

Sensing Through Glass: A Practice of Perception

Submitted for the Degree of
Doctor of Philosophy, School of Arts and Humanities

Royal College of Art

2025

Jinya Zhao

Word count: 38,517



© Jinya Zhao 2025 Doctor of Philosophy.

This thesis is copyright material and no quotation from it may be published without proper acknowledgement.

Abstract

This practice-based research repositions blown glass as a perceptual medium, one that operates not simply as an aesthetic object, but as a dynamic site in which sensation, space, and memory coalesce. Rather than treating glass as a surface for visual appreciation, this study explores how glass actively modulates perception, constructs fluctuating spatial experiences, and evokes embodied responses. Through iterative material experimentation, installations shaped by environmental and sensory conditions, audience interaction, and a series of site-responsive exhibitions and residencies, it proposes glass as a medium that shapes, rather than merely receives, sensory experience.

At the core of this research lies an enquiry into how perception is actively shaped through material interaction. How does blown glass mediate sensory conditions that dissolve the boundaries between seeing and touching, transparency and opacity, depth and surface? In what ways do colour, spatial layering, and fluctuating visibility evoke embodied sensations and remembered associations in viewers? How is audience perception influenced by the environmental, spatial, and cultural contexts in which glass is experienced? Rather than simply analysing visual forms, this study explores these questions by engaging directly with glass as a perceptual medium, investigating how sensory experience emerges through situated interaction between audience, object, and environment.

To articulate these encounters, the research develops four interwoven conceptual frameworks: synaesthetic touch, layerspace, colour, and site. These are treated not as fixed categories, but as contingent conditions that shape and complicate the act of perceiving. Synaesthetic touch draws on Merleau-Ponty's phenomenology to explore how visual experience in glass can become tactile, even affective. Layerspace, informed by Deleuze's theory of affect and movement, reflects the shifting spatiality produced by optical layering

and depth modulation. Colour is framed as a sensory agent, unstable, immersive, and memory laden, whose perception is shaped by environmental light, transparency, and spatial context. Site extends beyond physical location, encompassing cultural, architectural, and atmospheric conditions that alter the reception of glass artworks. Together, these frameworks offer a model for understanding perception as situated, participatory, and continuously unfolding.

By activating techniques such as layering, sandblasting, transparency modulation, and chromatic distortion, the practice constructs glass-based environments that invite perceptual navigation. These works resist fixed interpretation: instead, they generate shifting perceptual fields in which the viewer becomes implicated as a sensing subject.

Ultimately, this research reframes glass not as a static material, but as a perceptual event, an embodied, spatial, and affective situation. It contributes new methodologies for thinking through material agency, colour perception, and sensory aesthetics in contemporary art, offering a model of research in which perception is not simply observed, but produced. In doing so, it positions glass as both medium and method: not something to be seen, but something through which we sense, dwell, and attend.

Declaration

This thesis represents partial submission for the degree of Doctor of Philosophy at the Royal College of Art. I confirm that the work presented here is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

Signature: 

Date: 8 September 2025

Table of Contents

| | |
|---|-----------|
| Abstract..... | 2 |
| Declaration..... | 4 |
| Table of Contents | 5 |
| List of Illustrations..... | 10 |
| List of Tables..... | 19 |
| Acknowledgements | 20 |
| 1. Introduction..... | 21 |
| 1.1. Research Overview | 21 |
| 1.2. Research Context and Background | 23 |
| 1.2.1. Glass as a Medium for Sensory and Perceptual Exploration | 23 |
| 1.2.2. Positioning my Artistic Practice | 24 |
| 1.2.3. Identifying Gaps in Existing Knowledge | 25 |
| 1.3. Research Questions and Aims | 26 |
| 1.4. Methodology and Approach | 27 |
| 1.4.1. Material Experimentation..... | 28 |
| 1.4.2. Theoretical Frameworks..... | 28 |

| | | |
|-------------|--|-----------|
| 1.4.3. | Audience Interaction and Workshops..... | 31 |
| 1.5. | Contribution to the Advancement of Knowledge | 32 |
| 2. | Colour Perception | 34 |
| 2.1. | Introduction | 34 |
| 2.2. | The Conditions of Colour | 35 |
| 2.2.1. | Light | 36 |
| 2.2.2. | Object | 43 |
| 2.2.3. | Variations of Perception (Viewer)..... | 45 |
| 2.3. | Colour as Visual Phenomena | 47 |
| 2.3.1. | Colour Layers, Mixing Interactions and Gradations | 48 |
| 2.3.2. | Watercolour | 51 |
| 2.3.3. | Colour Depth | 57 |
| 2.3.4. | Colour Association and Memory..... | 59 |
| 2.3.5. | Colour Experimentation | 62 |
| 2.4. | Sensory Perception and Synaesthetic Touch in Glass Practice | 69 |
| 2.4.1. | Synaesthetic Touch: Seeing as Feeling | 69 |
| 2.4.2. | Theoretical Grounding: From Synaesthesia to Sensorial Attention | 71 |
| 2.5. | Conclusion | 73 |
| 3. | Layerspace | 76 |
| 3.1. | Introduction | 76 |
| 3.1.1. | Theoretical Framing | 77 |
| 3.1.2. | Layerspace..... | 79 |
| 3.2. | Mental Layers | 80 |
| 3.2.1. | Emotional Depth | 83 |
| 3.3. | Physical Layers | 86 |
| 3.3.1. | Material Strategies: Subtraction and Addition | 86 |
| 3.3.2. | Light and Layering: Spatial Thresholds | 89 |

| | | |
|-------------|---|------------|
| 3.3.3. | Spatial Experience and Perceptual Instability | 93 |
| 3.4. | Workshop | 96 |
| 3.4.1. | Workshop 1: Colour, Memory, and Landscape | 97 |
| 3.4.2. | Experimentation: Developing Layerspace through Material Research..... | 100 |
| 3.4.3. | The Creative Work | 106 |
| 4. | Glass and Sensation | 108 |
| 4.1. | Introduction | 108 |
| 4.2. | Glassblowing: From Craft to Sensory Medium..... | 109 |
| 4.2.1. | Glass and Light..... | 111 |
| 4.2.2. | Glass and Smell..... | 114 |
| 4.3. | Sensory Connection | 115 |
| 4.4. | Glass and Memory..... | 118 |
| 4.5. | Glass and Perception..... | 120 |
| 4.6. | Workshop 2: Scent and Visual Representation..... | 124 |
| 4.7. | Creative Artwork..... | 127 |
| 4.7.1. | New Creations | 130 |
| 4.8. | Conclusion | 134 |
| 5. | Site as Research Method | 137 |
| 5.1. | Theoretical Framework: Situating Site through Practice | 137 |
| 5.1.1. | Site as Active Participant..... | 138 |
| 5.1.2. | Site as a Continuum..... | 142 |
| 5.2. | Glassblowing Practice and Site | 143 |
| 5.2.1. | Residencies: Expanding Practice Through Immersive Contexts | 144 |
| 5.2.2. | En Plein Air: Glassblowing Beyond Studio Boundaries | 146 |
| 5.2.3. | The Jingdezhen Studio: A Site of Continuity and Innovation..... | 148 |
| 5.3. | Methodological Implications of Site-Based Practice | 150 |
| 5.3.1. | Site as Catalyst for Research Questions | 151 |

| | | |
|---|--|------------|
| 5.3.2. | Theoretical Integration | 154 |
| 5.3.3. | Reflection on Practice | 158 |
| 5.4. | The Research Exhibition..... | 160 |
| 5.4.1. | The Chinese University of Hong Kong, Shenzhen: Testing the Framework | 161 |
| 5.4.2. | Royal College of Art: Forthcoming Viva Exhibition | 172 |
| 5.5. | Conclusion | 173 |
| 6. | Conclusion | 176 |
| 6.1. | Reframing the Research Scope..... | 176 |
| 6.2. | Key Findings and Contributions..... | 177 |
| 6.3. | Methodological Reflections and Challenges..... | 179 |
| 6.4. | Visual Trajectories of the Research..... | 182 |
| 6.5. | Future Research Directions | 184 |
| 6.6. | Final Reflections | 185 |
| Appendices..... | | 187 |
| Appendix A: Experimentation..... | | 187 |
| Experiment 1: Taoxichuan Glass Studio, Jingdezhen, China (2022) | | 189 |
| Experiment 2: Ceramics and Glass workshop, Royal College of Art, London, UK (2023)..... | | 199 |
| Experiment 3: Exploring Colour Perception Under Changing Light Conditions (2023)..... | | 206 |
| Experiment 4: Pilchuck Glass School, United States (2023) | | 209 |
| Appendix B: Workshop..... | | 212 |
| Workshop 1: Glass Art Society (GAS) Conference..... | | 213 |
| Workshop 2: Pump House Gallery | | 215 |
| Workshop 3: CUHKSZ Research Workshop Series: Perception as Experiment..... | | 218 |
| Appendix C: Exhibition | | 232 |
| Exhibition 1: ‘Nebulosity Walk in Thy Memory’, Jinya Zhao Glass Art Exhibition | | 233 |
| Exhibition 2: ‘Strange Friends’: Group Exhibition | | 239 |
| Exhibition 3: ‘Sattvic Beings’, Chen Lizhu & Zhao Jinya Duo Exhibition | | 243 |

| | |
|---|------------|
| Exhibition 4: ‘Colour Made Manifest’, Material Engagements Research Cluster (MERC) exhibition | 249 |
| Exhibition 5: ‘Fluid Threads’, two-person exhibition of Ptolemy Mann and Jinya Zhao..... | 254 |
| Exhibition 6: ‘Before the Feeling Forms’, A Practice-Based Research Exhibition by ZHAO Jinya | 260 |
| Exhibition 7: ‘EN ROUTE II’: Group Exhibition | 280 |
| Bibliography | 285 |

List of Illustrations

Figure 1. Installation view of Sattvic Beings, 1979 Gallery, Shenzhen (2023–24). Blown glass forms exhibited in a naturally lit space, encouraging audience engagement with shifting chromatic effects throughout the day. Natural light served not merely as illumination but as a co-producing agent of perception. Photo Credit: 1979 Gallery.37

Figure 2. Exhibition view of ‘A Dream Dreamt in a Dreaming World is not Really a Dream...’, Roni Horn (2023), He Art Museum (HEM), China. From right to left: This is Me, This is You (1997–2000), 96 photochromatic prints, including stand and frame, 31.8 × 26 cm each; Opposites of White (2006/2018), solid cast black and clear glass with as-cast surfaces on all sides (fire-polished top), two pieces, 50.8 (H) × 142.24 (D) cm each. © Roni Horn. Courtesy of the artist and Hauser & Wirth. Photo by JJYPHOTO. © He Art Museum. The installation employs natural lighting to emphasize shifting appearances as sunlight and shadows interact with the sculptures.....39

Figure 3. Jinya Zhao, Whispering through the Echoes of Ancient Dreams, 2024, blown glass, 49 × 30 × 30 cm. **Left:** Studio documentation under controlled LED lighting. Photo Credit: He Junjie. **Right:** Installation view at Taste Contemporary during the exhibition ‘Fluid Threads’, a two-person show featuring work by Ptolemy Mann and Jinya Zhao. The exhibition lighting significantly altered the work’s chromatic and spatial presence. Photo Credit: Ruth Ward. (For further exhibition information, see Appendix C.5.).....41

Figure 4. James Turrell, Amrta, 2011. Installation view from the Ganzfeld series. Photo Credit: Florian Holzherr.42

Figure 5. Jinya Zhao, *Sunset Under Open Cloud*, 2022. Blown glass, 30 × 30 × 49 cm. This work explores how glass enables dynamic shifts in colour perception. Photo Credit: He Junjie.44

Figure 6. ‘*Sattvic Beings*’, 1979 Gallery, Shenzhen, 2023. Exhibition view in evening gallery lighting. Images illustrate how perceptual experience of colour in blown glass varies across time and illumination. Photo Credit: He Junjie. (For more details, see Appendix C.3.)46

Figure 7. *The Illusion of Distance*. Artists use cooler colours with greys to create atmospheric perspective and suggest depth. In this example, the foreground colours are more saturated than those in the background, demonstrating how colour gradation enhances spatial effects. (Edith Anderson Feisner and Ron Reed, *Color Studies*, 3rd ed. (Fairchild Books, 2013), 79.)49

Figure 8. Jinya Zhao, *Tracing the Shadows of Time* (2022). Blown glass, 49 × 30 × 30 cm. Layered gradients and curved volume mediate chromatic variability. Photo Credit: He Junjie.50

Figure 9. Jinya Zhao, *Detail of Early Spring Movement*, 2022. Blown glass. This work explores how translucent, sandblasted blown glass can generate layered chromatic effects comparable to watercolour washes. As light passes through the curved matte surface, hues blend, dissolve, and reappear depending on spatial and temporal conditions. The softened edges and visual veiling reflect the shifting perceptual conditions shared by glass and watercolour. Photo Credit: He Junjie.52

Figure 10. Jinya Zhao, *Algae in the Air We Breathe* (2023). Watercolour on paper. This painting served as the base subject for a photographic experiment analysing the chromatic variability of a single artwork under diverse lighting conditions. Photo Credit: Jinya Zhao. (For a full visual sequence and image metadata, see Appendix A.3.)54

Figure 11. Exhibition view of ‘*Nebulosity Walk in Thy Memory*’, Jinya Zhao Glass Art Exhibition, 2023, Liuli China Museum. watercolour and glass artworks presented side by side to explore shared chromatic behaviour under changing light. From left to right: *Lotus Shadow in Water*, *Mixture Memory*, *Out and Beyond the Window*, *Bush Walk*, *A Figment of the*

| | |
|---|----|
| Imagination, Nature Tears, Phantom. Watercolour, 39 × 30 × 3 cm each (framed), 2023. Photo Credit: Luo Chenqi. | 56 |
| Figure 12. Blown glass sculpture on the left: Mixture Memory, 2023. Exhibition view of 'Nebulosity Walk in Thy Memory', Jinya Zhao Glass Art Exhibition, 2023, Liuli China Museum. Watercolour and glass artworks presented side by side to explore shared chromatic behaviour under changing light. Photo Credit: He Junjie. (More exhibition information, see Appendix C.1.)..... | 57 |
| Figure 13. Antony Gormley, Blind Light, 2007. Fluorescent light, water, ultrasonic humidifiers, toughened low iron glass, aluminium. 320 × 978.5 × 856.5 cm. Hayward Gallery, London. Photo Credit: Stephen White. | 59 |
| Figure 14. Example of layering variations affecting depth perception in glass. Reference Numbers: 1–5, 1–6..... | 62 |
| Figure 15. Colour gradation testing demonstrating light-to-dark transitions and their impact on form perception. Reference Number: 1–7, 1–8. | 63 |
| Figure 16. Illustration of how light refraction influences colour perception in transparent layers. Reference Number: 2–3..... | 63 |
| Figure 17. From left to right: Jinya Zhao, The Summer – Colour Perception Study I, 57 × 25.5 × 25.5 cm, 2024; The Sea – Colour Perception Study II, 55 × 27 × 27 cm, 2024. Photo Credit: Anyan Wu Studio. | 65 |
| Figure 18. Jinya Zhao, The Innate Resonance of Bones, 51 × 31 × 31 cm, 2024. Photo Credit: He Junjie. | 66 |
| Figure 19. Jinya Zhao, A Breathtaking yet Deeply Enigmatic Alien Planet. From left to right: 14.5 × 16.5 × 12 cm, 27 × 13 × 10 cm, 7.5 × 9.5 × 6 cm, 21 × 12.5 × 9 cm, 4.6 × 7 × 6.5 cm, 2024. Photo Credit: He Junjie..... | 67 |
| Figure 20. Jinya Zhao, A Wedding on That Enigmatic Planet, 52 × 31 × 31 cm, 2024. Photo Credit: He Junjie. | 68 |

Figure 21. Jinya Zhao, *Tracing the Shadows of Time*, 2024. Blown and layered glass, 37 × 29 × 29 cm. This work explores the perceptual delay and emotional ambiguity central to the concept of mental layering. Internal silhouettes and chromatic strata remain partially obscured until the viewer shifts position, at which point veiled forms gradually emerge. The interplay between reflection, transparency, and opacity invites relational looking over time, producing a spatial field that is not optically resolved but perceptually assembled. Photo Credit: He Junjie.82

Figure 22. James Turrell, *Skyspace*, 2013. The University of Texas at Austin, USA. This installation transforms natural light into a perceptual event. As viewers shift position, the sky appears alternately flat or spatially deep, echoing the delay and instability central to mental layering in layerspace. Photo Credit: Florian Holzherr.83

Figure 23. Mark Rothko, *No. 14*, 1960. San Francisco Museum of Modern Art, Helen Crocker Russell Fund purchase. © 1998 Kate Rothko Prizel & Christopher Rothko – Adagp, Paris, 2023. © Fondation Louis Vuitton / Marc Damage.85

Figure 24. Barbara Hepworth, *Pierced Hemisphere*, 1937. Sculpture in Hoptonwood stone on Portland stone base, 435 × 380 × 380 mm. Accession no. T11785. Tate Collection, London. © Barbara Hepworth, all rights reserved / DACS 2025.88

Figure 25. Jinya Zhao, *Sunset Under Open Cloud*, 2023. Blown and coldworked glass, 49 × 30 × 30 cm. Left: Exhibited in ‘In Residence III’ at Cromwell Place, London, UK. Installed next to a window, where direct sunlight modulated the visibility of internal colour gradients and refracted shadows throughout the day. Photo Credit: Jinya Zhao.....89

Figure 26. James Turrell, *Aten Reign*, 2013. Photo Credit: David Heald © Solomon R. Guggenheim Foundation, New York.90

Figure 27. Jinya Zhao, *The Summer – Colour Perception Study I*. 57 × 25.5 × 25.5 cm. Installation view at ‘Objects of Contemplation’, Hauser & Wirth. (2024). Photo Credit: Dave Watts and Make Hauser & Wirth.91

Figure 28. Jinya Zhao, Detailed Image of Artwork Mime, 2024. 50 × 30 × 30 cm. Layered surface contrast creates shifting optical thresholds. Photo Credit: Anyan Wu Studio.....92

Figure 29. Christian Marclay, Skeleton Door, 2023. Altered Wooden Door, 201.5 × 72 × 4 cm (79 5/16 × 28 3/8 × 1 9/16 in.).....93

Figure 30. Christian Marclay, Doors, 2022. Single-Channel Video Installation, Projection, Colour and Black & White, Continuous Loop.....93

Figure 31. Anthony McCall, You and I Horizontal, 2005. Installation view, Institut d’Art Contemporain, Villeurbanne, France, 2006. Photo Credit: Blaise Adilon.94

Figure 32. Detailed image demonstrating the varying qualities of glass with different colour thicknesses. This experiment tested how coloured layers modulate light transmission and affect perceived density. Thicker segments intensify chromatic saturation, while thinner regions permit translucency. Photo Credit: Jinya Zhao.95

Figure 33. Jinya Zhao Research Workshop at Berlin Glass, during The Glass Art Society (GAS) Conference 2024, Berlin. Photo Credit: Jinya Zhao.98

Figure 34. Outline drawing derived from the blown form, used for structure translation..... 102

Figure 35. Layer separation study using paper cutouts. Photo Credit: Jinya Zhao. 102

Figure 36. Jinya Zhao, Three Experiments on Layering. Exploring different fusion techniques to manipulate structure, light diffusion, and spatial depth. Photo Credit: Jinya Zhao..... 104

Figure 37. Jinya Zhao, final works before framing. Photo Credit: Jinya Zhao. 107

Figure 38. Jinya Zhao glassblowing demonstration at Berlin Glas during the Glass Art Society (GAS) conference 2024, Berlin. Photo Credit: Andrew Yu..... 110

Figure 39. Christopher Wilmarth, Days on Blue, 1974–1977. Etched glass and steel, 84 × 210 × 60 in. (213.36 × 533.4 × 152.4 cm). The Doris and Donald Fisher Collection at the San Francisco Museum of Modern Art. © Estate of Christopher Wilmarth..... 112

Figure 40. Ernesto Neto, anthropodino, 2009. Polyamide tulle, handmade polyamide carpet, maple plywood, clove, black pepper, paprika, cumin, ginger, turmeric, sand, lavender, camomile, black gravel, river stones, rice, plastic balls, glass beads, polypropylene string, Styrofoam beads and polyurethane foam, 5852 × 3719 × 2103 cm. Installation view, Park Avenue Armory, New York, 2009. Photo Credit: James Ewing. 115

Figure 41. Carsten Höller, installation view of Atlas at Fondazione Prada, Milan, Italy. Photo Credit: Delfino Sisto Legnani and Marco Cappelletti. 122

Figure 42. Jinya Zhao, Where Thought Enters Space, 2025. Blown glass and metal, 27 × 126.5 × 44 cm. Installation view (suspended at a deliberately elevated position, wall-mounted), ‘Before the Feeling Forms: A Practice-Based Research Exhibition’, The Chinese University of Hong Kong, Shenzhen. The work visible on the wall is Where Thought Enters Space; other works from the exhibition are also shown. Photo Credit: He Junjie..... 123

Figure 43. Jinya Zhao research workshop at Pump House Gallery during ‘Colour Made Manifest’. Photo Credit: Jinya Zhao. 126

Figure 44. Installation view of exhibition: ‘Colour Made Manifest’, Pump House Gallery, London, 2024. Photo Credit: Jinya Zhao. 128

Figure 45. Illustrates the texture of glass powder, which exhibits dazzling reflections on its surface when exposed to intense natural sunlight, highlighting its unique optical properties. Installation view of exhibition ‘Colour Made Manifest’, Pump House Gallery, London, 2024. Photo Credit: Jinya Zhao. 129

Figure 46. Details of new works created upon returning to my studio in China, integrating and reflecting research findings. 2024. Photo Credit: He Junjie. 131

Figure 47. The Body, As Tension Manifest. 58 × 28 × 38 cm. 2025. A new work integrating and reflecting the findings of my research. Photo Credit: He Junjie. 134

Figure 48. What Holds, What Leans (2025), exhibition view at The Chinese University of Hong Kong, Shenzhen. Glass and frosted stainless steel, 120 × 60 × 35 cm. Photo Credit: He Junjie. 135

Figure 49. Sites of inspiration and production: Pilchuck Glass School, the cabin I lived in during the residency, surrounded by the forest environment. 2023. Photo Credit: Jinya Zhao. 140

Figure 50. Site of Inspiration: Nujiang. 2023. Photo Credit: He Junjie..... 141

Figure 51. Experimenting with glass powders at Pilchuck Glass School during the residency, 2023..... 145

Figure 52. Teamwork during the 2025 residency at Barrio Glassworks, California. Photo Credit: Jason Sulli. 146

Figure 53. Glassblowing (en) plein air by the Nujiang River in a natural environment. 2023. Photo Credit: He Junjie. 148

Figure 54. Site of production: Jingdezhen studio, situated within natural surroundings, 2025. Glassblowing in progress. Photo Credit: He Junjie. 149

Figure 55. Work produced in Nujiang, responding to diffused mountain light through thinning of glass walls. 2023. Photo Credit: Anyan Wu Studio. 152

Figure 56. Jinya Zhao. Erhai 18:37, 2022. Glass, 41 × 28.5 × 28.5 cm. Produced in Jingdezhen, China, at Yutian Reservoir. Photo Credit: He Junjie. 153

Figure 57. Experimental glasswork with organic forms, 2025. Produced during the artist residency at Barrio Glassworks, California. Photo Credit: Jason Sulli, on-site documentation. 153

Figure 58. Applying glass powders on blown glass, 2024. Process photograph showing textures and dynamic effects emerging through site-specific environment. Photo Credit: He Junjie. 157

Figure 59. Working in the Jingdezhen glassblowing studio, China. 2024. Local conditions shape the glass and its interaction with its surroundings. Photo Credit: He Junjie. 159

Figure 60. Installation view of workshop outcomes at the exhibition space TC101 SPACE, CUHKSZ, 2025. As integral components of the research process, these participatory artefacts fostered audience interaction and extended the exhibition’s dialogic field. Photo Credit: Jinya Zhao. 162

Figure 61. Natural Colour Perception workshop with kindergarten children, CUHKSZ, 2025. Engaging intuitive sensory responses to natural colours. Photo Credit: He Junjie. 164

Figure 62. Natural Colour Collection and Sculpture workshop with university participants, CUHKSZ, 2025. Investigating perceptual translation from colour to form. Photo Credit: He Junjie. 164

Figure 63. Introducing Perceptual Image Memory workshop, CUHKSZ, 2025. Interactive exercise exploring how linguistic prompts influence colour perception. Photo Credit: UAC@CUHKSZ. 165

Figure 64. Scent and the Memory of Colour session, CUHKSZ Exhibition, 2025. Viewers re-enter the exhibition space with olfactory cues, triggering memory recall and renewed sensory interpretation of the glass works. Photo Credit: UAC@CUHKSZ. 165

Figure 65. Site of Encounter: CUHKSZ. Installation view of Before the Feeling Forms: A Practice-Based Research Exhibition at TC101 SPACE, CUHKSZ, 2025. Photo Credit: He Junjie. 168

Figure 66. Site of Encounter: CUHKSZ. Installation view of ‘Before the Feeling Forms: A Practice-Based Research Exhibition’ at TC101 SPACE, CUHKSZ, 2025. The work shown on the far left is Erhai 18:37, 2022, glass, 41 × 28.5 × 28.5 cm. Photo Credit: He Junjie. 170

Figure 67. Audience response card, olfactory workshop, July 2025. The participant associated Erhai 18:37 with a sunset at West Lake, blending visual and olfactory memory. Original text in Chinese; English translation by the author. 170

Figure 68. Visitor drawing in exhibition notebook, CUHKSZ, July 2025. Produced by a child after viewing the exhibition. 171

Figure 69. Practice-based research cycle (Jinya Zhao, 2025). From inspiration and conceptual drawings, through scaled design and glassblowing, to exhibition and audience feedback, which in turn generates new inspiration. 180

Figure 70. Collection of works, Taoxichuan Glass Studio, 2022. Jingdezhen. Photo Credit: He Junjie. Early collection of works exploring symmetrical forms, colour transitions, and the layering of space. This body of work reflects the initial stage of the PhD, when perceptual experimentation was channelled through more formal structures. 182

Figure 71. Collection of works, Jinya Studio, 2024. Jingdezhen. Photo Credit: He Junjie. This collection reflects both the mid-stage explorations of organic forms, fluidity, and site-responsive strategies, and the later investigations of nuanced tonal variation articulated in colour theory as chromatic greys. 183

Figure 72. Collection of works, Jinya Studio, 2025. Jingdezhen. Photo Credit: He Junjie. This collection demonstrates bolder forms and more experimental use of colour, emphasising the relationship between the body and the works, and highlighting interaction as an integral part of the perceptual encounter. 183

Figure 73. Collection of works, Before the Feeling Forms, CUHKSZ, 2025. Shenzhen. Photo Credit: He Junjie. This collection represents the most recent stage of the PhD, combining glass with metal elements and exploring the interplay of space and colour. The works synthesise earlier research concerns into an exhibition format that emphasises perceptual encounter and spatial resonance..... 184

List of Tables

| | |
|---|-----|
| Table 1. Summary of experimental results for glass layering techniques, comparing spatial depth, perceptual delay, light modulation and structural flexibility..... | 104 |
| Table 2. Experimental conditions for the colour perception study under variable lighting contexts. | 206 |
| Table 3. Parameters of Firing Test 1, 9 October 2023. | 210 |
| Table 4. Parameters of Firing Test 2, 10 October 2023. | 211 |
| Table 5. Summary of Responses from the ‘Introducing Perceptual Image Memory’ workshop (prepared by the author)..... | 224 |
| Table 6. Summary of responses to ‘Before the Feeling Forms’ scent card exercise (prepared by the author). | 228 |
| Table 7. High-frequency words observed in audience responses, with Chinese originals, English translations, illustrative quotations, and research relevance..... | 267 |
| Table 8. Visitor book entries high-frequency words, with Chinese originals, English translations, illustrative quotations, and research relevance..... | 274 |

Acknowledgements

This journey of research and creation would not have been possible without the support and guidance of many individuals and institutions, and I am deeply grateful to all who have contributed to this process.

I would like to thank my supervisors, Steve Brown and Heike Brachlow, for their guidance, encouragement, and insight throughout this research. Their mentorship has been invaluable in helping me navigate challenges and extend the boundaries of my artistic and intellectual practice.

I am also grateful to the institutions, galleries, and residencies that have supported me over the years. They have allowed me to immerse myself in diverse materials, environments, and cultures, enriching my artistic practice and shaping the core of this research. Their belief in my work has meant a great deal, and I am thankful for their trust and encouragement. To my colleagues, collaborators, collectors, and friends, thank you for your ongoing support and encouragement. Your companionship and shared enthusiasm for exploring the boundaries of glass as a medium have been a constant source of inspiration.

Special thanks go to Andrew and my family for their constant love, understanding, and support. Your faith in me has been the bedrock upon which this thesis rests, and I am eternally grateful for your presence in my life.

Finally, I wish to acknowledge my own perseverance throughout this journey. The past four years have not always been easy, but each challenge has been a step toward personal growth. This process has shaped not just my research, but also who I am today.

1. Introduction

1.1. Research Overview

In contemporary glass art, discussions surrounding materiality have often emphasised technical mastery and aesthetic form, yet the sensory, perceptual, and spatial dimensions of glass remain underexplored. Some scholarship, such as Vanderstukken's *Glass: Virtual, Real*, acknowledges the relevance of these experiential aspects, although they continue to receive comparatively limited critical attention.¹ Glass, as an inherently paradoxical material – fragile yet durable, transparent yet solid – offers a compelling site for investigating how perception and sensation are shaped through interaction. The ability of glass to manipulate light, space, and surface enables it to function not just as a physical medium, but also as an active participant in sensory and spatial engagement. This thesis investigates specifically how such sensory and perceptual interactions are articulated through my practice-based approach.

This research examines how blown glass fosters multisensory encounters that evoke emotional and perceptual resonance. By developing the conceptual frameworks of 'colour', 'layerspace', and 'site', this study explores the ways in which material manipulation, spatial configuration, and environmental context shape viewer perception. Through material experimentation, theoretical inquiry, and audience participation, the thesis contributes to emerging dialogues in phenomenology, sensory studies, and material engagement. A practice-based research methodology structured around iterative making, reflective analysis, and participatory workshops, underpins the investigation throughout.

¹ Koen Vanderstukken, "Introduction", in *Glass: Virtual, Real* (Black Dog Publishing, 2016), Introduction. Vanderstukken's opening chapter situates contemporary glass within wider discourses on materiality, with reference to, but not extensive development of, its sensory, perceptual, and spatial dimensions.

The thesis engages primarily with Maurice Merleau-Ponty's phenomenology of perception, along with Gilles Deleuze's theory of sensation and Edward Casey's phenomenology of place. These theoretical frameworks recur across the chapters of the thesis, collectively supporting the exploration of perceptual ambiguity, embodied movement, and spatial affect. The chapters are structured progressively. They begin with this Introduction, which outlines the conceptual and methodological basis, and continue with core chapters focused on colour perception, layerspace, glass and sensation, and site, each combining theory, case studies, and practice; they culminate in a discussion of new works, which synthesise earlier insights through materially embodied outcomes. The thesis concludes by reflecting on the findings and their contribution to knowledge, while outlining possible future trajectories for glass-based research and practice.

Key Conceptual Frameworks

This research is structured around three interconnected conceptual models:

- **Synaesthetic Touch:** Examines how the visual properties of glass evoke tactile and embodied responses, extending beyond direct physical interaction. Rooted in Merleau-Ponty's theory of embodied perception, which emphasises the interrelation of vision and touch in constituting bodily experience,² this framework suggests that vision itself can take on haptic qualities. Drawing also on Deleuze's notion of sensation as a bodily encounter, the study investigates how light, texture, transparency, and depth in blown glass blur the boundaries between seeing and touching.
- **Layerspace:** Explores how opacity, transparency, and reflection construct spatial and material depth in glass. By analysing layering techniques, optical distortion, and spatial positioning, this research considers how glass functions as an immersive medium generating fluctuating perceptual field, as demonstrated through my practical explorations of glass layering.
- **Site:** Extends beyond physical location to examine the cultural, environmental, and spatial factors shaping the viewer's engagement with glass. Drawing on Edward

² Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Colin Smith (1945; reis. Routledge, 2005), 94–130.

Casey's phenomenology of place,³ this research explores how the viewer's response to glass is shaped by its spatial setting, architecture, and surrounding environmental conditions. My practice in different locations, such as Pilchuck and Nujiang, specifically exemplifies these dynamics.

By integrating these three frameworks, this practice-based study positions glass as a dynamic and site-responsive medium, moving beyond static sculptural interpretations to actively shape sensory and spatial perception.

1.2. Research Context and Background

1.2.1. Glass as a Medium for Sensory and Perceptual Exploration

Historically, research on glass has been situated within craft, design, and industrial production,⁴ with a predominant focus on technical mastery, functionality, and aesthetics.⁵ While glass is recognized for its optical, structural, and chemical properties, its conceptual and affective dimensions have only recently gained attention in contemporary art discourse. The rise of the Studio Glass movement in the mid-twentieth century marked a shift from glass as a functional and decorative material to glass as a medium for personal and artistic expression.⁶ While artists have explored fluidity, transparency, and spatial presence, discussions often remain centred on the form, process, and surface aesthetics of glass, rather than its multisensory and perceptual capacities.⁷

Glass is distinct from traditional sculptural materials such as stone, wood, and metal, due to its ability to manipulate light, obscure or reveal form, and engage with space. It functions as a

³ Edward S. Casey, *The Fate of Place: A Philosophical History* (University of California Press, 1997), 102.

⁴ David Klein and William Lloyd, *The History of Glass* (Little, Brown, 2000).

⁵ Hugh Tait, *Five Thousand Years of Glass* (University of Pennsylvania Press, 2004).

⁶ Jane Adlin, *Studio Glass in The Metropolitan Museum of Art* (The Metropolitan Museum of Art, 1996).

⁷ Vanderstukken, "Introduction", in *Glass: Virtual, Real*. Vanderstukken notes that critical discourse in glass often privileges considerations of form, process, and surface, with comparatively less sustained attention to its multisensory and perceptual dimensions.

liminal medium,⁸ shifting between transparency and opacity, fragility and durability, visibility and invisibility. As demonstrated through my installations and immersive works, these sensory activations encourage viewers to engage beyond visual perception, activating haptic awareness, spatial movement,⁹ and, crucially for my own practice, evoking memory.

Despite these characteristics, critical discourse on how glass actively shapes the viewer's experience remains limited. While contemporary artists have increasingly incorporated approaches involving installation and immersive practices, research into how viewers engage with glass through sensory and phenomenological perspectives remains underdeveloped.¹⁰ Critical discourse on glass as an active shaper of the sensory experience of an audience remains notably underdeveloped, creating a gap in research that this thesis addresses directly.

This research seeks to broaden the discussion of glass as a sensory agent, emphasising its role in evoking perception, memory, and embodied interaction. By integrating phenomenological enquiry, material experimentation, and viewer interaction, this study repositions glass as a dynamic mediator, thereby offering a new perspective on the relationship between materiality, spatiality, and multisensory perception.

1.2.2. Positioning my Artistic Practice

As an artist and researcher, my practice is rooted in glass as a medium for both sensory exploration and conceptual enquiry. Over the past decade, my work in blown glass sculpture has continuously challenged traditional boundaries of form and material perception. Initially focused on transparency, light, and spatial depth, my research has evolved into a deeper investigation of material layering, spatial positioning, and sensory interaction.

Through international residencies, including those at Nujiang, Pilchuck Glass School, Barrio Glassworks, and my studio practice in Jingdezhen, I have developed an awareness of how

⁸ Merleau-Ponty, *Phenomenology of Perception*, 98–105. Merleau-Ponty describes perception as an active negotiation between object, subject, and space, where boundaries remain fluid. This perspective aligns with the way glass operates as a liminal material, constantly shifting between states of transparency, opacity, and spatial interaction.

⁹ Tim Ingold, *Making: Anthropology, Archaeology, Art and Architecture* (Routledge, 2013), 94–101.

¹⁰ Vanderstukken, *Glass: Virtual, Real*.

environmental contexts, material resources, and cultural narratives influence both creation and reception. These experiences have reinforced my belief that materials are not passive instruments but active collaborators in artistic meaning-making.

As Glenn Adamson discusses in *Fewer Better Things*, material intelligence is cultivated through an ongoing dialogue between maker and material, where objects hold agency in shaping creative decisions.¹¹ This perspective has become integral to my site-responsive practice, leading to the development of evolving sites of practice, where material engagement is shaped by spatial and cultural contexts.

Building on this perspective, the interplay between materiality and environment in my residencies and long-term practice in Jingdezhen has led me to establish evolving sites of practice, where material engagement is shaped by spatial and cultural contexts. This trajectory culminates in the development of a major workshop at The Chinese University of Hong Kong, Shenzhen (CUHKSZ) (2025). Conceived as a research-led experiment, the workshop will provide a site for viewer interaction with glass installations, investigating how transparency, layering, and spatial conditions influence perception. The findings will directly inform the study's evaluation of material agency and site-responsive methodologies. Taken together, these workshops and residencies provide the empirical foundation for examining the dynamic interactions between material, environment, and audience.

1.2.3. Identifying Gaps in Existing Knowledge

This study addresses the following critical gaps:

- How can blown glass facilitate embodied, multisensory encounters for an audience?
- In what ways do spatial and environmental contexts ('site') influence the perception of glass works?

¹¹ Glenn Adamson, *Fewer Better Things: The Hidden Wisdom of Objects* (Bloomsbury Publishing, 2018), 112–130.

- How do techniques of layering, opacity, and varied material composition influence memory and sensation in audience interaction?

By integrating practice-led experimentation, audience engagement, and cross-disciplinary theoretical frameworks, this research offers a new methodology for understanding glass beyond its materiality, positioning it as a unique sensory medium and significantly extending current understandings of material perception in contemporary art practice.

1.3. Research Questions and Aims

Research Questions

- How does blown glass mediate and enhance audience perception and sensory engagement?
- Which theoretical frameworks and methodological tools best analyse perceptual phenomena within glass practice?
- How are colour, surface texture, and transparency experienced by viewers, specifically in relation to memory and embodied sensation?
- How does site, including spatial, cultural, and environmental context, shape an audience's interpretation and sensory experience of glass artworks?

Research Aims

- To establish 'synaesthetic touch' as a novel conceptual framework for understanding how glass art transcends visual engagement, fostering embodied, multisensory interactions.
- To develop 'layerspace' as a theoretical model to examine how transparency, layering, and spatial positioning create emotional resonance and perceptual complexity.
- To reconceptualise 'site' as a dynamic agent in artistic creation, focusing on its significant role in shaping both material perception and audience interaction.

- To implement audience engagement workshops as a methodological strategy, employing observational studies, structured interviews, and participatory approaches to systematically document and evaluate phenomenological responses to glass art across diverse contexts.

Through these targeted questions and aims, this research provides new understandings of glass as a multi-dimensional sensory medium situated at the intersection of materiality, perception, and embodied experience.

1.4. Methodology and Approach

This research adopts a practice-based methodology, positioning making as both a creative and an analytical act, integrating material experimentation, audience engagement, and theoretical enquiry to reveal the sensory dimensions of blown glass.

In contrast to traditional theoretical studies, this practice-based research is distinguished by its reliance on direct empirical engagement, producing embodied insights into the sensory interactions of glass. The dynamic nature of glass as a fluid, light-responsive, and spatially interactive medium necessitates an approach that allows for direct engagement with materials, spaces, and audiences.

The methodological approach is structured around three interrelated components:

- **Material Experimentation:** Investigating how transparency, layering, and spatial composition actively shape perceptual and sensory experiences.
- **Theoretical Enquiry:** Employing phenomenology, affect theory, and theories of material agency to contextualise glass as a perceptually interactive medium.
- **Audience Interaction and Workshops:** Using structured empirical methods to evaluate viewer responses and interactions with glass artworks in diverse contexts.

1.4.1. Material Experimentation

The research employs a series of material investigations designed explicitly to manipulate the sensory and perceptual qualities of glass, thus directly influencing the experience of, and engagement with, an audience. These experiments focus on:

- Exploring how opacity, translucency, and layering dynamically influence perceptual depth and sensory engagement.
- Testing how glass powder application, sandblasting, and surface manipulation extend visual perception into tactile or haptic realms.
- Evaluating how spatial composition, including context, placement, and environmental conditions, mediates viewer interaction and interpretive responses.

These material investigations serve as a testing ground for theoretical concepts, allowing for an iterative cycle of making, reflecting, and refining to shape insights into perception, material agency, and spatial embodiment that are informed directly by theoretical models.

1.4.2. Theoretical Frameworks

This study draws on theories of phenomenology, sense, materiality, and colour by interdisciplinary scholars, forming an integrated theoretical-practical framework that explores the perceptual, spatial, and affective dimensions of glass art at a deep level. By engaging these theoretical perspectives with experimental methodologies in glass practice, the research offers a multidimensional approach to sensory perception, material agency, and spatial engagement.

Maurice Merleau-Ponty: Embodied Perception and Materiality

Maurice Merleau-Ponty's phenomenology of perception (2012) provides a foundational framework for understanding embodied experiences, guiding the practical exploration of materiality, spatiality, and movement within glass art. Merleau-Ponty's theory challenges the

Cartesian separation of mind and body, proposing that perception is inherently embodied and shaped by sensory interaction with the environment.

In relation to glass practice, this theory directly informs the concept of ‘synaesthetic touch’, demonstrating how vision can acquire tactile qualities, thus enabling audiences to experience materiality through perceptual and spatial interaction without direct physical touch. This insight is particularly relevant to the ability of glass to manipulate transparency, opacity, and depth, as these properties create an interplay of perceptual ambiguity and embodied spatial navigation.

Merleau-Ponty’s phenomenology of perception, particularly his notions of embodied perception and sensory materiality, is introduced here and will also be explored extensively in the chapters titled ‘Layerspace’ and ‘Glass and Sensation’, providing conceptual continuity throughout the thesis.

Gilles Deleuze: Sensation, Affect, and Material Encounters

Gilles Deleuze’s philosophy of sensation (2003) supports the investigation of affective material encounters, leading to the proposition of sensation as an active force that glass artworks generate, thus shaping audience perception through material presence and spatial intensity. Deleuze emphasises that sensation is not passive reception but an active force that generates intensity and transformation. His work argues that materials themselves have affective capacities, influencing perception not just through form and structure, but also through the forces and sensations they produce.

This framework directly informs my practical exploration of layerspace in blown glass, particularly through experiments with translucency and optical layering, enhancing perceptual fluidity and immersive experiences. Deleuze’s theories support an analysis of how the visual and textural variations of glass produce sensory engagement that is immersive, unpredictable, and dynamic. The research applies Deleuzian concepts to examine how the materiality of glass exceeds fixed meaning, instead operating as a fluid sensory medium that reshapes perception and experience.

Edward Casey: Place, Memory, and Environmental Perception

The framework established by Edward Casey is integral for this research: it provides analytical tools to evaluate how specific environmental contexts and cultural memories influence audience interactions with glass artworks in situ. Casey argues that place is not merely a backdrop for experience but an active force that shapes memory, identity, and engagement with materials. His work suggests that perception is site responsive, meaning that an artwork's effect varies depending on its spatial, historical, and cultural context.

This framework underpins the study's analysis of site-specificity in glass art, particularly in the development of the concept of 'site' within the research. By adopting Casey's place-based phenomenology, this study innovatively examines glass as actively responsive to specific spatial and cultural contexts, significantly shaping audience perception and interpretive experience.

Colour Theory: Contingency, Context, and Perceptual Interaction

Josef Albers' theory significantly influences this research, providing a basis for understanding the contingent interactions of colour in glass, as explored through my practical tests and installations. In *Interaction of Color*, Albers demonstrates that colour is never perceived in isolation but is instead shaped by its surrounding hues, lighting conditions, and spatial context.

This concept is particularly relevant to glass practice, where transparency, reflection, and layering influence how colours interact and shift depending on environmental conditions. In practice, Albers' insights inform my experiments with glass transparency, reflections, and layering, demonstrating how these properties dynamically alter colour interactions and perceptual experiences.

Synthesising these Frameworks in Glass Practice

Synthesising the theories of Merleau-Ponty, Deleuze, Casey, and Albers, this research proposes an original methodology that rigorously integrates embodied perception, sensory affect, spatial responsiveness, and colour contingency within glass practice. These theoretical foundations guide the study's material experimentation and methods of engaging with audiences, ensuring that the research investigates glass not only as a sculptural form but also as a perceptual and interactive experience where colour is contingent and context dependent.

1.4.3. Audience Interaction and Workshops

Methods of audience interaction form an empirical foundation for this research, systematically capturing the experiences and perceptions of viewers through structured participatory and qualitative approaches. Participatory methodologies in art and sensory research, as discussed by Claire Bishop¹² and Sarah Pink,¹³ emphasise the importance of engaging audiences beyond passive viewing, allowing for embodied and sensory encounters with materials. This study integrates these approaches to explore how viewers' perception of glass is shaped by spatial, tactile, and chromatic experiences.

To achieve this, the research employs:

- **Observational studies:** a systematic documentation of physical interactions and emotional responses to artworks across various sites.
- **Qualitative feedback:** the structured collecting of questionnaires, surveys, and reflections to rigorously assess perceptual and emotional responses.
- **Interaction sessions:** combining structured guidance with unstructured explorations to investigate how material and spatial properties actively shape audience perception.

¹² Claire Bishop, *Artificial Hells: Participatory Art and the Politics of Spectatorship* (Verso, 2012), 10–45.

¹³ Sarah Pink, *Doing Sensory Ethnography* (Sage, 2015), 22–38.

These combined methods facilitate an iterative research cycle of practical making, audience testing, analytical reflection, and subsequent refinement, ensuring a robust methodological approach to sensory inquiry.

1.5. Contribution to the Advancement of Knowledge

This research makes several significant contributions to contemporary glass practice and sensory studies by demonstrating how glass functions as a perceptual, spatial, and interactive medium. This thesis significantly advances contemporary glass practice and sensory research, demonstrating through rigorous practice-led enquiry how glass actively shapes multi-dimensional perceptual experiences.

Key Contributions:

- Introducing ‘synaesthetic touch’ as a novel conceptual tool, the research challenges traditional ocularcentric perceptions of glass, highlighting how optical, textural, and spatial qualities produce embodied and tactile sensory engagement.
- By introducing ‘layerspace’ as an original analytical framework, the research uniquely demonstrates how spatial depth, optical layering, and transparency in blown glass actively construct perceptually immersive environments, significantly affecting its sensory engagement with audiences.
- By expanding the concept of ‘site’ beyond mere physical location to encompass environmental, cultural, and spatial influences, the research offers innovative insights into site-responsive practices, revealing how diverse contexts shape the emotional and perceptual interpretations of glass artworks by audiences in profound ways.
- Integrating phenomenological theory, sensory aesthetics, and empirical audience engagement methods, this research innovatively bridges theory and practice, offering novel methodologies to investigate sensory and spatial perception, affective resonance, embodiment, and memory within glass art.

Beyond contemporary glass art, this research has broader interdisciplinary applications:

- In museum and exhibition design, these findings inform strategies for using materials and spatial arrangements to enhance visitor engagement, sensory interaction, and emotional resonance. A notable example is Hella Jongerius's 'Breathing Colour' exhibition at the Design Museum, London (2017), which foregrounded the sensory and affective dimensions of colour through a carefully orchestrated spatial display. This illustrates how curatorial practice can activate a multisensory audience experience, and in this respect the research contributes directly to the field of curating.
- In architecture and design, the 'layerspace' framework provides new ways of manipulating spatial perception, transparency, reflection, and material layering to generate perceptual depth and experiential richness.
- In phenomenological and sensory studies, the research advances theoretical understandings of material presence in shaping perception, contributing new perspectives to debates on embodiment, affect theory, and multisensory aesthetics.

Ultimately, by synthesising rigorous theoretical discourse with systematic material experimentation and empirical audience studies, this research significantly repositions glass as an active participant in shaping sensory and spatial perception, offering original conceptual tools and innovative methodologies for deepening audience engagement and experiential interactions within contemporary glass art.

2. Colour Perception

2.1. Introduction

Colour does not exist.

Colour is not an inherent property of objects, but a perceptual construction shaped by light, context, and bodily experience. It emerges through the interplay between light, material, and the perceiving body, acting as a mediator that reconnects the senses and deepens our engagement with the material world.

Within this research on ‘synaesthetic touch’ in blown glass, colour functions as a central conduit between visual and tactile modes of perception. Glass does not merely transmit or reflect light; it modulates perception, revealing and obscuring form, evoking memory and sensation. This phenomenological depth becomes the site for material exploration in my practice.

This study considers the interplay between material composition, spatial positioning, and environmental context, examining how these factors collectively mediate sensory experience and perceptual engagement.

Taking colour as a foundational element,¹⁴ this chapter explores how it bridges the optical and the haptic in my practice. Colour’s variability under different lighting and environmental

¹⁴ Frank M. Adams and Charles E. Osgood, "A Cross-Cultural Study of the Affective Meanings of Color," *Journal of Cross-Cultural Psychology* 4, no. 2 (1973): 135–156, <https://doi.org/10.1177/002202217300400201>.

conditions, understood as contingency, transforms it from an aesthetic attribute into an active perceptual force, shaping audience engagement and deepening intersensory experience.

2.2. The Conditions of Colour

Does colour exist?

Contemporary neuroscience supports the claim that colour does not exist objectively. As Newton observed in *Opticks* (1704), objects do not possess colour in themselves but reflect certain wavelengths of light that are then interpreted by the observer.¹⁵ Colour thus emerges as a conditional phenomenon, contingent upon light, material, and the viewer.

Fugitive by nature, it shifts with the materiality of the object, environmental conditions, and the observer's position. Technological variations, including photography, digital display, or scanning, only intensify this instability. Metamerism,¹⁶ where colours alter under changing light sources, exemplifies the relational complexity of colour perception. In consideration of this, this research addresses a specific problem that has been raised by Daphne and Charles Maurer. They suggest that in adulthood we largely lose the inter-relation between our senses, and thus our multisensory abilities.¹⁷

This chapter investigates how colour perception can be re-sensitised through blown glass practice. Building on theories of synaesthetic perception, I aim to develop works that evoke visual-tactile crossover, enabling viewers to conceptually 'feel' through sight. Light becomes a critical component, revealing chromatic depth and optical ambiguity. These concerns are central to several of my works, including *Sunset Under Open Cloud* (2023), where layered

¹⁵ Isaac Newton, *The Correspondence of Isaac Newton*, Vol. 1: 1661–1675, ed. H. W. Turnbull (Cambridge University Press, 1959), 92–102. (Letter to Henry Oldenburg, 6 Feb. 1672/3).

¹⁶ Metamerism refers to the phenomenon whereby two objects with different spectral reflectance curves appear the same colour under one light source but different under another. This effect, well documented in colour science, highlights the context-dependence of visual perception. Mark D. Fairchild discusses this extensively in *Color Appearance Models*, 3rd ed. (Chichester: Wiley, 2013), 335–340.

¹⁷ Daphne Maurer and Charles Maurer, *The World of the Newborn* (New York: Basic Books, 1988), 69.

colour interacts with shifting natural light to produce perceptual ambiguity and delayed recognition (see Figure 5).

2.2.1. Light

Light is not merely a medium through which colour is perceived; it is a generative force that reveals the chromatic and spatial qualities of glass. In my practice, I treat light as a co-author in the making of perception. Rather than viewing it as a passive illuminator, I explore how its varying conditions, both natural and artificial, actively shape the perceptual encounter between viewer and object. This approach aligns with a phenomenological understanding of visual experience, particularly Maurice Merleau-Ponty's claim that 'the visible is not an object; it is a field which underlies all our perceptions'.¹⁸ Through this lens, colour is not fixed but evental, emerging in the shifting relationships between light, material, and the observer.

The following subsections explore two contrasting modes of illumination, natural and artificial light, as key conditions through which the chromatic and affective properties of blown glass emerge and transform. I examine how these modes alter the viewer's perceptual experience and how they were consciously manipulated in my own exhibitions to stage sensory and affective responses.

2.2.1.1. Natural Light

Natural light introduces temporal instability and perceptual variation into the viewing experience. Unlike artificial lighting, which can be calibrated and controlled, daylight is unpredictable: its intensity, temperature, and direction change according to the time of day, weather, and season. Rather than correcting for this variability, I embrace it in my practice as an aesthetic and conceptual strategy. Light is not simply a condition of viewing; it is an active agent in the perceptual unfolding of colour in glass.

¹⁸ Maurice Merleau-Ponty, *The Visible and the Invisible*, ed. Claude Lefort, trans. Alphonso Lingis (Northwestern University Press, 1968), 133.

This dynamic was central to my solo exhibition ‘Sattvic Beings’ (1979 Gallery, Shenzhen, 2023–24), where a series of blown glass sculptures were installed in a space framed by floor-to-ceiling windows (Figure 1; see Appendix C.3). The works were positioned to receive extensive daylight throughout the day. As the sun moved across the sky, so too did the chromatic character of the pieces: tones deepened or dissolved, internal layers shifted in legibility, and edges blurred with the motion of shadow. The works did not present a fixed visual identity; they became optically unstable, open to continual re-reading depending on light, angle, and moment.



Figure 1. Installation view of Sattvic Beings, 1979 Gallery, Shenzhen (2023–24). Blown glass forms exhibited in a naturally lit space, encouraging audience engagement with shifting chromatic effects throughout the day. Natural light served not merely as illumination but as a co-producing agent of perception. Photo Credit: 1979 Gallery.

This dynamic variability led to a crucial observation: colour, in glass, is not simply observed, it is encountered. Visitors frequently adjusted their positions to follow the way the light moved through the works, often returning at different times of day to witness perceptual changes. Several described the works as ‘flickering’, ‘breathing’, or ‘opening up’, suggesting an intuitive awareness that the pieces responded to light rather than statically presenting

themselves. In this way, the encounter with the artwork became durational, multisensory, and participatory.

As both artist and researcher, I came to understand this temporality as integral to the chromatic phenomenon. Colour in glass not only shifts; it also waits. It waits for the precise alignment of material, light, time, and viewer, through which it momentarily comes into presence. This experiential latency reflects Merleau-Ponty's notion of embodied perception, where the act of seeing is inherently temporal and corporeal. As he notes, 'Our bodily experience of movement [...] provides us with a way of access to the world and to the object'.¹⁹ In 'Sattvic Beings', colour emerged not as a static property of the object, but as a contingent, situated event, one that underscored the capacity of glass to transform seeing into sensing.²⁰

The perceptual dynamics of light and colour in glass are explored powerfully in the work of Roni Horn. In her 2023 exhibition at the He Art Museum (HEM) in China, Horn used cast glass cylinders, solid yet translucent forms whose chromatic and spatial qualities shifted subtly under different lighting conditions. Often installed in naturally lit spaces, Horn's sculptures resist a fixed reading: their colours change based on the time of day, the position of the sun, and the movement of the viewer (Figure 2).²¹

Horn's work exemplifies a fundamental principle that informs my own practice: that perception is constructed, not a given. Her glass forms do not declare their colour but defer it, offering ambiguity, reflection, and delay. These qualities allow viewers to encounter the work slowly, sensing its chromatic content as contingent, partial, and responsive. While my methods differ, particularly in the use of blown rather than cast forms, I share Horn's emphasis on temporal engagement, multisensory activation, and colour as an atmospheric condition. Comparing my practice with Horn's highlights both conceptual parallels and practical strategies that can inform exhibition display, audience experience, and curatorial

¹⁹ Merleau-Ponty, *Phenomenology of Perception*, 162.

²⁰ Fairchild, *Color Appearance Models*, 276.

²¹ He Art Museum (HEM), *Roni Horn: A Dream Dreamt in a Dreaming World Is Not Really a Dream... But a Dream Not Dreamt Is*, exhibition, Shunde, China, 7 June–7 October 2023, <https://hem.org/exhibition/19>.

approaches, demonstrating how individual artistic choices may serve as useful references for others.



Figure 2. Exhibition view of *'A Dream Dreamt in a Dreaming World is not Really a Dream...'*, Roni Horn (2023), He Art Museum (HEM), China. From right to left: *This is Me, This is You* (1997–2000), 96 photochromatic prints, including stand and frame, 31.8 × 26 cm each; *Opposites of White* (2006/2018), solid cast black and clear glass with as-cast surfaces on all sides (fire-polished top), two pieces, 50.8 (H) × 142.24 (D) cm each.

© Roni Horn. Courtesy of the artist and Hauser & Wirth. Photo by JJYPHOTO. © He Art Museum.

The installation employs natural lighting to emphasize shifting appearances as sunlight and shadows interact with the sculptures.

Natural light, in this context, is not merely illumination but a compositional variable. Its qualities of warmth, direction, and diffusion modulate how colour behaves. This echoes what I term ‘chromatic fugacity’: a notion occasionally employed in material studies to describe colour’s tendency to evade fixity, and here applied to glass as a perceptual condition responsive to time, light, and viewer position.²² By engaging natural light as a collaborator

²² While the term ‘chromatic fugacity’ does not have a fixed definition in existing literature, it has appeared in art and material discourse to suggest the impermanence or perceptual instability of colour in certain environmental conditions. In this thesis, it is adopted as a conceptual shorthand to describe the temporally contingent and responsive qualities of colour in blown glass practice, particularly under natural light. For broader discussions on light, perception, and sensory materiality, see Merleau-Ponty, *Phenomenology of Perception*, 98–105, and Gilles Deleuze, *The Logic of Sense*, trans. Constantin V. Boundas (Columbia University Press, 2003), 110–115.

rather than a backdrop, I recognise its role in rendering perception evental. The viewer does not simply receive colour; they encounter it as it unfolds over time.

2.2.1.2. Artificial Light

Artificial light, unlike natural illumination, offers compositional precision. It allows artists to manipulate the visibility, mood, and chromatic register of glass through calibrated intensity, direction, and spectral tone. Far from being a neutral utility, artificial lighting becomes an active medium for sculpting perception, enabling works to appear differently over time and in different conditions.²³

My installation *Whispering through the Echoes of Ancient Dreams* (2024) exemplifies this compositional use of artificial light (Figure 3). A single blown glass form was exhibited under programmed LED lighting that shifted in colour temperature and angle to simulate the progression of a day (see Appendix C.2). These shifts affected not only the tonal balance of the work, where ambers deepened and silhouettes collapsed into translucency, but also its spatial and emotional resonance. Viewers described the work as ‘breathing’, ‘opening’, and ‘flickering’, suggesting a perceptual experience that unfolded over time. The glass did not remain visually static; it staged a chromatic narrative that encouraged sustained, embodied looking.

This approach enabled a condition often referred to as ‘staged fugacity’: a state in which colour does not merely change but holds itself in suspension, emerging only in response to specific temporal and optical cues.²⁴ Artificial light, in this sense, does not simply reveal the work; it co-produces it. The viewer participates in this unfolding, engaging with colour not as a fixed property, but as a fluctuating presence.

²³ John Gage, *Colour and Culture: Practice and Meaning from Antiquity to Abstraction* (Thames & Hudson, 2024), Chapters 3–4.

²⁴ The term ‘staged fugacity’ is not widely established in glass or colour studies, but here refers to an intentional manipulation of perceptual delay and chromatic instability through artificial lighting. It draws conceptually from broader discussions of material fugacity in visual culture and colour theory (see David Batchelor, *Chromophobia* (Reaktion Books, 2001); John Gage, *Colour and Culture: Practice and Meaning from Antiquity to Abstraction* (Thames & Hudson, 2024); and Maurice Merleau-Ponty, *The Visible and the Invisible*).



Figure 3. Jinya Zhao, *Whispering through the Echoes of Ancient Dreams*, 2024, blown glass, 49 × 30 × 30 cm.

Left: Studio documentation under controlled LED lighting. Photo Credit: He Junjie.

Right: Installation view at Taste Contemporary during the exhibition ‘Fluid Threads’, a two-person show featuring work by Ptolemy Mann and Jinya Zhao. The exhibition lighting significantly altered the work’s chromatic and spatial presence. Photo Credit: Ruth Ward.

(For further exhibition information, see Appendix C.5.)

This strategy resonates with the work of artists like James Turrell, who treats light not as a backdrop but as a medium. His immersive environments construct perceptual delay and chromatic ambiguity as central experiences (Figure 4).²⁵ While Turrell works with light itself, and my focus is on blown glass, both our practices share an interest in choreographing the viewer’s perceptual temporality through controlled illumination.²⁶

Studio-based trials further explored this principle. By exposing the same glass object to UV, incandescent, and fluorescent lighting, I observed distinct shifts in internal layering and

²⁵ “James Turrell: A Retrospective”, *Los Angeles County Museum of Art*, 2013, accessed June 2, 2024, <https://www.lacma.org/art/exhibition/james-turrell-retrospective>.

²⁶ Gage, *Colour and Culture*, 242–271.

surface opacity. These trials revealed how colour perception in glass shifts under varying wavelengths, particularly through effects akin to ‘metamerism’, where colours appear to be different depending on the spectral properties of the light source. Viewers’ responses also suggested a gradual perceptual adjustment, echoing what colour science refers to as ‘spectral adaptation’. These effects reinforce the ontological role of light in mediating chromatic presence.

If natural light invites the viewer to discover colour, artificial light enables the artist to construct it, to selectively conceal, delay, or intensify chromatic events. This controlled fugacity becomes a partner in shaping meaning. Its spatial implications will be explored further in Chapter 5, where the interaction between colour and environmental site is examined in greater depth.



Figure 4. James Turrell, Amrta, 2011. Installation view from the Ganzfeld series. Photo Credit: Florian Holzherr.

2.2.2. Object

J.M.W. Turner's assertion that 'light is therefore colour and shadows the privation of it' captures the fundamental interdependence between light and colour. Yet, colour does not exist in isolation; it is brought into being through its encounter with matter. Without an object, colour remains intangible, existing only as potential. Only through the material presence of an object does colour become visible, legible, and perceptually meaningful.

The surface texture, thickness, reflectivity, and translucency of an object determine how light behaves in contact with it. These material properties not only shape colour's visual attributes, but also modulate its sensory and emotional resonance. As Merleau-Ponty argues in *Phenomenology of Perception*, objects structure perceptual experience and anchor our inhabitation of space.²⁷ Colour perception, then, is not purely optical. Rather, it is embodied, spatially situated, and mediated through material contact.

This insight becomes especially salient in glass practice. Glass, as a translucent medium, transforms light not merely at the surface but through depth. In *Sunset Under Open Cloud* (2022), the chromatic fields embedded within the glass were composed to interact with the sculpture's curvature, which bent and refracted light unevenly across its surface (Figure 5). These interactions produced gradual transitions in hue, evoking phenomena such as dusk skies or the undulating movement of water. Colour here did not present as a static attribute, but as a perceptual event – emerging, fluctuating, and time bound, contingent on the viewer's movement and ambient light.

These shifting chromatic states prompted prolonged looking and positional adjustments, indicating that viewers experienced colour not as fixed hue, but as an unfolding perceptual process. As light travelled across the form, amber tones deepened or receded, internal silhouettes grew crisp or blurred, and the edges of the object dissolved into its environment. The work enacted a choreography of colour, one that could only be perceived over time and through movement.

²⁷ Merleau-Ponty, *Phenomenology of Perception*, 77–82.

These perceptual shifts reinforce a central claim of this chapter: that objects do not passively reflect colour, they transform it. The material configuration of an artwork governs how light becomes sensation, and how visual experience becomes felt. This embodied temporality echoes Merleau-Ponty's notion that vision is not detached observation but 'a mode of existence'.²⁸ In *Sunset Under Open Cloud*, chromatic perception becomes durational, participatory, and contingent upon the object's spatial logic.

In summary, this section argues that colour perception is inextricably linked to objecthood, and in glass this link becomes materially and optically heightened. The ability of glass to refract, absorb, and scatter light introduces a perceptual complexity that makes colour a relational event rather than a static quality. Through its form, surface, and placement, the object co-produces chromatic experience, rendering perception a temporally unfolding act of seeing and sensing.



Figure 5. Jinya Zhao, Sunset Under Open Cloud, 2022. Blown glass, 30 × 30 × 49 cm. This work explores how glass enables dynamic shifts in colour perception. Photo Credit: He Junjie.

²⁸ Merleau-Ponty, *The Visible and the Invisible*, 133.

2.2.3. Variations of Perception (Viewer)

Josef Albers, in *Interaction of Color*, emphasises the subjective nature of colour perception, famously observing that if fifty people hear the word ‘red’, each will imagine a different shade.²⁹ This observation underscores a core premise of my research: colour perception is a deeply personal and context-dependent phenomenon shaped by neurological, cultural, and environmental factors. In glass, colour is never fixed; it emerges in relation to the viewer’s position, movement, and the surrounding conditions of light. This perceptual multiplicity is particularly evident in blown glass, where chromatic experience shifts not only between viewers but also across time and changing environments.

During my exhibition ‘Sattvic Beings’ (1979 Gallery, Shenzhen, 2023), this relationship became strikingly evident. Installed in a space with expansive floor-to-ceiling windows, the works responded dramatically to natural daylight during daytime hours (see Figure 1). However, as evening fell and the gallery lighting took over (see Figure 6), the same pieces adopted entirely different chromatic registers. Tones that had appeared diffused and subtle became concentrated; internal layers once revealed by sunlight were now obscured or reconfigured by spotlight shadows. Some colours intensified to near-opacity while others receded into reflective ambiguity.

During the exhibition I positioned the space as a site of research, using prolonged observation to study how viewers experienced colour in blown glass. The shifting chromatic states prompted visitors to move repeatedly through the space, sometimes returning at different times of day. Their bodily movements, stepping closer, walking around, crouching, actively engaged with the work, revealing changes in reflectivity, gradients, and hidden internal silhouettes. Through these embodied actions, it became clear that the glass object does not simply present colour: it stages an evolving perceptual process.

From a phenomenological standpoint, this affirms Merleau-Ponty’s understanding of perception as co-constituted by body and world.³⁰ The act of seeing is not neutral; it is a

²⁹ Josef Albers, *Interaction of Color* (Yale University Press, 2013), 3.

³⁰ Merleau-Ponty, *The Visible and the Invisible*, 133.

temporal, tactile, and situated event. In ‘Sattvic Beings’, colour was not merely observed, it was met, tracked, and returned to. Perception became a durational exchange, anchored in movement and variation.



Figure 6. ‘Sattvic Beings’, 1979 Gallery, Shenzhen, 2023. Exhibition view in evening gallery lighting. Images illustrate how perceptual experience of colour in blown glass varies across time and illumination. Photo Credit: He Junjie. (For more details, see Appendix C.3.)

These perceptual dynamics were not only visual, but affective. Evening lighting cast the works in more intimate, inward registers. When asked, viewers described feelings of ‘calm’, ‘reverie’, or ‘introspection’ (see Appendix C.6.A).³¹ By contrast, daylight generated openness and diffusion. Light and colour here did not just ‘appear’; they modulated mood, shaping emotional atmospheres through visual conditions.

³¹ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.

In this way, glass invites a relational model of colour perception, where what is seen is never separable from how and when it is seen. This aligns with Deleuze's understanding of sensation not as recognition, but as force that acts on the nervous system prior to cognition, generating new perceptual territories.³² In 'Sattvic Beings', colour was not delivered as optical fact but encountered as a becoming: fluctuating, durational, and corporeally modulated. The viewer does not merely observe colour, they are acted upon by it.

2.3. Colour as Visual Phenomena

Perception, particularly of colour, is not a passive reception of visual data but an active, dynamic process shaped by bodily presence, environmental context, and temporal variation. While traditionally considered an optical phenomenon, colour perception exceeds the limits of the eye, engaging memory, affect, and kinaesthetic response. As Merleau-Ponty observes, 'Perception is not a science of the world [...] it is the background from which all acts stand out',³³ which suggests that colour must, likewise, be understood as a relational event, constituted through embodied experience rather than isolated visual input.

This concept finds concrete expression in glass, a material whose perceptual logic relies upon transparency, reflection, and internal layering. Within my practice, blown glass becomes a site where visual and tactile modes of sensing converge. Rather than presenting colour as an isolated optical signal, my work mobilises colour as a fluctuating perceptual presence, responsive to shifts in light, space, and the body of the viewer.

Cognitive science further complicates this understanding. The phenomenon of colour constancy – where the brain maintains perceived colour despite changes in lighting, demonstrates that perception is mediated by both internal calibration and environmental input. In the context of glass, this constancy is disrupted: colour changes not only with light temperature but with viewer angle and spatial position, revealing its contingent and temporal nature.

³² Gilles Deleuze, *Francis Bacon: The Logic of Sensation*, trans. Daniel W. Smith (Bloomsbury Academic, 2017), 35–38.

³³ Merleau-Ponty, *Phenomenology of Perception*, xi.

This was particularly evident in ‘Sattvic Beings’ (1979 Gallery, Shenzhen, 2023). During the day, sunlight produced expansive chromatic fields, diffusing colour and heightening the internal transparency of the artworks. At night, artificial lighting condensed and intensified the same hues, exposing hidden silhouettes and surface opacities (see Figures 1–6). When asked, viewers described the works as ‘breathing’, or ‘holding back’ (see Appendix C.6.A), indicating a multisensory register of engagement.³⁴ The act of perception here unfolded over time, requiring bodily repositioning and extended observation. This aligns with Deleuze’s theory of sensation as a force that bypasses cognition and acts directly upon the nervous system.³⁵ In this view, colour in blown glass is not simply seen, it is sensed, met, and returned to. It becomes evental, situated, and irreducibly embodied.

This section thus reframes colour not as a fixed visual property but as a temporal and affective phenomenon, shaped through material presence and interaction with the viewer.³⁶ Within contemporary glass practice, this understanding repositions colour as a participant in perceptual transformation, an unstable and responsive entity that insists on being experienced, rather than merely observed.

2.3.1. Colour Layers, Mixing Interactions and Gradations

Colour does not exist independently; it is contingent upon the presence of an object. In glass, this dependency is intensified through transparency, curvature, and internal layering. Unlike pigment-based colour, which sits atop a surface, colour in glass resides within the material body, shaped by its thickness, refractive density, and interaction with light. As Heike Brachlow notes, volume colour refers to ‘the colour of a transparent three-dimensional object,

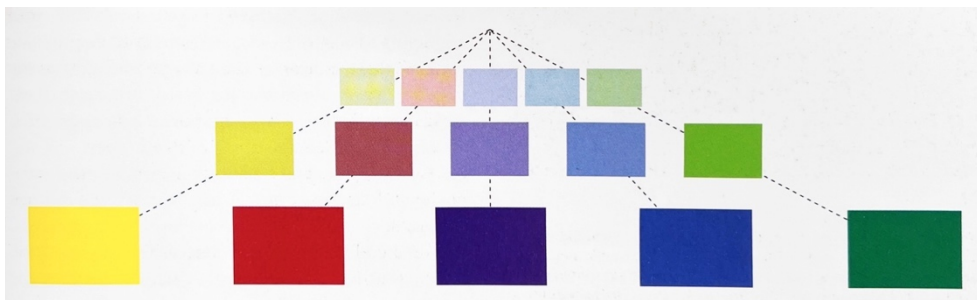
³⁴ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.

³⁵ Deleuze, *Francis Bacon: The Logic of Sensation*.

³⁶ Bevil R. Conway, “Color Vision, Cones, and Color-Coding in the Cortex,” *The Neuroscientist: A Review Journal Bringing Neurobiology, Neurology and Psychiatry* 15, no. 3 (2009): <https://doi.org/10.1177/1073858408331369>.

which is coloured throughout its mass',³⁷ and is influenced by factors such as the form, size and density of the object, and the conditions of illumination.³⁸

Feisner and Reed note that cooler hues and low saturation tend to recede, while warm and saturated tones appear to advance.³⁹ This principle of atmospheric perspective, often applied in painting, also governs how layered colour in glass can generate depth and spatial illusion (Figure 7). This effect is particularly pronounced when working with transparency,⁴⁰ where cooler hues combined with desaturated tones establish atmospheric perspective, creating the illusion of distance. Yet in blown glass, where pigment is fused within curved volumes, such effects are not static. As light passes through different sections of the object, colour is filtered, delayed, and sometimes split, producing perceptual gradations that unfold in relation to viewpoint.



*Figure 7. The Illusion of Distance. Artists use cooler colours with greys to create atmospheric perspective and suggest depth. In this example, the foreground colours are more saturated than those in the background, demonstrating how colour gradation enhances spatial effects. (Edith Anderson Feisner and Ron Reed, *Color Studies*, 3rd ed. (Fairchild Books, 2013), 79.)*

Tracing the Shadows of Time (2022) explores this dynamic. The work layers subtle gradients of cobalt, smoke grey, and amber within a smooth blown form (Figure 8). These embedded colours do not lie side by side but move through one another, alternately obscuring, revealing, and blending in response to light and the angle of viewing. The form's curvature

³⁷ Heike Brachlow, "Shaping Colour: Density, Light and Form in Solid Glass Sculpture" (PhD diss., Royal College of Art, 2012), 76.

³⁸ *Ibid.*, 77–78.

³⁹ Edith Anderson Feisner and Ron Reed, *Color Studies*, 3rd ed. (Fairchild Books, 2013).

⁴⁰ *Ibid.*, 81.

intensifies this optical modulation, such that what appears saturated from one position dissolves into near-transparency from another.

This responsive behaviour invites movement. Viewers often shift their position, return to the work at different times of day, or pause to track the change in chromatic presence. These actions suggest that colour, in glass, is not simply seen but actively negotiated. As one visitor remarked, the piece seemed to ‘withhold and unfold’ in equal measure (see Appendix C.6.A),⁴¹ a phrase that reflects the interdependence of materiality, time, and visual attention.



Figure 8. Jinya Zhao, Tracing the Shadows of Time (2022). Blown glass, 49 × 30 × 30 cm. Layered gradients and curved volume mediate chromatic variability. Photo Credit: He Junjie.

Such perceptual variability aligns with Merleau-Ponty’s insight that ‘a movement is learned when the body has understood it, that is, when it has incorporated it into its “world”, and to move one’s body is to aim at things through it’,⁴² highlighting that spatial understanding emerges through bodily movement and embodied presence rather than detached observation. Colour becomes less a property of the object and more a phenomenon generated through

⁴¹ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.

⁴² Merleau-Ponty, *Phenomenology of Perception*, 160–161.

encounter. The physical structure of the object, through its veiling, internal diffusion, and chromatic layering, actively shapes perception, determining not only what is seen but how it is sensed. Techniques such as layering and controlled revelation do not merely generate aesthetic depth; they operate affectively, engaging memory, hesitation, and curiosity.

These strategies will be further developed in Chapter 3, where I explore how glass can spatialise perception through layered opacity and relational depth. For now, it is sufficient to note that colour in glass is never static. It moves, delays, and resists fixation, disclosing its visual life not in isolation but only through encounter.

2.3.2. Watercolour

Watercolour has long functioned as a preliminary site of chromatic exploration in my glass practice. It is neither a substitute for glass nor directly analogous to it; it is a speculative tool and a fast, flexible medium for visualising perceptual transitions, atmospheric tones, and layering effects. Its immediacy allows intuitive responses to colour to emerge before technical constraints are introduced. In this way, watercolour supports an iterative visual thinking process that helps me to choreograph chromatic relationships prior to their material realisation in glass.

Although the material logic of watercolour and that of blown glass differ fundamentally, both operate through colour suspended in a transparent or translucent medium – water and molten silica, respectively. Colour in each discipline is not applied to the surface but emerges from within, shaped by layering, diffusion, and light modulation. These structural and optical conditions afford perceptual effects such as translucency, chromatic bleeding, and spatial ambiguity, which I explore across both practices.

This conceptual affinity finds material form in *Early Spring Movement* (2022), a blown glass sculpture whose curved, translucent volume evokes the veiled logic of watercolour layering (Figure 9). The surface has been lightly sandblasted to produce a soft, matt finish that diffuses incoming light rather than sharply reflecting it. As illumination moves across its form, colour does not resolve into a single hue but drifts, with amber softening into green and violet that dissolve into cooler blue, modulated by the viewer's position, the intensity of

ambient light, and the time of day. Unexpected refractions and veiling effects emerged during making, reinforcing the idea that glass does not merely carry colour: it transforms it into a durational event of perception.



Figure 9. Jinya Zhao, Detail of Early Spring Movement, 2022. Blown glass. This work explores how translucent, sandblasted blown glass can generate layered chromatic effects comparable to watercolour washes. As light passes through the curved matte surface, hues blend, dissolve, and reappear depending on spatial and temporal conditions. The softened edges and visual veiling reflect the shifting perceptual conditions shared by glass and watercolour.

Photo Credit: He Junjie.

In my studio, watercolour operates as a space of chromatic hypothesis, a low-risk, responsive environment for testing how certain hues might blend, recede, or layer. Through successive washes and overlays, I sense the behavioural tendencies of colour: how certain pairings intensify each other, how others become muddled. These painted studies rarely predict exact visual outcomes in glass, but they heighten my attentiveness to how chromatic interplay may perform in volumetric and luminous contexts. The shift from fluid pigment to molten glass becomes not only a technical transition but also an epistemological one: a movement from imagined to encountered colour, from hypothesis to haptic discovery.

Despite their different physical mechanisms of light interaction, both watercolour and glass fundamentally reshape our perception of layering, spatial depth, and the balance between opacity and transparency.⁴³ Watercolour softens and obscures forms through absorbed and scattered light on fibrous paper; glass transmits, refracts, and diffuses light through its three-dimensional structure. These perceptual effects alter not only what is seen but *how* it is seen, activating a dynamic relationship between light, material, and viewer.

This shared quality is integral to my artistic practice. Both mediums act as metaphors for the fluidity of perception and memory. Objects perceived through veiled layers, whether in translucent blown glass or watercolour washes, undergo a transformation in which form itself becomes unstable, detail dissolves, and edges blur. As Merleau-Ponty observed, perception is not passive reception but a temporal, embodied negotiation between seer and seen, where visibility is shaped by the conditions of encounter.⁴⁴ In this sense, watercolour and glass do not just depict colour: they stage its event.

2.3.2.1. Investigating Colour Perception Under Changing Light

To examine how environmental lighting conditions affect chromatic perception, I conducted a series of controlled photographic studies using my watercolour painting *Algae in the Air we Breathe* (2023) as the test subject (Figure 10). This single composition was photographed under diverse conditions, including natural and artificial light, changing weather, and varying times of day, to explore how colour transforms under different illuminants.⁴⁵ These experiments extend my broader inquiry into material sensitivity and perceptual instability, foregrounding the contextual nature of colour.

These tests spanned a range of parameters: time of day (sunrise, noon, dusk), weather (sun, mist, rain), spatial settings (indoor, outdoor, gallery), and artificial light sources

⁴³ Feisner and Reed, *Color Studies*, 79.

⁴⁴ Merleau-Ponty, *The Visible and the Invisible*, 133.

⁴⁵ This method follows principles outlined in Mark D. Fairchild, *Color Appearance Models*, 167–170, which demonstrates how human colour perception is modulated by chromatic adaptation to ambient lighting conditions.

(incandescent, fluorescent, UV, LED). Each image was captured with a fixed lens (iPhone 13 Pro, 26mm f1.5) to ensure consistency in format and scale.⁴⁶



Figure 10. Jinya Zhao, Algae in the Air We Breathe (2023). Watercolour on paper.

*This painting served as the base subject for a photographic experiment analysing the chromatic variability of a single artwork under diverse lighting conditions. Photo Credit: Jinya Zhao.
(For a full visual sequence and image metadata, see Appendix A.3.)*

This investigation conceptually engages with the phenomenon of metamerism, a condition in which two colours appear identical under one light source but differ under another. However, rather than comparing two colour samples, I focused on a single chromatic configuration and tracked its visual modulation across lighting environments. These shifts underscore the instability of colour perception, which is not inherent to pigment or surface alone, but contingent upon light, environment, and the embodied position of the viewer.

My observations confirmed that light green hues nearly disappeared under dim or oblique lighting; dark greens appeared nearly black in low-light conditions, and strong LED or UV light washed out highlights. Tonal shifts also emerged over the course of the day, from cooler blues in the morning to warmer reds at dusk. Artificial lighting further modulated chromatic ambiance: incandescent light added a yellowish cast, while fluorescent light cooled the composition. These perceptual changes, conditioned by light type, intensity, and viewer

⁴⁶ Full experiment details and images see Appendix A.3.

proximity, demonstrate that colour is not a fixed attribute but a dynamic interplay arising from the relation of material, light, and observer.

These results demonstrate that colour is not a fixed property of pigment or surface, but a relational phenomenon arising between material, light, and viewer. Full experimental data, photographic documentation, and key perceptual findings, including lighting types, conditions, and their chromatic effects, are detailed in Appendices A.3. These records include comparisons between natural and artificial light, shifts during the day, and viewer-position variables. Taken together, they reveal that colour perception in both watercolour and glass is context sensitive, mutable, and relational, arising not from pigment alone but from the contingent interplay of light, surface, and space.

This investigation directly informs my glass practice, where light and surface treatments play an equally critical role. For instance, in my blown glass works with matt finishes, surface opacity and sandblasting techniques alter the way that light is refracted, softening edges and modulating chromatic transitions.⁴⁷ These material decisions echo insights gained through watercolour: both processes demonstrate how chromatic phenomena are always mediated through environmental interaction.⁴⁸

My exhibition ‘Nebulosity Walk in Thy Memory’ (Liuli China Museum, 2023) brought these cross-material strategies into a shared space. Two-dimensional (watercolour paintings) and three-dimensional (blown glass sculptures) works were displayed in close proximity, highlighting how transparency, colour diffusion, and shifting light could structure affective and perceptual experience (Figures 11–12). Rather than merely illustrating atmospheric conditions, these works revealed how colour perception itself is *constructed* through the relational play of material, light, and spatial context.

The principles of colour layering, transparency, and opacity control in watercolour painting directly inform my approach to glass. In my matt-surfaced blown glass works, colour

⁴⁷ Margaret Livingstone, *Vision and Art: The Biology of Seeing* (Harry N. Abrams, 2002), 138. Livingstone notes that surface treatments such as texture and reflectivity can alter how light is processed by the visual system, thereby affecting edge definition and chromatic perception.

⁴⁸ Albers, *Interaction of Color*; 5. Albers demonstrates that the appearance of colour is always relational, shifting according to its surrounding conditions.

transitions from the interior to the exterior, influenced by surface treatments that modulate light refraction and texture. Similarly, sandblasting diffuses light, softening edges and altering the perception of depth.



Figure 11. Exhibition view of 'Nebulosity Walk in Thy Memory', Jinya Zhao Glass Art Exhibition, 2023, Liuli China Museum. watercolour and glass artworks presented side by side to explore shared chromatic behaviour under changing light. From left to right: Lotus Shadow in Water, Mixture Memory, Out and Beyond the Window, Bush Walk, A Figment of the Imagination, Nature Tears, Phantom. Watercolour, 39 × 30 × 3 cm each (framed), 2023. Photo Credit: Luo Chenqi.



Figure 12. Blown glass sculpture on the left: Mixture Memory, 2023. Exhibition view of 'Nebulosity Walk in Thy Memory', Jinya Zhao Glass Art Exhibition, 2023, Liuli China Museum. Watercolour and glass artworks presented side by side to explore shared chromatic behaviour under changing light. Photo Credit: He Junjie. (More exhibition information, see Appendix C.1.)

2.3.3. Colour Depth

In my glass practice, colour is not limited to surface phenomena but is actively shaped by the way that material depth, texture, and light intersect. Techniques such as sandblasting and layering allow me to modulate opacity and edge definition, cultivating ambiguity and visual recession. These strategies do not simply render form obscure – they construct immersive, spatialised fields of colour that require temporal, embodied engagement.

This perceptual strategy echoes the spatial disorientation experienced in Antony Gormley's *Blind Light* (2007), an installation filled with dense fog that dissolves visible boundaries and compels viewers to navigate space through shifting luminosity rather than fixed contours. In both cases, visibility is suspended; perception becomes an event of orientation, hesitation, and adjustment. Gormley's use of fog parallels my own material tactics, where etched or matt surfaces diffuse light, obscuring outlines and inviting the viewer to enter a chromatically veiled environment (Figure 13).

In works such as *Whispering through the Echoes of Ancient Dreams* (2024), the surface is deliberately softened through sandblasting, disrupting clarity and fostering a sense of atmospheric distance (see Figure 3). As viewers move around the form, internal colour gradients appear and vanish, generating a mutable spatial presence. Rather than presenting colour as an object to be seen, the work enacts it as a shifting encounter shaped by proximity and light incidence.

These perceptual shifts align with Merleau-Ponty's phenomenological account of vision, where spatial understanding arises through bodily movement and lived engagement, for, as he notes, 'the body is our general medium for having a world'.⁴⁹ The viewer does not merely observe form but constitutes depth through the act of looking. Gestalt psychology further supports this: Wertheimer's principle of organisation demonstrates that figure-ground relations are not static givens but contingent upon context and positionality.⁵⁰ My glass works operate in this interstice, where transparency and opacity, distance and proximity, vision and movement continuously redefine the sensory field.

In this sense, colour depth in glass is not a measurable dimension but a relational phenomenon, emerging from the choreography of surface, material resistance, viewer movement, and environmental light. The optical and tactile interplay inherent in these strategies transforms perception from a moment of recognition into one of exploration, where meaning unfolds through time, motion, and attentiveness.⁵¹

⁴⁹ Merleau-Ponty, *Phenomenology of Perception*, 203. Here Merleau-Ponty emphasises that the body is not a passive receptor but the very medium through which space and depth are constituted.

⁵⁰ Max Wertheimer, "Laws of Organization in Perceptual Forms," in *A Source Book of Gestalt Psychology*, ed. William D. Ellis (Routledge & Kegan Paul; Harcourt, Brace, 1938), 71–88. Wertheimer discusses how perceptual organisation, particularly figure-ground relations, depends on contextual variables rather than being fixed attributes.

⁵¹ Antony Gormley, "Blind Light," *Antony Gormley*, accessed June 2, 2022, <https://www.antonygormley.com/projects/item-view/id/241>.



Figure 13. Antony Gormley, *Blind Light*, 2007. Fluorescent light, water, ultrasonic humidifiers, toughened low iron glass, aluminium. 320 × 978.5 × 856.5 cm. Hayward Gallery, London. Photo Credit: Stephen White.

2.3.4. Colour Association and Memory

Colour is never neutral. It operates as both a perceptual and a symbolic register, one that evokes memory, emotion, and cultural resonance. This reflects a lived understanding: colour perception emerges not as fact but as feeling, a view that also resonates with art-historical accounts of colour's symbolic and perceptual significance.⁵² While earlier sections of this chapter have examined colour in terms of its material and optical phenomena, the following discussion shifts to its associative dimensions: how colour carries personal and collective meaning, and how those meanings shape the response of the viewer in my practice.

Perceptual engagement with colour is shaped not solely by the immediate sensory input but also by processes of memory and contextual framing. Contemporary neuroscientific research has demonstrated that colour should not be regarded as an intrinsic property of objects:

⁵² John Gage, *Color and Meaning: Art, Science and Symbolism* (University of California Press, 1999), 201–209. Gage highlights how colour functions as a cultural and symbolic medium, shaping perception and meaning across different historical and artistic contexts.

rather, it emerges as a cognitive construction, modulated by prior experience and environmental conditions.⁵³ The same colour may be perceived as calming, alarming, or nostalgic, depending on the viewer's associations, rendering colour both unstable and affectively potent.

In my own work, this mnemonic and emotional potential is materialised through blown glass. I use chromatic transparency, veiling, and light diffusion to produce atmospheres that feel simultaneously familiar and ambiguous. Rather than relying on symbolic colour codes, I aim to generate emotional resonance through perceptual latency, where meaning emerges not through fixed reference but through embodied encounter.

This process is deeply subjective, yet not entirely idiosyncratic. Cultural and biological frameworks shape how viewers respond to colour. Evolutionary research by Conway⁵⁴ suggests that humans are neurologically predisposed to respond to certain wavelengths, reinforcing colour's capacity to affect mood and cognition. These biological responses are then filtered through cultural systems: for instance, the colour red in Chinese cosmology corresponds with fire and vitality, while in Western contexts it may signal danger or desire.

However, these meanings are neither fixed nor universal. The historical and cultural trajectory of colour, as David Batchelor has explored, shows how its status has shifted across artistic, political, and scientific discourses. In contemporary art, colour often operates at the threshold between sensation and narrative, inviting open-ended interpretation.⁵⁵

Colour Memory and Materiality

Memory plays a crucial role in shaping and stabilising the perception of colour. Studies suggest that colour preferences develop through early sensory experiences, supporting the idea that perception is not innate but is constructed over time.⁵⁶ However, memory is not a

⁵³ John Carroll, "Colour Vision and Perception," in *Human Color Vision*, ed. Jan Kremers, Rigmor C. Baraas, and John Marshall (Academic Press, 2021), 93–118, <https://doi.org/10.1016/B978-0-12-821377-3.00005-2>

⁵⁴ Conway, "Color Vision, Cones, and Color-Coding in the Cortex."

⁵⁵ Batchelor, *Chromophobia*.

⁵⁶ John Maule, Alice E. Skelton, and Anna Franklin, "The Development of Color Perception and Cognition," *Annual Review of Psychology* 74 (2023): 88–90, <https://doi.org/10.1146/annurev-psych-032720-040512>.

perfect reproduction of reality: it is an interpretive process, shaped by emotion, time, and sensory input.

In *Touching the Rock*, John Martin Hull describes how rain evokes the vivid colours he once saw before losing his sight, highlighting how memory retains sensory impressions even in the absence of vision.⁵⁷

Glass, as a material, mirrors this duality of memory, both fragile and enduring, revealing and obscuring. In my practice, blown glass functions as a medium for recording memory, capturing fleeting impressions through light, transparency, and surface treatment. Techniques such as sandblasting and layering serve as metaphors for memory's simultaneous clarity and distortion, just as recollections shift between vividness and obscurity.

Audience interaction is integral to this exploration. Viewers' perceptions of colour in my work fluctuate based on lighting conditions, movement, and personal associations, reinforcing the idea that memory and perception are fluid rather than static. These shifting responses highlight the temporal nature of colour: how it exists not as a fixed property, but as an evolving force shaped by environment, material, and individual experience.⁵⁸

By treating colour as a living element that shifts with light and motion, my work challenges conventional understandings of sensory experience. Colour in blown glass is never fixed: it continuously transforms based on environment, material, and viewer interaction, reinforcing its role as a situated, experiential phenomenon rather than a static property.

Ultimately, memory does not merely recall colour: it shapes and reanimates it within each encounter.

⁵⁷ John M. Hull, *Touching the Rock: An Experience of Blindness* (SPCK Publishing, 2016), 127.

⁵⁸ Observations collected from audience interactions during the exhibition 'Sattvic Beings', Chen Lizhu & Zhao Jinya Duo Exhibition, 1979 Gallery, Sea World Culture and Arts Centre, Shenzhen, China, 24 November 2023 – 12 March 2024, where viewers commented on how the glass appeared to change in hue and intensity under varying lighting conditions at different times of the day. This was further supported by informal interviews and written visitor feedback, highlighting the role of memory and perception in their engagement with the artworks. More information can be found in Appendix C.3.

2.3.5. Colour Experimentation

My exploration of colour in glass has developed through iterative experimentation, guided by practice-led research residencies at Taoxichuan Glass Studio (Jingdezhen, 2022) and the Royal College of Art (London, 2023). These experiments focused not merely on aesthetics, but on how colour behaves as a spatial and perceptual agent within blown glass, through layering, transparency, light modulation, and viewer interaction.

Full procedural documentation, diagrams, and photographic data for these experiments are included in Appendices A.1 and A.2. Key examples are selectively included in this chapter to illustrate how technical decision-making shaped conceptual outcomes.

Layering and Depth Perception

Layering proved fundamental to generating spatial depth. Darker colours embedded at the object's core enhanced the sense of inner structure, while paler hues at the periphery created a softened, floating effect. Variations in opacity affected how chromatic zones merged or diverged (Figure 14), revealing that perceptual depth in glass arises not through size or mass, but through the interplay between light transmission and layered transparency.



Figure 14. Example of layering variations affecting depth perception in glass. Reference Numbers: 1–5, 1–6.

Chromatic Gradation and Spatial Balance

Gradation from light to dark produced distinct perceptual effects. When colour flowed from top to bottom, works felt luminous and weightless; inverting the gradient made them appear

heavier and more grounded. These variations altered the viewer’s interpretation of balance and movement (Figure 15), confirming that subtle chromatic shifts can reposition the visual ‘gravity’ of a form.

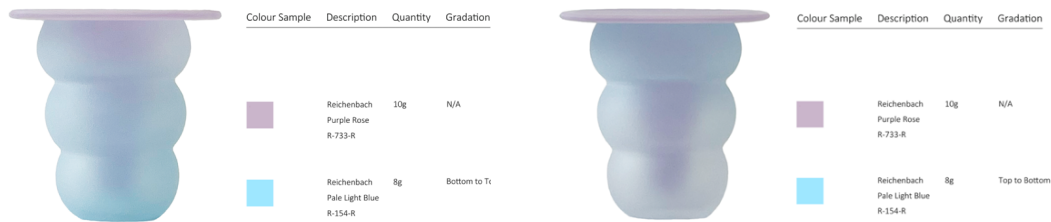


Figure 15. Colour gradation testing demonstrating light-to-dark transitions and their impact on form perception. Reference Number: 1–7, 1–8.

Light Interaction and Inter-layer Depth

Light played a critical compositional role in these experiments. When transparent colour layers were spatially separated within the glass form, light passed through multiple strata before reaching the viewer’s eye. This layering introduced subtle delays in chromatic legibility: certain hues appeared to hover within the form, emerging gradually as the viewer moved around the piece. The effect was not caused solely by angle or surface treatment, but also by the spatial depth between layers, where colour was suspended within the volume rather than fixed to its surface. In this sense, colour in glass became a volumetric event, unfolding through space and time, shaped by both material configuration and the viewer’s position (Figure 16).



Figure 16. Illustration of how light refraction influences colour perception in transparent layers. Reference Number: 2–3.

Obscuring, Revealing, and Surface Treatment

Techniques such as sandblasting were integral to manipulating visibility. By diffusing light at the surface, these processes softened contours and obscured internal form, transforming glass into a veiling rather than a displaying material. Strategic placement of opaque layers further shaped chromatic legibility, heightening contrast and enhancing compositional rhythm.

Spatial Configurations and Viewer Engagement

Subtle changes in the internal spacing between layers of blown glass significantly altered how colour depth was perceived. Unlike volume colour in solid glass, which depends on the density and thickness of a single mass, layered colour allows for deliberate modulation. The spacing and interaction of layers can be precisely adjusted to shape chromatic depth and optical resonance, an effect far more challenging to achieve within solid glass forms. These dynamics were further evidenced through exhibition feedback, where viewers' responses varied according to lighting, movement, and proximity. This reinforced a central premise of my thesis: colour in glass is not simply visual: it is also perceptual, shaped by context, light, and the embodied engagement of the viewer.

Conclusion

These experiments offered more than technical refinement: they revealed how colour in glass becomes an active phenomenon rather than a passive attribute. Layering, gradation, and surface modulation do not simply decorate form but co-construct perception. In this way, colour operates not as an additive visual effect but as an event, co-produced by material, light, and viewer. As discussed throughout this chapter, this situates blown glass within a broader sensory and temporal framework, where perception becomes both dynamic and participatory.

(For technical process images and full material records, see Appendices A.1 and A.2.)

Monochrome and Perception

While colour is often central to visual and emotional engagement, the deliberate removal of chroma introduces a different kind of perceptual intensity.⁵⁹ Within my glass practice, monochrome becomes a strategy not of reduction, but of recalibration – foregrounding contrast, transparency, and material subtlety. This section investigates how the shift from chromatic to achromatic conditions alters the perception and spatial reading of glass, and the affective response to it, drawing from both visual experiments and audience reception.

My 2024 series investigated how the removal of colour alters visual hierarchy and emotional resonance. Two works were created using identical forms and compositions, the only difference being colour and sequencing (Figure 17). The grayscale version marked the first time I had introduced black into my practice – its presence altered the balance of light absorption and transparency across the form.



Figure 17. From left to right: Jinya Zhao, *The Summer – Colour Perception Study I*, 57 × 25.5 × 25.5 cm, 2024; *The Sea – Colour Perception Study II*, 55 × 27 × 27 cm, 2024. Photo Credit: Anyan Wu Studio.

⁵⁹ Gage, *Colour and Culture: Practice and Meaning from Antiquity to Abstraction*.

This experiment aligns with Josef Albers' principle of relative colour, which suggests that colours shift in value and temperature depending on adjacent hues.⁶⁰ In grayscale, these shifts become structural rather than expressive, guiding the viewer's attention through tonal contrast and luminosity rather than hue.

Further studies explored how monochrome and chromatic zones might co-exist within a single work. In *The Innate Resonance of Bones* (2024), colour was strategically placed within a primarily neutral composition, heightening its perceptual weight through juxtaposition (Figure 18). This dynamic tension aligns with research on simultaneous contrast in the science of vision, which identified that colour perception is enhanced when set against desaturated surroundings.⁶¹



Figure 18. Jinya Zhao, *The Innate Resonance of Bones*, 51 × 31 × 31 cm, 2024. Photo Credit: He Junjie.

Two additional works, *A Breathtaking yet Deeply Enigmatic Alien Planet* and *A Wedding on that Enigmatic Planet*, investigated the subtle tonal variation articulated in colour theory as

⁶⁰ Albers, *Interaction of Color*, 59-71.

⁶¹ Livingstone, *Vision and Art: The Biology of Seeing*, 138.

chromatic greys⁶² (Figures 19–20). These pieces avoided stark contrast, relying instead on nuanced differences in reflectivity, translucency, and surface treatment to evoke atmospheric affect. Audience feedback described them as ‘calming’, ‘slow’,” or ‘introspective’ (see Appendix C.6.A), suggesting a connection between low-saturation chromatic environments and reduced cognitive arousal, consistent with findings in environmental psychology.⁶³



Figure 19. Jinya Zhao, *A Breathtaking yet Deeply Enigmatic Alien Planet*. From left to right: 14.5 × 16.5 × 12 cm, 27 × 13 × 10 cm, 7.5 × 9.5 × 6 cm, 21 × 12.5 × 9 cm, 4.6 × 7 × 6.5 cm, 2024. Photo Credit: He Junjie.

This exploration of monochrome perception has expanded my understanding of contrast, tone, and absence as active agents in visual engagement. Within glass art, where light transmission, opacity, and reflection play critical roles, these findings suggest that non-colour elements can be as perceptually powerful as vibrant hues. Monochrome artworks challenge conventional expectations of colour by emphasising form, materiality, tonal values, and the

⁶² Albers, *Interaction of Color*, 59. Albers distinguishes between neutral greys, produced by black–white mixtures, and chromatic greys, produced by complementary colour interactions, underscoring the perceptual variability within grey tonalities.

⁶³ Andrew J. Elliot and Markus A. Maier, “Color Psychology: Effects of Perceiving Color on Psychological Functioning in Humans,” *Annual Review of Psychology* 65 (2014): 95–120, <https://doi.org/10.1146/annurev-psych-010213-115035>.

subtleties of contrast, inviting a reevaluation of how light and transparency influence spatial experience.⁶⁴



Figure 20. Jinya Zhao, A Wedding on That Enigmatic Planet, 52 × 31 × 31 cm, 2024. Photo Credit: He Junjie.

The implications of this study extend beyond material experimentation to broader contexts of exhibition design and viewer perception. This work, rather than being positioned as a wholly novel investigation, builds upon existing research in colour perception, materiality, and curatorial practice, offering insights into how artists and curators might engage with monochrome aesthetics to create immersive, contemplative environments where absence is as significant as presence. In this respect, monochrome emerges as an essential and deeply experiential artistic strategy, expanding the expressive and perceptual possibilities of glass practice.

⁶⁴ Albers, *Interaction of Color*, 62. Albers highlights the role of tonal values in shaping visual contrast and perceptual relationships, demonstrating that shifts in lightness and darkness carry equal weight to chromatic variation in determining visual impact.

2.4. Sensory Perception and Synaesthetic Touch in Glass Practice

Contemporary perception theory recognises that aesthetic experience engages far more than vision alone. Developmental research demonstrates that human beings possess more than the traditional five senses, encompassing proprioception (awareness of body position), interoception (awareness of internal bodily states), thermoception (awareness of temperature), and equilibrioception (awareness of balance), alongside vision, hearing, touch, taste and smell. This expanded framework suggests that aesthetic engagement cannot be reduced to isolated visual or tactile channels, but instead emerges from the interweaving of multiple bodily registers.⁶⁵

Glass artworks, especially when layered, translucent, or textured, are rarely experienced purely as visual objects. Rather, they provoke sensations of density, pressure, temperature, and weight, even in the absence of physical touch. This chapter explores how these perceptual effects can be intentionally composed, theorised, and mobilised as part of a multisensory artistic practice.

2.4.1. Synaesthetic Touch: Seeing as Feeling

In response to the perceptual ambiguity of glass, this research proposes the term ‘synaesthetic touch’, a practice-led concept that designates the way in which visual properties such as surface modulation, chromatic layering, and spatial lighting are composed to evoke haptic sensation through sight alone. Unlike neurological synaesthesia, this is not an involuntary cross-wiring of the senses but a designed perceptual experience, intentionally constructed within the artwork to activate tactile associations in the viewer.

This approach draws conceptually on Laura U. Marks’ notion of haptic visuality, wherein the eye ‘feels’ its way across texture, density, and opacity through careful looking.⁶⁶ In my blown glass practice, these perceptual cues are produced through material processes: layering colour

⁶⁵ Maurer and Maurer, *The World of the Newborn*, 159–169.

⁶⁶ Laura U. Marks, *Touch: Sensuous Theory and Multisensory Media* (University of Minnesota Press, 2002), xiii.

within volumetric forms, applying matt finishes to diffuse light, and using controlled lighting to shift what is seen and how it is seen.

Viewers encountering such works often report sensations of softness, warmth, or weight, suggesting that what they ‘see’ triggers somatic memory and felt presence (see Appendix C.6.B).⁶⁷ These responses are not illusions but perceptual effects: the body’s attempt to complete sensory input based on previous experiences of material, light, and proximity.

Enhanced empathy⁶⁸ emerges here as a key dimension. As visual attention deepens, viewers are drawn into a closer perceptual relationship with the object, where seeing and sensing collapse into a single act.⁶⁹ In this way, synaesthetic touch offers an aesthetic strategy for disrupting the hierarchy of the senses and drawing viewers into more embodied, affective modes of engagement.

Exhibition-based observations from ‘Sattvic Beings’ and ‘Nebulosity Walk in Thy Memory’ suggest that lighting conditions, proximity, and spatial context significantly shape this effect. During these exhibitions, I observed that works with layered translucency or suspended inner forms prompted viewers to shift position, lean forward, or move round the piece, behaviours that I associated with bodily orientation and anticipatory touch.⁷⁰

Beyond the scope of this PhD, future workshop-led research could investigate how variations in light temperature and direction influence visual tactility; how chromatic layering correlates with emotional intensity and imagined texture, and how colour memory and perceptual delay contribute to synaesthetic resonance. This enquiry moves beyond the binary of vision versus touch, situating glass as a medium that blurs and bridges sensory boundaries. It resonates with Brian O’Shaughnessy’s account of perception as a mode of consciousness oriented

⁶⁷ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.

⁶⁸ A term mentioned by Jamie Ward in *The Frog Who Croaked Blue: Synesthesia and the Mixing of the Senses* (Routledge, 2008), 123.

⁶⁹ Vittorio Gallese and Corrado Sinigaglia, "How the Body in Action Shapes the Self," *Journal of Consciousness Studies* 18, no. 7–8 (2011): 117–143.

⁷⁰ These observations are based on the author’s practice-based field notes during the exhibitions. No formal questionnaires or transcripts were collected.

toward potential action and touch,⁷¹ which I extend here to glass practice as a form of visual tactility or ‘nearly-felt’ perception. Through controlled perceptual staging of surface, light, colour, and form, glass invites the viewer to experience not only the seen but also the nearly felt. In this suspended potential for touch, glass art discloses its unique capacity for immersive and imaginative sensory encounter.

2.4.2. Theoretical Grounding: From Synaesthesia to Sensorial Attention

Synaesthesia is a neurological phenomenon in which stimulation of one sensory modality involuntarily activates another, such as hearing colours, tasting shapes, or feeling texture through sound. This phenomenon, often described as ‘using feeling to describe feeling’, challenges the traditional notion of isolated senses by demonstrating how visual, auditory, and tactile stimuli can merge. Far from being a mere anomaly, it reveals the underlying interdependence of the senses and challenges the longstanding notion of perceptual compartmentalisation. Studies in cognitive neuroscience, including early case-based work⁷² and subsequent fMRI research, have shown that synaesthetes activate the visual cortex (specifically area V4, associated with colour processing) even when responding to non-visual stimuli such as sound or language.⁷³

The developmental psychologists Daphne and Charles Maurer suggest that this kind of cross-modal experience is not exclusive to clinical synaesthesia but may in fact be a fundamental early state of human perception. According to their research, infants probably experience the world as an undifferentiated sensory field, where vision, hearing, touch, and internal bodily states (interoception) are not yet separated into discrete cognitive pathways.⁷⁴ While this perceptual unity becomes segmented through learning and socialisation, it perhaps never fully

⁷¹ Brian O’Shaughnessy, *Consciousness and the World* (Oxford University Press, 2000), 78. O’Shaughnessy argues that perception is not a passive state, but a mode of consciousness oriented toward potential action and touch. This thesis extends his account of perceptual imminence into the artistic domain of glass, proposing that visual staging can generate a quasi-tactile or ‘nearly-felt’ encounter.

⁷² Richard E. Cytowic, *Synesthesia: A Union of the Senses*, 2nd ed. (MIT Press, 2002).

⁷³ J. Nunn et al., "Functional Magnetic Resonance Imaging of Synesthesia: Activation of V4/V8 by Spoken Words," *Nature Neuroscience* 5 (2002): 371–375, <https://doi.org/10.1038/nn818>.

⁷⁴ Maurer and Maurer, *The World of the Newborn*.

disappears, and under the right aesthetic or attentional conditions it can be partially reactivated.

My own artistic inquiry into this topic was shaped, in part, by participating in a somatic movement workshop led by the dancer and activist Katy Coe at the Royal College of Art.⁷⁵ One exercise involved closing our eyes and attending exclusively to surrounding sounds such as feet on the floor, breath, and ambient hum, before reopening our eyes to ‘rediscover’ visual input. The sudden return to sight was not merely optical; it was haptic, affective, and disorienting. I realised that perception is not a passive reception of stimuli, but a bodily negotiation of attention, memory, and orientation. This embodied shift reaffirmed the notion that seeing is never purely visual; it is always modulated by past sensations and the body’s readiness to receive or resist them.

This experience helped to frame my understanding of synaesthetic touch not as an imitation of neurological synaesthesia, but as a composed perceptual condition, constructed through glass and activated in the viewer. By layering colour inside translucent volumes, by altering surface tactility through sandblasting and matt finishes, and by shaping light to obscure or reveal depth, my artworks invite viewers to ‘feel’ the object through sight. The sensory effect is subtle but consistent: during my 2025 solo exhibition ‘Before the Feeling Forms’ (CUHKSZ), audience members described these works as ‘soft’, ‘thick’, ‘dense’, ‘textile-like’, and ‘wet’, terms drawn from guided exhibition questionnaires (see Appendix C.6.B).⁷⁶ Such responses, although drawn from informal conversations rather than verbatim transcripts, nevertheless indicate a tactile register activated by purely visual cues.

This interplay between visual suggestion and tactile anticipation is central to my concept of synaesthetic touch. It functions not through metaphor but through perception, drawing on the brain’s capacity to map surface, depth, weight, and materiality across sensory pathways. As these perceptual mappings unfold, they often give rise to a condition I describe as ‘enhanced

⁷⁵ Katy Coe, Somatic Movement Workshop, Royal College of Art, London, 2023. Artist-led workshop attended by the author.

⁷⁶ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.

empathy': the viewer's sensorial and affective proximity to the object increases, not through physical contact but through a multisensory awareness of presence.

This positioning aligns with broader studies in embodied cognition and affective aesthetics, which argue that viewers engage with artworks not as disembodied observers but as somatically attuned bodies in space. As Marks observes in her account of haptic visuality in media, vision itself can operate in a tactile way, a perspective extended here to the spatial and material conditions of glass practice.⁷⁷ My work in glass builds upon this by treating the viewer's body as a co-participant in perception, foregrounding how colour, light, form, and texture can reconfigure attention and invite cross-modal encounter.

2.5. Conclusion

This chapter has examined colour not as a fixed visual element, but as a relational and multisensory phenomenon, shaped by materiality, perception, memory, and spatial context. Through a combination of experimental glass practice, theoretical inquiry, and audience observation, the research has established how colour, in both its presence and absence, functions as a sensorial medium that extends well beyond retinal engagement.

At the centre of this investigation is the concept of synaesthetic touch, developed in response to the perceptual ambiguity of blown glass. While rooted in the neurological phenomenon of synaesthesia, this term is redefined through practice as a composed visual-tactile condition: a state in which sight alone triggers tactile resonance. Techniques such as chromatic layering, surface modulation, and controlled lighting generate not only optical depth but also affective presence, allowing the viewer to 'feel' materiality through looking.

This strategy also challenges conventional sensory hierarchies by activating visual empathy – what I have described as enhanced empathy, through which the viewer enters a more embodied relationship with the artwork. Here, perception is not passive observation, but a temporal, multisensory negotiation involving memory, movement, and attentiveness.

⁷⁷ Marks, *Touch*, xiii.

Key Contributions

- **Colour as Event:** Demonstrates that colour emerges relationally through glass, light, and viewer, evidencing its ephemeral, contextual, and affective nature.
- **Synaesthetic Touch:** Introduces a practice-led concept for visual-tactile convergence, showing how haptic responses can be activated through sight alone.
- **Embodied Viewer Engagement:** Confirms, through audience feedback and exhibition observation, that glass prompts bodily responses such as sensations of softness, density, or warmth.
- **Monochrome as a Tool:** Shows how the absence of colour intensifies tonal gradation, spatial depth, and emotional resonance, offering an alternative pathway to perceptual immersion.
- **Glass as a Sensorial Medium:** Establishes blown glass as a conduit for cross-modal perception, bridging vision, memory, and affect.

Implications

The findings of this research contribute to wider debates in multisensory aesthetics, perceptual theory, and practice-based art. They suggest applications in:

- **Lighting and spatial calibration,** demonstrating how the perceptual effects of glass can inform exhibition and installation design.
- **Cross-modal exhibition design,** indicating how sound, temperature, or smell can be integrated to reinforce or reshape synaesthetic engagement.
- **Curatorial strategies for perceptual priming,** offering insights into how sequencing, light placement, and environmental pacing can prepare audiences for heightened sensory awareness.

Future Research

Looking beyond the scope of this PhD, future investigations could extend these directions more systematically: for example,

- Developing experimental installations that combine glass with other sensory media to test cross-modal perception.
- Collaborating with cognitive scientists to measure perceptual and emotional responses to glass environments.
- Expanding the ‘synaesthetic touch’ framework into interdisciplinary dialogues with museum studies, architecture, and environmental design.

In sum, this research positions glass as not only a sculptural material but also a perceptual engine, capable of staging immersive sensory encounters that reshape how we see, feel, and remember.

3. Layerspace

3.1. Introduction

In my practice, layering is not merely a compositional strategy but also a perceptual condition. By deliberately manipulating layers and spatial relationships, I aim to demonstrate how sensory ambiguity, perceptual depth, and emotional resonance emerge. These structures are both visual and affective, producing experiences that shift as the viewer moves, looks, and recalls. It is from this evolving intersection of visual depth, material opacity, and spatial framing that I propose the term ‘layerspace’.

Layerspace, as developed through my practice, refers to the spatialised layering of visual, material, and perceptual fields that activate multiple registers of seeing and sensing. Unlike traditional layering, which implies sequential addition or compositional stacking, layerspace suggests a dynamic condition in which surfaces, volumes, and voids interact to shape how perception unfolds over time. This concept emerged gradually from working with both blown and flat glass and was significantly clarified during a residency at Pilchuck Glass School, where I explored powder-layered flat panels in contrast to volumetric blown forms.

This chapter investigates the theoretical, material, and phenomenological dimensions of layerspace. Drawing on phenomenological accounts of space and depth,⁷⁸ artistic theories of

⁷⁸ Merleau-Ponty, *Phenomenology of Perception*.

surface and perception,⁷⁹ and material-led research in glass and installation art, I frame layerspace as both a conceptual lens and an operational method within my practice.

Practically, this chapter traces how layerspace manifests in three domains of my work:

- **Three-dimensional forms in blown glass**, where layering is embedded within interior mass and opacity.
- **Flat glass forms**, especially those developed at Pilchuck, where two-dimensional layering stages perceptual delay and optical ambiguity.
- **Installation context**, where space itself becomes a medium for layering light, image, and bodily position.

While this research draws from relevant case studies in contemporary art and architectural glass, it ultimately foregrounds the emergence of layerspace through my own practice. Through audience engagement data, workshop reflections, and exhibition testing,⁸⁰ I evaluate how this perceptual condition enhances emotional resonance and somatic attention. The goal is not only to define a term, but also to articulate how material and spatial design can create layered fields of experience – spaces that are both constructed and felt.

3.1.1. Theoretical Framing

I propose that the concept of layerspace emerges from a perceptual condition in which depth is not only visualised, but also physically negotiated. This view draws on the phenomenology of Maurice Merleau-Ponty, who redefines space as lived and embodied rather than objectively measured. In *Phenomenology of Perception*, he argues that perception is not a detached observation of the world but a mode of embodied presence, in which the body is both the subject and the site of spatial experience.⁸¹ Space, in this account, is not an empty container where objects reside but a dynamic field structured by the body's movement and

⁷⁹ E. H. Gombrich, *The Sense of Order: A Study in the Psychology of Decorative Art* (Cornell University Press, 1979).

⁸⁰ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.

⁸¹ Merleau-Ponty, *Phenomenology of Perception*, 61–97.

sensory orientation. Vision itself is never neutral but is tethered to position, proximity, light, and memory. As we move, space is reconstituted around us not only geometrically but also perceptually.

This perspective shifts the understanding of layering in art from a flat compositional device to a spatial condition shaped by embodied viewing. In this sense, layerspace is not simply built into the object but enacted through the viewer's movement and attention. The 'layer' becomes a perceptual surface or threshold that the viewer must navigate, sometimes visually and sometimes emotionally. A useful parallel can be drawn with the phenomenon of parallax, where depth perception arises from the relative displacement of objects at varying distances as the observer moves. Just as nearby objects appear to shift more rapidly than distant ones, the layers in blown glass generate subtle but dynamic differences in chromatic depth and spatial resonance, which unfold as the viewer changes position.⁸²

When applied to installation and gallery contexts, this theory positions the viewer not as an external observer but as a co-constructor of perceptual space. The spatial sequencing of artworks, the thickness of transparency, and the distance between surfaces all become modulating factors in the experience of depth. Rather than merely 'looking at' the work, the viewer participates in reconfiguring it through positional variation, a process that resonates with the perceptual phenomenon of parallax, where spatial relations shift according to the observer's movement. The gallery becomes, rather than a container for objects, a field of perceptual elasticity.

In my own practice, this has meant treating the artwork not as an isolated form but as a relational construct, dependent on light, orientation, and viewer proximity. The layering of coloured forms in glass, the diffusion of space through matt or reflective finishes, and the orchestration of bodily navigation all contribute to what I term 'layerspace': a spatialised field of embodied perception.

⁸² On parallax as a perceptual mechanism of depth, see Ian Howard, *Perceiving in Depth, Volume 1: Basic Mechanisms* (Oxford University Press, 2012).

3.1.2. Layerspace

Layerspace, as developed through my practice, is not merely a compositional or material strategy, but a perceptual condition in which depth, delay, and spatial ambiguity are activated by the viewer's embodied attention. I propose that through this embodied engagement, the audience experiences colour and spatial layering not as passive observers, but as active participants whose moment-to-moment attention modulates what is revealed, concealed, and felt across time and position. This enriched perceptual experience arises from the interplay of material layering, spatial dynamics such as parallax, and the viewer's attentiveness to these conditions. Consequently, this framework calls for glass artists, exhibition designers, and curators to attend carefully to these factors, to create works and environments that foster and respond to such embodied perceptual co-construction.

A layer, in this sense, is not a passive surface. It may be a shift in translucency, a plane of colour suspended behind another, or a spatial gap that permits partial visibility. In my work, layering frequently involves the stacking of blown or flat glass forms, each with its own optical behaviour, allowing internal veiling, colour blending, and depth occlusion to emerge through light and movement. These visual hesitations produce a delayed encounter, requiring the viewer to move, refocus, or reorient themselves in order to 'complete' the perceptual field.

Space within layerspace is, likewise, not inert. It is the active void between layers, the perceptual thickness that enables the viewer to sense depth as something both seen and intuited. By controlling the distance between surfaces, the opacity of layers, and the spatial rhythm of presentation (for example, through staggered framing or volumetric transparency), the work produces a sense of suspended seeing: the eye does not access the work all at once, but engages incrementally, unfolding perception as a temporal as well as a spatial experience.

This layered structure also generates a temporal engagement. Meaning is not embedded in a fixed surface but is distributed across strata that unfold through time, motion, and proximity. For instance, a viewer may first encounter a coloured silhouette and, upon approaching more closely, detect the presence of a second layer whose form had been occluded. Such gradual

unfolding enables memory, affect, and curiosity to enter the perceptual field, transforming layers into affective membranes that mediate both spatial and temporal experience.

Techniques such as veiling, obscuring, and chromatic diffusion are central to this process. By applying sandblasting, edge-softening, or matt finishing to selected surfaces, I control how light enters and how forms recede or emerge. These material manipulations are not merely aesthetic; they produce perceptual ambiguity, inviting the viewer to pause, refocus, or reposition themselves, thereby activating a spatialised sense of perception. A useful parallel can be drawn with atmospheric perspective, where the presence of particles in air causes distant forms to appear lighter or bluer,⁸³ and with the phenomenon of light scattering, in which diffusion through vapour or particulate matter softens visual clarity.⁸⁴ In glass practice, sandblasted surfaces operate in a comparable way, dispersing light to create depth, delay, and perceptual resonance.

Ultimately, layerspace is not a metaphor, but a spatialised perceptual structure: one that is constructed through material decision-making and activated by the viewer's movement. It offers a way of composing with opacity, delay, and relational depth, transforming space into an evolving experience rather than a fixed condition.

The following sections examine how layerspace operates across two intersecting dimensions: mental layers, which organise perception, memory, and sensory recall; and physical layers, which structure the material, spatial, and optical dynamics of the work.

3.2. Mental Layers

Layerspace, in its mental dimension, describes a perceptual structure composed of delay, recall, and spatial ambiguity. It unfolds not as a visible surface, but as a stratified field of embodied memory and sensory construction. These 'mental layers' are shaped not only by

⁸³ E.H. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* (1960; reis. Princeton University Press, 2000), 181–290.

⁸⁴ John S. Werner and Leo M. Chalupa, eds., *The New Visual Neurosciences* (The MIT Press, 2013), 412–418.

optical stimuli but also by the viewer's position, anticipation, and accumulated perceptual history.

Perception, as Merleau-Ponty suggests, is not a passive reception of the world, but an active bodily negotiation with space and time.⁸⁵ What we see is always situated, filtered through prior knowledge, emotional states, and movement. In layerspace, this condition is amplified: a work may not be fully legible at once but must be assembled through motion, delay, and memory. Meaning emerges incrementally, requiring the viewer to revisit and reconfigure what they think they have seen.

This stratified perception aligns with Edward C. Tolman's theory of 'cognitive maps', internal spatial schemas that guide how we mentally construct, navigate, and recall environments.⁸⁶ In my work, I activate these mental cartographies by constructing visual fields that demand attention over time. A blurred silhouette, a partially occluded volume, or a veiled chromatic shift invites the viewer to bridge perceptual gaps through inference and memory. This act of mental completion becomes a crucial layer of the work itself.

To extend this enquiry, I developed a sensory workshop that investigated how olfactory prompts elicit visual-spatial recall. Participants were asked to recall a specific scent and articulate the colours, material textures, and spatial forms they associated with it. This exercise aims to understand how memory encodes spatial qualities, while also testing the applicability of mental layering as an experiential methodology within practice-led research (see Appendix B.3, Workshop IV).

These theoretical and experimental insights resonate with my own studio experience. In works like *Tracing the Shadows of Time* (2024), the viewer first encounters a blurred chromatic field (Figure 21). It is only when they shift their physical position that internal silhouettes emerge, reflections clarify, and layers separate into discernible spatial registers. The visual field does not offer resolution; it unfolds through relational looking.

⁸⁵ Merleau-Ponty, *Phenomenology of Perception*, 61–97.

⁸⁶ Edward C. Tolman, "Cognitive Maps in Rats and Men," *Psychological Review* 55, no. 4 (1948): 189–208, <https://doi.org/10.1037/h0061626>.



Figure 21. Jinya Zhao, *Tracing the Shadows of Time*, 2024. Blown and layered glass, 37 × 29 × 29 cm.

This work explores the perceptual delay and emotional ambiguity central to the concept of mental layering. Internal silhouettes and chromatic strata remain partially obscured until the viewer shifts position, at which point veiled forms gradually emerge. The interplay between reflection, transparency, and opacity invites relational looking over time, producing a spatial field that is not optically resolved but perceptually assembled. Photo Credit: He Junjie.

This principle is echoed in the work of James Turrell, whose *Skyspaces* orchestrate natural light to dissolve distinctions between interior and exterior, object and atmosphere (Figure 22). While Turrell's installations manipulate ambient light to dissolve architectural edges, my works use glass layering to internalise perceptual uncertainty within the material itself. Both practices, however, rely on optical ambiguity and the movement of the viewer to produce experiential depth.

In this way, layerspace becomes a cognitive and sensorial construct, activated not only by material arrangement but also by the viewer's own perceptual participation. Memory, imagination, and attention assemble the work piece by piece, forming a mental landscape that is simultaneously constructed and felt. Perception in this context is never instantaneous: it is layered, negotiated, and remade across time.



Figure 22. James Turrell, *Skyspace*, 2013. The University of Texas at Austin, USA. This installation transforms natural light into a perceptual event. As viewers shift position, the sky appears alternately flat or spatially deep, echoing the delay and instability central to mental layering in layerspace. Photo Credit: Florian Holzherr.

3.2.1. Emotional Depth

‘Emotional layering’ describes how depth, ambiguity, and temporal delay in layerspace invite emotional resonance, not through representation, but through material atmospheres and perceptual deferral. In this condition, light, colour, and spatial hesitation become emotional triggers, shaping an affective response through what is withheld, veiled, or felt incompletely.

This idea resonates with Gaston Bachelard’s *The Poetics of Space*, where space is not passive but is an intimate container of memory and reverie.⁸⁷ Enclosure, threshold, and depth all provoke emotional reactions rooted in personal history and spatial imagination. In my work,

⁸⁷ Gaston Bachelard, *The Poetics of Space*, trans. Maria Jolas (Beacon Press, 1994).

these spatial devices, such as layered surfaces, chromatic fog, and optical depth, structure emotional presence not through figuration but through embodied perception.

Chromatically, this affective condition aligns with the work of Mark Rothko, whose colour fields construct meditative states through blurring, saturation, and atmospheric absorption (Figure 23).⁸⁸ His canvases are not windows but emotional chambers, spaces of contemplation in which colour becomes environment. However, while Rothko's transitions are produced through pigment layering, my practice achieves similar affective states through modulated transparency, diffused edges, and shifting optical thresholds in glass.

For instance, in *Tracing the Shadows of Time* (2024), layers of transparent and sandblasted glass interact with ambient light to conceal and gradually reveal internal colour fields (Figure 21). As the viewer changes position, silhouettes come into focus, and chromatic registers clarify or dissolve. This optical latency produces a temporal unfolding, evoking not clarity but a rhythm of perception that opens space for emotion and reflection.

In *Sunset Under the Opening Clouds* (2023) (see Figure 5), gradients of warm tones embedded within curved glass interact with natural daylight, shifting in density and tone throughout the day. The work presents, rather than a fixed image, a durational chromatic field – open-ended, immersive, and emotionally resonant.

Audience feedback⁸⁹ confirms that these works prompt affective responses such as calm, melancholy, or quiet attentiveness, not through narrative content, but through sensorial disorientation and visual ambiguity. This affect arises from spatial veiling, perceptual slowness, and internal contradiction between what is sensed and what is fully seen.

⁸⁸ Mark Rothko, *The Artist's Reality: Philosophies of Art*, ed. Christopher Rothko (Yale University Press, 2006).

⁸⁹ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.



Figure 23. Mark Rothko, No. 14, 1960. San Francisco Museum of Modern Art, Helen Crocker Russell Fund purchase. © 1998 Kate Rothko Prizel & Christopher Rothko – Adagp, Paris, 2023. © Fondation Louis Vuitton / Marc Domage.

These emotional unfoldings are inseparable from memory – not as stored imagery, but as lived presence. Merleau-Ponty asserts that memory is not a mental residue of the past, but a bodily continuity of experience, a way of reinhabiting what has already been seen or felt.⁹⁰ The body becomes a medium of return, through which perception and recollection collapse into each other.

The texts in Ian Farr’s anthology *Memory*, in the Whitechapel *Documents of Contemporary Art* series, reinforce this view. Susan Hiller’s writing on memory as a lived, sensory practice and Jan Verwoert’s reflections on memory’s perceptual reactivation are particularly relevant.⁹¹ In layerspace, memory is not illustrated but structured: through opacity, delay, and perceptual thresholds, the work elicits recollection through unfolding perception.

⁹⁰ Merleau-Ponty, *Phenomenology of Perception*.

⁹¹ Ian Farr, ed., *Memory: Documents of Contemporary Art* (Whitechapel Gallery; MIT Press, 2012).

In this sense, ‘emotional layering’ may also be understood as a form of ‘memory layering’ (sometimes described in mnemonic terms). The viewer engages not only with what is optically given, but with what is partially remembered, imagined, or momentarily lost. As Bachelard observes, the spaces we inhabit are built not simply with walls, but also with ‘dreams, hesitations, and memories’.⁹²

3.3. Physical Layers

In glass-based practice, physical layering is not merely a compositional method but also a perceptual strategy that generates spatial ambiguity, emotional resonance, and cognitive activation. Layers, whether formed through material strata, visual veiling, or spatial gaps, create tension between what is visible, what is withheld, and what is gradually revealed. In my work, layering becomes a structural and atmospheric condition: it allows light to travel, pause, and scatter, encouraging a slower, more participatory encounter with the object.

This chapter considers how glass engages with sculptural traditions of addition and subtraction, how layers modulate perception through optical density and veiling, and how spatial and perceptual fields are constructed between the artwork, the viewer, and the environment. Through material experimentation, theoretical alignment, and spatial composition, I explore how glass functions as a medium of layered presence, where transparency and opacity, surface and depth, space and memory converge.

3.3.1. Material Strategies: Subtraction and Addition

In the history of sculpture, spatial depth has often emerged through the physical negotiation of material, either by carving into form (subtraction) or building into space (addition). These approaches offer not only formal solutions but also perceptual and phenomenological implications: they shape how bodies encounter volume, void, and surface. In my glass practice, I draw from both traditions, adopting subtractive and additive logics as strategies to articulate layered spatial experience.

⁹² Bachelard, *The Poetics of Space*, 3–13.

Subtractive strategies, exemplified in the work of Barbara Hepworth, reveal form through removal.⁹³ Her pierced and smoothed sculptures generate intimacy and tension by exposing what lies within, creating zones of passage that invite both vision and touch (Figure 24). In glass, this logic appears in processes such as powdering, sandblasting, and coldworking, where surface is stripped or abraded to modulate translucency, shadow, and texture. A carved-out zone does not simply remove material; it produces a perceptual depth that invites the eye inward and reorients the body in relation to surface. The influence of Hepworth's forms can be traced in my shaping of molten glass in the hotshop, in which curves and voids act as visual and tactile passages. Through subtractive labour, I aim not only to refine form but also to allow light to enter, pause, or diffuse, transforming optical clarity into perceptual resonance.

Additive methods, by contrast, accumulate volume and presence. Rodin's expressive layering of clay⁹⁴ and Giacometti's attenuated gestures⁹⁵ demonstrate how form can emerge through repetition, massing, or vertical reach. These approaches foreground material as temporal trace, a visible record of motion and memory. In my blown and flat glass practice, I explore additive logic through layering and compositional stacking, creating air gaps and intersections that enable internal refraction, chromatic shifts, and perceptual latency to unfold.

This additive/subtractive interplay becomes especially potent when it is used to manipulate the viewer's perspective. A surface treated with opacity may veil a deeper layer that gradually emerges as one moves; a protruding volume may cast unexpected shadows, inviting bodily repositioning. Both strategies function not as ends in themselves but as compositional mechanisms for activating spatial ambiguity, material memory, and affective encounter. Glass thus becomes not only a sculptural material, but also a spatial medium through which transparency, volume, and void construct temporal experiences of looking.

⁹³ Alan Bowness, *Barbara Hepworth: Drawings from a Sculptor's Landscape* (Cory Adams & Mackay, 1966).

⁹⁴ Albert E. Elsen, *Rodin's Art: The Rodin Collection of the Iris & B. Gerald Cantor Center for Visual Arts at Stanford University* (Oxford University Press, 2003), 52–55.

⁹⁵ James Lord, *Giacometti: A Biography* (Farrar, Straus and Giroux, 1985), 210–215.



Figure 24. Barbara Hepworth, *Pierced Hemisphere*, 1937. Sculpture in Hoptonwood stone on Portland stone base, 435 × 380 × 380 mm. Accession no. T11785. Tate Collection, London. © Barbara Hepworth, all rights reserved / DACS 2025.

This interplay is embodied in *Sunset Under Open Cloud* (2023), a blown and coldworked glass work developed through layered chromatic construction and subtractive surface modulation. The form was shaped hot to retain gentle curvature, then selectively sandblasted to soften its optical edges and introduce atmospheric veiling. Internally, colour gradients were embedded through additive layering, each tone partially obscuring or enhancing others depending on the angle and the light. From one perspective, the work presents a solid chromatic mass; from another, the interior appears to dissolve into mist. As light enters and refracts across the sandblasted surface, a perceptual delay unfolds, requiring the viewer to reposition the body and recalibrate focus. Through the dual strategies of carving light and building optical depth, *Sunset Under Open Cloud* transforms a sculptural object into a dynamic perceptual environment (Figure 25).



Figure 25. Jinya Zhao, *Sunset Under Open Cloud*, 2023. *Blown and coldworked glass, 49 × 30 × 30 cm.*
Left: Exhibited in 'In Residence III' at Cromwell Place, London, UK. Installed next to a window, where direct sunlight modulated the visibility of internal colour gradients and refracted shadows throughout the day. Photo Credit: Jinya Zhao.

3.3.2. Light and Layering: Spatial Thresholds

In glass, layering is not merely an act of formal accumulation, it is a spatial strategy that constructs thresholds between visibility and concealment, surface and depth, interior and exterior. These thresholds are made perceptible through light. In my work, I use layering not only to modulate colour and opacity but to shape the movement of light across and within material. Light enters as both a structural agent and a perceptual force, turning the static object into a mutable spatial field.

This approach draws on the perceptual logic developed by James Turrell. His light installations *Aten Reign* use layered illumination and spatial enclosure to dissolve material boundaries (Figure 26). Within these chambers, colour appears to hover, expand, or retract, depending on the viewer's position and duration of looking. The experience of space becomes temporal and bodily. Like Turrell, my interest lies in how light can construct spatial

ambiguity, not through architectural intervention, but through the modulation of surface, density, and chromatic interaction.



Figure 26. James Turrell, *Aten Reign*, 2013. Photo Credit: David Heald © Solomon R. Guggenheim Foundation, New York.

My blown and coldworked glass work *The Summer – Colour Perception Study I* exemplifies this inquiry. Created through multiple firings and surface interventions, the piece presents shifting veils of tone and reflection that change depending on angle and ambient light (Figure 27). Its powder-worked surface softens optical clarity, diffusing the edge between form and shadow. Viewers reported that they ‘felt’ the colour moving, not because it physically changed, but because the layering, under light, created perceptual instability (see Appendix C.6.B).⁹⁶ This spatial play was heightened by its installation, which allowed natural light to pass through from different angles over the course of the day.

⁹⁶ Responses were originally in Chinese. A selection of sample scans is included in Appendices B.6, together with an English summary table prepared by the author.



Figure 27. Jinya Zhao, *The Summer – Colour Perception Study I*. 57 × 25.5 × 25.5 cm. Installation view at ‘*Objects of Contemplation*’, Hauser & Wirth. (2024). Photo Credit: Dave Watts and Make Hauser & Wirth.

Turrell's concept of ‘felt space’ is also echoed in *Mime* (2024), where contrasting layers, opaque and transparent, textured and smooth, create internal visual rhythms that shift with movement (Figure 28). The viewing body is required to reposition itself, not just to see the work but to perceive its full depth. The layering acts as a sequence of spatial thresholds, some visible, some implied, that delay perception and invite curiosity.

This experience is aligned with Bachelard’s notion that thresholds are not just physical but also psychological: ‘The door’, he writes, ‘is not only an object for crossing, it is a metaphor for perception’. Christian Marclay’s *Doors* (2022) explores this metaphor directly (Figure 29). His montage of cinematic thresholds and altered wooden doors creates a visual language of interruption and passage (Figure 30).⁹⁷ Just as Marclay layers time and space through

⁹⁷ Bachelard, *The Poetics of Space*, 3–10.

visual sequencing, I layer light, material, and reflection to structure transitional visual zones, spaces in which perception becomes durational.⁹⁸

Layering in my practice is thus not only material but phenomenological. It creates suspended zones of looking, where depth is not given but must be sought. Like the softening edge of a shadow or the occlusion of one tone behind another, these spatial veils ask the viewer not just to look, but to stay, with their body, their memory, and their attention.



Figure 28. Jinya Zhao, Detailed Image of Artwork Mime, 2024. 50 × 30 × 30 cm. Layered surface contrast creates shifting optical thresholds. Photo Credit: Anyan Wu Studio.

⁹⁸ White Cube, *Christian Marclay (Mason's Yard 2023)*, 2023, accessed February 17, 2024, <https://www.whitecube.com/gallery-exhibitions/christian-marclay-masons-yard-2023>.



Figure 29. Christian Marclay, *Skeleton Door*, 2023. *Altered Wooden Door*, 201.5 × 72 × 4 cm (79 5/16 × 28 3/8 × 1 9/16 in.).



Figure 30. Christian Marclay, *Doors*, 2022. *Single-Channel Video Installation, Projection, Colour and Black & White, Continuous Loop*.

3.3.3. Spatial Experience and Perceptual Instability

In layered glass practice, space is not a fixed container – it is continuously constructed, sensed, and reshaped through interactions between light, opacity, and bodily movement. As viewers reposition themselves in relation to a work, what was once hidden becomes visible; what appeared solid reveals its transparency; colour shifts into shadow. This instability is not

a limitation but a strategy, one that transforms a static composition into a durational encounter.

Anthony McCall's *Solid Light* series exemplifies this principle. In works like *You and I, Horizontal*, McCall uses volumetric light projections to create ephemeral spatial structures, forms that appear architectural yet remain intangible, visible only through haze, darkness, and the viewer's presence (Figure 31). These installations blur the line between drawing and sculpture, as viewers are invited to step inside, breaking the beam and becoming part of the form. Delay, partial appearance, and movement are essential to their operation. These same elements – temporal emergence, spatial delay, and bodily co-presence – inform my engagement with layerspace.

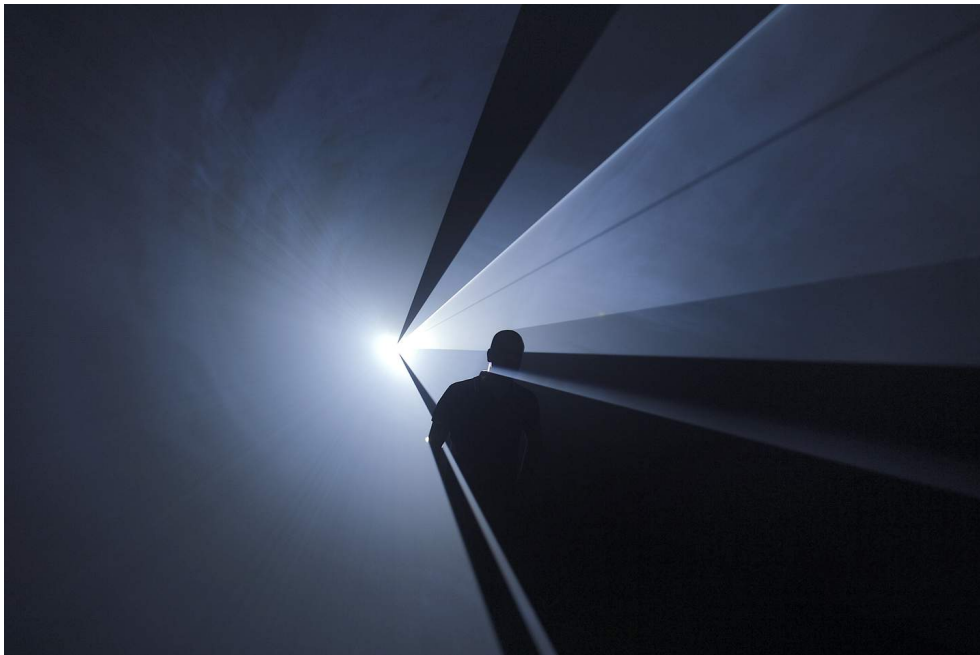


Figure 31. Anthony McCall, *You and I Horizontal*, 2005. Installation view, Institut d'Art Contemporain, Villeurbanne, France, 2006. Photo Credit: Blaise Adilon.

My work *Tracing the Shadows of Time* (2024) similarly explores space as a durational condition. Composed of layered blown glass with internal tonal variation and sandblasted modulation, the piece initially appears as a hazy, coloured volume. But as the viewer shifts position, internal silhouettes begin to emerge, and reflected fragments, overlapping shadows, and delayed refractions reveal previously obscured forms (see Figure 21). These are not

visible from a single vantage point. Instead, they demand the kind of choreographed seeing that McCall's work also requires – slow, relational, and embodied.

Figure 32 offers a further technical insight into how material thickness in glass affects chromatic clarity. This work was produced through a series of experiments in which differently layered coloured glass segments were tested under shifting light conditions. As the layers deepen, the visual qualities of the work change: thin areas remain luminous and translucent, while thicker segments absorb and reflect light unevenly, creating chromatic compression or gradient collapse. These subtle shifts are rarely perceived all at once; they appear gradually, depending on the distance and angle of the viewer and the surrounding light.



Figure 32. Detailed image demonstrating the varying qualities of glass with different colour thicknesses. This experiment tested how coloured layers modulate light transmission and affect perceived density. Thicker segments intensify chromatic saturation, while thinner regions permit translucency. Photo Credit: Jinya Zhao.

Such perceptual instability aligns closely with Merleau-Ponty's theory of embodied perception. For Merleau-Ponty, vision is not a passive reception of the world, but an active negotiation between body, world, and intention. Meaning is not accessed instantaneously but produced through the unfolding of spatial-temporal experience.⁹⁹

In this light, my glass works operate not as autonomous objects, but as participatory environments. They absorb and reshape ambient conditions, borrowing shadows, redirecting light, and offering layered imagery that remains partial until activated by the viewer. It is not merely a question of what is seen, but of how seeing is staged: spatial ambiguity becomes a method, not a mystery.

3.4. Workshop

Workshops serve as a critical methodological tool in practice-based research, enabling direct engagement with viewers to investigate how material properties, spatial arrangements, and sensory perception intersect in contemporary glass practice. In my research, workshops are deployed not as pedagogical ends, but as participatory sites where the conceptual frameworks of layerspace and synaesthetic touch are tested, re-evaluated, and refined through embodied viewer interaction.

Merleau-Ponty's theory of embodied perception provides a critical framework for understanding perception not as a passive reception of stimuli but as an active, corporeal engagement with the world. His assertion that 'the body is our general medium for having a world'¹⁰⁰ resonates with my material experimentation in layered and translucent glass, where perceptual meaning arises through the shifting interplay of transparency, opacity and chromatic veiling. In this context, the viewer's bodily movement and perspectival shifts not only register pre-existing qualities but also actively constitute the work's sensory and affective presence, making perception a co-generated event between body, materiality and space.

⁹⁹ Merleau-Ponty, *Phenomenology of Perception*.

¹⁰⁰ *Ibid.*, 169–171.

Building on this phenomenological foundation, Miwon Kwon's analysis of site-specificity further emphasises that spatial and environmental contexts are not neutral containers but co-productive agents in shaping the meaning of artworks.¹⁰¹ The site itself participates in the phenomenological event of perception, inflecting how works are encountered and understood. This perspective directly informs my practice, where the physical and temporal characteristics of a given environment such as light, temperature and spatial configuration interact with the glass material to modulate perception and generate affective resonance.

Framed in this way, the workshops I design function as immersive research spaces in which audience interaction is not ancillary but constitutive. They provide an empirical platform through which artistic inquiry, material experimentation and conceptual frameworks are tested and refined, positioning glass as a multisensory and affective medium rather than a static sculptural object.

3.4.1. Workshop 1: Colour, Memory, and Landscape

Taking inspiration from Turrell's, Rothko's, and Marclay's methodologies, I have integrated these approaches into a laboratory setting to examine how sensory memories can be transformed into visual and sculptural art (Figure 33).

A key example is Research Workshop 1, conducted during the Glass Art Society Conference (GAS) in Berlin in 2024. Participants were invited to recall the scents and emotions associated with particular landscapes they remembered and then translate these olfactory and emotional recollections into tangible artistic expressions. Using colours, shapes, and layers, they explored how sensory experiences could be visualised, deepening their understanding of how layers, space, and light interact in art. This process facilitated creative translation and highlighted the interplay between sensory perception and artistic expression. (Detailed workshop overview and questionnaire be found in the Appendix B.1.)

¹⁰¹ Miwon Kwon, *One Place After Another: Site-Specific Art and Locational Identity* (MIT Press, 2002), 89–112.



Figure 33. Jinya Zhao Research Workshop at Berlin Glass, during The Glass Art Society (GAS) Conference 2024, Berlin. Photo Credit: Jinya Zhao.

The workshop yielded several compelling insights into the role of colour in memory perception. When asked, ‘In what ways did the use of colour influence your recollection of memories?’ most of the participants responded that their perception of colour ‘keeps developing and changing with my current experience’. This response suggests a dynamic interplay between colour and memory, where colour not only recalls past experiences but also evolves in meaning as one's lived experiences change. Additionally, one participant noted that colour helps to ‘better articulate and express my concept and relationship with my memories’, demonstrating its role as a vital tool for expressing and shaping personal narratives. These findings emphasise the transformative nature of colour in recollections and artistic representation.

When asked, ‘How did the use of transparent colours in the glass art affect your experience of memory?’ the most frequent responses were ‘Created a sense of openness and clarity’, and ‘Allowed for multiple layers of meaning’. Another participant remarked, ‘The contrast

created between transparent and opaque provided further depth to the discourse between myself, memory, and time.’ This feedback highlights how transparency and opacity in glass dynamically influence the engagement with memory and perception over time.

Participants also reflected on the role of form in shaping memory, and many noted that the forms offered new perspectives or became integral to their recollection of the moment. This emphasises the profound connection between physical forms and their role in shaping personal narratives.

At the conclusion of the workshop, participants were asked, ‘What new insights did you gain about the relationship between memory, colour, and form?’ Responses included:

- ‘What is being recalled is what is currently longing for.’
- ‘The colour clarified my feelings towards the memory.’
- ‘It is easier to express my memory in colours than in words.’
- ‘The trinity of memory, colour, and form creates a bond that affects and shifts each other, infused with the fluidity of memory.’
- ‘By manipulating the transparency and observing how light and fractures affect colour, I found a lot of energy moving in and out of the piece. It made me happy, feeling that everything, including memories, is fluid and they can come and go as allowed.’
- ‘The memories themselves create colours.’

These reflections emphasise the intricate relationship between sensory input and memory perception, highlighting how artistic processes can shape and refine recollection.

These workshops will inform my creative work, particularly in exploring memory representation through material and colour variations, enhancing both artistic and pedagogical methods. encouraging a dynamic investigation of how sensory inputs, especially visual elements, evoke emotional and cognitive responses.

Opacity in materials, akin to the shifting visibility of landscapes under changing light, influences the clarity and intensity of memory. Future research will explore how varying levels of material transparency affect perception and emotional engagement, refining its role in representing memory. By refining these variables, I aim to craft immersive experiences that engage viewers emotionally and conceptually with the artwork. This approach not only expands the scope of my artistic practice but also contributes to a richer, more nuanced understanding of the interplay between art, memory, and emotion.

These reflections were documented through a preliminary mixed-methods approach that combined observation, short interviews and participant questionnaires. At this stage the methods were exploratory rather than systematic, serving primarily to capture immediate impressions and experiential insights. Nevertheless, they provided a valuable foundation for developing a more rigorous framework for data collection and analysis in subsequent workshops at CUHKSZ (see Chapter 5.4.1; Appendix B.3).

3.4.2. Experimentation: Developing Layerspace through Material Research

My exploration of layerspace was significantly extended during my residency at Pilchuck Glass School (Washington, USA, October 2023), where I shifted from working with three-dimensional blown glass to the precise layering of flat glass sheets. This transition allowed me to explore new forms of spatial orchestration and visual ambiguity through kiln-based techniques.

This period allowed me to experiment with kiln-firing techniques. Like working with watercolour, I found it productive to approach the qualities I am researching through a process that was different from that of hot-blown glass. Engaging with flat glass enabled me to focus more fully and simply on the manipulation of layers and on careful observation of how these interventions affected texture, translucency and perceptual depth. These investigations resonate with the conceptual model of layerspace as not merely physical stratification but also a mode of embodied perception.

This period allowed me to experiment with kiln firing techniques to manipulate the texture and quality of glass. By varying firing temperatures, I observed distinct transitions in the

glass surface from granular to glossy, deepening my understanding of how thermal conditions affect materiality and aesthetics. (Detailed firing schedules and technical specifications can be found in the Appendix A.3.)

Thermal Variation and Surface Tactility

A series of tests revealed how firing temperature dramatically alters both the appearance and tactile qualities of glass. Higher temperatures (760°C) produced a smoother, more reflective surface, while lower settings (732°C) retained a granular texture and matt finish, enhancing diffusive light effects. These findings demonstrate that heat is not just a tool of transformation but a compositional variable that influences how light interacts with surface texture and layering.

Translating Blown Forms into Layered Structures

To explore spatial layering beyond the vessel, I selected *Sunset Under Open Cloud* (2022) as a reference (see Figure 5). I traced the form and divided it into three horizontal strata (Figures 34–35). Negative templates were cut and used to sift glass powders onto flat sheets. Each layer thus became a translation of volumetric curvature into chromatic and spatial zones across two-dimensional surfaces.

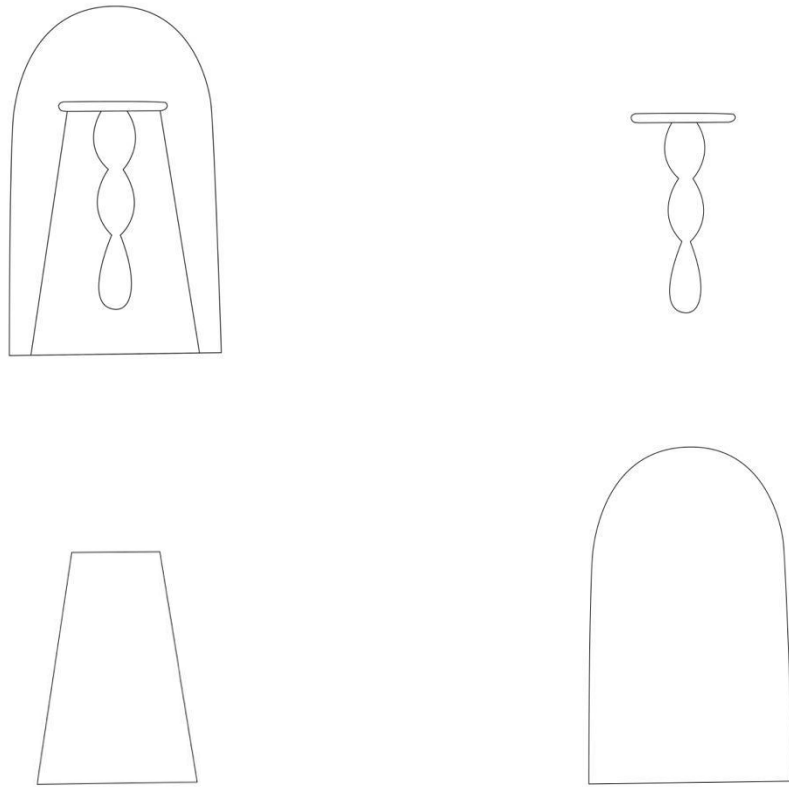


Figure 34. Outline drawing derived from the blown form, used for structure translation.

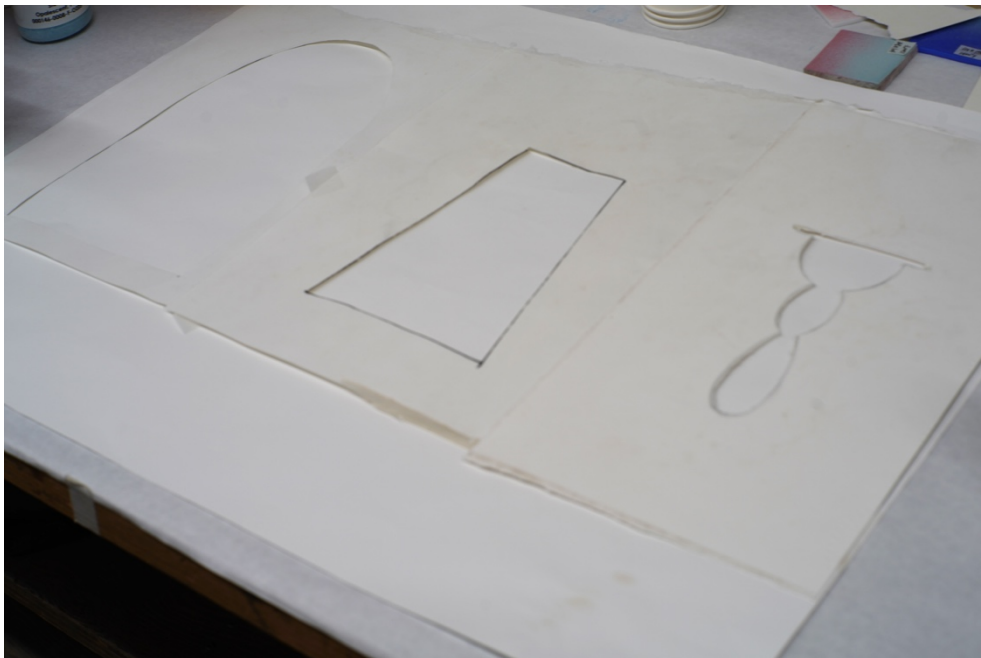


Figure 35. Layer separation study using paper cutouts. Photo Credit: Jinya Zhao.

Three Techniques of Spatial Layering

The following three experiments were conducted using the same basic material and design, each testing a different layering logic (Figure 36):

- **Full Fusion**

All the glass sheets were fused together at once. This created a singular object with minimal internal depth. The visual experience was unified, but it lacked interstitial complexity.

→ *Outcome: stable form, low spatial ambiguity.*

- **Fused with Interstitial Powder**

Transparent powder was introduced between layers before firing. This increased diffusion and created semi-obscured transitions between forms.

→ *Outcome: enhanced optical veiling, more perceptual delay.*

- **Unfused Layer Suspension**

Layers were left unfused and mounted to retain space between them. This technique allowed for active interlayer shadowing, light transmission, and reflection.

→ *Outcome: maximum spatial complexity, viewer-dependent variation.*

Sandblasting was applied to all surfaces to enhance the interplay between layers. These experiments underscored the potential of non-fused layers to create a more dynamic spatial experience, allowing for greater manipulation of the interstitial spaces between them. This approach deepens the conceptual and material exploration of transparency, perception, and spatial engagement, demonstrating how subtle variations in material structure can redefine spatial depth and viewer interaction.

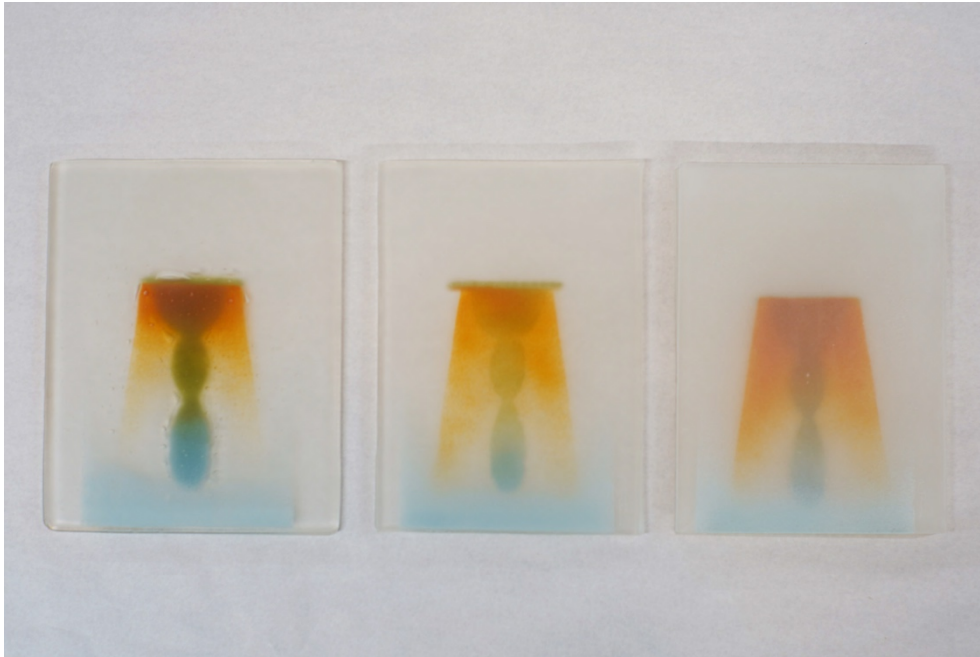


Figure 36. Jinya Zhao, *Three Experiments on Layering*. Exploring different fusion techniques to manipulate structure, light diffusion, and spatial depth. Photo Credit: Jinya Zhao.

Table 1. Summary of experimental results for glass layering techniques, comparing spatial depth, perceptual delay, light modulation and structural flexibility.

| Technique | Spatial Depth | Perceptual Delay | Light Modulation | Structural Flexibility |
|---------------------------|----------------------|-------------------------|-------------------------|-------------------------------|
| Full Fusion | Low | Minimal | Clean transitions | High |
| Fused with Powder | Medium | Moderate | Diffused layering | Medium |
| Unfused Suspension | High | High | Reflective, shifting | High (with mounting) |

Material Philosophy and Spatial Implication

These experiments emphasise a key concept in layerspace: that physical gaps between layers are not inert but are perceptually generative. In the unfused configuration, glass ceases to be a singular object and instead becomes a relational field in which the interplay of light, transparency and distance activates spatial awareness and perceptual instability. This aligns with Merleau-Ponty's phenomenology of perception, particularly his view that space is lived

and sensed through bodily orientation. As he observes, ‘its spatiality is not, like that of external objects or like that of “spatial sensations”, a spatiality of position, but a spatiality of situation’.¹⁰² The viewer’s shifting position alters how the artwork unfolds, enacting layerspace as a dynamic perceptual field.

Extending this phenomenological insight, the rigidity of glass sheets in tension with the malleability of powdered layers reflects the dual character of embodied existence as both structured and adaptive. This interplay between control and openness parallels the lived tension between stability and transformation that is at the core of perceptual experience.

Conclusion

By working across fused, semi-fused, and non-fused formats, I transformed sheet glass from a static medium into a sculptural strategy for perceptual choreography. Light no longer simply reveals form; it animates and negotiates spatial thresholds. The transparency of glass becomes an instrument of delay and encounter, foregrounding the interstitial as a site of meaning.

These findings will inform future site-specific installations and curatorial experiments, where audiences are invited not just to see, but also to *navigate* the spaces within and between layers.

¹⁰² Merleau-Ponty, *Phenomenology of Perception*, 114–115.

3.4.3. The Creative Work

The outcomes informed my creation of an innovative collection, merging my three-dimensional blown glass expertise with the aesthetic nuances of my two-dimensional watercolours (Figure 37). A key element of this series is the deliberate spacing between glass layers within the frames, which enhances depth while allowing light and shadow to weave through the works, animating them with movement and transformation.

The final flat works invite interaction, shifting in appearance as viewers move around them. This highlights the active role of the body in perception, echoing Merleau-Ponty's assertion that perception is not passive reception but an embodied relation between perceiver and perceived.

Building on my exploration of colour in the previous chapter, I interwove these insights throughout the gallery, examining display as layered space. The new three-dimensional objects in my practice extend research into transparency, reflection and fragility, refining and deepening these themes. The integration of blown glass objects, flat framed pieces and the gallery space forms the cornerstone of this chapter, orchestrated to explore the interplay of materiality, space and perception.



Figure 37. Jinya Zhao, final works before framing. Photo Credit: Jinya Zhao.

Through the inherent capacity of glass to manipulate light and spatial depth, the works enact the concept of layerspace, foregrounding how viewers co-constitute meaning through movement and perspective. This interconnectedness underscores the interactive nature of the artworks without relying on literal representation, thus inviting both tactile and visual engagement.

This investigation into flat glass layering and powder-based surface treatments laid the groundwork for subsequent explorations in three-dimensional blown forms. Extending these techniques into sculptural volumes enabled the translation of chromatic veiling, soft-edge opacity and spatial ambiguity into more complex optical structures. Applying glass powder onto curved surfaces introduced further veils of diffusion, allowing translucency, reflection and shadow to coexist within a single form. This shift established a conceptual and material bridge between two- and three-dimensional practice, demonstrating how perceptual logics of layering and light move fluidly across formats and spatial registers. In doing so, it set the foundation for the expanded layering strategies examined in the following chapters.

4. Glass and Sensation

4.1. Introduction

In this chapter I investigate how blown glass, as a sensorially volatile and perceptually porous material, mediates what Gilles Deleuze describes as ‘sensation’, an affective force that bypasses representation and engages the body at the level of intensity.¹⁰³ Rather than privileging the visual, I propose that glass initiates an event of perception in which sight, touch, memory and sound converge within a temporally unfolding experience. Drawing on Deleuze’s *Logic of Sensation* and Maurice Merleau-Ponty’s *Phenomenology of Perception*,¹⁰⁴ I examine how glass can generate synaesthetic responses, forms of haptic visibility and tactile vision that challenge conventional sensory hierarchies.

The chapter is structured around three interlocking strands. First, I analyse glass as a material of sensation, exploring how its opacity, texture and fluid formation embody perceptual ambiguity. Second, I articulate the philosophical stakes of sensory experience through key frameworks developed by Deleuze and Merleau-Ponty. Finally, I situate these ideas in my practice, considering artworks and audience-engagement workshops as sites where sensation is not only theorised but also materially enacted.

In doing so, this chapter builds on the preceding analysis of layerspace and prepares the ground for the following chapter, which discusses site as a research method, demonstrating how glass enables material thinking through embodied, sensory and spatial encounter.

¹⁰³ Gilles Deleuze, *Francis Bacon: The Logic of Sensation*, 31, 34–35.

¹⁰⁴ Merleau-Ponty, *Phenomenology of Perception*, 133–147.

4.2. Glassblowing: From Craft to Sensory Medium

While glass is ubiquitous in contemporary life, its transformative potential as an artistic medium has a long and complex lineage. Ancient Egyptian core-formed vessels, Islamic mosaic glass, and the *pâte de verre* techniques of the Art Nouveau period all demonstrate that glass has historically traversed the boundary between utility and artistry.¹⁰⁵ However, these traditions often remained within workshop or factory structures, with limited space for conceptual authorship by individual makers.

The emergence of the Studio Glass movement in the early 1960s marked a decisive rupture in this trajectory.¹⁰⁶ Pioneered in the United States by Harvey Littleton and Dominick Labino, the movement's most radical contribution lay not only in aesthetic experimentation but also in the technological innovation of the small-scale furnace.¹⁰⁷ For the first time, artists could melt and shape glass outside factory contexts, enabling independent, self-directed studio practice. This decentralisation catalysed a redefinition of blown glass, in certain contexts, as a potentially expressive and materially autonomous art form. It also raised questions about the distinction between the decorative object and the conceptual artwork.¹⁰⁸

Glassblowing, a technique historically associated with utility and ornament, was thus reclaimed and reimagined. The act of inflating molten glass through a blowpipe is no longer solely a means to produce vessels; it becomes a choreography of heat, gravity, breath and resistance. In practice, the *parison* (the molten bubble) is approached not as a predetermined form to be controlled but as a site of negotiation between body and material. The body does

¹⁰⁵ Tait, *Five Thousand Years of Glass*, 145–162.

¹⁰⁶ Toledo Museum of Art, *Glass & TMA*, 2024, accessed August 21, 2025, <https://toledomuseum.org/collection/glass-tma>.

Bard Graduate Center, *Dominick Labino – Voices in Studio Glass History*, n.d., accessed August 21, 2025, <https://exhibitions.bgc.bard.edu/studioglasshistory/artists/dominick-labino/>.

¹⁰⁷ Corning Museum of Glass, "Studio Glass Movement," *Glass Dictionary*, 2025, accessed August 21, 2025, <https://allaboutglass.cmog.org/definition/studio-glass-movement>.

Cleveland Museum of Art, "Studio Glass in Focus," *Cleveland Art*, September/October 2012, accessed August 21, 2025, <https://www.clevelandart.org/articles/studio-glass-focus>.

¹⁰⁸ Peter Dormer, *The Culture of Craft: Status and Future* (Manchester University Press, 1997), 45. Dormer discusses the cultural positioning of craft, highlighting the tension between decorative function and claims to artistic or conceptual autonomy.

not merely impose form but co-constitutes it through breath, timing and subtle bodily attunement.¹⁰⁹

This embodied process is not merely visible; it is also audible and thermal. The hiss of flame, the pulse of the reheating chamber, and the heat radiating from the furnace generate a sensory field that envelops both maker and audience. During public demonstrations, such as the one at Berlin Glas (2024) (Figure 38), viewers often described the sensation of ‘being inside the breath’ or ‘watching the form inhale’. This vocabulary speaks to the affective transference between glass and the observer, where spectators do not simply see a form emerge; they feel its becoming.



Figure 38. Jinya Zhao glassblowing demonstration at Berlin Glas during the Glass Art Society (GAS) conference 2024, Berlin. Photo Credit: Andrew Yu.

Glassblowing therefore operates not only as a technique but as an event, a performative, sensorial and experiential encounter that destabilises the dichotomy between process and product, subject and object. The breath-infused vessel becomes a record of embodied gesture,

¹⁰⁹ Glenn Adamson, *Fewer Better Things: The Hidden Wisdom of Objects* (Bloomsbury Publishing, 2018), 24–28. Adamson emphasises that material knowledge arises through embodied attunement, where maker and object co-constitute form through practice. This framework underpins the interpretation of glassblowing as a negotiation between body and material.

and the material, far from passive, returns the gesture in kind: it stretches, collapses, resists and flows. In this way, glass reveals what Deleuze terms ‘material becoming’, a force-field rather than a fixed form, sensation rather than representation.¹¹⁰

4.2.1. Glass and Light

The interplay between glass and light has long fascinated artists seeking to transcend the material’s functional origins. Unlike opaque sculptural media, glass feels as though it dances with light, refracting, diffusing and absorbing it in ways that modulate visual clarity and emotional atmosphere. Through light, glass ceases to function merely as an object and becomes an optic phenomenon, one that is capable of spatial attenuation, perceptual deferral and chromatic ambiguity. These capacities render it an ideal medium for evoking sensation, not as representation but as a temporal, embodied encounter.

The American artist Christopher Wilmarth (1943–1987) offers a particularly nuanced investigation into the perceptual effects of glass and light. As Diane Ashton observes, his work explored ‘the energy of restraint’ through glass and steel assemblages that subtly manipulated spatial awareness and affective presence. His *Days on Blue* (1974–77), the largest work he completed, which is now in the Fisher Collection at SFMOMA, exemplifies this strategy (Figure 39).¹¹¹ The composition features a single etched glass pane placed at an angle against a welded steel structure. The acid-scarred surface diffuses the steel behind it, transforming a heavy industrial material into a spectral image.¹¹² Optical illusions emerge through graduated tone and placement, so that the glass appears to bend even as its structure

¹¹⁰ Deleuze, *Francis Bacon: The Logic of Sensation*, 34. Deleuze defines sensation as a material force exceeding representation, a concept that illuminates glassblowing as the becoming of form through process and intensity rather than as a fixed object.

¹¹¹ *Days on Blue*, 1974–77, The Doris and Donald Fisher Collection, San Francisco Museum of Modern Art, accessed March 21, 2025, <https://www.sfmoma.org/artwork/FC.686.A-C/>.

¹¹² Harvard Art Museums, "Special Collections: Christopher Wilmarth," n.d., accessed July 7, 2024, <https://harvardartmuseums.org/publications/special-collections/christopher-wilmarth>.

remains physically flat. This perceptual contradiction, what I term ‘optic delay’, disorients the viewer’s sense of mass, balance and boundary.¹¹³



Figure 39. Christopher Wilmarth, Days on Blue, 1974–1977. Etched glass and steel, 84 × 210 × 60 in. (213.36 × 533.4 × 152.4 cm). The Doris and Donald Fisher Collection at the San Francisco Museum of Modern Art. © Estate of Christopher Wilmarth.

Wilmarth himself described his sculptures not as representations but as ‘places to generate experience’, a formulation that resonates with Deleuze’s notion of the event as a site of sensation.¹¹⁴ The work’s refusal to disclose itself entirely at once engages what Laura U.

¹¹³ I introduce the term ‘optic delay’ to describe a perceptual hesitation or temporal lag in apprehending glass, whereby visual expectation is unsettled by the contradiction between apparent movement and structural fixity. This usage is distinct from the ‘optical delay line’ in photonics, which denotes engineered delays in light transmission.

¹¹⁴ Harvard Art Museums, "Special Collections: Christopher Wilmarth," n.d., which states that Wilmarth’s aim was to create “places to generate experience,” accessed July 7, 2024, <https://harvardartmuseums.org/publications/special-collections/christopher-wilmarth>.

Marks describes as ‘haptic visuality’, where the eye searches across textures that cannot be touched and where meaning emerges through duration rather than instant legibility.¹¹⁵

These strategies inform my own approach to material translation. I examine how Wilmarth's perceptual logic might be re-articulated through the thermal volatility and fluid tactility of blown glass in the following ways:

- **Light as Material Force:** Wilmarth’s use of acid-etched diffusion inspires my experiments with sandblasting and glass powders. By altering surface opacity and microtopography, I explore how light can become a sculptural agent, dematerialising form, dislocating volume, and creating visual suspension within blown structures.
- **Gravity as Compositional Logic:** Wilmarth’s delicate equilibrium of vertical weightlessness guides my own investigations into how gravity and heat shape the internal flow of molten glass. By following, rather than resisting, gravitational pull, I develop forms whose surface rhythm and structural instability evoke a perceptual state of movement, even stillness held in motion.¹¹⁶
- **Space as Sensory Threshold:** Wilmarth’s configurations alter the viewer’s sense of inside and outside, proximity and distance. In my own installation practice, I aim to extend this by allowing glass and light to co-construct architectural atmosphere, where material is not placed within space but shapes it from within, producing emotional registers such as introspection, wonder, or dissolution.

In this way, the dialogue between Wilmarth’s material poetics and my own exploratory techniques becomes a conceptual resonance. The movement from observation to practice is not linear: it is filtered through questions of perception, tactility, and affect – themes I continue to examine through experimental workshops and audience encounters. As such,

¹¹⁵ Marks, *Touch: Sensuous Theory and Multisensory Media*, 19–20. Marks develops the concept of haptic visuality to describe how visual perception can invoke tactile, embodied experience, privileging duration and materiality over immediate legibility.

¹¹⁶ Gombrich, *The Sense of Order*, 150–155. Gombrich discusses gravity as a fundamental perceptual reference, shaping compositional balance and visual stability.

Wilmarth's work becomes, rather than a template, a lens through which to refine how glass itself might mediate sensation.

4.2.2. Glass and Smell

While glass is conventionally understood as a visual and tactile medium, its potential to engage smell has rarely been foregrounded in art-historical or theoretical discourse. Smell activates memory and emotion with a Proustian immediacy, offering a further layer of embodied engagement with glass. In this respect, olfactory strategies open a multisensory dimension that extends perception beyond optical and haptic registers.

Artists such as Ernesto Neto have demonstrated how smell can transform sculptural experience. His immersive environments are conceived as sculptural landscapes that guide the eye while releasing the odours of turmeric, cumin and other spices. These aromas stimulate the nose and suffuse the installation space, ensuring that smell becomes inseparable from form and atmosphere (Figure 40).¹¹⁷ Similarly, Sissel Tolaas has pioneered the use of smell as an artistic medium, reconstructing and deploying scents in ways that evoke memory, cultural association and spatial awareness. In projects such as her work with The Metropolitan Museum of Art, New York, she has shown how smell can reconfigure the audience's perception of objects and environments, shifting attention from visual recognition to embodied, affective experience.¹¹⁸

In my own research, this intersection of glass and smell was tested in workshops and exhibitions at The Chinese University of Hong Kong, Shenzhen (CUHKSZ) (2025). While these are analysed in detail in Chapter 5 (Site), it is important to note here that smell emerged as a critical dimension in extending the concept of synaesthetic perception. The presence or absence of smell functioned not as an additive effect but as a relational force that reconfigured how audiences encountered glass, memory and space.

¹¹⁷ Galerie Max Hetzler, "Ernesto Neto," n.d., accessed March 2, 2025, <https://www.maxhetzler.com/artists/ernesto-neto>.

¹¹⁸ Hannah Marriott, "The Met Exhibition's Unexpected New Feature: Smell," *Financial Times*, May 10, 2024, accessed August 16, 2025, <https://www.ft.com/content/a1e17d84-74e4-4440-a763-9579ebdb5585>.



Figure 40. Ernesto Neto, *anthropodino*, 2009. Polyamide tulle, handmade polyamide carpet, maple plywood, clove, black pepper, paprika, cumin, ginger, turmeric, sand, lavender, camomile, black gravel, river stones, rice, plastic balls, glass beads, polypropylene string, Styrofoam beads and polyurethane foam, 5852 × 3719 × 2103 cm. Installation view, Park Avenue Armory, New York, 2009. Photo Credit: James Ewing.

4.3. Sensory Connection

Deleuze's theory of sensation reconfigures the relationship between art and perception. In *Francis Bacon: The Logic of Sensation*, he explains that 'Cézanne gave a simple name to this way of the Figure: sensation. The Figure is the sensible form related to a sensation; it acts immediately upon the nervous system, which is of the flesh'.¹¹⁹ Here Deleuze positions sensation not as representation but as a pre-cognitive encounter, one that emerges across and beyond individual sensory modalities, shifting the emphasis from image as sign to art as embodied event.

In this section, I examine how this model of sensation informs, and is informed by, the medium of blown glass. Blown glass *can* enact Deleuzian principles when its material properties and experiential context support sensory instability. Like painting or sound, it

¹¹⁹ Deleuze, *Francis Bacon*, 34.

encompasses a range of forms, from functional to expressive, opaque to translucent: hence it is not the material alone, but its activated potential, that matters.

Deleuze distinguishes between form, which invites recognition, and the Figure, which carries force. He writes that ‘the Figure is the sensible form related to a sensation’.¹²⁰ The Figure does not depict, it acts. It operates as an agent of tension, movement, and corporeal response. Sensation, for Deleuze, unfolds across two domains:

- **The Nervous System:** Sensation triggers bodily reaction, unease, alertness, excitation, before thought intervenes.
- **The Flesh:** Sensation materialises through embodied contact, drawing the viewer into the field of the artwork.

These intertwined forces form what Deleuze calls a ‘zone of indiscernibility’,¹²¹ where subject and object blur, and art becomes something to be inhabited, not just observed.

Within this framework, blown glass becomes especially relevant. When molten, it resists fixity, its form is temporal, responsive, and inherently unstable. For the maker, this is a visceral process: heat, breath, rhythm, and gravitational pull structure the act of shaping. The sounds of blowing and the pulsing of flame establish an acoustic temporality that choreographs the making. This bodily engagement embeds a resonant memory into the object.¹²²

Yet these experiences do not stay with the maker alone. When displayed under calibrated light or in open spatial settings, the finished glass can transmit traces of its formation. Viewers do not physically experience the heat or breath, but may perceive their echoes, in

¹²⁰ Ibid., 34.

¹²¹ Ibid., 59.

¹²² Erin Manning, *Always More Than One: Individuation's Dance* (Duke University Press, 2013), 90–93. Manning argues that movement is not predetermined but emerges through embodied relation with environment, rhythm and sensation, a framework that parallels the temporal and corporeal dynamics of glassblowing.

asymmetric distortions, in the flow of line, or in the suspension of colour and light. What was once tactile becomes optical; what was once internalised becomes public.

- **Visual:** Refracted light through curved or layered forms destabilises optical legibility.
- **Tactile (imagined):** Uneven thickness or tension in form invites slow looking and felt perception.
- **Acoustic (metaphorical):** While absent, sound leaves a temporal residue, a silence charged with motion.

These perceptual registers intertwine. The glass object becomes a field of becoming, not fixed in meaning or experience, but responsive to time, position and context. Deleuze distinguishes between the virtual and the actual, where the work holds latent potential (virtual) even as it presents material presence (actual).¹²³ As Brian Massumi elaborates, this distinction can be understood as the interplay between potentiality and its actualisation in embodied experience.¹²⁴

This dynamic also informs my own work. In pieces such as *Sunset Under Open Cloud* and *Tracing the Shadows of Time*, I intentionally preserve shifting layers, asymmetry and chromatic diffusion. The aim is not to obscure but to create a durational encounter. These works are not intended to be read all at once; rather, they unfold across time, light, and viewer movement. In this way, my practice applies Deleuze's theory not to illustrate sensation but to stage it materially, enabling the viewer to engage with blown glass as an affective and perceptual field.

Thus, blown glass does not simply offer multisensory impressions: it can also perform sensation. Through its fluid transformation, thermal trace, and optical ambiguity, it repositions the viewer within a space of perceptual instability. Glass, like sensation, is never static. It remains suspended between force and form, surface and depth, seeing and feeling, a material logic of becoming.

¹²³ Deleuze, *Francis Bacon*, 98–100.

¹²⁴ Brian Massumi, *Parables for the Virtual: Movement, Affect, Sensation* (Duke University Press, 2002), 25.

4.4. Glass and Memory

While earlier sections (Chapter 2.3.4) explored how colour and environmental light conditions can trigger associative memory, often through perceptual and emotional responses rooted in cultural, sensory, or personal histories, this chapter shifts the focus toward a different register of memory: one that is materially embedded, structurally configured, and temporally enacted through the medium of glass. Rather than memory as fleeting recognition or affective association, here it is addressed as a layered spatial and ontological condition. This approach aligns with the Deleuzian notion that sensation and memory are not distinct domains but are interwoven through material assemblage, perception, and transformation. Through transparency, opacity, layering, and tactile encoding, blown glass can function not only as a trigger of memory but also as its vessel and catalyst.

Extending Deleuze's insights, the medium of glass offers a unique way of exploring the connection between art and memory. Glass, with its capacity to encapsulate and reflect light, can evoke a sense of timelessness and fragility, resonating with personal and collective memories. The translucency and texture of glass pieces can trigger associations with light, colour, and form, creating a multisensory dialogue between the artwork and the viewer's past experiences.

This perspective is enriched by Ian Farr's anthology *Memory*, mentioned above in section 3.2.1.¹²⁵ Rather than providing a singular framework, the collection offers a range of critical perspectives on how art engages with memory through material and spatial conditions. Themes such as haunting, repetition, reappearance, and active forgetting reveal how memory is not simply stored but continually re-activated through aesthetic encounter. These insights open useful ways of considering how glass works might similarly evoke memory through their temporal unfolding, their play of presence and absence, and their capacity to refract traces of lived experience.

¹²⁵ Farr, ed., *Memory*. This anthology brings together a range of critical perspectives on memory in contemporary art, addressing themes such as haunting, repetition, reappearance and active forgetting, and highlighting how memory is activated through material and spatial conditions.

In my glass practice, I aim to harness the medium's potential to evoke both sensation and memory. The physical properties of glass, including its clarity, fragility and fluidity, operate as material metaphors for memory, which is, likewise, transparent, delicate and ever-changing. By incorporating elements that play with light and shadow, colour and texture, I strive to create pieces that not only engage the senses but also resonate with the viewer's memories, generating a layered perceptual experience.

Inspired by the approach of the French painter Paul Cézanne (1839–1906) and Deleuze's interpretation, my work seeks to evoke sensations that transcend mere visual appeal, engaging the viewer's nervous system and eliciting a physical response. The interplay of colours, forms, and textures in blown glass can invoke personal and collective memories, deepening the sensory and emotional impact of the artwork. By understanding and applying Deleuze's framework, I aim to produce artworks that embody a unity of sensation and memory, where the viewer's interaction with the piece involves a deep, visceral connection.

Integrating Deleuze's philosophical concepts into my creative process, I aim to produce artworks that embody a unity of sensation and memory, fostering a deep, visceral connection with the viewer. Central to this approach is Deleuze's notion of 'assemblage',¹²⁶ which focuses on the combination of diverse components to form a dynamic and interconnected whole. By layering different materials, textures and sensory stimuli such as light, sound and tactile surfaces, the artwork becomes an assemblage of memories and sensations. It invites viewers to engage in a process of 'becoming',¹²⁷ where their personal experiences and memories interact with the piece, creating a unique and individual encounter for each observer.

Further, Deleuze's concept of 'becoming',¹²⁸ the idea that identity and meaning are constantly evolving, guides the interactive aspects of my work. For instance, incorporating responsive elements that change in reaction to the viewer's movements or presence allows the artwork to evolve in real time, reflecting the fluid nature of memory and sensation. This

¹²⁶ Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (University of Minnesota Press, 1987), 88–89.

¹²⁷ *Ibid.*, 232–238.

¹²⁸ *Ibid.*, 232–233.

dynamic interaction fosters a deep, visceral connection, as viewers become active participants in the continual transformation of the artwork, aligning with Deleuze's vision of art as a catalyst for experiential and perceptual evolution.

In this context, mnemonics, techniques that aid memory and facilitate recall, serve as a pivotal device that enhances the relationship between the viewer and the artwork. They play a crucial role in object-making by embedding symbolic elements that trigger personal and collective memories. In my glass practice, mnemonics are integrated through the use of recurring shapes, patterns and colours that resonate with universal and individual mnemonic associations.¹²⁹ For instance, specific geometric forms may symbolise personal experiences or cultural motifs, acting as cognitive anchors that evoke memories and emotions when viewers interact with the artwork. This deliberate incorporation of mnemonic devices transforms the glass objects into vessels of memory, where each element is meticulously crafted to serve as a mnemonic trigger, thereby deepening the sensory and mnemonic engagement of the viewer.

The relationship between mnemonics and object-making can also be clarified through Deleuze's frameworks. As noted above, assemblage enables the integration of mnemonic elements with diverse materials into layered and multifaceted sensory experiences, while 'becoming' highlights how evolving perceptions and memories continuously reshape the encounter, making each engagement with the work unique and personally meaningful. By combining these Deleuzian insights with Edward Casey's account of mnemonics,¹³⁰ my artworks transcend traditional static forms. They offer immersive experiences that resonate on both sensory and cognitive levels, unifying sensation and memory while encouraging viewers to engage with the artwork in a multidimensional and transformative way.

4.5. Glass and Perception

Perception is not merely the passive reception of visual data, but an embodied, dynamic process shaped by spatial, temporal, and sensory variables. Informed by phenomenological

¹²⁹ Edward S. Casey, *Remembering: A Phenomenological Study*, 2nd ed. (Indiana University Press, October 22, 2000), 221–244.

¹³⁰ *Ibid.*, Part Two, "Mnemonic Modes," 87–143.

accounts such as those by Merleau-Ponty, perception is understood here as a continuous negotiation between the body and the world, a co-constituted event that is neither wholly internal nor external.¹³¹ Within this framework, glass offers a particularly compelling site for interrogating perceptual experience due to its capacity to distort, delay, and destabilise visual and spatial legibility.

Artists like Carsten Höller have explored perceptual thresholds by crafting environments that invite disorientation. His *Upside-Down Mushroom Room* (2000), for instance, creates a surreal inversion of scale and gravity, immersing the viewer in a space where logic is momentarily suspended (Figure 41).¹³² Although Höller does not work with glass directly, his strategies of perceptual redirection and embodied confusion provide a fertile conceptual model for exploring how glass might stage similar disruptions. Entering through a dark corridor, viewers encounter suspended *Amanita muscaria* mushrooms, oversized and inverted, inducing a bodily vertigo that challenges spatial orientation. While primarily visual, the work operates on the level of dissonance, prompting proprioceptive recalibration.

Drawing from such methods, I explore how glass can be used to construct perceptual ambiguity through reflection, transparency, and refracted spatial layering. In my own practice, I design environments in which blown and flat glass elements intervene in the viewer's spatial navigation, encouraging shifts in pace, posture, and orientation. For example, works are placed to reflect and double architectural lines, or to interrupt expected sightlines through tinted opacity. Rather than offering clarity, these surfaces foster what I describe as 'perceptual hesitation': a pause in the act of looking that re-engages the body in the act of perception.

¹³¹ Merleau-Ponty, *Phenomenology of Perception*.

¹³² Carsten Höller, *Upside-Down Mushroom Room*, installation, Fondazione Prada, Milan, 2000.



Figure 41. Carsten Höller, installation view of *Atlas* at Fondazione Prada, Milan, Italy. Photo Credit: Delfino Sisto Legnani and Marco Cappelletti.

Building on this notion of perceptual hesitation, I have also experimented with spatial placement as a means of recalibrating embodied viewing. At my solo exhibition ‘Before the Feeling Forms: A Practice-Based Research Exhibition’, held at CUHKSZ, the work *Where Thought Enters Space* was suspended at a deliberately elevated height so that viewers had to look upward to see it (Figure 42). This enforced change in posture slowed the encounter and redirected attention from habitual frontal viewing to an embodied act of craning and re-positioning. The shift from eye-level alignment to an upward gaze altered cues about depth, intensified reflections, and layered transparencies, and produced a subtle proprioceptive adjustment in balance and breath.

This strategy draws on Höller’s interest in experiential reorientation. While my materials and aims differ from his, what I have learnt from works such as *Upside-Down Mushroom Room* is the value of structuring entry conditions that momentarily unsettle spatial expectation, prompting viewers to renegotiate their relation to the work and to the surrounding architecture. In my case, elevation and suspension become the means by which glass stages perceptual hesitation, inviting the audience to inhabit a durational interval in which looking, balance and spatial sense are reconfigured.

Rather than propose a series of effects, my research interrogates how these sensory layers impact the conditions of perception. Through user testing, documentation, and iterative installation adjustments, I trace how audiences reposition themselves, alter their breathing, hesitate before touching, or even report sensations of instability. These responses inform my understanding of how perception functions as a negotiated event between material and body – responsive, situated, and contingent.



Figure 42. Jinya Zhao, Where Thought Enters Space, 2025. Blown glass and metal, 27 × 126.5 × 44 cm. Installation view (suspended at a deliberately elevated position, wall-mounted), 'Before the Feeling Forms: A Practice-Based Research Exhibition', The Chinese University of Hong Kong, Shenzhen. The work visible on the wall is Where Thought Enters Space; other works from the exhibition are also shown. Photo Credit: He Junjie.

Importantly, this research does not aim to replicate Höller's conceptual framework as a whole. Rather, it draws from his logic of experiential reorientation and re-situates it within a materially distinct practice: glass. Glass, unlike the industrial or synthetic materials that Höller often uses, carries its own perceptual weight. It is fragile yet sharp, transparent yet resistant, and loaded with associations of vision, display, and boundary. Working through glass means staging perception as a process of becoming, wherein clarity is deferred and certainty undone.

In this sense, my installations function as perceptual laboratories. They are spaces where visual and haptic ambiguity act not as obstacles but as entry points into a deeper awareness of one's own perceptual apparatus. One such work features a continuous loop formed by glass and metal, evoking a sense of cyclical flow and perceptual slippage. The piece employs multi-angled layering and tinted transparency to disrupt visual continuity and prompt perceptual redirection. The proximity of the viewer alters both optical legibility and spatial interpretation. As light shifts or the viewer moves, the artwork reconstitutes itself, not as image but as situation. The result is not merely an aesthetic object but a perceptual ecology that evolves with each encounter.

This investigation into perception as a spatially and sensorially distributed phenomenon lays the conceptual groundwork for the next section, which focuses more specifically on the role of smell in shaping visual response and the constructing of memory. Where the preceding analysis foregrounded vision's entanglement with movement, tactility, and spatial context, the next section turns to olfaction, one of the most affectively charged and temporally dislocating senses, as a means of accessing and materialising memory. Building on the premise that perception is never singular but always negotiated across sensory thresholds, the following workshop-based study examines how olfactory cues modulate visual memory, associative meaning, and viewer orientation in relation to glass objects. In doing so, it extends the understanding of perception not as passive reception but as a situated, embodied, and materially embedded event.

4.6. Workshop 2: Scent and Visual Representation

Building upon previous explorations of perception through spatial and visual disorientation, this workshop focused on a different sensory register, olfaction, and its potential to activate memory and shape visual translation. Inspired by the poetic material strategies of Christopher Wilmarth,¹³³ I adapted these principles within a research-based, practice-led workshop format. Expanding upon the themes explored in Research Workshop 1 (see 3.4.1.), Research Workshop 2, conducted during the exhibition 'Colour Made Manifest' at the Pump House

¹³³ Steven Henry Madoff, *Christopher Wilmarth: Light and Gravity* (Princeton University Press, 2004). Madoff describes Wilmarth's works as poetic structures of light and gravity, emphasising how glass and steel generate perceptual depth, delay and opacity that extend beyond the strictly visual.

Gallery (London), and as part of the Material Engagements Research Cluster (MERC), this workshop investigated how smells can catalyse memory and guide the creation of two- and three-dimensional visual forms.¹³⁴ A detailed overview of the workshop and participant questionnaires is in Appendix B.3.

Participants engaged with ‘Le Nez du Vin (The Nose of Wine)’, a smell-education tool comprising a ‘book-object’ that contains a curated collection of glass vials containing samples of aromas (Figure 43). Selected for its integration of tactile, visual, and olfactory dimensions, the work provided an effective means of probing how memories are constructed across sensory modalities.¹³⁵

Participants selected from the 36 vials, categorised into olfactory families such as Earthy (e.g., soil), Vegetal (e.g., garden), Fruity (e.g., blackcurrant, lemon), and Chemical (e.g., rubber). Each participant chose one or more aromas and responded in two stages, first through drawing and then through sculptural experimentation. They were asked to consider sensory attributes such as transparency, translucency, hue, and texture, and were provided with materials exhibiting these visual properties.

The format of the workshop involved rolling twenty-minute sessions, with three participants per session. This structure allowed for semi-private engagement and deep individual exploration while retaining the energy of a shared collective setting. Feedback revealed how deeply scent could restructure memory and perception.

¹³⁴ See Appendix B.3. Overview and Participant Feedback Documentation.

¹³⁵ Editions Jean Lenoir, "Handmade in France – Editions Jean Lenoir," n.d., accessed July 18, 2024, <https://www.lenez.com/en/made-in-france>.



Figure 43. Jinya Zhao research workshop at Pump House Gallery during 'Colour Made Manifest'. Photo Credit: Jinya Zhao.

One participant, prompted by a sweet-and-sour aroma, initially recalled only a vague association with sweets. However, through drawing, her memory sharpened into a vivid recollection of going to see films as a child, complete with sensory textures and emotional tone. Another participant, encountering Scent No. 7, was transported to the burnt fields of her Apulian childhood, evoking not only image but emotional valence: 'the fascination and fear of watching fire eat the grass'. A third participant identified the scent of potpourri from her grandmother's home. The recollection unfolded in associative spirals, as one memory triggered another, ultimately leading her to reflect on how memory is not static but associative, unfolding through chains of connection.

These reflections revealed a crucial insight: that memory is not recalled whole but activated through sensual triggers, unfolding iteratively and emotionally. The participants not only re-encountered moments from their past lives but recognised the shifting nature of these recollections as layered, fragmentary, and affectively charged.

In the final discussion, participants noted how shared scent encounters, despite their personal origins, often resonated across the group. This created a collective awareness of how

memory, while personal, contains overlapping cultural textures. The workshop thus fostered both individual introspection and a sense of communal affectivity.

As a material-focused artist, I was particularly interested in how participants translated memory into visual attributes, using opaque strokes to represent incompleteness, translucent overlays to suggest temporal layering, and chromatic shifts to mark emotional tone. These responses affirmed that perception and memory are not distinct faculties but are reciprocally entangled: sensory information shapes how memory is constructed, while memory conditions how we perceive. My approach situates these findings within an artistic and philosophical framework rather than seeking empirical validation through neuroscience, highlighting the role of practice in generating knowledge.

Glass, as a material, mirrors this dual nature. Its capacity for clarity and opacity, fragility and structure, positions it as an ideal mediator between sensation and representation. In my ongoing practice, I experiment with integrating scent into sculptural glass forms, using thermal change, micro-encapsulation, or viewer interaction as triggers. This next body of work will continue the enquiry initiated in Workshop 2, offering audiences their own points of perceptual entry through scent and material atmosphere.

Ultimately, the workshop reframed memory not as passive retrieval, but as active generation, co-authored by the senses, shaped by materials, and externalised through form. It demonstrated how olfactory engagement can serve not only as stimulus, but as methodology: a way to structure artistic exploration and foster dynamic audience connection.

4.7. Creative Artwork

By exploring artworks as case studies and gathering feedback from my research workshops, I began creating new pieces that embody the outcomes of my investigations. A significant output of this research was my participation in the exhibition ‘Colour Made Manifest’ at the Pump House Gallery in Battersea Park, London. This exhibition featured three primary elements of my research: blown glass objects, flat framed pieces, and a specially designed gallery space (Figure 44).

In this exhibition, I examined the relationships between these elements. The interplay between the architectural forms of the gallery, such as the arch of the window, and the dome of my blown glass pieces created a dialogue that merged structural and sculptural aesthetics. I also considered how the natural surroundings of Battersea Park influenced the perception of the artworks within the gallery space. This interplay between external and internal environments emphasised the spatial dynamics between the three primary elements and the overall spatial configuration within the gallery. These investigations revealed fascinating contrasts and harmonies, enriching the viewers' perceptual experience.



Figure 44. Installation view of exhibition: 'Colour Made Manifest', Pump House Gallery, London, 2024. Photo Credit: Jinya Zhao.

One notable finding was the contrast between different geometries, such as round and square shapes, which provided a focal point for the audience's perception. This deliberate juxtaposition created a dynamic visual tension, guiding the viewer's gaze and emphasising the interaction between different geometric forms within the exhibition space.

Natural light played a crucial role in the exhibition's set-up. When the light was strong, it highlighted the inner layers of the blown glass, while the flat glass pieces exhibited a shiny reflection due to their textured surfaces (the detailed firing schedule is in Appendix A.4) (Figure 45). In lower natural light, or during twilight, the pieces displayed subtle colour variations, softening the colour differences and the visual experience. This dynamic interaction with natural light highlighted the importance of temporal changes in the environment, further integrating the sensory experience.



Figure 45. Illustrates the texture of glass powder, which exhibits dazzling reflections on its surface when exposed to intense natural sunlight, highlighting its unique optical properties. Installation view of exhibition 'Colour Made Manifest', Pump House Gallery, London, 2024. Photo Credit: Jinya Zhao.

The beautiful natural environment surrounding the Pump House Gallery served as an additional source of inspiration. My work is profoundly influenced by personal experiences, diverse environments, and my practice of working *en plein air* (which will be discussed further in the following chapter). This realisation led to the understanding that the site-specific locations where the pieces are displayed are also part of the artistic journey, introducing elements of surprise and altering the audience's perspective. The site-specific nature of the exhibition allowed the artworks to resonate differently with each unique setting, enriching the overall narrative.

In summary, my participation in ‘Colour Made Manifest’ not only showcased the outcomes of my research but also emphasised the significance of environmental context, sensory integration, and spatial dynamics in creating a comprehensive and immersive art experience. By intertwining visual, tactile, and olfactory elements (during the workshops), the exhibition offered a multifaceted exploration of sensory perception, contributing to the ongoing discourse on the relationship between sensory stimuli and artistic expression. This approach paves the way for future investigations into multisensory integration in art, fostering a deeper connection between the audience and the artwork.

4.7.1. New Creations

Upon my return to the studio in China in July 2024, I began a new body of work that sought to materially test the ideas explored throughout this thesis. Rather than treat these pieces as conclusive statements, I approached them as processual responses to ongoing questions about perception, temporality, and embodiment. The studio became a site for iterative experimentation in form, colour, texture, and scent, each aspect deliberately positioned to challenge static notions of objecthood and to invite multilayered sensory engagement (Figure 46).



Figure 46. Details of new works created upon returning to my studio in China, integrating and reflecting research findings. 2024. Photo Credit: He Junjie.

- **Textural Enhancements:** During my residency at Pilchuck Glass School, I began developing techniques for applying powdered glass to surface compositions, initially working on flat glass panels. These experiments focused on building up layers of granulated material to fragment light, alter opacity, and introduce a tactile register into the viewing experience. What began as a method for flat surface modulation has since evolved into a more spatially ambitious approach.

In the new body of work, I extended these powdered applications into fully volumetric blown forms. By layering textured glass powders onto curved and asymmetrical surfaces, I was able to produce works with enhanced optical depth and material presence. The granular surfaces disrupt even light reflection, creating fluctuating densities that compel the viewer to shift between close inspection and spatial apprehension. This deepens the ambiguity between surface and structure, encouraging ‘perceptual slippage’ between what is touched and what is seen. Texture

here operates not as embellishment but as a strategy for ‘visual deceleration’, inviting the viewer to slow down, refocus, and move in relation to the object.¹³⁶

- **Dynamic Colour Contrasts:** Colour, already central to my earlier work, became a site of more dramatic juxtaposition. I paired deep blacks with high-frequency blues, or muted earth tones with luminous yellows, to activate visual tension and emotional contrast. Rather than treat colour as a static quality, I considered it as a temporal force – mutable across light conditions and shifting with spatial context.
- **Olfactory Elements:** Following my earlier workshop-based investigations into the association between smell and memory, I began experimenting with integrating olfactory components into my glass works. These initial studies included the use of absorbent surfaces and hollow forms designed to hold or release fragrance in subtle ways. In the upcoming residency project at CUHKSZ, this line of enquiry will be developed into a more structured comparative installation, where visitors will encounter parallel sets of glass pieces, some embedded with scent and others unscented.

This controlled contrast will allow for a direct examination of how olfactory presence modulates visual interpretation, emotional resonance, and the activation of memory. Audience responses will be systematically gathered through informal interviews and reflective prompts, forming a critical part of my ongoing research into multisensory perception. The project aims not only to test the perceptual effects of smell, but also to open up new questions about sensory hierarchy, cultural variability, and the limits of ocularcentrism in the experience of contemporary art.

- **Spatial and Temporal Reflection:** Many forms produced during this phase explored slowness and gravitational pull. By allowing the molten glass to elongate, collapse, or warp according to the time spent on the pipe or the bench, I relinquished control and

¹³⁶ ‘Perceptual slippage’ and ‘visual deceleration’ are both terms I introduce in this thesis to describe perceptual conditions specific to glass practice: the former denotes the shifting ambiguity between tactile and visual registers, while the latter designates a strategy of slowing down visual engagement through material and spatial texture.

let the material move according to its own tendencies. These decisions were informed by site-specificity and environmental perception, including my changing position between China and Europe, between mountain and city.¹³⁷

- **Process and Material Agency:** This making approach draws on Tim Ingold's concept of material engagement and Deleuze's ontology of becoming.¹³⁸ I did not begin with a fixed idea of form, but let the encounter between hand, heat, and glass unfold as a negotiation. As such, these pieces resist the logic of the autonomous crafted object and instead function as events: temporally bound, materially contingent, and perceptually open-ended.

A key example from this body of work is *The Body, As Tension Manifest* (Figure 47). Its asymmetrical body and lopsided tilt resulted from deliberate overextension in the annealing phase, when I allowed gravity to pull the body out of symmetry. Rather than correcting this deformation, I retained it, letting the form document its own making. Viewers described the piece as 'tilting forward' or 'breathing', perceiving not stasis but subtle instability. In this context, instability became a compositional and perceptual strategy. The work does not assert form; it invites negotiation. It is not finished, but in tension.

By embedding Ingold's emphasis on material relationality and Deleuze's concept of becoming into my making process, I propose an alternative model of glass, not as crafted product but as perceptual ecology. These works emerge through dynamic interaction: between artist and material, viewer and object, light and time. What results is not objecthood in the conventional sense, but a field of affective resonance, wherein attention, memory, and perception are made and remade with each encounter.

¹³⁷ Tim Ingold, *The Life of Lines* (Routledge, 2015).

¹³⁸ Deleuze and Guattari, *A Thousand Plateaus*.

Also see Tim Ingold, *Bringing Things to Life: Creative Entanglements in a World of Materials*, NCRM Working Paper 05/10 (ESRC National Centre for Research Methods, 2010).



Figure 47. *The Body, As Tension Manifest*. 58 × 28 × 38 cm. 2025. A new work integrating and reflecting the findings of my research. Photo Credit: He Junjie.

4.8. Conclusion

This chapter has unfolded as an enquiry into how blown glass, as both process and material, can activate expanded forms of perception. Rooted in the Deleuzian theory of sensation and phenomenological approaches to embodied experience, it has traced how glass functions not merely as a visual medium, but also as a sensorially distributed field involving temperature, touch, smell, spatial tension, and bodily movement. Through close readings of the work of artists such as Christopher Wilmarth, alongside experimental workshops and original artworks, I have developed an approach that treats perception not as reception, but as a situated, durational encounter.

Central to this investigation is the body – both the artist’s and the viewer’s. The act of glassblowing itself becomes a performative choreography of breath, rotation, and heat management, inscribing memory and temporality into form. The resulting works invite the viewer into an equally physical relationship, requiring movement, repositioning, and attentiveness to the subtleties of light, scent, and surface. This is exemplified in *What Holds, What Leans* (2025), first exhibited at The Chinese University of Hong Kong, Shenzhen, where blown glass is combined with frosted stainless steel to evoke a slow state of

sedimentation (Figure 48). Here, translucency, opacity, and soft material counterpoints generate shifting perceptual registers that extend my concept of layerspace.



Figure 48. *What Holds, What Leans* (2025), exhibition view at *The Chinese University of Hong Kong, Shenzhen*. Glass and frosted stainless steel, 120 × 60 × 35 cm. Photo Credit: He Junjie.

Rather than offering fixed interpretations, the works developed in this phase function as what Deleuze might term ‘zones of indiscernibility’, where sensation overrides representation, and the object ceases to be a stable end-point.¹³⁹ Glass becomes a medium through which forces such as gravity, breath, time, heat, and memory are staged, felt, and made visible. In this sense, the practice as a whole challenges the conventional binary of craft and concept, foregrounding relational form and perceptual ambiguity as artistic strategies.¹⁴⁰

To summarise, this chapter contributes a materially grounded theory of sensation in glass practice. It unfolds through making, perception, and viewer engagement, and argues that

¹³⁹ Deleuze, *Francis Bacon*, 130.

¹⁴⁰ Glenn Adamson, *Thinking Through Craft* (Bloomsbury Visual Arts, 2019), 2–4. As Adamson observes, craft has persistently been defined in opposition to art’s conceptual ambitions, a binary that continues to shape its critical reception.

glass, when approached as a durational and multisensory medium, can reorient conventional understandings of objecthood, attention, and affect.

5. Site as Research Method

5.1. Theoretical Framework: Situating Site through Practice

This chapter conceptualises ‘site’ not as a static geographical setting but as an active, relational, and materially implicated methodology for making and thinking through glass. In contrast to conventional notions of site-specificity that centre on institutional critique or locational fixity,¹⁴¹ this study proposes an expanded model in which *site functions as co-constitutive agent*, intertwining sensory, environmental, cultural, and technical dynamics that shape both production and reception. Drawing on phenomenological, affective, and spatial theory, particularly the work of Maurice Merleau-Ponty (2005)¹⁴² and Edward Casey (1993),¹⁴³ this chapter argues that the perceptual and conceptual logic of glass is inseparable from the specific sites in which it is formed, displayed, and encountered.

My practice-based enquiry engages with a constellation of residencies and long-term studio sites, each not merely as a backdrop to creation but as a co-generator of the work and of my formation as an artist. These sites can be grouped into three modalities:

- **Sites of inspiration:** contexts that shaped thematic directions and perceptual strategies (Nujiang, Pilchuck).

¹⁴¹ Kwon, *One Place After Another*, 1–3.

¹⁴² Merleau-Ponty, *Phenomenology of Perception*, 98–105.

¹⁴³ Edward S. Casey, *Getting Back into Place: Toward a Renewed Understanding of the Place-World* (Indiana University Press, 1993), xiii–xx.

- **Sites of production:** technical and material environments that enabled spatial and chromatic experimentation, refinement, and innovation (Pilchuck, Jingdezhen, Barrio Glassworks).
- **Sites of encounter:** spaces where audience perception, sensory engagement, and environmental variability became central to the work's reception (Nujiang, Pilchuck, Chinese University of Hong Kong, Shenzhen (CUHKSZ)).

Within this triadic framework, I explore how environmental conditions (light, humidity, spatial rhythm), cultural contexts (studio hierarchies, linguistic fluency, aesthetic traditions), and technical infrastructures (tools, kiln behaviours, blowing teams) operate not as neutral variables, but as structuring conditions within artistic formation.

By critically reflecting on situated making and *en plein air* experimentation, this chapter foregrounds site as a methodological hinge, connecting material agency, perceptual complexity, and cultural embeddedness. Through sustained engagement with place, this approach contributes to the development of synaesthetic touch as a key conceptual framework in this research and articulates the methodological implications of working *with* rather than *in* an environment.

This section builds upon the broader conceptual framing by repositioning site not as a passive location but as a relational framework that fundamentally informs both the sensory materiality of glass and the viewer's embodied encounter with it.

5.1.1. Site as Active Participant

This section examines how specific sites, through their technical, environmental, and cultural conditions, actively shape my glass practice, functioning as more-than-material collaborators in the evolution of both form and concept.

In this research, site is conceptualised as a co-creator, an active and relational force that shapes material outcomes, conceptual orientations, and audience perception. As a structuring

condition, it informs how techniques are adapted, forms evolve, and meanings emerge through situated acts of making.

These dynamics revealed the influence of site across three interrelated domains:

- **Materials and Technique:**

Each location introduced specific technical infrastructures and modes of collaboration that reshaped how I approached form and process. For instance, in Jingdezhen and Barrio I worked with experienced gaffers¹⁴⁴ and glassblowing teams, whose roles were fundamentally those of the ‘hands’ shaping hot glass under my direction. Yet these hands were never neutral; their embedded rhythms, studio habits, and procedural expectations, shaped by regional conventions and interpersonal dynamics, inevitably inflected the making process. My bilingual fluency allowed effective negotiation, but decisions around form-building, annealing, and coordination were conditioned by the tacit knowledge and habitual gestures of those I worked with. In this sense, the gaffer and the team functioned less as co-authors and more as embodied extensions of practice, materialising the tensions between intention, execution, and the contingencies of site. My experience at Pilchuck marked a methodological shift away from hot glassblowing, as discussed further in 5.2.1, where surface experimentation with sifted glass powder catalysed a new approach to layering and light (Figure 49).

¹⁴⁴ In glassblowing, a gaffer is the lead artisan responsible for shaping the glass piece.



Figure 49. Sites of inspiration and production: Pilchuck Glass School, the cabin I lived in during the residency, surrounded by the forest environment. 2023. Photo Credit: Jinya Zhao.

- **Environmental Conditions:**

Environmental phenomena – light, humidity, temperature, wind – directly shaped my technical choices and perceptual outcomes. In Nujiang, the high humidity and diffused light altered cooling rates and visual chromatics (Figure 50). In Barrio, the coastal air and relaxed spatial tempo fostered intuitive play. In Pilchuck, forest-filtered light shaped the way I modulated texture and powder density. These affective and physical variables acted as co-authors in the development of the works, guiding how the material behaved and how perception was staged.



Figure 50. Site of Inspiration: Nujiang. 2023. Photo Credit: He Junjie.

- **Cultural Context:**

Cultural conditions such as language, hierarchy, and aesthetic lineage filtered how site was experienced. Jingdezhen enabled fluid creative dialogue in my first language (Mandarin), while Barrio’s American ethos promoted open iteration and expressive experimentation. Each site activated different assumptions around material restraint, innovation, and formality. These cultural textures not only inform the work from the outside: they also operate as embedded structuring forces within the conceptual and collaborative process. At times, however, what shifted was less a tangible condition than the creative spirit inflected by each context, shaping the orientation of my practice rather than prescribing specific cultural codes.

Through these interwoven influences, site functions not only as a physical setting but also as a perceptual and conceptual collaborator. Its impact is felt in the materials chosen, the techniques applied, the affective tone of the work, and the embodied experience of its

reception. In this way, site becomes integral to the development of synaesthetic touch, embedding sensory, cultural, and environmental dimensions into the structure of the glasswork itself.

Together, these domains reveal how site-specific practice not only shapes material conditions but also generates a situated, relational methodology. This formulation is indebted to, and yet diverges from, past articulations of site-specificity in art practice, ranging from the formalist material interventions of Richard Serra to the critical relocations analysed by Miwon Kwon.¹⁴⁵ Such contextual grounding situates my practice within a broader discourse while opening it to new methodological possibilities, which are elaborated in the following sections.¹⁴⁶

5.1.2. Site as a Continuum

Building on phenomenological and post-site-specific theory,¹⁴⁷ this section frames site as a temporal and spatial co-creator, a structuring condition through which artistic processes unfold across time and place, layering material and cultural knowledge into an evolving framework.

This aligns with Kwon's notion of the 'nomadic site',¹⁴⁸ which critiques the fixity of traditional site-specific art and instead proposes a relational, mobile model in which artists navigate shifting geographies, temporalities, and cultural frameworks. The work of artists such as Francis Alÿs exemplifies this approach, using walking and displacement as strategies through which meaning is continually reconstituted across different sites and contexts.¹⁴⁹

¹⁴⁵ Kwon, *One Place After Another*.

¹⁴⁶ Richard Serra's *Shift* (1970–72), a set of six concrete walls embedded in the rolling topography of King City, Ontario, exemplifies early site-specificity in which the physical form of the work is inseparable from the contours of the landscape. The work highlights how material intervention and environment together structure perception.

¹⁴⁷ Merleau-Ponty, *Phenomenology of Perception*, 114–115.

¹⁴⁸ Kwon, *One Place After Another*, 166–199.

¹⁴⁹ Francis Alÿs, *The Green Line*, performance, Jerusalem, 2004. In this work, in which the artist walked the armistice boundary in Jerusalem dripping green paint, Alÿs demonstrates how site is activated through nomadic movement and socio-political context, producing meaning that shifts with geography and perception.

The continuum I describe is both geographical and durational. Previous residencies shape present decisions, while current projects anticipate future reconfigurations. This recursive temporality offers a methodological model through which site-based enquiry generates new questions, new techniques, and new forms of sensory engagement.

Each site thus operates as a node in an expanding network of situated knowledge, fostering a dialogue between regional traditions and transnational movement. Glassblowing becomes not merely a medium of form but one of cultural translation, where material, memory, and method are continuously recalibrated through place-based practice.

In treating site as a research method, I foreground its capacity to function as a layered, evolving collaborator. This methodology not only grounds the conceptual trajectory of my work but also opens the medium itself to more expansive, ecological, and interconnected readings.

5.2. Glassblowing Practice and Site

Building on the theoretical framing outlined in Section 5.1, this section examines how site functions in practice through a series of residencies and studio contexts. While the previous discussion established site as co-creator and continuum, here the focus shifts to how these concepts materialise in lived artistic situations.

These residencies are analysed through the triadic framework introduced earlier: as sites of inspiration (Nujiang, Pilchuck), production (Pilchuck, Jingdezhen, Barrio), and encounter (Nujiang, Pilchuck, CUHKSZ). My glassblowing practice engages site as an active agent in the creative process. In my residencies in Pilchuck (USA), Nujiang (China), Jingdezhen (China), and Barrio Glassworks (USA), each location has contributed distinct modalities of making:

- **Pilchuck (USA):** a site of experimentation, where the forested environment and communal rhythm enabled spatial and chromatic exploration.

- **Nujiang (China):** a space of atmospheric and perceptual transformation, shaped by ecological immersion and open-air practice.
- **Jingdezhen (China):** a long-term site grounded in material precision, informed by local resources and dialogue with ceramic traditions.
- **Barrio Glassworks (USA):** a hybrid site bridging rigorous studio infrastructure with cultural openness, shaping both technical processes and audience interaction.
- **CUHKSZ (China):** a site of encounter, offering insights into audience perception and sensory engagement through structured pedagogical and public interactions.

These engagements, encompassing residencies, *plein air* practice, and the establishment of a permanent studio, reveal how local conditions shape material behaviour, inform conceptual approaches, and transform artistic methods. In this framework, site is not a backdrop but a co-creator.

5.2.1. Residencies: Expanding Practice Through Immersive Contexts

Artist residencies have functioned as methodological laboratories, offering distinct combinations of environmental, cultural, and technical variables that provoke shifts in process and perception. At Pilchuck, isolation within a forested landscape prompted a move toward kiln-based experiments with sifted glass powders, introducing new possibilities for surface tactility and chromatic modulation (Figure 51). In Nujiang, environmental forces such as wind, humidity, and light shaped formal spontaneity and colour layering. Barrio Glassworks, in contrast, offered a hybrid model: a structured studio context infused with Californian openness, where the experience of working with North American gaffers shaped procedural rhythm and collaborative dynamics (Figure 52).

Across these sites, the residency became more than a location: it became a co-creator, reconfiguring the terms of engagement between body, material, and environment. These residencies demonstrate how theoretical understandings of site as active and relational are

tested and extended in practice, with each context inflecting the dynamics of material behaviour, collaboration, and perceptual outcome.



Figure 51. Experimenting with glass powders at Pilchuck Glass School during the residency, 2023.



Figure 52. Teamwork during the 2025 residency at Barrio Glassworks, California. Photo Credit: Jason Sulli.

5.2.2. En Plein Air: Glassblowing Beyond Studio Boundaries

Adapting the tradition of *(en) plein air* from painting,¹⁵⁰ I relocated glassblowing into natural environments, including riverbanks, wooded peripheries, and open courtyards, to explore the interaction between environmental forces and molten material. In both Nujiang and the outskirts of Jingdezhen, elemental conditions such as wind, humidity, and diffused light influenced form and colour in real time. A sudden gust of wind, for instance, altered my state of attention and disposition; rather than treating this a disturbance, I allowed the shift in atmosphere to guide the unfolding of form. In this sense, the environment worked less as a physical agent upon the glass and more as an affective force upon the maker, shaping mood and perception in ways that became materialised in the work.

¹⁵⁰ Anthea Callen, *The Art of Impressionism: Painting Technique and the Making of Modernity* (Yale University Press, 2000), 97.

These site-responsive improvisations exemplify how material and environment act together and can be understood through the lens of improvisation, as described by Nachmanovitch,¹⁵¹ where responsiveness rather than pre-determined control shapes creative emergence.

This approach simultaneously expands the technical vocabulary and destabilises studio-based paradigms of control. *Plein air* glassblowing introduces logistical constraints, from mobile furnace set-up to managing thermal stability in volatile climates, but these constraints are generative. In these contexts, the site functions as both a *site of production* and a *site of inspiration*, and occasionally as a site of encounter, when passers-by or local collaborators became participants in the process. The elemental conditions of wind, humidity, and ambient light thus operate not as passive surroundings but as active participants in the shaping of form and meaning (Figure 53).

Culturally, this method resonates with Chinese philosophies of landscape and making, in which nature is not a backdrop to human activity but a co-constitutive force. As François Jullien observes,¹⁵² classical Chinese thought does not contrast human action with natural process but situates creativity within the rhythms of the world. This perspective aligns with my outdoor practice, where creative labour moves in correspondence with elemental conditions rather than against them.

Equally important is the affective and embodied dimension of this practice. Working outdoors transformed not only the logistics of making but also my inner state. Shifts in temperature, air movement, and changing light coloured my mood and concentration. These affective modulations shaped how I held the pipe, when I paused, and how I allowed forms to emerge. The body, in this sense, became a site where environment and emotion converged, translating atmospheric change into material decision.

By embedding glassblowing within open-air environments, I foreground site not merely as a physical context but also as a perceptual and philosophical agent. This practice extends my enquiry into synaesthetic touch by enabling direct sensory responsiveness, where light, the

¹⁵¹ Stephen Nachmanovitch, *Free Play: Improvisation in Life and Art* (J.P. Tarcher, 1990)

¹⁵² François Jullien, *The Great Image Has No Form, or On the Nonobject through Painting*, trans. Jane Marie Todd (University of Chicago Press, 2009).

flow of air, and temperature become tactile agents in shaping both form and experience. In this way, *plein air* practice functions not only as a mode of making but also as a methodological stance, one that reinforces the interdependence of the artist, their materials, and the environment.



Figure 53. Glassblowing (en) *plein air* by the Nujiang River in a natural environment. 2023. Photo Credit: He Junjie.

5.2.3. The Jingdezhen Studio: A Site of Continuity and Innovation

The relocation and establishment of my studio in Jingdezhen marks a significant evolution in my practice. Situated in a natural environment, the site was deliberately chosen to foster an embodied integration between process and place, enabling my work to extend beyond the limitations of a conventional studio setting (Figure 54). As a *site of production*, Jingdezhen embodies both continuity and transformation: it consolidates long-term technical refinement and sustained dialogue with regional ceramic traditions while simultaneously opening new directions through its responsiveness to seasonal and environmental variations. These

conditions do not simply frame the act of making: they also inflect the perceptual and affective dimensions of the finished work, embedding environment within form.



Figure 54. Site of production: Jingdezhen studio, situated within natural surroundings, 2025. Glassblowing in progress. Photo Credit: He Junjie.

The architectural design of the studio reflects this duality of rootedness and adaptability. Permanently embedded within the landscape, it is nonetheless configured for mobility, enabling glassblowing to occur both within and outside its physical bounds. This spatial fluidity facilitates *plein air* engagements that heighten responsiveness to light, temperature, and wind, reinforcing my conception of site as an active material agent. Recent structural renovations to stabilise the studio's infrastructure, such as improved ventilation and the integration of a portable furnace, highlight its role as a hybrid making space, one that bridges craft precision with environmental flux.

Working in Jingdezhen also places me in dialogue with a deeply embedded local material culture. The city's renowned legacy of ceramic production fosters a heightened sensitivity to

thermal control, surface treatment, and the modulation of form. While my medium differs, the technical ethos and tacit knowledge of this place continue to inform the refinement of my glassblowing methods. For instance, adopting kiln techniques inspired by ceramicists has prompted subtle adjustments to annealing times, affecting the final tension and clarity of certain pieces.

This studio consolidates the methodologies I have explored elsewhere, including residencies, *plein air* practice, and situational improvisation, into a coherent research environment. While artists have previously engaged with site episodically through residencies or outdoor experiments, the deliberate relocation of glassblowing into natural landscapes for *plein air* practice is distinctive to my approach and constitutes an original contribution to knowledge.¹⁵³ To my knowledge, there are very few, if any, examples of artists anywhere in the world intentionally configuring hot glass within scenic environments as a mode of practice. This situates the Jingdezhen studio as singular, both in its configuration and as a methodological innovation, reframing site-specificity not merely as an episodic intervention but as an expanded framework for relational and ecological making.

5.3. Methodological Implications of Site-Based Practice

This practice-based research investigates the transformative potential of glass art through the conceptual lens of ‘synaesthetic touch’, a framework developed to bridge sensory experiences and evoke expanded emotional and perceptual engagement with practice. Central to this enquiry are questions of how the viewer’s perception is shaped by glass works, what conceptual vocabularies best support such enquiry, and how colours and surfaces are experienced across varying contexts. These questions are grounded not only in phenomenological and material theories but also in site-based practice, a methodology that places environmental, cultural, and spatial conditions at the heart of making and thinking.

¹⁵³ The claim here is made with reference to my survey of published literature and exhibition catalogues on contemporary glass practice, in which no precedent was identified for the deliberate relocation of hot glass to natural or scenic outdoor environments. While temporary mobile furnace demonstrations exist within educational or festival contexts (e.g., public glassblowing events at Pilchuck Glass School or the Corning Museum of Glass), these differ substantially in intention and scope from a research-led *plein air* methodology.

Building on experiences across key sites, including Jingdezhen (production), Pilchuck (encounter and experimentation), and Nujiang (inspiration and environmental immersion), this section considers how place operates as a catalyst in the formulation of research questions. Through these engagements, site emerges not as a neutral container for practice but as a structuring agent in shaping material logic and perceptual intent. In this sense, site functions not only as material condition but also as a methodological principle, generating the very terms through which research questions are articulated.

5.3.1. Site as Catalyst for Research Questions

Working within diverse geographic and cultural contexts has profoundly shaped the methodological development of this research. Each site generated specific environmental and perceptual challenges that expanded the scope of the initial research concerns. For instance, Jingdezhen, as a longstanding site of production, revealed how kiln practices and material refinements influence how colour stabilises or shifts in varying thermal conditions. At Pilchuck, the interplay between translucency and forest-filtered light prompted an expanded inquiry into the perception of layered textures and temporal colour shifts in glass. These experiences positioned environmental variability as a methodological tool for interrogating how viewers interpret chromatic and tactile cues.

Further, Nujiang's intensely saturated natural palette and atmospheric luminosity inspired a deeper exploration into the mnemonic and affective dimensions of colour. For example, the decision to thin the glass walls of certain pieces was made in response to diffused mountain light, allowing their inner hues to fluctuate subtly throughout the day (Figure 55). These adjustments demonstrated that sensory conditions not only alter visual reception but can also trigger synaesthetic associations, moments where light, emotion, and memory converge.



Figure 55. Work produced in Nujiang, responding to diffused mountain light through thinning of glass walls. 2023. Photo Credit: Anyan Wu Studio.

Crucially, cultural conditions also played a role in shaping the formulation of the research questions. The ethos of material restraint embedded in Chinese craft traditions fostered my attunement to minimal formal gestures, exemplified in *Erhai 18:37* (2022), a pared-back work produced in Jingdezhen, whose thin glass walls respond to the subtle modulations of mountain light (Figure 56). By contrast, the experimental collectivism of North American studios encouraged risk-taking and technical innovation, as seen in a new body of work created during my residency at Barrio Glassworks in 2025 (Figure 57). Developed in an open, collaborative studio environment, this piece pushed both scale and technical complexity beyond the parameters I had previously attempted, marking a breakthrough that expanded my understanding of glass as a medium of experimentation.



Figure 56. Jinya Zhao. Erhai 18:37, 2022. Glass, 41 × 28.5 × 28.5 cm. Produced in Jingdezhen, China, at Yutian Reservoir. Photo Credit: He Junjie.



Figure 57. Experimental glasswork with organic forms, 2025. Produced during the artist residency at Barrio Glassworks, California. Photo Credit: Jason Sulli, on-site documentation.

5.3.2. Theoretical Integration

This section draws on Merleau-Ponty's phenomenological approach to deepen the methodological grounding of synaesthetic touch and the embodied reception of glass practice. Merleau-Ponty's emphasis on embodied experience offers a profound lens for understanding the interplay between site-specific variables and the perception of glass works. His phenomenological framework focuses on the idea that perception is not merely a passive reception of external stimuli but an active, embodied engagement with the world, shaped by the interplay of the senses, the body, and the environment.¹⁵⁴ This perspective resonates deeply with my methodology of site-specific glass practice, where shifting conditions of light, temperature, and spatial configuration shape not only the creation of the work but also the way it is encountered and experienced.¹⁵⁵

Merleau-Ponty's notion of embodiment suggests that the viewer's experience of an artwork is mediated by their bodily presence within the environment. In the context of glass works, this means that perception extends beyond the visual to include tactile and spatial dimensions. For example, the interaction of light with the surface of glass can evoke a sense of touch: audiences might 'feel' the smoothness or texture of the material through its visual qualities. Similarly, the spatial positioning of glass works within an environment can influence how viewers move around and engage with the piece, making their bodily awareness integral to their sensory experience. In this way, site-specific variables become active agents in the process of perception. The quality of natural light, for instance, can enhance or transform the transparency and reflectivity of glass, creating dynamic effects that shift as the viewer changes position. Temperature and humidity, while not directly visible, may influence the behaviour of light and shadow on the material, subtly shaping the mood and emotional resonance of the work. These elements work together to create a multisensory engagement that transcends the visual, aligning with Merleau-Ponty's assertion that perception is always embodied and interconnected with the surrounding world.

¹⁵⁴ Merleau-Ponty, *Phenomenology of Perception*, 235–239.

¹⁵⁵ Taylor Carman, *Merleau-Ponty* (Routledge, 2008), 95–102. Carman highlights Merleau-Ponty's account of perception as an embodied and situated activity, always open to environmental conditions and shifting spatial contexts.

The dialogic relationship between material and environment further emphasises the phenomenological dimensions of glass practice. Glass, as a medium, is uniquely responsive to environmental conditions, as it captures and refracts light, interacts with temperature, and responds to spatial configurations.¹⁵⁶ This responsiveness makes it an ideal material for exploring the phenomenology of perception.

For instance, a glass sculpture displayed in an open-air environment such as Nujiang interacts dynamically with shifting natural light, creating ephemeral patterns of colour and shadow that change throughout the day. The audience's perception of these patterns is not static: it evolves as they move through the space, experiencing the work from different angles and distances. This temporal and spatial interaction exemplifies Merleau-Ponty's notion of perception as a process of 'becoming', where meaning and experience emerge through the ongoing interplay of body, material, and environment.¹⁵⁷ Similarly, the integration of temperature as a site-specific variable highlights the embodied nature of perception. In warmer climates, the radiance of light through glass may feel more vibrant and saturated, creating a sense of heat and vitality that resonates with the viewer's physical experience of the environment. Conversely, in colder settings, the same material might convey stillness or fragility, eliciting a different emotional response. These contextual shifts demonstrate how site-specific variables engage the senses holistically, fostering deeper tactile and emotional connections with the artwork.¹⁵⁸

Merleau-Ponty's framework further supports the idea that the interaction of material and environment can evoke tactile and emotional connections.¹⁵⁹ The visual qualities of glass, including its transparency, reflectivity and fluidity, often mimic tactile sensations, inviting viewers to imagine how the material might be felt through vision. For example, a smooth polished surface may be imagined as cool and solid, while a textured or layered finish may suggest warmth, softness or even fragility. These tactile associations, though mediated visually, are rooted in the embodied nature of perception, where the viewer's sensory memory and physical presence shape their encounter with the work. In this sense, glass

¹⁵⁶ Merleau-Ponty, *Phenomenology of Perception*, 235–239.

¹⁵⁷ *Ibid.*, 218.

¹⁵⁸ *Ibid.*, 248–251.

¹⁵⁹ *Ibid.*, 235–240.

practice exemplifies Merleau-Ponty's account of perception as a holistic and intersensory process, in which vision is always intertwined with touch, memory and affect.¹⁶⁰

During my residency at Pilchuck, I developed techniques using flat glass powder on blown three-dimensional glass forms to create intricate textures that enhance the tactile qualities of the works.¹⁶¹ This innovation extended beyond the initial surface applications of flat glass powder, transforming it into a method for augmenting the haptic dimensions of my works. The textured surfaces produced by this technique evoke a tactile response even when perceived visually, inviting the audience to engage with the materiality of the glass more intimately (Figure 60). This integration of texture into three-dimensional forms bridges the visual and the tactile, enriching the sensory dimensions of the work and reinforcing Merleau-Ponty's assertion that perception is a multisensory and embodied process.¹⁶²

Emotional connections, too, are influenced by the interplay of material and environment. The way light interacts with the glass, casting colourful reflections or shadows, can create an atmosphere of wonder, tranquillity, or nostalgia. As Adamson argues in 'Manipulation', the opening chapter of his book *The Invention of Craft*, craft insists on the presence of the object, embedding sensory and emotional investment in the encounter with material.¹⁶³ These emotional responses are shaped not only by the physical qualities of the artwork but also by the context of its site. As Casey observes, 'place is the immediate ambiance of our lived experience, charged with affect and memory',¹⁶⁴ and thus the situation of a glass work, its relationship to surrounding space, the time of day, and the viewer's position within it, becomes central to its reception. For instance, the application of textured glass powder on blown forms, combined with site-specific lighting conditions, amplifies the emotional

¹⁶⁰ Rachel Herz, *The Scent of Desire: Discovering Our Enigmatic Sense of Smell* (William Morrow Paperbacks, 2008). Herz demonstrates how olfactory experience is never isolated but always entwined with memory and emotion, showing perception itself to be holistic and intersensory.

¹⁶¹ This development is based on self-documented practice during my residency at Pilchuck Glass School in 2023. More details are in Chapter 3.4.2.

¹⁶² Taylor Carman, *Merleau-Ponty* 91–94.

¹⁶³ Adamson, *The Invention of Craft*, 10–12.

¹⁶⁴ Edward S. Casey, "How to Get from Space to Place in a Fairly Short Stretch of Time: Phenomenological Prolegomena," in *Senses of Place*, ed. Steven Feld and Keith H. Basso (School of American Research Press, 1996), 27–28.

resonance of the work by producing dynamic visual effects that shift with the viewer's perspective and the ambient light (Figure 58).



Figure 58. Applying glass powders on blown glass, 2024. Process photograph showing textures and dynamic effects emerging through site-specific environment. Photo Credit: He Junjie.

This alignment between the material, the environment, and the experience of the viewer reflects Merleau-Ponty's belief that perception is always relational, rooted in the dynamic interplay of the self and the world. By integrating site-specific techniques such as the textured application of flat glass powder developed at Pilchuck, my practice extends sensory engagement beyond the visual, emphasising the role of material innovation in fostering tactile and emotional connections. This phenomenological perspective enriches the methodology of site-responsive practice, emphasising the potential of glass to bridge the sensory and emotional dimensions of artistic engagement.

5.3.3. Reflection on Practice

Reflecting on my practice, the integration of site-specific methodologies has fundamentally transformed how I approach the creation and perception of glass works. Engaging with diverse cultural, environmental, and material conditions has revealed the importance of site as dynamic collaborator, influencing both the technical and conceptual dimensions of my work. This understanding has reshaped my methodology and expanded the possibilities for glass as a medium capable of evoking tactile, sensory, and emotional connections.

In my practice, site is not merely a backdrop but an agent that directly interacts with material processes and conceptual frameworks. The structured rhythms of a specific studio environment, the unpredictable conditions of open-air settings, and the collaborative ethos of residencies all contribute to a process where material and environment exist in constant dialogue. For example, the textured flat glass powder techniques initially developed during my residency at Pilchuck have evolved to be applied to blown three-dimensional forms. This innovation, developed in the production context of Pilchuck, also extends into the stage of the encounter, as the blown forms respond dynamically to environmental conditions such as light and spatial context. It enhances the tactile and sensory appeal of the works, reinforcing the integration of material and site as central to the artistic process.

The temperature, humidity, and quality of light in a specific location influence not only how glass behaves during creation but also how it interacts with its surroundings after it is created (Figure 59). This dynamic interaction emphasises the idea of site as a co-creator, where local traditions, environmental conditions, and cultural narratives become integral to the artistic process. The interplay of light and transparency in forested environments, the vibrant hues inspired by tropical landscapes, and the disciplined techniques that were honed in traditional studios collectively enrich the material and conceptual layers of my work. While these influences may not always be tangibly evident to audiences encountering the finished works, they remain embedded within the processes of inspiration, production and display, creating the potential for viewers to re-read them and to sense how the works resonate with the environment while inviting universal sensory engagement.



Figure 59. Working in the Jingdezhen glassblowing studio, China. 2024. Local conditions shape the glass and its interaction with its surroundings. Photo Credit: He Junjie.

Through this reflection, I have come to see materiality as both a response to, and an extension of, the site. The glass surfaces, textures, and layers I create are shaped by environmental factors that inform their visual and tactile qualities. For the viewer, these material elements often transcend the visual, evoking tactile and emotional responses.

- **Transparency and Light:** The way light filters through, or reflects off, glass, influenced by site-specific variables, creates dynamic interactions that shift with the viewer's position. This encourages an embodied engagement, where perception involves movement and spatial awareness.
- **Colour and Emotion:** Vibrant or muted tones, inspired by local environments, create emotional resonances, inviting viewers to connect the visual experience with personal memories or cultural narratives.

- **Layering and Texture:** Subtle surface treatments and layered compositions evoke a sense of depth and complexity, allowing audiences to ‘feel’ the material through visual cues, bridging the sensory and the emotional.

These material qualities, deeply informed by site, position glass as a medium capable of transforming perception and fostering connections that are tactile, spatial, and emotional. Reflection on my practice has revealed the profound impact of site-specific methodologies on both the creation and perception of glass works. By conceptualising site as an active co-creator, I have developed a practice that integrates environmental, cultural, and material influences into works that resonate across sensory and emotional dimensions.

As a result, glass emerges as a dynamic medium of embodied engagement, where environmental and material conditions coalesce to shape perceptual and emotional resonance. This aligns with Merleau-Ponty’s and Casey’s shared emphasis on the co-generative relationship between place, body, and meaning.¹⁶⁵ Additionally, the integration of site-specific narratives into the material process aligns with Casey’s exploration of place as a lived, dynamic experience that informs meaning and perception.¹⁶⁶

Through this practice, I contribute to a deeper understanding of the relationship between art, environment, and experience, positioning glass as a medium that transcends its physical properties to engage audiences on both sensory and conceptual levels.

5.4. The Research Exhibition

The research exhibition represents a critical phase within my practice-based PhD, providing a platform to test, refine, and showcase the methodologies and findings developed throughout my research. Through exhibitions at The Chinese University of Hong Kong, Shenzhen (CUHKSZ) and the Royal College of Art (RCA) in London, I explored how sensory engagement, particularly through the concept of synaesthetic touch, can deepen and transform audience interaction with glass art. These exhibitions emphasise the dynamic

¹⁶⁵ Merleau-Ponty, *Phenomenology of Perception*, 98–104.

¹⁶⁶ Casey, "How to Get from Space to Place in a Fairly Short Stretch of Time".

interplay between materiality, sensory perception, and environmental context, highlighting the potential of glass as a medium capable of evoking complex sensory and emotional connections.

5.4.1. The Chinese University of Hong Kong, Shenzhen: Testing the Framework

Conducted from June to September 2025, my residency and exhibition at The Chinese University of Hong Kong, Shenzhen (CUHKSZ) provided a pivotal testing ground to explore and refine methodologies related to sensory engagement in glass art, particularly through synaesthetic touch. Central to this phase was the CUHKSZ Research Workshop Series: Perception as Experiment, a structured series of four workshops designed to investigate intersections between colour, memory, language, and perception across varying sensory modalities and demographic groups. Each workshop functioned as a distinct yet interconnected data collection site, contributing directly to my broader research inquiry. (Detailed documentation can be found in Appendix B.3.) For the theoretical foundations informing this stage of practice, see Chapter 5.1 (Theoretical Framework) and Chapter 5.3 (Methodology).

The visual and material outcomes generated by each session, ranging from colour maps and perceptual diagrams to sculptural responses, were also exhibited within the gallery space as part of the research presentation (Figure 60). Their inclusion affirmed the role of the workshops not only as methodological tools but also as integral contributions to the evolving sensory and conceptual ecology of the project. These participatory artefacts invited audiences to engage with the research process itself, thereby extending the dialogic field of the exhibition and strengthening the relational methodology underpinning synaesthetic touch.



Figure 60. Installation view of workshop outcomes at the exhibition space TC101 SPACE, CUHKSZ, 2025. As integral components of the research process, these participatory artefacts fostered audience interaction and extended the exhibition's dialogic field. Photo Credit: Jinya Zhao.

Residency Objectives

The residency specifically aimed to investigate how sensory elements, especially the olfactory and the visual, could enhance audience emotional engagement and sensory experience with glass artworks. The primary objectives were:

- Exploring techniques for integrating scent with glass surfaces and exhibition spaces.
- Systematically examining audience responses to multisensory stimuli.
- Facilitating interdisciplinary dialogue to expand theoretical frameworks surrounding synaesthetic touch.

Workshop Series Overview

- **Natural Colour Perception with Kindergarten Children (July 8, 2025)**

This workshop explored intuitive and embodied responses to natural colours among children aged five to six, highlighting sensory cognition that develops independently of structured linguistic systems (Figure 61).

- **Natural Colour Collection × Visual Expression × Small-Scale Sculptures (July 10, 2025)**

This session investigated cognitive and conceptual interpretations of colour and form with university students and faculty. The results provided insights into contrasts between intuitive sensory responses and more analytical modes of engagement (Figure 62).

- **Introducing Perceptual Image Memory (July 15, 2025)**

This workshop examined the influence of linguistic prompts on colour perception through interactive gameplay and visual interpretation, emphasising the variability of cognitive responses (Figure 63).

- **Scent and the Memory of Colour (July 17, 2025)**

This final workshop focused on the interplay of olfactory perception, memory and emotional resonance in the context of exhibited glass artworks (Figure 64).



Figure 61. Natural Colour Perception workshop with kindergarten children, CUHKSZ, 2025. Engaging intuitive sensory responses to natural colours. Photo Credit: He Junjie.



Figure 62. Natural Colour Collection and Sculpture workshop with university participants, CUHKSZ, 2025. Investigating perceptual translation from colour to form. Photo Credit: He Junjie.



Figure 63. Introducing Perceptual Image Memory workshop, CUHKSZ, 2025. Interactive exercise exploring how linguistic prompts influence colour perception. Photo Credit: UAC@CUHKSZ.



Figure 64. Scent and the Memory of Colour session, CUHKSZ Exhibition, 2025. Viewers re-enter the exhibition space with olfactory cues, triggering memory recall and renewed sensory interpretation of the glass works. Photo Credit: UAC@CUHKSZ.

Although these workshops are presented here in summary, they were not conceived as controlled experiments but rather as practice-based interventions designed to generate sensory data on colour, perception and memory. The responses, whether expressed through drawings, verbal association or bodily interaction, were analysed qualitatively in order to identify recurring perceptual tendencies and to contrast intuitive with analytical modes of engagement. Their value lies less in producing generalisable results than in testing and refining methodologies of sensory elicitation, thereby consolidating the conceptual development of synaesthetic touch and extending its application within site-based glass practice.

Exhibition Design and Audience Interaction

Curated by Wang Che, the exhibition ‘Before the Feeling Forms: A Practice-Based Research Exhibition’ at TC101 SPACE (June–September 2025) synthesised findings from the workshop series into a comprehensive sensory narrative. The exhibition was structured to embody the research methodology in both content and form, emphasising:

- Chronological and thematic sequencing of artworks to reflect the evolution of sensory methodologies developed across residencies and studio experiments.
- Selective olfactory interventions, such as scent diffusions embedded in the space, which enhanced immersive engagement and complemented the visual and tactile dimensions of the glass works.
- Interactive audience participation, including artist-guided tours, dialogues, and structured feedback, which encouraged diverse forms of embodied response.

Significantly, the material outcomes of the workshop series were also exhibited within the gallery space (see Figure 60), integrated as a parallel yet dialogically linked axis alongside the glass installations. Their inclusion blurred the boundaries between audience, participant, and maker, emphasising my commitment in the research to reciprocity, co-creation, and perceptual plurality. This spatial strategy allowed viewers to navigate across a spectrum of experiences, from professionally realised glassworks to participatory artefacts generated through embodied experimentation. By doing so, the exhibition reinforced the

methodological premise of synaesthetic touch as a multi-directional and inclusive process of meaning-making (Figure 65).





Figure 65. Site of Encounter: CUHKSZ. Installation view of *Before the Feeling Forms: A Practice-Based Research Exhibition* at TC101 SPACE, CUHKSZ, 2025. Photo Credit: He Junjie.

Insights from Dialogue with Wang Che

In a detailed conversation with the curator Wang Che (Appendix C.6), key conceptual and methodological insights emerged. Our discussion addressed the transformation of spatial and emotional responses into glass art, exemplified by my residency along the Nujiang River. I elaborated on how environmental elements such as mist, temperature, and shifting light influenced the creation of a colour gradient transitioning from warm orange hues to cooler tones, subtly echoing the atmospheric dissolution of fog. This approach embodies the porous boundary between existence and perception.

Rather than acting solely as a facilitator, Wang Che became a reflective agent within the research process. His emphasis on spatial narrative, sensory rhythm, and chromatic transitions was instrumental in refining the exhibition layout, ensuring that the perceptual flow between works mirrored the conceptual arc developed throughout the workshops. The curatorial dialogue not only formed a discursive reflection on the work presented: it also constituted a methodological contribution to the research, foregrounding how curatorial framing actively co-produces modes of audience perception and interpretive depth.

Analytical Reflections and Methodological Integration

The data gathered across all the workshops, ranging from visual artefacts and smell logs to verbal reflections and spatial responses, was analysed using thematic coding techniques to identify emergent patterns in cross-modal perception. For example, during the olfactory workshop one participant reflected on the work *Erhai 18:37* (Figure 66), describing how its layered chromatic shifts evoked the experience of watching a sunset at West Lake (China), where pink, orange and purple had blended into nightfall, accompanied by the imagined scent of oranges. They noted that the moment was so moving that it recalled a memory in embodied form and brought them close to tears (Figure 67).¹⁶⁷

¹⁶⁷ Original response in Chinese: “《洱海》这件作品真的很像我那天看到的日落，之前没有真的在展厅好好停下来感受。但这次，我透过这件作品有了到了西湖的日落，粉色，橙色，紫色在天空中杂糅，而又慢慢过入夜晚，混合着橙子的香气，安心的，清爽的。（回想起的一刻有点想落泪，好像看到了一段记忆，一场风素的实体化，很惊奇、很喜欢!!!）” Translated into English by the author.



Figure 66. Site of Encounter: CUHKSZ. Installation view of 'Before the Feeling Forms: A Practice-Based Research Exhibition' at TC101 SPACE, CUHKSZ, 2025. The work shown on the far left is Erhai 18:37, 2022, glass, 41 × 28.5 × 28.5 cm. Photo Credit: He Junjie.

几近触及展览嗅觉卡

| |
|---|
| 嗅觉卡 No. 01 |
| 嗅觉关键词: 薄荷糖 |
| 它让你想到的是什么: 炎热的夏天吃到薄荷糖时, 口腔、鼻腔冰爽清凉的质感, 清凉的, 令人愉悦的 |
| 哪件作品与你的联想有关? 名称: 年中初夏 |
| 你为这组搭配写的一句话: 深浅不同的绿色, 蒙蒙雾看不清的绿色, 围绕着薄荷糖的香气, 好像把我拉进了盛夏的森林, 凉爽的, 清新的, 充满生命力的。 |
| 嗅觉卡 No. 02 |
| 嗅觉关键词: 橘子 |
| 它让你想到的是什么: 上周六去西湖游玩, 坐在船上, 落日时分, 整个天空都是橘子的颜色, 好像掉进了橘子海, 对我来说是幸福的味道。 |
| 哪件作品与你的联想有关? 名称: 洱海 |
| 你为这组搭配写的一句话: 《洱海》这件作品真的很像我那天看到的日落, 之前没有真的在展厅好好停下来感受, 但这次, 我透过这件作品看到了西湖的日落, 天色橘色, 景色在天空中东探, 而又慢慢进入夜色, 混合着橘子的香气, 安心的, 清凉的。(回想起来, 刻有点想落泪, 好像看到了一段记忆, 一场风景的实体化, 很快乐, 很喜欢!!!) |
| 嗅觉卡 No. 03 |
| 嗅觉关键词: |

Figure 67. Audience response card, olfactory workshop, July 2025. The participant associated Erhai 18:37 with a sunset at West Lake, blending visual and olfactory memory. Original text in Chinese; English translation by the author.

In addition to structured workshops, spontaneous responses recorded in the exhibition notebook also contributed to the corpus of sensory data. A child visitor produced a drawing after viewing the exhibition and described it orally as ‘the colour of warmth’. This artefact illustrates how encounter-based contexts can elicit affective and intuitive responses, extending beyond the designed parameters of the workshops (Figure 68).

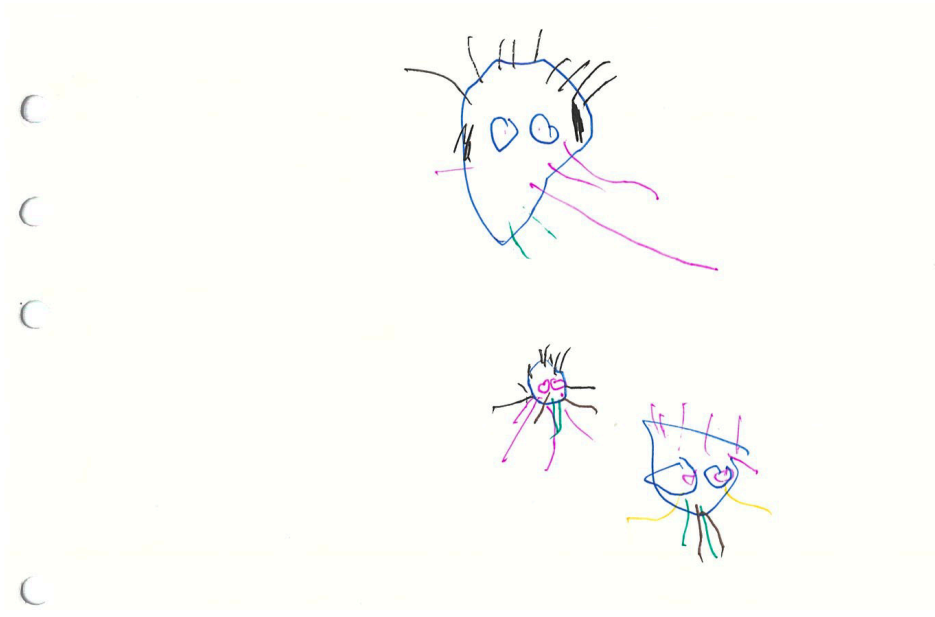


Figure 68. Visitor drawing in exhibition notebook, CUHKSZ, July 2025. Produced by a child after viewing the exhibition.

Findings

The residency and workshop series collectively provided significant insights:

- **Enhanced Engagement:** Audience feedback indicated deepened perceptual and emotional connections facilitated by the integration of multiple sensory experiences.
- **Methodological Refinement:** Techniques developed during the workshops, particularly the application of sensory elements onto textured glass surfaces and their diffusion in environmental settings, proved to be effective strategies for activating perceptual engagement.
- **Interdisciplinary Insights:** Cross-disciplinary collaboration enriched both the theoretical perspectives and the practical methods, demonstrating the efficacy of interdisciplinary frameworks in sensory research.

Together, the residency and the CUHKSZ workshop series conclusively validated synaesthetic touch as a robust methodological framework for investigating and enhancing multisensory engagement within glass art practices. As the first fully site-responsive stage of this research, it laid the methodological and conceptual groundwork for the final viva exhibition at the Royal College of Art, where these findings will be critically tested within a new institutional context.

5.4.2. Royal College of Art: Forthcoming Viva Exhibition

The viva exhibition at the Royal College of Art is planned as the culminating stage of my PhD research, synthesising the methodologies and insights developed throughout the project. Rather than serving as a site of reflection within this thesis, it will act as a future platform where the research will be further tested, presented, and encountered by examiners and audiences.

Planned Objectives

- To present the evolution of my research through a curated selection of works, highlighting key milestones in material and sensory experimentation.
- To demonstrate how tactile and perceptual elements may enhance the interaction between the viewer and glass.
- To provide a platform for gathering additional feedback on the methodologies and findings developed during the PhD.

Anticipated Features

The exhibition will be designed to create a cohesive narrative that guides audiences through the sensory and conceptual dimensions of the research. Key elements include:

- **Interactive Components:** works encouraging close and multisensory engagement, inviting audiences to experience glass beyond its visual dimension.
- **Environmental Integration:** display arrangements that consider spatial conditions and their impact on perception.

- **Chronological Development:** a display tracing the progression of techniques and concepts, contextualising findings within the broader scope of the research.

Potential Outcomes

- **Audience Interaction:** observations and feedback are expected to capture how visitors respond to the works, generating insights into the impact of material and perceptual strategies.
- **Validation of Findings:** the exhibition will provide an opportunity to test how methodologies developed during the PhD might be translated into a cohesive body of work.
- **Future Directions:** insights gained are anticipated to inform the continuing evolution of my practice, emphasising the interdisciplinary potential of glass.

Taken together, the research exhibitions at CUHKSZ and the forthcoming RCA viva exhibition represent complementary stages in the development of my PhD project. While the CUHKSZ exhibition provided an opportunity to test methodologies in situ, the RCA exhibition will serve as the final moment of application and encounter, positioning glass as an evolving framework for multisensory engagement. By situating audience perception at the heart of the display, the research aims to contribute to an expanded understanding of how glass can function as a dynamic and interdisciplinary medium within contemporary art.

5.5. Conclusion

This chapter has demonstrated the critical role of site as a research method in shaping the conceptual, material, and sensory dimensions of my practice-based PhD. By positioning site as an *active co-creator*, rather than a passive or pre-existing backdrop, this research moves beyond traditional notions of site-specific art as static or location bound. Instead, it proposes a dynamic and relational framework in which sensory, environmental, cultural, and technical conditions operate as *structuring forces* within both the making and reception of glass artworks. This approach has been foundational to the development of synaesthetic touch, a conceptual and methodological framework that explores how multisensory engagement deepens affective and perceptual response.

The residency and exhibition at CUHKSZ played a pivotal role in testing and refining these methods. Through workshops and experimental installations, I examined how smell interacts with the visual and tactile elements of glass, shaping emotional and mnemonic perception. Audience responses emphasised the capacity of olfactory stimuli to activate layered sensory memory, validating synaesthetic touch as a resonant strategy for viewer engagement.

These insights will be further synthesised and expanded in the viva exhibition at the Royal College of Art (RCA), where spatial curation and environmental variables (such as lighting and spatial arrangement) become agents in staging perception. Through interactive components and structured feedback mechanisms, the RCA exhibition will reaffirm the potential of site-informed methodologies to transform audience experience and interpretive depth.

The theoretical underpinnings of this research draw from phenomenology, particularly Merleau-Ponty's notion of 'embodied perception'¹⁶⁸ and Casey's emphasis on the 'lived experience of place'.¹⁶⁹ These perspectives inform my approach to site not merely as a geographic situation but as an evolving continuum of cultural, material, and perceptual entanglements. Their integration into my practice has enabled a materially grounded yet conceptually expansive rethinking of site-responsiveness in contemporary art.

This chapter also evidences the distinct contribution of site as a method within practice-based research. By embedding site-specific variables, such as light, humidity, scent, and social context, into the logic of making, this research transforms such conditions into *generative constraints*, rather than external limitations. Through this, glass emerges not only as a material of precision and fragility, but as a vehicle for an embodied, multisensory encounter.

Looking forward, these findings point towards new methodological and conceptual directions. Future trajectories may include expanding the notion of site into virtual, remote, or digitally augmented environments, where sensory interaction could unfold through different temporal and technological conditions. Interdisciplinary dialogue with fields such as

¹⁶⁸ Merleau-Ponty, *Phenomenology of Perception*, 94–130.

¹⁶⁹ Casey, *Getting Back into Place*, esp. xiii–xvii (“Preface”, on returning to the lived experience of place) and 15–36 (on the phenomenological grounding of the experience of place).

neuroscience and architecture may further enrich the understanding of how memory, perception, and emotion are shaped by place.

In conclusion, this chapter has repositioned site as a generative and evolving agent within artistic research. By attending to its material, cultural, and perceptual complexity, the project contributes to an expanded discourse on environmental responsiveness, sensory innovation, and the methodological potential of working *with* place. These insights not only extend the possibilities of glass as a contemporary medium but also offer a model for site-integrated thinking within interdisciplinary creative practice.

6. Conclusion

6.1. Reframing the Research Scope

This research has reconceptualised blown glass as a medium of perceptual negotiation, an evental, site-responsive material that co-produces sensory experience rather than merely reflecting form or light. Rather than positioning glass within the traditional domain of sculptural or decorative art, the study articulates it as a *relational field* through which light, space, and embodiment are continuously reorganised.

By situating practice-based experimentation within the philosophical frameworks of Maurice Merleau-Ponty, Gilles Deleuze, and Edward Casey, this research offers a methodological shift: it moves away from representational thinking towards a phenomenological and affective understanding of materiality. Through the entangled concepts of colour, layerspace, synaesthetic touch, and site, the project establishes that glass, rather than being a passive transmitter is a perceptual engine that mobilises light, evokes memory, and provokes spatial reorientation.

Across exhibitions, residencies, and audience engagement, the research has illuminated how perceptual depth, sensory ambiguity, and embodied attention arise through dynamic relations between material form, environmental conditions, and cultural context. In doing so, it contributes to wider discourses in contemporary material aesthetics, multisensory design, and spatial theory.

This final chapter synthesises these insights, reflecting critically on their theoretical implications, practical methodologies, and emergent limitations, while opening new trajectories for research and practice.

6.2. Key Findings and Contributions

This research has articulated four interrelated conceptual frameworks: colour, layerspace, site, and synaesthetic touch, each developed through iterative cycles of material experimentation, audience engagement, and theoretical reflection. Rather than functioning as discrete themes, these frameworks operate in concert to reposition glass as a ‘perceptual catalyst’, a material that generates affective depth, sensory ambiguity, and spatial responsiveness.

Together, they form a methodological ecology through which the material, environmental, and experiential dimensions of glass practice can be critically rethought. Their key contributions are as follows:

Colour as Contingent Perception and Affective Depth

This study approaches colour not simply as an optical attribute, but as a contingent perceptual event shaped by light, transparency, material layering, and the viewer’s embodied relation to space. In the context of blown glass, colour can operate as a sensory mediator that may delay recognition, evoke memory, and intensify atmospheric affect.

- **Chromatic fugacity:** in this study this term refers to the temporal instability of colour, which emerged as a central condition, heightened particularly by natural light and spatial repositioning.
- **Layering and translucency:** these qualities were observed to generate perceptual fields that shift with the viewer’s movement, destabilising visual fixity.
- **Audience responses:** these often referred to emotional states, sensory memory, or kinaesthetic awareness, suggesting that colour in glass may extend across both cognitive and pre-cognitive registers.

Layerspace and the Construction of Perceptual Depth

The concept of *layerspace* reframes spatial depth as a relational construction, produced through material opacity, transparency, and light refraction rather than sculptural mass or volume.

- Spatial perception was shown to be evental, fluctuating with the viewer's position, the environment of the work, and the logic of optical distortion.
- Layering operates not as an additive strategy but as a method of *perceptual choreography*, that requires audience movement and duration in order to unfold.
- Through Deleuzian affect theory, layerspace is understood not as geometric but 'intensive',¹⁷⁰ a sensory field marked by ambiguity, latency, and transformation.

Site as Co-creator of Perception and Material Behaviour

This research expands the notion of site from a passive context to an active participant in both the making and reception of glass works. Across projects in Pilchuck, Nujiang, Shanghai, and Jingdezhen, site emerged as a co-constitutive force shaping form, concept, and perceptual atmosphere.

- Variations in light, climate, and spatial orientation reconfigured how layering and transparency were experienced.
- Cultural histories and material lineages (e.g. the intersection of glass and porcelain in Jingdezhen) informed conceptual decisions and viewer interpretations.
- Site-responsive perception was shown to be culturally situated and environmentally specific, reinforcing that material reception is neither universal nor autonomous.

¹⁷⁰ Deleuze and Guattari, *A Thousand Plateaus*, 474.

Synaesthetic Touch as a Visual–Haptic Threshold

By drawing on Merleau-Ponty's phenomenology of perception and recent sensory studies,¹⁷¹ this research proposes *synaesthetic touch* as a framework for understanding how glass extends perception beyond the visual.

- Optical properties – transparency, texture, chromatic layering, elicited tactile responses in viewers without physical contact, confirming that seeing can acquire haptic qualities.
- Glass was repeatedly described in audience feedback as 'soft', 'breathing', or 'flickering', indicating its capacity to activate kinaesthetic empathy and embodied sensation.
- The perceptual instability of glass enables cross-modal experiences, destabilising sensory hierarchies and inviting alternative models of material encounter.

Collectively, these findings reposition glass from a medium of representation to a *sensorial interface*, one through which vision touches, space bends, and experience is durationally co-produced. The four frameworks, while distinct, together constitute a methodological constellation for investigating spatial affect, embodied perception, and material contingency in contemporary practice.

6.3. Methodological Reflections and Challenges

This research has not simply applied a pre-existing methodology, but has enacted a methodology that emerges from within the contingencies of glass, place, and perception. Practice-led research, here, is not a vehicle for illustrating theory but a means of generating it: a responsive, recursive process in which thinking is shaped through making, and making is unsettled through encounters.

¹⁷¹ Merleau-Ponty, *Phenomenology of Perception*.

This recursive process can be visualised as a practice-based research cycle (Figure 69), moving from inspiration through sketches, scaled drawings, and making, towards exhibition and audience encounters, which in turn generates new inspiration.

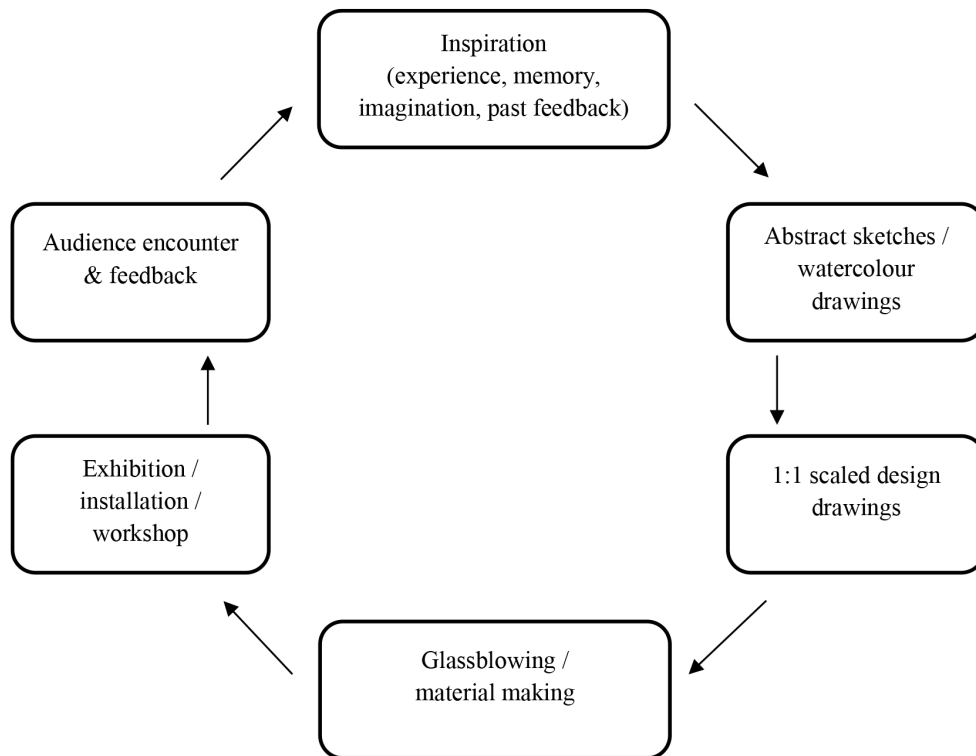


Figure 69. Practice-based research cycle (Jinya Zhao, 2025). From inspiration and conceptual drawings, through scaled design and glassblowing, to exhibition and audience feedback, which in turn generates new inspiration.

Central to this approach was an acceptance of uncertainty within the method: the recognition that materials may behave unpredictably, audiences may respond in unexpected ways, and sites may act upon the process. In this context, three core challenges arose, not as hindrances but as epistemological provocations:

- **Subjectivity as methodological resource:** audience responses revealed not merely variation but deep divergence, shaped by memory, culture and expectation. While this frustrates attempts at standardisation, it foregrounds a key principle of this research: that perception is always situated, and that embodied knowledge is plural, contingent and irreducible. The instability of response therefore became part of the method, functioning as a texture of experience rather than a deviation from it.

- **Material agency and resistance:** Glass – volatile, fragile and intensely responsive to environmental stimuli – resisted instrumentalisation. Its cracks, delays and distortions became active participants in the unfolding of the research. This demanded a methodology based not on control but on listening to material behaviour – what Glenn Adamson terms ‘material intelligence’,¹⁷² and what Tim Ingold describes as ‘correspondence with materials’.¹⁷³ Through these instances of resistance, the research was continually reoriented by the material itself.
- **Environmental and temporal unfixity:** Site-specific installations behaved differently at noon and dusk, under humid skies or fluorescent light. These shifts revealed that perception is a temporal act: durational, unstable and shaped by ambient forces beyond the edge of the artwork. Methodologically, this required attunement rather than calibration. Instead of eliminating variation, the research embraced it as constitutive of meaning. A comparable strategy can be seen in Hella Jongerius’s exhibition ‘Breathing Colour’, where colour was curated in relation to changing daylight conditions, demonstrating how temporal variability itself can become a material and curatorial resource.¹⁷⁴

Together, these challenges called for a shift from methodology as structure to methodology as *situated responsiveness*. The research evolved toward a model of *perceptual attunement*, where theory and practice engage not in illustration, but in mutual disruption and co-formation.

In this way, the methodological legacy of the project lies not only in its findings, but also in its mode of working: a stance of embodied attentiveness, theoretical permeability, and material co-agency. It offers a model for future research into sensory aesthetics and spatial practice that embraces fragility, uncertainty, and emergence as generative forces.

¹⁷² Adamson, *Thinking Through Craft*. Adamson introduces the notion of ‘material intelligence’ as a sensibility that involves a deep understanding of materials through responsive engagement.

¹⁷³ Ingold, *Making*, 21–42.

¹⁷⁴ Hella Jongerius, ‘Breathing Colour’, exhibition, Design Museum, London, 28 June–24 September 2017. See also Design Museum, “Breathing Colour by Hella Jongerius,” 2017, accessed August 13, 2023, <https://designmuseum.org/exhibitions/breathing-colour-by-hella-jongerius>.

6.4. Visual Trajectories of the Research

While the conceptual and methodological contributions of this thesis have been set out in the preceding sections, the trajectory of the research can also be traced visually (Figures 70–73). Across the PhD, the practice developed from early explorations of glass as a responsive material, through site-specific installations, towards recent works that synthesise colour, layerspace, site and synaesthetic touch in more mature forms.



Figure 70. Collection of works, Taoxichuan Glass Studio, 2022. Jingdezhen. Photo Credit: He Junjie. Early collection of works exploring symmetrical forms, colour transitions, and the layering of space. This body of work reflects the initial stage of the PhD, when perceptual experimentation was channelled through more formal structures.



Figure 71. Collection of works, Jinya Studio, 2024. Jingdezhen. Photo Credit: He Junjie. This collection reflects both the mid-stage explorations of organic forms, fluidity, and site-responsive strategies, and the later investigations of nuanced tonal variation articulated in colour theory as chromatic greys.



Figure 72. Collection of works, Jinya Studio, 2025. Jingdezhen. Photo Credit: He Junjie. This collection demonstrates bolder forms and more experimental use of colour, emphasising the relationship between the body and the works, and highlighting interaction as an integral part of the perceptual encounter.



Figure 73. Collection of works, Before the Feeling Forms, CUHKSZ, 2025. Shenzhen. Photo Credit: He Junjie. This collection represents the most recent stage of the PhD, combining glass with metal elements and exploring the interplay of space and colour. The works synthesise earlier research concerns into an exhibition format that emphasises perceptual encounter and spatial resonance.

Together, these examples highlight the visual and material development of the research journey, reinforcing the central argument of this thesis: that glass is not a static object but an active perceptual engine, reconfiguring the relation between material, site, and audience.

6.5. Future Research Directions

The findings of this research, rather than marking a closure, offer a threshold, an opening toward new forms of practice, material inquiry and sensory integration. While blown glass remains the conceptual and material heart of this study, future explorations will consider how its perceptual qualities may be expanded through collaboration with other sensory modalities and spatial contexts.

A key strand of development will refine the methodological engagement with audiences through the integration of physiological sensing tools. Collaborations with cognitive

scientists or human–computer interaction designers may enable the use of eye-tracking, galvanic skin response or motion mapping to better understand how viewers navigate spatial ambiguity, chromatic fluctuation and temporal unfolding. These tools will not supplant qualitative insight but will serve as complements, adding granularity to the understanding of how perception is modulated by light, delay and spatial tension.

Future work may also expand the site of glass practice beyond the gallery into architectural and public environments. By applying the concepts of layerspace and sensory modulation to architectural façades, landscape installations or urban interventions, glass may be repositioned as an environmental interface that is capable of shaping not only visual perception but also thermal, atmospheric and affective conditions. In these contexts, glass becomes a sensorium through which place, time and body are re-negotiated.

Taken together, these directions indicate that glass practice will continue to evolve as a multisensory and site-responsive medium that can generate new forms of perceptual and conceptual engagement.

6.6. Final Reflections

This research has repositioned glass as an active mediator of perception, space and sensory experience, challenging its conventional categorisation as a sculptural or decorative medium. By integrating the frameworks of synaesthetic touch, layerspace, colour and site, the study has demonstrated that glass engages the body and senses beyond visual aesthetics, constructing dynamic, affective and spatial interactions.

Through iterative material experimentation and sustained audience engagement, several key insights have emerged: glass perception is inherently dynamic, shaped by light, spatial context and audience movement; site functions not as a backdrop but as a co-creator, altering perceptual depth and emotional resonance; and glass evokes sensory ambiguity, extending perception across haptic, mnemonic and embodied registers.

These findings contribute not only to contemporary glass practice, but also to wider fields such as spatial perception, sensory aesthetics and material engagement in art and design.

Glass, when approached as a perceptual event rather than a fixed object, becomes a medium of encounter that can activate spatial awareness, memory and affect.

Ultimately, this research proposes a shift in discourse: from glass as artefact to glass as temporal, relational and affective experience. In reframing glass in this way, the study establishes a materially grounded, practice-based model of perception that reconfigures the interaction between material, site and audience. This repositioning moves glass from the margins of craft and art to the centre of a renewed discourse on materiality and perception.

Appendices

Appendix A: Experimentation

This appendix provides a comprehensive exploration of the methodologies and experimental processes undertaken in this research, supplementing the findings presented in the main body of the thesis. The experiments detailed here were designed to investigate how colour, spatial relationships, and material properties interact within blown glass to influence perception. Each experiment builds upon the theoretical frameworks established in the main text, particularly in relation to synaesthetic touch, layerspace, and site-specific perception.

The methodology combines technical experimentation with conceptual inquiry, integrating material manipulation, documentation, and analysis to better understand the sensory and perceptual dimensions of glass. This section also includes visual simulations, mould design strategies, and testing conclusions to provide insight into the iterative development of these experiments.

By examining the relationship between glass thickness, refractive index, and transparency, the research aims to expand the discourse on materiality in contemporary glass art. The following pages document the step-by-step methodologies, procedural refinements, and results of experiments carried out in the research, offering a systematic approach to understanding how glass functions as a multi-layered perceptual medium.

All referenced technical images and diagrams are placed in this section for clarity and ease of reference.

Colour Application in Glass

Colour in glass can be introduced through several techniques, each influencing the final aesthetic and structural properties of the piece. The primary methods include:

- **Glass Rods:** Glass rods are commonly used for solid colour applications and layering. They are melted and applied directly onto the molten glass or layered between transparent sections to achieve deep, rich hues and structural consistency.
- **Glass Frits and Powders:** Frits (small glass granules) and powders allow for subtle effects such as speckled, marbled, or gradient transitions. These materials can be applied onto the hot glass surface or incorporated into kiln-formed pieces to create soft transitions and layered colour effects.
- **Layered Colouring:** Thin sheets (flashed glass) or multiple glass layers can be combined to create depth and tonal variations. This method is widely used in both blown and fused glass techniques to achieve complex colour interactions.
- **Sandblasting and Etching:** These techniques selectively remove surface layers, altering transparency and colour intensity. Sandblasting can be used to create frosted or matt surfaces, enhancing textural contrast and modifying light diffusion.
- **Staining and Painting:** Glass surfaces can be stained or painted using enamels or metal-based pigments, which are then fired to fuse the colour onto the glass.

Each of these methods offers unique visual and tactile qualities that play a crucial role in how colour interacts with form, transparency, and spatial perception. In this research, I primarily experimented with and applied glass rods, glass frits and powders, and layered colouring to achieve specific colour effects and spatial depth in blown glass.

Experiment 1: Taoxichuan Glass Studio, Jingdezhen, China (2022)

The experimental framework was developed following the methodology outlined in Section 2.3.5 of the main text.

The initial phase of my colour experimentation series, launched in early 2022, concentrated on exploring the intrinsic properties of glass as a medium for colour expression. This foundational exploration delved into the nuances of colour combination and gradation within the glass, as well as examining how these elements interact dynamically with the form of the glass pieces themselves.

Colour Application Process

The glass pieces consisted of two separate parts: an inner layer and an outer layer, each of which contributed to the final visual experience.

The inner layer utilised a solid opaque colour with no gradation, in order to maintain a consistent base tone, using glass in rod form, which was melted and applied evenly.

The outer layer featured a subtle colour gradation, achieved by carefully controlling the thickness, temperature, and application force of the colour rod during the blowing process. This allowed for a dynamic transition in transparency and hue, creating a seamless effect of gradation.

This structured approach enabled precise control over how light passed through the glass, creating a layered effect of depth.

Curved-edge forms were designed to enhance colour contrast through varying glass thicknesses.

The initial experiment in Jingdezhen involved designing forms with curved edges to facilitate colour contrasts through varying glass thicknesses (Figure A1). The design incorporated a

combination of curves and straight lines, enabling me to explore the interaction of colour within these shapes on a scaled-down version. This experiment simulated the situation on a smaller scale and experimented with the possibility of different colour combinations. In addition, my goal was to achieve more colour effects between different layers, to explore different possibilities of colour overlay effects.

This experiment involved the creation of two distinct glass layers: an inner layer and an outer layer. Each layer played a specific role in influencing the final colour perception and spatial effect.

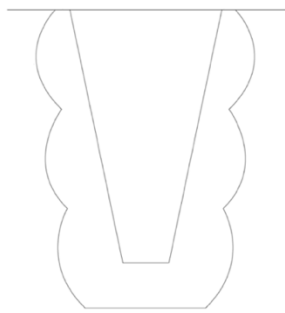


Figure A1. Illustration for Colour Experiment 1.

Detailed mould design was developed based on preliminary renderings.

To ensure consistency and efficiency, I opted for mould-blowing techniques. The mould was made based on my previous illustration and detailed rendering (Figure A2).

The mould was subsequently modified to better accommodate the angles needed after mould-blowing (Figures A3–A4).

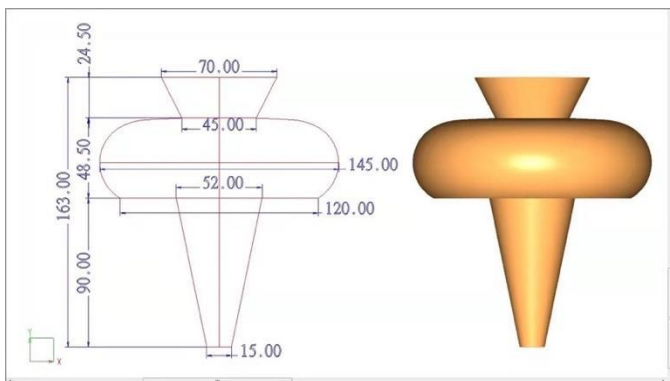
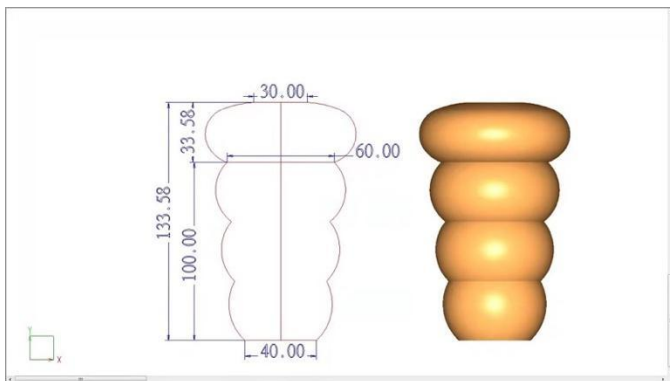
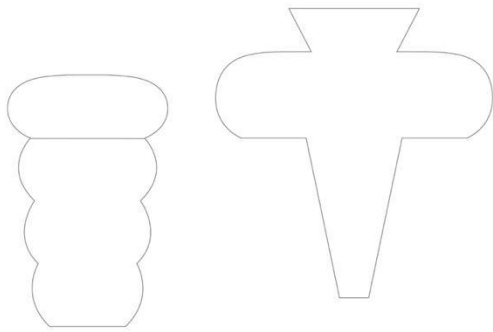


Figure A2. Detailed rendering for the mould design of Colour Experiment 1.



Figure A3. Testing with the new mould for Colour Experiment 1.



Figure A4. Adjusted internal angles of the mould to optimise colour distribution and visual depth.

Visual colour simulations were conducted to anticipate gradation outcomes.

After designing the mould, I conducted visual colour simulations to plan out gradations and combinations effectively (Figure A5). This step was crucial for anticipating the visual outcomes and adjusting the parameters of the experiment accordingly.

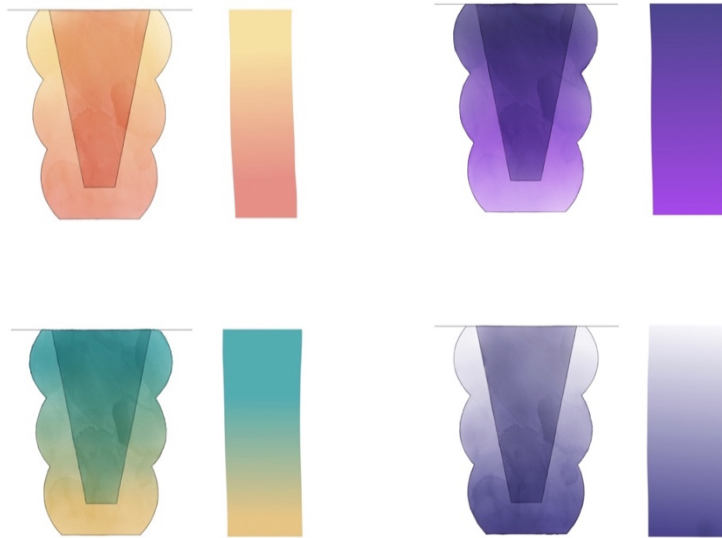


Figure A5. Visual colour simulation for Colour Experiment 1.

Documentation System

A rigorous documentation system was established from the start, cataloguing each step and variation in the process, including photographic records using a Sony A7R digital camera (Figure A6). This systematic approach facilitated a clear evaluation of the outcomes and supported further refinements.

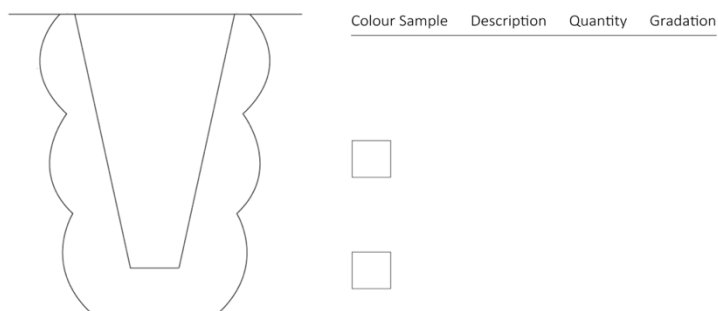


Figure A6. Diagram for Colour Experiment 1 recording system.

Testing Pieces with Conclusions



Figure A7. Reference Number: 1-1.

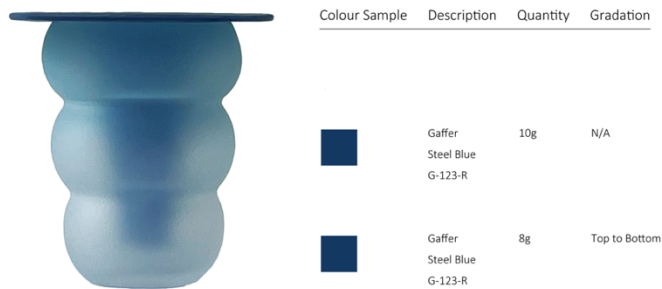


Figure A8. Reference Number: 1-2.

- Visual Experience:** In comparative tests (Figures A7 and A8), a homogeneously coloured inner layer (G-123 Gaffer Steel Blue Opaque 10g) was used. The gradation effects varied, with the top-to-bottom (clear to blue) gradation in Reference 1-1

creating a denser visual impact, whereas the reverse in Reference 1–2 offered a lighter, more dynamic visual experience.

- **Surface Finishes:** Both opaque colouring and texturing (sandblasting) were employed across samples to obscure surface finishes and modify the light interaction with the glass, enhancing the atmospheric and sublime effects of the colours.

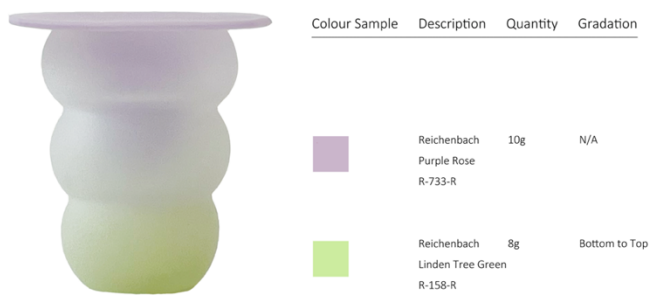


Figure A9. Reference Number: 1–3.



Figure A10. Reference Number: 1–4.

- Layer Interactions:** The experiments demonstrated that darker inner colours accentuated the form's layers more distinctly, while lighter inner colours tended to merge visually into the outer layers, creating a more ethereal and mysterious effect.



Figure A11. Reference Number: 1–5.

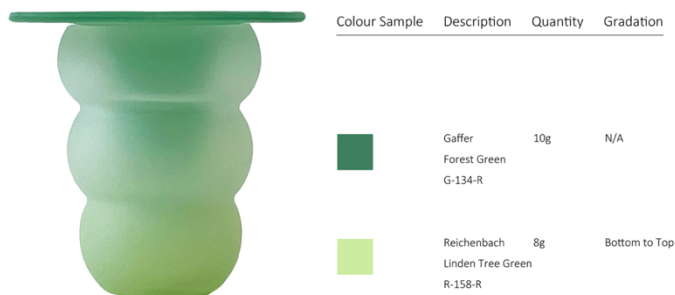


Figure A 12. Reference Number: 1–6.

Contrast in Visibility Due to Colour Depth

- When using a combination of two colours within the same piece, the visual impact and perceptibility of the form of the inner layer are significantly influenced by the relative darkness or lightness of the colour. A darker inner colour makes the form more pronounced and distinct, enhancing the perceived layering and depth of the glass piece. This results in a stronger, more defined presentation, where the structural contours are clear and visually impactful.
- Conversely, a lighter inner colour tends to diminish the visibility of the form itself, focusing attention more on the colour than on the shape. This creates a more enigmatic and mysterious effect, where the form seems to dissolve into the surrounding hues, blurring the boundaries between the layers and contributing to a more subtle and nuanced visual experience.

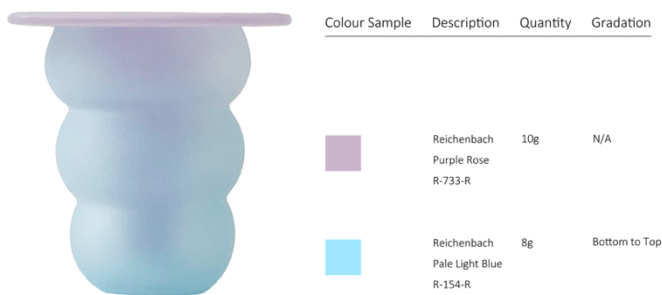


Figure A13. Reference Number: 1–7.

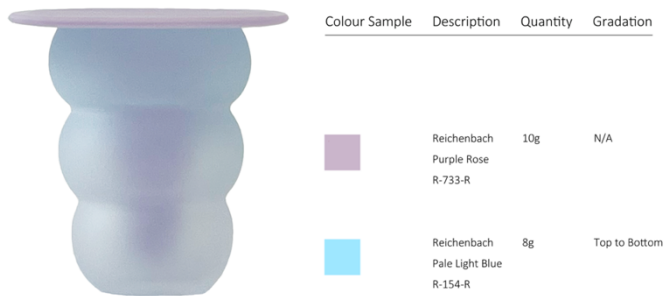


Figure A14. Reference Number: 1–8.

Gradation: Directional Colour Gradation and Its Visual Effects

- This part of the experiment highlights how the direction of colour gradation within the glass affects the visual weight and dynamics of the piece. When the gradation flows from bottom to top, it tends to give the piece a visually heavier appearance, anchoring the colour at the base and lightening as it ascends. This gradient can make the piece seem more grounded and solid.
- In contrast, reversing the direction of the gradation, top to bottom, introduces more light at the base and deepens the colour towards the top, creating an erratic and lighter visual effect. This approach can make the glass piece appear more ethereal and dynamic, as the lighter hues at the bottom draw the eye upward through the changing shades, enhancing the perception of depth and volume.

Experiment 2: Ceramics and Glass workshop, Royal College of Art, London, UK (2023)

The development of Colour Experiment Two at the Ceramics and Glass workshop at the Royal College of Art marked a pivotal continuation of my exploration into the relationship between colour and space within three-dimensional forms. This series of experiments was specifically designed to manipulate and understand spatial dynamics through colour and form, leveraging the capabilities of glass as a medium to achieve nuanced perceptual effects.

The experimental framework was developed following the methodology outlined in Section 2.3.5 of the main text.

Design of the Form

For this experiment, I selected intuitive shapes with straight lines for both layers, in order to control the spatial interactions between them more effectively (Figure A15). This experiment also featured a two-part glass structure, consisting of an inner layer and an outer layer to further explore the interactions of colour and spatial relationships.

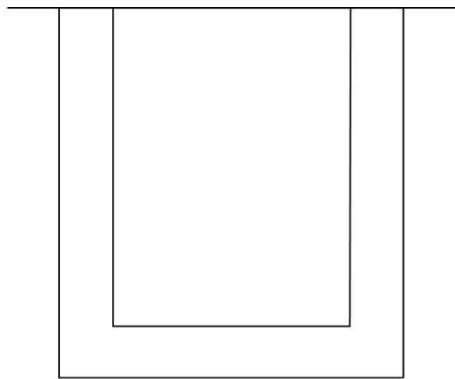


Figure A15. Illustration for Colour Experiment 2.

Documentation System

The approach undertaken to explore this relationship involved adjusting the size of the inner layer to explore colour-space dynamics while maintaining consistent glass thickness (Figure A16).

Documentation was meticulously maintained using a Sony A7R digital camera.

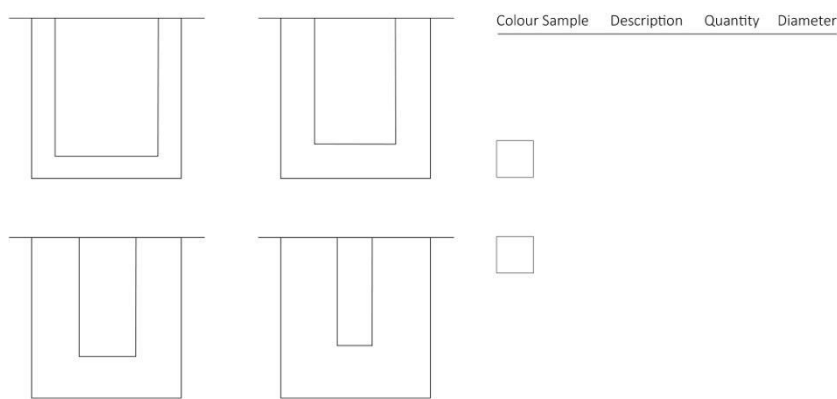


Figure A16. Diagram for Colour Experiment 2-1 recording system.

Colour Simulation

Watercolour simulations were used initially to gauge the colour intensity required and interaction between the Kugler colour rods K-179 Blue Jade and K-150 Old Rose (Figure A17).

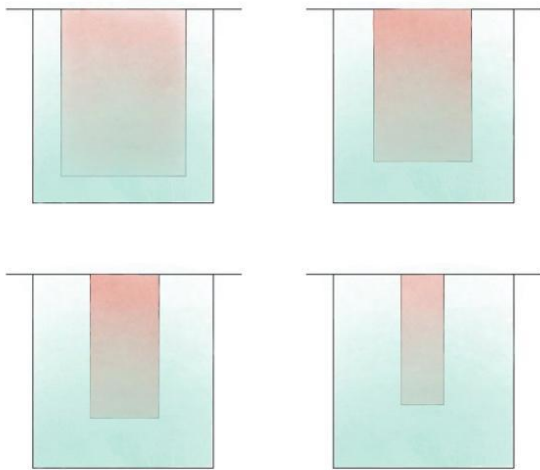


Figure A17. Visual colour simulation for Colour Experiment 2.

Testing with Conclusions



| Colour Sample | Description | Quantity | Diameter |
|---|--------------------------------|----------|----------|
|  | Kugler Blue Jade K-179-K | 10g | 4.5 cm |
|  | Kugler Old Rose K-150-A | 10g | |

Figure A18. Reference Number: 2-1.





| Colour Sample | Description | Quantity | Diameter |
|---|--------------------------------|----------|----------|
|  | Kugler Blue Jade K-179-K | 10g | 3.5 cm |
|  | Kugler Old Rose K-150-A | 10g | |

Figure A19. Reference Number: 2-2.



| Colour Sample | Description | Quantity | Diameter |
|---|--------------------------------|----------|----------|
|  | Kugler Blue Jade K-179-K | 10g | 2.5 cm |
|  | Kugler Old Rose K-150-A | 10g | |

Figure A20. Reference Number: 2-3.



| Colour Sample | Description | Quantity | Diameter |
|---|--------------------------------|----------|----------|
|  | Kugler Blue Jade K-179-K | 10g | 1.5 cm |
|  | Kugler Old Rose K-150-A | 10g | |

Figure A21. Reference Number: 2-4.

From previous simulations, test pieces were produced, leading to several key conclusions:

Colour Simulation and Testing:

- Colour and form should be observed simultaneously to fully utilise the impact of colour, with simpler forms enhancing the focus on colour and spatial dynamics.
- Smooth gradations influence the perception of light, enhancing atmospheric or spatial sensations.
- Translucency in the glass enables objects to be overlapped while maintaining visibility in colour, form, and the intervening space.
- Spatial perception is significantly influenced by the overlapping of tones, particularly in the top layer.
- The relative sizes of the internal and external diameters drastically affect spatial perceptions, from feelings of crowdedness (Figure A18) to sensations of emptiness (Figure A21).
- A balanced spatial arrangement that is neither too cramped nor too sparse tends to be the most visually satisfying (Figures A19–A20).

Colour Gradation:

- One of the critical elements of these experiments was mastering colour gradation within the glass. By adjusting the number of colour rods I used (10g for each designated part), along with precise temperature control during the blowing process, I was able to achieve the desired gradations that subtly transitioned across the glass piece.
- This gradation process was crucial for thinning out the opacity at specific sections (approximately one-fifth of the entire piece), thereby creating a gradual shift that adds depth and a sense of dimension to the piece.

Obscuring and Revealing:

- The interplay between obscuring and revealing became a focal point in these experiments, particularly through the manipulation of transparency and opacity. By placing opaque coloured glass layers between layers of translucent glass (Experiment 1), I could manipulate the visibility and intensity of colour.
- The technique of sandblasting was integral to fine-tuning the degree of opacity and transparency. This method not only added texture but also allowed for the controlled diffusion of light through the glass, enhancing the interplay between visible and hidden elements.

Influence of Colour Theory:

- My ongoing studies in colour theory, combined with personal artistic insights and prior research, significantly influenced the selection and application of colours in these experiments. This theoretical backdrop provided a robust framework for predicting and understanding the psychological and spatial effects induced by different colour combinations.
- These explorations were not merely about aesthetic appeal: they were deeply rooted in understanding how colours interact within space and how they are perceived by the viewer, as further discussed in Section 3.3 of the main text.

Comparisons Between Experiments

Experiment 1 and Experiment 2 share the same two-layered structural approach but explore different spatial and colour strategies. While Experiment 1 focused on curved-edge forms and gradual transitions between colour and layers, Experiment 2 investigated how straight-line structures influence spatial depth and colour perception. By modifying the space between two layers in Experiment 2, I could control how light interacted with the inner layer, leading to varying perceptions of transparency and layering that were less apparent in the first experiment.

Integration with Broader Research Themes

These findings contribute to my broader PhD research on the synaesthetic touch and perception of glass in spatial contexts by deepening the understanding of how material layering and optical properties influence the viewer's engagement with the work. The interaction of thickness, the refractive index, and layering not only affects how colours and forms are perceived but also suggests new methodologies for manipulating glass in order to create immersive sensory experiences. The insights gained from these experiments provide a strong foundation for future artistic exploration, allowing for the refinement of techniques that enhance light diffusion, spatial illusion, and perceptual depth in blown glass structures.

Experiment 3: Exploring Colour Perception Under Changing Light Conditions (2023)

Watercolour painting: *Algae in the Air We Breathe*, 2023

Methodology

To examine how colour perception shifts between various lighting contexts, I conducted a photographic experiment using a fixed watercolour painting under diverse forms of illumination and environments (Table 2). This included changes in:









- Time of day (midday, twilight, evening)
- Weather (sunlight, rain)
- Types of artificial light (incandescent, LED, UV)
- Spatial settings (indoor, outdoor, gallery)

Location: Summer, London, UK

Camera: Apple iPhone 13 Pro, 26 mm f/1.5 wide lens

Table 2. Experimental conditions for the colour perception study under variable lighting contexts.

| Number | 1 | 2 | 3 | 4 |
|---------------------|-------------------------------|-----------------------|---|--------------------------------|
| Time | 19 June 2023 12:15 | 19 June 2023 12:15 | 22 June 2023 19:40 | 25 June 2023 21:00 |
| Light and Condition | Incandescent light, sunny day | Natural, sunlight | Artificial light in a gallery (with one layer of 90gsm tracing paper) | Twilight before rain, outdoors |

| | | | | |
|----------------------------|--|--|---|--|
| Image |  |  |  |  |
| Number | 5 | 6 | 7 | 8 |
| Time | 25 June 2023 21:00 | 25 June 2023 21:12 | 26 June 2023 21:45 | 26 June 2023 21:46 |
| Light and Condition | Twilight before rain, indoors, no artificial light | Twilight during rain, indoors, no artificial light | UV light | LED light |
| Image |  |  |  |  |

Summary of Key Findings

- Disappearance of Light Green: In dim or diffuse settings (Tests 3, 4, 7, and 8), light green pigments became nearly imperceptible.
- Dark Greens Rendered Black: Under poor illumination (Tests 4–6), darker greens appeared black, indicating light loss at low contrast.
- Overexposure under LED/UV: Bright beams from LED or UV exaggerated reflections and diminished midtones.
- Hue Shift by Light Type: Sunlight rendered hues warm and clear; LED/fluorescent added chromatic distortion.
- Temporal Variability: Red hues intensified in late sunlight; morning and evening shadows cooled the tone.
- Spatial Influence: Viewer position and proximity to a light source further altered perceived chromatic balance.

Integration to the Main Thesis (Cross-reference to Section 2.3.2)

These visual tests formed the basis for later decisions in blown glass work, especially pieces with a matt surface. Insights into light-angle sensitivity, colour veiling, and saturation loss directly informed surface treatment strategies such as sandblasting, which soften chromatic transitions in glass in a way that is similar to the action of atmospheric light in watercolour.

Experiment 4: Pilchuck Glass School, United States (2023)

The experimental framework was developed following the methodology outlined in Section 3.4.2 of the main text.

This experiment investigated how surface textures influence colour perception and transparency in layered glass. Key objectives included:

- Experimenting with thin colour layers to create depth without excessive material thickness.
- Applying controlled heat treatments to modify opacity and transparency.
- Examining how light positioning altered perceived depth and vibrancy.

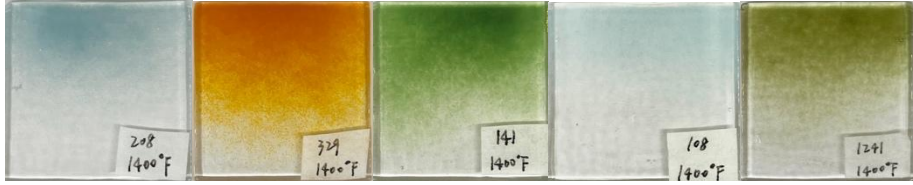
These findings supported conceptual insights into layered transparency, reinforcing the role of glass as both a material and a perceptual medium.

This test explored colour gradation by applying powdered coloured glass onto a clear sheet glass substrate. The goal was to assess how different heating conditions influence the blending and diffusion of colour within the layers.

Kiln Firing Schedule

To refine the material properties, I developed a meticulous kiln firing schedule, tailored to explore the textures and colours of glass. By varying firing temperatures, I observed transitions in the surface from granular to glossy textures, enriching my practice and expanding the potential for creating multi-layered, spatially engaging artworks.

Table 3. Parameters of Firing Test 1, 9 October 2023.

| Parameter | | Value | |
|---|---------------|-----------------------|------|
| Size | | 5 × 5 cm | |
| Thickness | | 3 mm | |
| Segment | Rate (DPH)* | Temperature | Hold |
| 1 | 222°C (400°F) | 538°C (1000°F) | :10 |
| 2 | 333°C (600°F) | <u>760°C (1400°F)</u> | :10 |
| 3 | AFAP** | 482°C (900°F) | :45 |
| 4 | 66°C (150°F) | 371°C (700°F) | :01 |
| 5 | AFAP** | 21°C (70°F) | :01 |
| Outcome: | | | |
|  | | | |

Technical Notes

- **DPH** = Degrees per hour
- **AFAP** = As fast as possible (without opening the kiln)

Table 4. Parameters of Firing Test 2, 10 October 2023.

| Parameter | | Value | |
|-----------------|---------------|----------------|-------------|
| Size | | 5 × 5 cm | |
| Thickness | | 3 mm | |
| Segment | Rate (DPH)* | Segment | Rate (DPH)* |
| 1 | 222°C (400°F) | 538°C (1000°F) | :10 |
| 2 | 333°C (600°F) | 732°C (1300°F) | :10 |
| 3 | AFAP** | 482°C (900°F) | :45 |
| 4 | 66°C (150°F) | 371°C (700°F) | :01 |
| 5 | AFAP** | 21°C (70°F) | :01 |
| Outcome: | | | |
| | | | |

Conclusion on Firing Tests

- Firing at 760°C (1400°F) results in a higher level of shine than firing at 732°C (1300°F), while 732°C (1300°F) yields a relatively matt surface with enhanced textural qualities.
- When a glass sheet serves as the background colour and is relatively pronounced, and the surface glass consists of transparent powders of lighter hues, the post-firing results can be challenging to discern with the naked eye.
- I have opted to use 760°C (1400°F) for future layering tests and 732°C (1300°F) for the final top surface.

The experiments were created from three layers of glass sheets with glass powders. Sandblasting was applied to all surfaces, further enhancing the interplay between layers. These tests confirmed that non-fused layers allow for greater spatial manipulation and refined interstitial depth perception.

Appendix B: Workshop

Audience workshops serve as a critical methodological tool, enabling the direct observation of audience responses and providing empirical validation of my key theoretical models, ‘synaesthetic touch’, ‘layerspace’, and ‘colour’. By capturing how viewers engage with glass artworks across different spatial contexts, these workshops reinforce the importance of site in shaping sensory perception and emotional response.

The workshops outlined in this Appendix form an integral part of my practice-based research, offering valuable insights into the interplay between perception, materiality, and memory. Through structured artistic exercises and interactive discussions, participants contribute to the evolving discourse on sensory engagement with glass art. These workshops also serve as a bridge between theoretical frameworks and practical experimentation, demonstrating how materiality and spatial configurations influence audience perception.

Workshop 1: Glass Art Society (GAS) Conference

Outlined in Section 3.4.1 of the main body.

Name: How Would You Recall Memories with Colour and Form?

Venue: Glass Art Society (GAS) Conference, Berlin, Germany, 2024

Time: Saturday, May 18th, 2024, 12:00 PM – 1:00 PM

‘Feel free to drop in at any time during the session. The activity may take anywhere from 10 to 30 minutes, depending on your creative process.’

Workshop Overview

‘This workshop examines the intersection of memory, colour, and form, encouraging participants to engage with their own recollections through artistic expression. Drawing on Gilles Deleuze’s concept of memory as a past continuously coexisting in the present, the session fosters critical reflection on how personal experiences influence perception and creativity.’

Participants will be guided through an interactive exploration of memory: Which memory would you like to recall today? How can colour and form serve as tools for capturing and expressing this memory? The session aims to provide a structured yet flexible environment in which individuals can articulate their past experiences through visual and material experimentation.’



Figure B1. Jinya Zhao research workshop during the Glass Art Society (GAS) Conference, Berlin, 2024. Photo Credit: Jinya Zhao.

Glassblowing Demonstration

‘Following the workshop, join Jinya and her team at 2:00 pm for a live glassblowing demonstration. This session will extend the themes explored in the workshop, offering insight into the ways in which heat, form, and transparency contribute to the artistic representation of memory. The demonstration provides a dynamic setting where artistic practice and research intersect, reinforcing the relationship between materiality and recollection.’

Workshop 2: Pump House Gallery

Outlined in Section 4.6 of the main text.

Name: How Would You Recall your Memories with Colour and Form?

Venue: Pump House Gallery, London, UK

Date: Friday, 12th July 2024, 3:00 – 5:00 pm

Workshop Overview

‘As part of the ‘Colour Made Manifest - Material Engagements Research Cluster Exhibition’, this research workshop investigates how colour perception functions as a cognitive, emotional, and material phenomenon in artistic contexts. Through hands-on engagement, participants will contribute to a broader academic discourse on multisensory perception, materiality, and artistic interpretation.

Join Jinya Zhao, a third-year practice-based PhD researcher, for an immersive and thought-provoking session. Jinya’s research explores the transformative potential of glass art through her pioneering concept of ‘synaesthetic touch’, a method aimed at bridging sensory experiences to elicit deeper emotional and perceptual connections with works of art.

This workshop is part of a research-driven series designed to explore the evocation and recollection of memory through sensory engagement. Participants will be encouraged to engage in active participation, deep reflection, and creative expression. Drawing inspiration from the French philosopher Gilles Deleuze (1925–1995), who theorised that memory is a past continuously carried into the living present, this session will challenge you to consider how memories shape perception and artistic experience.

In this interactive setting, you will explore the central question:

Which colour do you recollect today through the connection with smell?

How would you choose to represent this memory in colour and form?

This workshop provides a unique opportunity to engage with personal memories and perceptions and express them through artistic media. Participants will experiment with various materials and techniques, creating a visual dialogue between memory, sensory perception, and artistic expression.’



Figure B2. Jinya Zhao research workshop at the Pump House Gallery, London, during 'Colour Made Manifest'. Photo Credit: Jinya Zhao.

Workshop 3: CUHKSZ Research Workshop Series: Perception as Experiment

This appendix documents a four-part research workshop series I conducted as part of my practice-based PhD at the Royal College of Art. Taking place at CUHKSZ in June and July 2025, the workshops form a coherent methodological arc designed to investigate how colour, memory, language, and perception interact across age groups and sensory modalities. Each session constitutes a unique data collection site within my broader inquiry into synaesthetic touch, perceptual image memory, and material-affect translation.

Outlined in Section 5.4.1 of the main text.

Workshop 3–1 Natural Colour Perception with Kindergarten Children

Date: July 8, 2025

Venue: CUHKSZ Affiliated Kindergarten

Access: Not open to the public

Aims and Research Rationale

This workshop explored how children aged between five and six intuitively perceive, collect, and express colour found in nature. I aimed to understand early, embodied modes of sensory cognition and visual response, prior to formalised language structures.

Schedule and Activities

- **09:00–09:30:** Outdoor colour collection walk
- **09:30–10:00:** Verbal reflection and show-and-tell
- **10:00–11:00:** Creative composition using found materials

Observations and Methodological Notes

The children responded with such immediacy: they touched, picked up, and explored everything so instinctively. I remember one of them saying, ‘this leaf is not as sharp as it looks like,’ which showed me how they were already forming emotional connections to colour and texture. I documented their responses through colour maps, voice recordings, and photos of the little artworks they created.



Figure B3. 'Natural Colour Perception' workshop with kindergarten children, CUHKSZ Affiliated Kindergarten, 8 July 2025. Photo Credit: He Junjie.

Workshop 3–2 Natural Colour × Visual Expression × Small-Scale Sculptures

Date: July 10, 2025

Venue: TC101 Artist-in-Residence Studio

Aims and Research Rationale

This session extended Workshop 1 to university students and faculty, incorporating conscious verbal reflection, abstraction, and three-dimensional translation. While the structure and materials mirrored those of the session for kindergarten children, the participant group consisted of adults from diverse academic backgrounds. This allowed me to observe how age, education, and training in specific disciplines might influence perceptual choices and aesthetic strategies. The session also offered a comparative opportunity to identify key differences in sensory response and conceptual framing between children and adults.

Schedule and Activities

- Natural colour identification (outdoors)
- Material interpretation through drawing and object-making
- Group sharing and critical discussion

Observations and Methodological Notes

Participants demonstrated conceptual layering, often linking colour to memories, metaphors, or academic frameworks. Unlike the tactile spontaneity and emotional immediacy observed in children, adult participants tended to filter their responses through linguistic and symbolic structures. Their outcomes revealed distinctions between analytical and emotive perceptual modes, providing a valuable contrast with the intuitive chromatic-emotional mapping seen in the workshop for kindergarten children. I gathered visual and verbal data, including notes, images, and transcriptions of group discussions.



Figure B4. 'Natural Colour × Visual Expression × Small-Scale Sculptures' workshop, TC101 Artist-in-Residence Studio, 10 July 2025. Photo Credit: He Junjie.

Workshop 3–3 Introducing Perceptual Image Memory

Date: July 15, 2025

Venue: TC101 Artist-in-Residence Studio

Aims and Research Rationale

Using the board game Hues and Cues, this session examined how language cues shape colour association and visual representation. I addressed the differing stability of perception in each participant and the role of collective imagination.

Schedule and Activities

- Phased gameplay in rotation
- Simultaneous abstract drawing based on verbal prompts
- Post-game discussion comparing colours vs. images

Observations and Methodological Notes

The workshop generated productive tensions between spoken description, colour selection, and individual drawing. It allowed me to map out how perceptual disagreement reveals cognitive difference. I archived drawings, prompt logs, and dialogue transcripts.

Sample Questionnaire Scans

Representative scans are provided below.

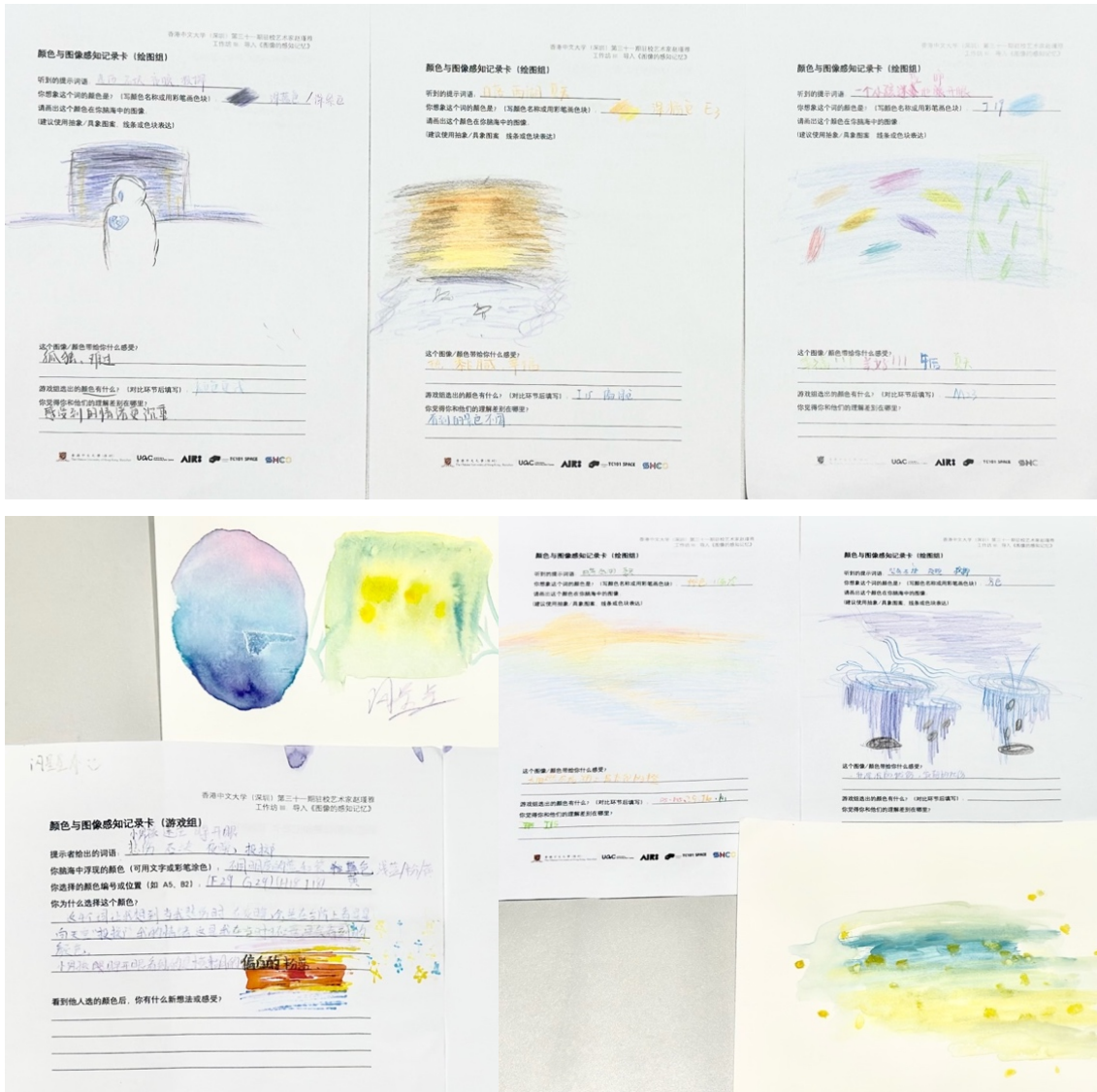


Figure B5. 'Introducing Perceptual Image Memory' workshop. Sample questionnaire scans in Chinese (unedited representative responses).

Table 5. Summary of Responses from the 'Introducing Perceptual Image Memory' workshop (prepared by the author).

| Prompt word: 悲伤, 夜晚 (sadness, night) | | |
|--------------------------------------|--|----------------------------------|
| Record Card | No. 01 | No. 02 |
| Colour(s) | 不同明度的蓝色、紫色和黄色 (Different tonal values of blue, purple, and yellow) | 深蓝色、深紫色 (Dark blue, dark purple) |

| | | |
|-----------------|--|-------------------------------------|
| Response | 悲伤时的夜晚会坐在台阶上看星星。 <i>(On sad nights I sit on the steps and watch the stars.)</i> | 孤独、难过 (<i>Loneliness, sorrow</i>) |
|-----------------|--|-------------------------------------|

Observed Themes

- **Shared codes:** Consistent association of ‘night’ and ‘sadness’ with darker hues (blue, purple).
- **Narrative vs. abstraction:** One participant framed colour within a remembered scene (steps and stars); another expressed abstract emotions (loneliness, sorrow).
- **Mnemonic triggers:** Colour acted as a memory prompt, linking perception with personal recollection.
- **Perceptual instability:** Collective agreement on chromatic codes coexisted with individual divergence in imagery and affect.

Concluding Notes

These findings suggest that colour stimuli serve as strong mnemonic and affective triggers, producing associations that bridge memory, emotion, and chromatic perception. Participants consistently linked night and sadness to dark blue and purple tones, highlighting a cultural chromatic code in which darker hues signify melancholy, solitude, or introspection. At the same time, individual differences emerged: some participants recounted remembered scenes, integrating place and embodied experience, while others emphasised abstract emotional states.

This duality demonstrates the instability of perception as a methodological condition. Colour functioned as a relational medium, translating between memory, imagination, and embodied affect, rather than presenting a fixed optical datum. The combination of language, drawing, and colour selection amplified this effect, reinforcing the notion of perception as multisensory and interpretive, rather than purely visual.

From a methodological perspective, this workshop confirms the value of integrating language, image, and chromatic choice in practice-led research. It shows how perceptual knowledge emerges between shared cultural codes (e.g. blue indicating sadness) and individual embodied experience (e.g. the remembered night sky). In doing so, the workshop supports the argument in the thesis that glass, and by extension colour, operates as a perceptual engine, destabilising fixed categories and revealing perception as plural, situated, and affectively charged.



Figure B6. 'Introducing Perceptual Image Memory' workshop, TC101 Artist-in-Residence Studio, 15 July 2025. Photo Credit: He Junjie.

Workshop 3–4 Scent and the Memory of Colour

Date: July 17, 2025

Venue: TC101 SPACE

Structure: Two sessions, one hour each

Aims and Research Rationale

This workshop investigated how olfactory perception interacts with memory, colour recognition, and affective spatial response. Held at my solo exhibition, it positioned the gallery space as a site of lived sensory enquiry.

Schedule and Activities

- Interaction with artworks via Le Nez du Whisky scent kits
- Reflection prompts on scent-colour-memory associations
- Optional drawing or writing response

Observations and Methodological Notes

Smell elicited strong emotional and mnemonic associations. Participants articulated vivid mental imagery and spatial resonance. The workshop demonstrated that scent bypasses rational filtering, directly affecting material perception. I collected scent logs, participant drawings, and verbal reflections.

Sample Questionnaire Scans

Representative scans are provided below.

几近触及展览嗅觉卡

| |
|--|
| 嗅觉卡 No. 01 |
| 嗅觉关键词: <i>Rose</i> |
| 它让你想到的是什么: <i>玫瑰花的粉碎, 捣碎的过程.</i> <i>大马士革</i> |
| 哪件作品与你的联想有关? 名称: <i>切尔西鲜花市场.</i> |
| 你为这组搭配写的一句话: <i>花市上闲逛会传来玫瑰花香, 穿越了. 很上世 纪.</i> <i>你看到了马牛</i> |
| 嗅觉卡 No. 02 |
| 嗅觉关键词: <i>Tabacco leaf</i> |
| 它让你想到的是什么: <i>烟草, whiskey, Jazz bar, 皮衣.</i> <i>昏暗的房间</i> |
| 哪件作品与你的联想有关? 名称: <i>光线离开后的房.</i> |
| 你为这组搭配写的一句话: <i>门关上的一刹那, 最后一丝光线也离开了. 昏暗的房间内若有若无的烟草味和酒味. 小资浪漫.</i> |
| 嗅觉卡 No. 03 |
| 嗅觉关键词: <i>土 Earth</i> |
| 它让你想到的是什么: <i>雨后大自然.</i> |
| 哪件作品与你的联想有关? 名称: <i>海海 18:37</i> |
| 你为这组搭配写的一句话: <i>海风在海边吹着风, 风里传来泥土的气息. 太阳缓缓落下, 染红了水面.</i> |
| 嗅觉卡 No. 04 |
| 嗅觉关键词: <i>grass</i> |
| 它让你想到的是什么: <i>草叶, 露水, 捣碎了. 绿意的青草香</i> <i>草地</i> |
| 哪件作品与你的联想有关? 名称: <i>年中初夏.</i> |
| 你为这组搭配写的一句话: <i>夏天草地 我蹒跚一跤, 浑身青草香</i> |

几近触及展览嗅觉卡

| |
|--|
| 嗅觉卡 No. 01 |
| 嗅觉关键词: <i>泥土</i> |
| 它让你想到的是什么: <i>母亲大地, 动植物, 生死, 下雨天, 善业.</i> |
| 哪件作品与你的联想有关? 名称: <i>身体人间的支撑之物 / 沉入之物</i> |
| 你为这组搭配写的一句话: <i>我是你未能杀死的女巫的后代.</i> |
| 嗅觉卡 No. 02 |
| 嗅觉关键词: <i>甜橙</i> |
| 它让你想到的是什么: <i>夏天, 湿润, 少女, 青春.</i> |
| 哪件作品与你的联想有关? 名称: <i>海海 18:37</i> |
| 你为这组搭配写的一句话: <i>皮肤是人体最大的器官.</i> |
| 嗅觉卡 No. 03 |
| 嗅觉关键词: <i>咖啡</i> |
| 它让你想到的是什么: <i>童年, 温暖, 女性, 回忆.</i> |
| 哪件作品与你的联想有关? 名称: <i>那么对于我来说呢 / 回家酒市</i> |
| 你为这组搭配写的一句话: <i>查理的可动工厂.</i> |
| 嗅觉卡 No. 04 |
| 嗅觉关键词: <i>芥末</i> |
| 它让你想到的是什么: <i>童年, 奶奶, 陈皮, 压脚, 自传, 记录, 自我疗愈.</i> |
| 哪件作品与你的联想有关? 名称: <i>内在练习</i> |
| 你为这组搭配写的一句话: <i>Everybody everybody is a kid.</i> |

Figure B7. 'Scent and the Memory of Colour' workshop. Sample questionnaire scans in Chinese (unedited representative responses).

Table 6. Summary of responses to 'Before the Feeling Forms' scent card exercise (prepared by the author).

| |
|---|
| Scent Card No. 01 |
| Scent Keyword: 泥土 (Soil) |
| What does it remind you of? 母亲, 大地, 动植物, 生死、下雨天 (Mother, earth, plants and animals, life-death, rainy days) |
| Which artwork is it associated with? Title: 《身体人间的支撑之物 / 沉入之物》 (In the Holding Between Bodies/ What Holds, What Leans) |
| Write one sentence to describe this pairing: 我是你未能杀死的女巫的后代 (I am the descendant of the witch you could not kill) |
| Scent Card No. 02 |
| Scent Keyword: 甜橙 (Sweet Orange) |

| |
|---|
| <p>What does it remind you of?</p> <p>夏天, 湿润, 少女, 青春 (<i>Summer, humidity, girlhood, youth</i>)</p> |
| <p>Which artwork is it associated with?</p> <p>Title: 《洱海 18:37》 (<i>Erhai 18:37</i>)</p> |
| <p>Write one sentence to describe this pairing:</p> <p>皮肤是人体最大的器官 (<i>Skin is the largest organ of the human body</i>)</p> |
| <p>Scent Card No. 03</p> |
| <p>Scent Keyword: 糖果 (<i>Candy</i>)</p> |
| <p>What does it remind you of?</p> <p>童年, 梦境、创伤、回忆 (<i>Childhood, dream, trauma, memory</i>)</p> |
| <p>Which artwork is it associated with?</p> <p>Title: 《那么对于未来的期许呢? 切尔西花市》 (<i>How about your thoughts for the future? Chelsea Flower Market</i>)</p> |
| <p>Write one sentence to describe this pairing:</p> <p>查理的巧克力工厂 (<i>Charlie and the Chocolate Factory</i>)</p> |
| <p>Scent Card No. 04</p> |
| <p>Scent Keyword: 凉茶 (<i>Herbal Tea</i>)</p> |
| <p>What does it remind you of?</p> <p>童年, 奶奶, 愧疚, 压抑、自我观察、自我疗愈 (<i>Childhood, grandmother, guilt, repression, self-observation, self-healing</i>)</p> |
| <p>Which artwork is it associated with?</p> <p>Title: 《内层练习》 (<i>Encased Becoming</i>)</p> |
| <p>Write one sentence to describe this pairing:</p> <p>everybody is a kid (<i>everybody is a kid</i>)</p> |

Observed Themes

- **Earth/soil (泥土):** Maternal, ecological, and existential associations (motherhood, life–death cycles, ground, rain).
- **Sweet orange (甜橙):** Youthful vitality, summer atmospheres, bodily metaphors.
- **Candy (糖果):** Childhood memories, playfulness interlaced with trauma.

- **Herbal tea (凉茶):** Family memory, intergenerational care, guilt, and self-reflection.

Concluding Notes

Together, these workshops form an integral component of my practice-based methodology. They test alternative modes of knowing through participatory experience, gathering a layered, cross-modal dataset that feeds back into both my studio practice and my theoretical reflection. This appendix thus documents not only what was observed, but also how practice itself became a method of knowledge production.

These findings suggest that olfactory stimuli serve as strong mnemonic triggers, producing associative bridges between sensory perception and individual interpretations of the exhibited artworks. The responses reveal how scent not only activated memory but also anchored it directly to specific works in the exhibition, demonstrating a tight interconnection between olfactory association, personal recollection, and artistic encounter.



Figure B8. 'Scent and the Memory of Colour' workshop, TC101 SPACE, 17 July 2025. Photo Credit: UCA@CUHKSZ.



Born and raised in China, Jinya Zhao received her BA in 2017 from the China Academy of Art, Hangzhou, China and her MA (2019) and MRes (2021) from Royal College of Art, London, UK. She is currently pursuing her PhD at Royal College of Art. In her research, she asks how her glass is perceived by the audience. The key development of this research is to establish a knowledge of vision and touch, an understanding of the relationship between the artist and the viewer, and practical strategies developed in the glass workshop leading to increased multi-sensory connections.

www.jinyazhao.com
www.rca.ac.uk/research-innovation/research-degrees/research-students/jinya-zhao/

Please participate in this interactive activity after you have attended the workshop. This activity is part of Jinya Zhao's research, your reply will become a part of her research. Time required: Participation requires around 10 minutes.

1. Background in Art?

- Yes
- No

2. In what ways did the use of colour influence your recollection of memories?

- It made memories more vivid.
- It altered the emotions associated with the memories.
- It helped me visualise memories more clearly.

• Other (Please specify)

5. How did the forms created during the workshop resonate with your personal memories?

- They accurately reflected my memories.
- They gave a new perspective to my memories.
- They were abstract and open to interpretation.
- I am not sure if they connect to my memories.
- They did not connect with my memories.
- Other (Please specify)

6. What new insights did you gain about the relationship between memory, colour and form?

Please carefully read through this consent agreement, this is part of Jinya Zhao's research, your reply will become a part of her research.

Risk: There is no expected risk.

Contact: For any inquiry regarding this activity, please contact Jinya Zhao (info@jinyazhao.com).

- It keeps developing and changing with my current experience.
- No significant impact.
- Other (Please specify)

3. How did the use of opaque colours influence your memory recollection?

- Enhanced the vividness of memories.
- Added depth to the emotional resonance.
- Added mystery and ambiguity to the emotional resonance.
- Obscured certain aspects, leading to new interpretations.
- No noticeable influence.
- Other (Please specify)

4. How did the use of transparent colours in the glass art affect your experience of memory?

- Created a sense of openness and clarity.
- Allowed for multiple layers of meaning.
- Made the experience more ethereal.
- No noticeable influence.

Consent: I have understood the nature and purpose of this activity. I understand I may withdraw at any time without penalty. If you are 18 or above or under consent of a legal guardian, have read and comprehend the above information and are voluntarily consented to participate in this activity, please click the "I Agree" button to participate in the activity. Otherwise, thank you for your time.

- I Agree

Figure B9. Jinya Zhao Research Workshop Questionnaire, May 2024.

Appendix C: Exhibition

This appendix documents selected exhibitions undertaken during my PhD research from 2021 to 2025, detailing their role in the development and articulation of key research concepts. These exhibitions served as critical testing grounds for material experimentation, audience interaction, and theoretical inquiry, contributing to the refinement of the conceptual frameworks of synaesthetic touch, colour, layerspace, and site. The exhibitions also provided opportunities to assess how glass functions as a perceptual and spatial medium, both shaping and being shaped by environmental and curatorial contexts.

Each exhibition is presented separately, with an outline of its curatorial premise, exhibited works, spatial and material considerations, audience reception, and research contributions.

Exhibition 1: ‘Nebulosity Walk in Thy Memory’, Jinya Zhao Glass Art Exhibition

Date: 18 May 2023 – 03 September 2023

Venue: Liuli China Museum, Shanghai, PRC

Type: Solo Exhibition

Curatorial Context

The Touch of the Intangible

How can we touch without touching?

In her book *The Skin of the Film: Intercultural Cinema, Embodiment, and the Senses*, Laura U. Marks shares her experience of watching Shauna Beharry’s film *Seeing Is Believing* as her vision being used “as though it were a sense of touch.”¹⁷⁵ If moving image could transmit senses which “it cannot technically represent”¹⁷⁶ and evoke memories which otherwise could not be conjured as illustrated by Marks then, we wonder, what about glass?

When viewing Jinya Zhao's glass sculptures, one may experience a sense of strangeness as the pieces present themselves in an unexpected manner, with hazy layers of colors and rhythmic, curvy shapes that soften the edges of glass, a material that is typically sharp and cold. Over the years of working with glass, the artist has not only delved into the material

¹⁷⁵ Laura U. Marks, *The Skin of the Film: Intercultural Cinema, Embodiment, and the Senses* (Duke University Press, 2000), 127.

¹⁷⁶ *Ibid.*, 129.

itself, constantly pushing the boundaries of glassblowing techniques, but also experimented with the aesthetic expression of this particular medium.

Since her earlier works, Jinya translates her observations of atmospheric phenomena, which correspond with personal experience and emotions, into different colors and shapes. As a result, she transforms the intangible into a kind of embodied knowledge captured in these glass containers of memories.

Moving forward, she investigates the concept of the sublime, following the discussions put forth by philosophers and artists such as Edmund Burke, J.M.W. Turner, and Barnett Newman. With the belief that sublimity being the utmost effect that could be achieved via vision, the artist further explores the potential of glass as a medium for transmitting senses and emotions.

In her recent research, Jinya focuses on what she refers to as "synesthetic touch," which has the ability to evoke experiences similar to those of synesthesia. In this line of inquiry, her iconic use of colors, qualities related to the sublime, and layering of glass all combine to create a haptic effect of visuality that is similar to Marks' experience. In doing so, she hopes to enable connections among our separate senses and communicate her bodily experience through the synesthetic touch. In "The Storyteller: Reflections on the Works of Nikolai Leskov," Walter Benjamin describes how Leskov regarded storytelling as a craft.¹⁷⁷ Here, in Jinya Zhao's work, the craft of glassblowing becomes an embodied practice and serves as a means of storytelling.

The works in this exhibition span from 2018 to 2023. In addition to the majority of sculptural works, the exhibition also showcases some of the artist's latest experiments with watercolor and wall pieces. Furthermore, the exhibition is supplemented with sketches by the artist and documentation of the making of the artworks, among other archival materials. Our hope is to provide a touch upon Jinya Zhao's artistic practice, both technically and aesthetically.

¹⁷⁷ Walter Benjamin, "The Storyteller: Reflections on the Works of Nikolai Leskov," in *Illuminations*, ed. Hannah Arendt (Schocken Books, 2007), 92.

Text by Feng Zhenting¹⁷⁸

Audience Engagement and Observations

The solo exhibition ‘Nebulosity Walk in Thy Memory’, at the Liuli China Museum, garnered significant attention, attracting 11,413 visitors over a fifteen-week period. Located in the heart of Shanghai, the exhibition not only drew dedicated glass and contemporary art enthusiasts, scholars, and collectors but also attracted a significant number of tourists and international visitors, expanding its reach beyond an academic and art-focused audience. This diverse engagement confirmed the accessibility and resonance of my work, demonstrating how themes of memory, perception, and sensory experience transcended cultural and disciplinary boundaries.

The exhibition provided a rare opportunity to present my research in a fully integrated manner, allowing my blown glass sculptures from the past five years to engage in dialogue with my sketches and watercolour paintings. This cohesive presentation invited audiences to navigate through the space intuitively, as if piecing together fragments of their own memories. Many visitors expressed a sensation of *déjà vu*, experiencing familiarity with moments they had never actually lived, which directly aligned with my enquiry into perception, memory, and the intangible nature of sensory experience.

Observational studies revealed that audience members engaged deeply with the interplay of light, transparency, and material layering within the glass sculptures. The exhibition space itself became an active participant in shaping perception, as shifting daylight subtly altered the depth, colour, and reflections within the works. Visitors often moved around the sculptures, drawn to the changing visual effects that seemed to dissolve the boundary between seeing and touching. This response reinforced the concept of synaesthetic touch, as many described experiencing a sensation of texture, fluidity, and weight despite the physical smoothness of the glass. The inclusion of sketches and process documentation further enriched the experience, offering insight into the iterative nature of my practice and

¹⁷⁸ Feng Zhenting, "Preface: Touching the Invisible". In Liuli China Museum, Shanghai, *Nebulosity Walk in Thy Memory: Jinya Zhao's Glass Art Exhibition (2023)*, accessed August 30, 2025, http://www.liulichinamuseum.com/news/jinya/jinya_zhao.html.

deepening the audience's engagement with the conceptual and technical foundations of the work.

Research Outcomes

This exhibition served as a pivotal research output, demonstrating how my practice and theoretical investigations exist in a mutually reinforcing relationship. The iterative cycle of writing, sketching, colour experimentation, and glassmaking, central to my PhD research, was fully realised in this exhibition, providing empirical evidence while also opening new directions for exploration. Seeing my works across different mediums in conversation with one another allowed me to better understand how materiality and perception function in my practice. The juxtaposition of blown glass with watercolour paintings, for example, emphasised the poetic affinities between transparency, layering, and fluidity, further reinforcing my concept of layerspace as an evolving perceptual experience rather than a fixed material property.

A key research finding was the audience's instinctive engagement with synaesthetic touch. Many visitors expressed their need to use multiple senses to fully comprehend the works, suggesting that vision alone was insufficient. The manipulation of light within the glass created a sense of mystery, prompting viewers to explore what was hidden within, rather than simply observing the surface. This aligns with my exploration of glass as a medium for reconstructing sensory integration, offering a bridge between the tangible and intangible, between vision and haptic perception.

The exhibition also reaffirmed my ongoing research into the sublime as a conceptual framework. Drawing from the philosopher Edmund Burke's and the painter J.M.W. Turner's ideas about vastness and the limits of human perception, I aimed to create works that evoke a sense of scale and spatial ambiguity beyond the immediate grasp of reason. The viewers' response, describing the glass as both expansive and intimate, shifting between clarity and obscurity, validated this approach, demonstrating that material can serve as a conduit for immersive and transcendent experiences. Moving forward, these findings will shape the next phase of my research, refining methodologies that position glass as an active participant in sensory engagement and emotional resonance.



Figure C1. Installation view of 'Nebulosity Walk in Thy Memory', Jinya Zhao Glass Art Exhibition, 2023, Liuli China Museum. Photo Credit: He Junjie.



Figure C2. Exhibition poster for 'Nebulosity Walk in Thy Memory', displayed at the entrance of Liuli China Museum, Shanghai, 2023. Photo Credit: He Junjie.

Exhibition 2: ‘Strange Friends’: Group Exhibition

Date: 17 August 2023 – 16 September 2023

Venue: Hauser & Wirth, London, UK

Type: Group Exhibition

Curatorial Context

Make Hauser & Wirth’s summer exhibition in London, ‘Strange Friends’, brings together a collective of artist-makers exploring new conceptual narratives through mixed material disciplines including glass, clay and stone. Across large-scale installations and still life compositions, the exhibition considers the way in which we interact with objects and how they in turn occupy space. Employing visual and tactile stimulation, the works question how we encounter the complexity and possibility of colour and our sensory response to textural and surface finish.

Anchored by form and process, a rich and varied vocabulary of material interpretation emerges from each work. Playful and experimental investigations of functional forms and objects question familiar archetypes, reimagining notions of use and the everyday. A common thread remains throughout; a sculptural ambiguity and sense of curiosity, testifying to the dynamic breadth of contemporary material-led practice.¹⁷⁹

¹⁷⁹ “Strange Friends,” Hauser & Wirth, London, *Make: Summer Exhibition*, accessed August 30, 2025, <https://www.hauserwirth.com/make/42104-strange-friends/>.

Audience Engagement and Observations

As visitors enter my exhibition at Hauser & Wirth, they are immediately immersed in the interplay of glass and light against the expansive window, where the environment itself becomes an active participant in shaping perception. The shifting daylight, combined with the movements of passers-by, creates an ever-changing landscape of colour and shadow, producing phenomena such as metamerism, where colours appear to transform depending on the lighting conditions and viewing angles.

Over the course of four weeks, the exhibition welcomed a total of 2,428 visitors, each engaging with the works in unique and personal ways. Observational studies revealed a range of audience interactions, from quiet contemplation to physical repositioning as viewers adjusted their perspectives to experience the variations in colour, transparency, and reflection. Audience feedback further highlighted these dynamic engagements, and many visitors described synaesthetic responses, where visual elements seemed to evoke tactile sensations or cross-modal associations with memory and emotion. Testimonials and survey responses provided critical insights into how theoretical concepts such as synaesthetic touch and layerspace were validated in practice, demonstrating that the materiality of glass, combined with its spatial positioning, facilitated a heightened sensory experience.

The exhibition functioned not only as a display of works but also as an evolving perceptual field, inviting participants to navigate their own subjective interpretations and deepening the discourse on the relationship between glass, colour, and embodied perception.

Research Outcomes

The exhibition at Hauser & Wirth provided significant insights into audience engagement, perception, and the evolving discourse on synaesthetic touch and layerspace. The dynamic interplay of glass, light, and spatial context reaffirmed the material's capacity to evoke multisensory responses, validating the theoretical frameworks underpinning my research. Observational studies highlighted how visitors instinctively moved around the works, adjusting their perspectives to explore variations in colour and transparency, reinforcing the notion that perception is an active, embodied process rather than a passive reception.

Audience feedback further illuminated the role of metamerism in shaping individual experiences: many participants noted how colours appeared to shift with changing lighting conditions, emphasising the subjectivity of colour perception. Some visitors described synaesthetic responses, associating certain hues with tactile sensations or memories, which aligns with my exploration of synaesthetic touch as a cross-modal perceptual phenomenon. These responses support the idea that glass functions beyond its physical boundaries, extending into sensory and emotional realms.

Informed by these findings, adjustments were made to refine future research methodologies. For instance, audience interactions emphasised the importance of spatial configurations, prompting further investigation into how different environments alter perceptual engagement with glass works. In addition, qualitative feedback suggested that layering and opacity played a crucial role in evoking depth and emotional resonance, leading to new experiments in material layering and translucency to heighten these effects.

Beyond influencing my practice, the exhibition contributed to the broader discourse on sensory aesthetics and participatory perception in contemporary glass art. The integration of audience engagement as an empirical method further reinforced the necessity of interdisciplinary approaches, bridging material studies, phenomenology, and sensory anthropology. Ultimately, the exhibition not only validated theoretical concepts but also generated new avenues for research, positioning glass as a medium that continuously reshapes and expands the boundaries of sensory experience.



Figure C3. Installation view of 'Strange Friends', group exhibition at Hauser & Wirth, London (2023). Jinya Zhao's sculptural glass work positioned near the front gallery window, interacting with natural light and producing chromatic shifts throughout the day. Photo Credit: Dave Watts.

Exhibition 3: ‘Sattvic Beings’, Chen Lizhu & Zhao Jinya Duo Exhibition

Date: 24 November 2023 – 12 March 2024

Venue: 1979 Gallery, Sea World Culture and Arts Centre, Shenzhen, PRC

Type: Two-person Exhibition

Curatorial Context

‘More than things, they are, like us, spirit incarnate.’ — Emma Crichton Miller ¹⁸⁰

I hesitated when reminded that I needed to write a preface to this exhibition. Part of the reason was the fear that no words could truly do justice to the works on display, which aim to evoke a viewer's bodily sensibilities, or to put it simply, to feel.

This exhibition brings together works by Chen Lizhu and Zhao Jinya, two artists from different backgrounds who work with distinct mediums. What connects their work is manifold, but the most apparent is the interplay between the expressive application of colours and the meticulous compositions.

To Chen Lizhu, colours are not merely the outcome of our optical response to varying wavelengths. Instead, she perceives them as living entities, each with its own distinct character, and corresponds to different circumstances. When she paints, sometimes it is like building a relationship with a person, or persons, if there are multiple colours involved. In contrast to this personifying perception of colours, Chen Lizhu approaches shapes in a more mathematical manner, with which she maps out the location of each vertex on the

¹⁸⁰ Emma Crichton Miller, "The Value In Things," in *The Value In Things* (Cromwell Place, 2023), 5.

canvas, to achieve complete control of the composition. And although she has been deviating from such a method in recent years, as she focuses less on, in her words, constructing, and begins to embrace spontaneity in her creation, geometric elements remain a key component in her work.

Similarly, Zhao Jinya's iconic glass sculptures also showcase a bold use of colours and a juxtaposition of geometric forms. However, for her, being a synesthete, colours and shapes represent intricate compositions that encapsulate her memories, emotions, sensations, and more. The titles of her works indicate that each piece is inspired by a specific experience, be it a glimpse of a bouquet, a particular moment during a journey, or a re-engagement with an old piece. Through her sophisticated craftsmanship, ordinary encounters are transformed into vibrant expressions.

If Zhao's work reflects and responds to her life story outwardly, Chen's work would be an introspective exploration of her inner self and her place in life. For Chen, painting is akin to practicing meditation; it serves as a means for her to reconcile with her emotions and find her place in life. As she became more interested in the edges of the painting and started extending the composition to the sides of the frame, the painting transformed into a space not only for her meditation but also a tangible space or sculpture, as she describes it, for viewers to contemplate and experience the serenity that the artist herself finds within it. This idea is reflected in the exhibition title, which suggests being in a state of 'sattva', a concept from Hindu philosophy that encourages individuals to fully immerse themselves in the present moment and achieve a peaceful state of mind.

Zhao Jinya's work is also relevant to the idea of sattva. More than just simply presenting her memories in the form of colourful sculptures, in her recent research and practice, Zhao has been exploring the possibility of what she calls a 'synesthetic touch' through the medium of glass. She carefully orchestrates the ensemble of colours, shapes, textures, and layers, hoping to bring to the audience a heightened visual experience which, she believes, would have the profound impact of re-establishing connections among our separate senses, thus creating a haptic effect, a sense of touch, through visibility. By doing this, she hopes to provide the audience with a way of sensing similar to her synesthetic encounters.

The term ‘Sattvic Being’ not only highlights the similarities between the two artists, but also represents the perspective that this exhibition aims to present. Both Chen's paintings from the *Meditation Space* series and Zhao's exploration of bodily experience seek to awaken the audience's awareness of the here and now. Through contemplating the artworks, this exhibition invites viewers to connect with their senses and attain a state of sattvic consciousness.

Text by Feng Zhenting¹⁸¹

Audience Engagement and Observations

The exhibition welcomed approximately 8,450 visitors over its 109-day duration, attracting a diverse audience of local and international visitors, including artists, scholars, and general art enthusiasts. The exhibition space featured an expansive layout with a high ceiling and large floor-to-ceiling glass windows, offering an unobstructed view of Shenzhen's natural landscape.

This setting played a crucial role in shaping both my experience as an artist and the audience's sensory perception. Observational studies revealed that visitors often adjusted their positions and movements to engage with the interplay of light, transparency, and reflection, as natural light from the windows dynamically altered the perception of the works throughout the day. Many audience members commented on how the changing daylight influenced their emotional response, reinforcing the immersive and contemplative qualities of the exhibition. Notably, the concept of synaesthetic touch was validated, as viewers reported experiencing a tactile awareness triggered purely by visual stimuli.

Further, the open space allowed for an enhanced spatial experience, encouraging viewers to navigate around the sculptures and observe shifting compositions of colour, shadow, and geometric forms. Some visitors even spent an entire day in the gallery, slowly observing how the shifting light transformed both the artworks and their own perception. The synthesis of

¹⁸¹ Feng Zhenting, preface in “Sattvic Beings,” Chen Lizhu & Zhao Jinya Duo Exhibition, 1979 Gallery, Sea World Culture and Arts Centre, Shenzhen, accessed August 30, 2025, <http://1979gallery.dome.me/portal/en-US/Exhibition/Detail/14459cea-ef3f-93cc-9f5d-d1948eefe66e>.

materiality, light, and environment addressed and answered the core research enquiry into how glass functions as an active perceptual medium, shaping embodied engagement and spatial awareness.

Research Outcomes

This exhibition offered critical insights into how spatial, environmental, and material conditions shape audience perception and engagement with glass artworks. It reinforced the notion that glass operates beyond its physical properties, functioning as an interactive medium that continuously transforms in response to light, space, and movement. The dynamic relationship between the works and natural light validated the conceptual framework of layerspace, illustrating how shifting illumination alters depth perception, transparency, and shadow, creating an evolving sensory experience rather than a static visual encounter.

Audience interactions further substantiated the concept of synaesthetic touch, demonstrating that glass has the capacity to evoke tactile sensations through visual engagement alone. The prolonged presence of visitors, some of whom remained in the space for extended periods to observe the changing light effects, confirmed the immersive potential of the works, revealing how material and site conditions influence not only momentary perception but also sustained sensory awareness.

Furthermore, the exhibition highlighted the expanded role of site, affirming that perception is contingent not just on the material qualities of an artwork but also on its spatial and environmental context. The seamless integration of the glass works with the high ceilings, open layout, and floor-to-ceiling windows of the venue created a setting where natural elements actively participated in the audience's experience. This reinforced the understanding that site is not merely a passive backdrop but is a co-creator in shaping meaning and engagement.

These findings contribute to a broader discourse on sensory perception in material practice, reinforcing the necessity of site-responsive approaches in contemporary glass art. Moving forward, the research will further investigate how varying spatial and lighting conditions

influence audience engagement, refining methodologies that position glass as a perceptual and affective medium beyond the traditional discourse on sculpture.



Figure C4. Installation view of 'Sattvic Beings', two-person exhibition at 1979 Gallery, Shenzhen (2023–2024), showing works by Jinya Zhao and Chen Lizhu. Photo Credit: 1979 Gallery.



Figure C5. Public talk, 'Beyond Transparency: Ecologies and Futures of Glass Art', held during the exhibition 'Sattvic Beings', at 1979 Gallery, Shenzhen. From left to right: Feng Zhenting (Curator), Jinya Zhao (Exhibiting artist), Zhang Lin (Founder, Director and CEO of Shanghai Museum of Glass), Quan Ronghua (Director, 1979 Gallery). Date: 21 January 2024, Venue: 1979 Gallery, Sea World Culture and Arts Centre, Shenzhen. Photo Credit: He Junjie.

Exhibition 4: ‘Colour Made Manifest’, Material Engagements Research Cluster (MERC) exhibition

Date: 10 July 2024 – 14 July 2024

Venue: Pump House Gallery, London, UK

Type: Group Exhibition

Curatorial Context

For a research cluster that engages with materials, colour prompts the exploration of a paradox - while our primary encounter with an object might be to consider its colour, that aspect of it only exists in our individual minds as a construct. A fictioned relationship between light, material and viewer, our sensed idea of an object or material’s colour is transient, fugitive, shifting constantly both physically and conceptually and through phenomena such as metamerism and synaesthesia. Our body physically reacts to photons, the basis of light and therefore colour and another paradoxical semi-material: both wave and particle. We evolved to see colour first as sea creatures, those wavelengths of light that could dive through the surface of the sea. Our perception of colour as our planet rotates from light to dark has physically evolved our bodies to use cone senses in the day and rods at night, transforming our view of the material world around us. For over 35,000 years humans gathered the useful materials of colour from nature, rocks and plants. This meant that applied material colour had locational provenance bringing further associations and connections with place.

How does our collective agreement of colour adjust culturally to naming it? Evidence suggests that from an anthropological perspective blue is often the last colour to come into a culture’s language. It is thought that this is because there is less blue stuff in the natural world

that can be actually grasped, handled and utilised materially: blue skies and oceans may be vast vistas but they cannot be held, flowers spring up but colour names come second to the flora that embody them. It is then perhaps when human culture makes contact with those rarer blue pigmented materials, such as lapis lazuli and they are extracted from context and made into pigments that a verbal or literary grasping through naming of this abstract phenomena is necessary. Sticking with the colour blue, two further encounters illustrate the vastly differing perceptions and associations of colour, cobalt blue, found naturally and forever synonymous with ceramic decoration, has a hugely negative toxic impact on the health of those who mine it, while cyan blue is ingested to help reveal unseen visual imaging of our bodies in support of health care.

Then there are also the non-spectral colours and qualities that have become known as Cesia, relating to material surface qualities of light that don't fit into Newtonian definitions of reflected hue wavelengths, such as gloss and metallic surface reflections along with the volume qualities of translucent materials, Wittgenstein was fascinated with the idea of a translucent white. There is projected light ever present through our materially complex glass phone screens and physically constructed print colour such as the ubiquitous C,M,Y,K approach.

These colour-material-perceptions prompt the research explored through the proposed weekend exhibition – workshop – residency at the Pump House Gallery in Battersea London, which aims to offer a further confusion of colours as the Material Engagements Research Cluster explores this imaginary realm.

Text by Steve Brown¹⁸²

Audience Engagement and Observations

The exhibition, located in Battersea Park in London, attracted a diverse audience, including not only artists and scholars but also a significant number of park visitors who encountered

¹⁸² “Colour Made Manifest,” Material Engagements Research Cluster (MERC) Exhibition, Pump House Gallery, London, accessed August 30, 2025, <https://www.rca.ac.uk/news-and-events/events/colour-made-manifest/>.

the exhibition as part of their exploration of the surrounding environment. This unique integration of an exhibition space within a public park created an organic flow of visitors: some of them engaged with the artworks spontaneously, while others returned multiple times to observe how the shifting daylight altered their perception of the pieces. The interplay between the natural surroundings and the curated space influenced the movement of the audience, as visitors often positioned themselves to explore how the works responded to changes in sunlight filtering through the park's landscape.

The combination of sculptural glass, framed pieces, and the architectural features of the Pump House Gallery, such as its arched windows, enhanced this interaction, allowing the audience to experience a dialogue between geometry, transparency, and the external environment. Many visitors remarked on the way the artworks were transformed throughout the day, reinforcing the idea that glass is not a static material but one that actively participates in an evolving perceptual experience.

Research Outcomes

This exhibition provided critical insights into the relationship between site, layerspace, and synaesthetic touch, demonstrating how environmental and spatial conditions significantly impact an audience's engagement with glass artworks. The site-specific nature of the Pump House Gallery – positioned within a vibrant natural setting – allowed the artworks to extend beyond the boundaries of the exhibition space, interacting dynamically with the shifting conditions of the light and the landscape.

The integration of natural elements, such as the trees in the park casting moving shadows and reflections from the surfaces of the water affecting the gallery's lighting, introduced unexpected yet meaningful layers to the experience. These findings emphasised the significance of temporal perception in shaping sensory engagement, as different lighting conditions highlighted distinct qualities of the glass, intensifying depth and reflection in bright sunlight while softening contrasts and enhancing subtle colour transitions at dusk.

Moreover, the presence of a wider, non-specialist audience, including casual park visitors, provided valuable perspectives on accessibility and spontaneous engagement with glass

artworks. This exhibition reaffirmed the importance of site-responsive methodologies in contemporary glass practice and offered new directions for integrating natural and environmental factors into future research, further advancing the discourse on material perception, sensory interaction, and spatial dynamics in glass art.



Figure C6. 'Colour Made Manifest', Material Engagements Research Cluster (MERC) exhibition, Pump House Gallery, London, 2024. Photo Credit: Jinya Zhao.

Exhibition 5: ‘Fluid Threads’, two-person exhibition of Ptolemy Mann and Jinya Zhao

Date: 16 January 2025 – 08 March 2025

Venue: Taste Contemporary, Geneva, CH

Type: Two Person Exhibition

Curatorial Context

‘Fluid Threads’ presents a compelling dialogue between two distinct artistic practices—glass and textile, through the works of Jinya Zhao and Ptolemy Mann. While their approaches stem from different disciplines, both artists share a deep engagement with colour, layering, and the interaction of material and light. This exhibition explores how glass and textile, despite their contrasting physical properties, can converge to create immersive sensory experiences that extend beyond visual perception.

Jinya Zhao’s latest body of work continues her research into synaesthetic touch and *layerspace*, focusing on how glass can evoke tactile and embodied responses through its transparency, texture, and structural layering. By manipulating colour and form, she creates sculptural compositions that shift in perception depending on environmental light and viewer movement, emphasizing the fluidity and depth inherent in glass.

Ptolemy Mann’s textile works, meanwhile, emphasize precision in colour gradation and woven structure, creating rhythmic compositions that capture a sense of movement and transition. While their processes and materials are distinct, Zhao and Mann’s works are presented in conversation, highlighting how different mediums engage with light, space, and perception in unique yet complementary ways.

By bringing together these two practices, 'Fluid Threads' encourages audiences to explore the nuanced relationships between transparency and opacity, structure and softness, solidity and movement. The exhibition does not position one medium as subordinate to the other but rather creates a space where both can be experienced on their own terms while enriching the viewer's sensory engagement with material and form.¹⁸³

Audience Engagement and Observations

The 'Fluid Threads' exhibition marked a significant turning point in my practice, debuting a transformative new series that fully integrated my research findings into a bold and experimental body of work. This collection redefined the boundaries of glass as a perceptual medium, engaging audiences through an intricate interplay of colour, transparency, and spatial depth. The juxtaposition of my glass sculptures with Ptolemy Mann's textile works further heightened the sensory experience, encouraging visitors to navigate the exhibition space with an acute awareness of shifting light and material relationships.

Many audience members commented on the evolving nature of their perception, how glass, with its fluctuating opacity and internal layering, seemed to change in response to their movement and the environmental conditions within the gallery. The presence of both natural and artificial light played a crucial role in this interaction, with certain moments of the day revealing depths and textures previously unnoticed, reinforcing the concept of layerspace.

Observational studies indicated that visitors engaged with the works on multiple levels, not only visually but also through an embodied sense of material interaction. My glass pieces, despite their rigid structure, conveyed an illusion of fluidity and tactility, prompting visceral responses that aligned with the research framework of synaesthetic touch. Viewers frequently described the sensation of texture despite the smooth surfaces, experiencing the works as something that could be 'felt' through vision alone. The presence of textile as a counterpoint in the exhibition further emphasised these tactile associations, leading to an enriched dialogue on material perception and sensory integration. The spatial design of the exhibition

¹⁸³ "Fluid Threads," exhibition of Ptolemy Mann and Jinya Zhao, Taste Contemporary, Geneva, accessed August 30, 2025, <https://www.tastecontemporary.com/exhibition/ptolemy-mann-and-jinya-zhao/>.

encouraged viewers to explore the works from different perspectives, discovering new relationships between colour, shadow, and depth at each turn.

Research Outcomes

This exhibition marked the culmination of my extensive research into the perceptual and sensory dimensions of glass, manifesting in a radically new body of work that fully embodied the theoretical principles of synaesthetic touch, layerspace, and site. The glass pieces in this series were not simply objects: they were dynamic perceptual experiences, designed to engage audiences in an immersive and evolving dialogue with materiality. By integrating new techniques that manipulated internal depth, transparency, and surface interaction, I expanded the possibilities of glass beyond its conventional sculptural and optical roles, positioning it as a medium that actively transforms in response to its surroundings.

A key research finding reinforced by this exhibition was the heightened role of environmental conditions in shaping the experience of the audience. The fluctuating interplay between natural and artificial light sources demonstrated how site functions as an active agent in perception, influencing the way colours, reflections, and transparency emerge and dissolve over time. The audience's engagement with this phenomenon validated my hypothesis that glass exists not in isolation but rather in a constant state of flux, responding to spatial, temporal, and perceptual variables.

Furthermore, the juxtaposition of glass with textiles reinforced the potential for interdisciplinary dialogues in material perception, illustrating how contrasting textures and structures can heighten sensory awareness. This insight suggests a new methodological approach for future research, exploring how the integration of different materials can enhance or alter the perception of transparency, depth, and tactility in glass art. The findings from 'Fluid Threads' not only affirmed the impact of my research but also set the stage for further explorations of the dynamic relationship between materiality, environment, and human perception, positioning glass as a transformative medium that extends beyond the visual into a fully embodied experience.





Figure C7. Installation view at Taste Contemporary during the exhibition 'Fluid Threads', a two-person show with Ptolemy Mann and Jinya Zhao. Photo Credit: Ruth Ward.

Conclusion

The exhibitions documented in this Appendix serve as integral components of my PhD research, acting as dynamic platforms for testing, refining, and expanding my theoretical and material investigations. Each exhibition, rather than being merely a presentation of completed works was a critical part of an iterative research process, allowing me to explore and validate key conceptual frameworks – synaesthetic touch, layerspace, colour, and site. By engaging with different spatial and environmental contexts, audience responses, and interdisciplinary dialogues, these exhibitions provided a means to examine how glass functions as a perceptual, sensory, and affective medium.

Throughout my PhD, exhibitions evolved alongside my research, shaping and being shaped by its findings. The act of exhibiting became an essential methodological tool, one that enabled direct interaction with audiences, facilitating real-time observations on perception and sensory engagement. The integration of my sculptural glass works with other disciplines,

such as textiles and painting, reinforced the potential for interdisciplinary dialogues, revealing new insights into materiality, transparency, and embodied perception. Audience feedback from multiple exhibitions demonstrated that glass, through its manipulation of light, depth, and texture, can evoke multisensory responses, confirming that visual experiences can extend beyond sight into the realm of haptic and emotional resonance.

The findings from these exhibitions not only affirmed the theoretical underpinnings of my research, but also influenced the direction of my creative practice. My work continuously responded to and evolved through these engagements, leading to the development of increasingly refined explorations of material layering, environmental interaction, and perceptual ambiguity. The cumulative effect of these exhibitions has been the positioning of glass not as a static sculptural material but as an active agent in sensory and spatial negotiation, one that exists in a state of flux, shaped by light, movement, and context.

As I move forward, these exhibitions lay the foundations for further research into the experiential and conceptual possibilities of glass. They demonstrate the necessity of site-responsive methodologies and interdisciplinary approaches in understanding material perception. Ultimately, this body of research has positioned glass as a medium that transcends conventional boundaries, bridging the tangible and the intangible, the seen and the felt, the ephemeral and the enduring. Through exhibiting as a research practice, my work continues to explore and challenge how materials shape and are shaped by human perception, offering new possibilities for understanding sensory experience in contemporary glass art.

Exhibition 6: ‘Before the Feeling Forms’, A Practice-Based Research Exhibition by ZHAO Jinya

Date: 27 June 2025 – 15 September 2025

Venue: TC101 SPACE, The Chinese University of Hong Kong, Shenzhen, China

Type: Solo Exhibition

Curatorial Context

ZHAO Jinya is a nomadic figure whose creative practice is shaped by her embodied engagement with diverse geographies. Through corporeal attunement to the specificity of each environment, her works trace a cartographic sensibility, articulating not only place, but the perceptual residue of being-in-place. This bodily responsiveness gradually gives way to more nuanced modes of perception, through which fluctuating inner states are brought into dialogue with surrounding conditions. While her creative methodology remains fluid, open to difference, disruption, and contingency, her work does not rest in the incidental. Rather, she draws consciously on the totality of these lived experiences, forging, through glass and fire, a distilled urgency: a singular moment held in material form.

Text by WANG Che¹⁸⁴

Audience Engagement and Observations

The exhibition unfolded across a spatial choreography designed in close collaboration with the curator Wang Che. One of the central plinths was custom-designed – based on the side

¹⁸⁴ ‘Before the Feeling Forms’: A Practice-Based Research Exhibition by ZHAO Jinya, TC101 SPACE, The Chinese University of Hong Kong, Shenzhen, accessed August 30, 2025, <https://uac.cuhk.edu.cn/en/venue/807>.

profile of an earlier glass sculpture, selected for its capacity to extend the bodily logic of the work into the surrounding space. This sculptural reference point served as both a formal echo and an ergonomic proposition, encouraging audiences to physically navigate the space in resonance with the object's silhouette. By inviting bodily alignment and proximity, the design fostered conditions for more intimate, multisensory engagement.

Long after the official opening I remained in the exhibition space regularly, engaging with a broad spectrum of visitors, including university faculty, researchers, students, parents, and collectors. These sustained dialogues allowed the exhibition to become an evolving site of perception, where the audience response recursively informed the framing and interpretation of the works. This extended relationality between the artist, the viewer, and the site emerged as one of the most distinctive features of the project.

A series of tailored guided tours complemented the spatial narrative. Sessions were designed for young children from the affiliated kindergarten, university students, academic staff, and professional art audiences, including collectors and curators. Each group brought distinct perceptual vocabularies and interpretive strategies, which enriched the dialogic field of the exhibition. The Scent and the Memory of Colour session (see Figure B8), for example, was particularly generative in catalysing affective recall through olfactory cues, enabling participants to re-encounter works with deepened mnemonic and emotional resonance.

In total, the exhibition engaged 9,258 visitors across its duration. Audience feedback was documented through both the structured exhibition guide and the spontaneous visitor book, producing a layered dataset of over nine thousand individual responses and approximately a hundred and fifty pages of written and visual comments. This dual form of data collection, analytical and emotive, not only grounded the evaluation of the exhibition but also directly informed the research outcomes presented in this thesis.



Figure C8. Exhibition view of 'Before the Feeling Forms', TC101 SPACE, CUHKSZ. 2025. Photo Credit: He Junjie.



Figure C9. Guided tour for kindergarten children, CUHKSZ. 2025. Photo Credit: He Junjie.



Figure C10. Specialist audience engagement during the public preview. CUHKSZ. 2025. Photo Credit: He Junjie.



Figure C11. Participants during 'Scent and the Memory of Colour' session, CUHKSZ. 2025. Photo Credit: UAC@CUHKSZ.

Research Outcomes

The exhibition validated and expanded core methodological propositions developed in this research:

- **Olfactory integration** effectively extends the perceptual field of glass art, prompting mnemonic and emotional responses that exceed the visual register.
- **Site-responsive curating**, enacted through ergonomic plinth design, scent diffusion, spatial pacing, and light modulation, operates as a framework for staging synaesthetic touch in exhibition contexts.
- **The role of the curator** as reflexive collaborator was key: Wang Che's spatial logic and use of sculptural reference forms contributed not only to exhibition design but also to the shaping of embodied audience encounters.
- **The continuing presence of the artist** within the gallery space redefined the exhibition as an evolving relational research site, in which informal conversations, spontaneous feedback, and revisits became qualitative components of the research process.
- The deployment of **cross-modal workshops and guided tours** as curatorial infrastructure offered not only data collection but also a participatory model for embedding practice-based research into multi-audience public programming.

Collectively, these outcomes frame the exhibition not as a terminal display, but as a durational and site-responsive method through which audience, material, and curatorial logic co-produce knowledge.

Conclusion

‘Before the Feeling Forms’ represents a culmination and distillation of my site-based research methodology, realised not only through material display but also through lived interaction and spatial experimentation. Situated within the Chinese University of Hong Kong, Shenzhen, one of the key sites of this project, the exhibition did not merely showcase outcomes: it also functioned as a generative site of enquiry, extending the relational logic of practice into curatorial form.

Through the interplay of sculptural installation, olfactory diffusion, and ergonomic spatial design, the exhibition enacted synaesthetic touch as a framework for multisensory engagement. This was reflected not only in the sensory qualities of the glass works themselves but also in the social and pedagogical dynamics cultivated through public engagement. The iterative dialogues between artist, curator, and audience transformed the gallery into a porous, reflexive site, where meaning was continually negotiated and reformed.

In this sense, the exhibition reaffirmed the central premise of this research: that site is not a neutral backdrop but a co-creative condition through which perception, materiality, and cultural knowledge are entangled. ‘Before the Feeling Forms’ offered not a retrospective, but an embodied proposition for how site-responsive methodologies can generate new forms of making, thinking, and feeling in contemporary glass practice.

June 2025, as part of *Before the Feeling Forms – A Practice-Based Research Exhibition* by ZHAO Jinya, held at The Chinese University of Hong Kong, Shenzhen.

When engaging with ZHAO Jinya's artworks, please slow down. Let go of the habit of "watching", and invite both your body and mind into the experience. Allow colour to evoke scent, form to awaken sound, stillness to inspire movement. Whatever you feel—is real. Choose one piece, or a particular space, Linger. There is nothing to decipher, only something to sense:

What do you feel?

- Which part of your body responds first? (Do your eyes linger? Your breath shift? Your fingers stir?)
- What part of the work first captures your gaze?
- What emotions arise? What colour, scent, or sound do they resemble?
- With eyes closed, where in your body does the impression remain?

What does it remind you of?

- A memory, a place, a feeling, or someone in particular?
- Does the feeling arrive gently, or flash back from a distance? How does it quietly connect to your present?

Imagine its motion:

- Does it move like a breath, a melody, a breeze, or a drop of water?
- What response does its movement stir in you? Do you feel drawn to approach and touch it—or to hold back, and observe from afar?
- Which part of your body is it speaking to now?

This experience belongs to you.

There is no need to rush, to interpret, or to conclude. Perception is a language.

It leads not only toward the work, but perhaps, quietly, back to yourself.



Figure C12. Jinya Zhao Practice-Based Research Exhibition Guide.

Section A. Exhibition Guide Responses

Methodological Note

The exhibition guide generated seventy-two pages of audience responses, from which approximately 9,258 valid entries were identified and coded. A qualitative coding and thematic clustering method was applied to extract recurring words, affective descriptors, and metaphoric expressions. This analysis aimed to trace how viewers articulated their perceptual encounters and to situate these accounts in relation to the thesis's four conceptual frameworks of colour, layerspace, site, and synaesthetic touch.

High-frequency Words

The table below presents the most frequently observed keywords. For each entry, the Chinese original is retained, followed by an English translation. A sample audience quotation illustrates its usage, and a final column indicates its research relevance within this study.

Table 7. High-frequency words observed in audience responses, with Chinese originals, English translations, illustrative quotations, and research relevance.

| High-frequency words (Chinese / English) | Frequency | Sample answers (Chinese + English translation) | Research Relevance |
|---|------------------|--|---|
| 颜色 / Colour | Very high | “颜色像呼吸一样变化” <i>The colours change like breathing</i> | Central affective trigger; supports colour as perceptual event |
| 光 / Light | Very high | “玻璃在不同角度会发光” <i>The glass glows differently at each angle</i> | Demonstrates perceptual instability; light as dynamic condition |
| 空间 / Space | High | “在这个展厅感觉不同” <i>It feels different in this exhibition space</i> | Emphasises site-responsiveness and spatial context |

| | | | |
|---|-------------|--|--|
| 层次 / Layerspace | Medium | “走动时层次在变化” <i>The layers change as I move</i> | Validates layerspace as dynamic perceptual depth |
| 时间 / Time | Medium | “像日落的过程” <i>Like the process of sunset</i> | Highlights durational perception and unfolding temporality |
| 身体 / Body | Medium | “身体在观看中也被牵动” <i>My body was also drawn in while watching</i> | Confirms embodied perception and synaesthetic touch |
| 记忆 / Memory | Medium | “让我想起小时候的家” <i>It reminds me of my childhood home</i> | Shows mnemonic dimension of perception |
| 平静、安静、冷静 / Calm, reverie, introspection | Medium–High | “让我感到很平静” <i>It made me feel very calm</i> | Indicates affective atmosphere and reflective stillness |
| 悲伤、孤独 / Sadness, loneliness | Medium | “悲伤、孤独” <i>Sadness, loneliness</i> | Links dark hues (blue, purple) with cultural emotional codes |
| 温暖 / Warmth | Medium | “温暖” <i>Warmth</i> | Suggests intimacy and comfort produced by light/colour |
| 呼吸 / Breathing | Medium | “颜色像呼吸一样变化” <i>The colours change like breathing</i> | Bodily metaphor for chromatic fugacity |
| 压抑、克制 / Withholding, restraint | Low–Medium | “有压抑感” <i>It feels restrained/suppressed</i> | Indicates perception as delayed/withheld; supports instability |
| 展开 / Unfolding | Low–Medium | “慢慢展开” <i>It slowly unfolds</i> | Expresses gradual revelation; supports durational unfolding |
| 柔软 / Soft | Low–Medium | “看起来很柔软” <i>It looks soft</i> | Vision translated into tactile imagination |

| | | | |
|--------------------------|----------------|--|--|
| 厚重 / Thick | Low– Medium | “感觉很厚重” <i>It feels heavy/thick</i> | Shows density/weight via optical layering |
| 密集 / Dense | Low– Medium | “很密集的感觉” <i>It feels dense/intense</i> | Visual experience becomes material accumulation |
| 织物般 / Textile-like | Low | “像织物一样” <i>Like a textile</i> | Visual texture imagined as textile; cross-sensory metaphor |
| 湿润 / Wet | Low | “好像是湿的” <i>It seems wet</i> | Gloss/shine translated into liquidity; sensory instability |
| 流动 / Flow, fluidity | Medium | “像流动的水” <i>Like flowing water</i> | Indicates temporal process and material fluidity |
| 透明 / Transparency | High | “很透明、很通透” <i>Very transparent, clear</i> | Links to layerspace and depth perception |
| 脆弱 / Fragility | Low– Medium | “感觉很脆弱，怕它碎掉” <i>It feels fragile, as if it might break</i> | Points to material agency and precarity of glass |
| 梦境 / Dreamlike | Medium | “像梦境一样” <i>Like a dream</i> | Supports ambiguity, memory, and affective atmospheres |
| 边界 / Boundary | Low– Medium | “边界模糊，看不清里面和外面” <i>The boundaries are blurred; cannot distinguish inside and outside</i> | Demonstrates perceptual thresholds and ambiguity |
| 沉浸 / Immersion | Medium | “有走进去的感受” <i>It feels like walking inside</i> | Confirms site-responsiveness and immersive encounter |
| 心跳、脉动 / Heartbeat, pulse | Low | “像心跳一样” <i>Like a heartbeat</i> | Expands bodily metaphors; connects |

| | | | |
|----------------------|------------|---|---|
| | | | perception to vital rhythms |
| 空白 / Void, emptiness | Low–Medium | “有留白感，很空” <i>It feels empty, like void space</i> | Indicates presence of absence; connects to threshold and negative space |
| 对比 / Contrast | Medium | “颜色对比很强烈” <i>The colour contrast is very strong</i> | Supports chromatic theory; tonal variation analysis |
| 延迟 / Delay | Low–Medium | “需要慢慢看出来” <i>It takes time to see it gradually</i> | Suggests temporal instability; aligns with perceptual delay |
| 折射 / Refraction | Medium | “光有折射感” <i>The light has a refractive quality</i> | Material optics linked with perceptual depth |
| 震动 / Vibration | Low | “有震动感” <i>It feels like vibration</i> | Visual/light experience translated into bodily sensation |
| 温度 / Temperature | Low | “感觉很冷” <i>It feels cold</i> | Extends perception into thermal register; cross-modal experience |
| 自然 / Nature | Medium | “像水/像云/像风” <i>Like water/like clouds/like wind</i> | Connects glass perception to natural metaphors and site |

Metaphoric Responses

A notable feature of the guide responses is the prevalence of metaphoric and cross-sensory language. Words such as ‘breathing’ (呼吸), ‘withholding’ (压抑/克制), ‘unfolding’ (展开), ‘soft’ (柔软), ‘dense’ (密集), ‘wet’ (湿润), and ‘textile-like’ (织物般) illustrate how visual encounters were consistently translated into tactile, temporal, or bodily registers. These terms reveal that audiences did not restrict their descriptions to the optical but consistently invoked haptic and affective metaphors. Such metaphoric vocabulary substantiates the argument this

thesis proposes for synaesthetic touch, where glass destabilises visual primacy and activates embodied, multisensory perception.

Sample Exhibition Guide Responses Scans

Representative scans are provided below.

香港中文大学(深圳) UAC

与赵瑾雅的作品共处时，请放慢节奏，放下“观看”的习惯，邀请你的身心一同参与。

允许色彩唤起气味，形状引发声音，静止激起流动，你所感受到的一切，都是真实的。

请选择一个作品或空间，静静驻足，你无需解读，只需感受：

你感受到了什么？ (可考虑的方向)

身体的哪一部分最先感知？(眼睛的停留？呼吸的变化？手指的跃动？)

目光最先被它哪一部分吸引？ **色彩、材质**

它唤起怎样的情绪？像什么颜色？何种味道？哪种声音？

闭上眼，它在身体的哪处留下了印记？ **蓝色、清新、“叮”**

朦胧、结构感、渐暖
光落到深处。

它让你想起什么？ (可考虑的方向)

一段记忆，某个场景，某个情境又或是某个人？

这感觉是靠近而柔和的，还是遥远而闪回的？此刻它和你的生活有何悄悄相连？

没有痕迹的记忆，只有对美好事物的欣赏。
像是对美好回忆或画面的一种记录方式。

想象它的动态 (可考虑的方向)

像一口呼吸？一段旋律？一阵风？一湾水？

这运动唤起了你何种反应？靠近触碰，还是退后？

它此刻正与你身体的哪一部分对话？ **想靠过去**

大雁的盘旋

这体验属于你自己。

无须急着解读或判断，感知本身就是语言。

它不只是通向作品的路径，也可能是你通往自己的入口。

AIRS TC101 SPACE SHCO

香港中文大学(深圳) UAC

与赵瑾雅的作品共处时，请放慢节奏，放下“观看”的习惯，邀请你的身心一同参与。

允许色彩唤起气味，形状引发声音，静止激起流动，你所感受到的一切，都是真实的。

请选择一个作品或空间，静静驻足，你无需解读，只需感受：

你感受到了什么？ (可考虑的方向)

身体的哪一部分最先感知？(眼睛的停留？呼吸的变化？手指的跃动？)

目光最先被它哪一部分吸引？

它唤起怎样的情绪？像什么颜色？何种味道？哪种声音？

闭上眼，它在身体的哪处留下了印记？

眼睛与心扉一同感受到析出的流淌与流苏，
析出的感觉，像辛辣的面糊，与乱七八糟的调料
相混，有些辛辣苦涩，还有断断续续的呜咽，
被慢慢地融化，滴落，漫延。

它让你想起什么？ (可考虑的方向)

一段记忆，某个场景，某个情境又或是某个人？

这感觉是靠近而柔和的，还是遥远而闪回的？此刻它和你的生活有何悄悄相连？

我，我的语言，与世辈不善言辞，拧巴地
藏着爱恋的女性，将自己无情地拧，直到外表
终有一日等来消融，化为流动的墨盒，沿地
砖的表面一点，一点地寻找被发现的目光。

想象它的动态 (可考虑的方向)

像一口呼吸？一段旋律？一阵风？一湾水？

这运动唤起了你何种反应？靠近触碰，还是退后？

它此刻正与你身体的哪一部分对话？

像毛中一样，熔化的玻璃一样拧着。
感觉心脏也被拧着，越想靠近，想多
接触，或许拧完后流出的流苏将告知
我该归向何处。

这体验属于你自己。

无须急着解读或判断，感知本身就是语言。

它不只是通向作品的路径，也可能是你通往自己的入口。

AIRS TC101 SPACE SHCO

香港中文大学(深圳) UAC

与赵瑾雅的作品共处时，请放慢节奏，放下“观看”的习惯，邀请你的身心一同参与。

允许色彩唤起气味，形状引发声音，静止激起流动，你所感受到的一切，都是真实的。

请选择一个作品或空间，静静驻足，你无需解读，只需感受：

你感受到了什么？ (可考虑的方向)

身体的哪一部分最先感知？(眼睛的停留？呼吸的变化？手指的跃动？)

目光最先被它哪一部分吸引？

它唤起怎样的情绪？像什么颜色？何种味道？哪种声音？

闭上眼，它在身体的哪处留下了印记？

眼睛呼吸
从展馆外看到光打在展品上，
玻璃的色块，让阴暗又显得
明亮又澄澈

它让你想起什么？ (可考虑的方向)

一段记忆，某个场景，某个情境又或是某个人？

这感觉是靠近而柔和的，还是遥远而闪回的？此刻它和你的生活有何悄悄相连？

偶尔，勾连起与颜色相近的情绪
of late June 让我想到深圳绿色
有时带着潮湿闷热的夏天

想象它的动态 (可考虑的方向)

像一口呼吸？一段旋律？一阵风？一湾水？

这运动唤起了你何种反应？靠近触碰，还是退后？

它此刻正与你身体的哪一部分对话？

像液态取回的流动

这体验属于你自己。

无须急着解读或判断，感知本身就是语言。

它不只是通向作品的路径，也可能是你通往自己的入口。

AIRS TC101 SPACE SHCO

香港中文大学(深圳) UAC

与赵瑾雅的作品共处时，请放慢节奏，放下“观看”的习惯，邀请你的身心一同参与。

允许色彩唤起气味，形状引发声音，静止激起流动，你所感受到的一切，都是真实的。

请选择一个作品或空间，静静驻足，你无需解读，只需感受：

你感受到了什么？ (可考虑的方向)

身体的哪一部分最先感知？(眼睛的停留？呼吸的变化？手指的跃动？)

目光最先被它哪一部分吸引？

它唤起怎样的情绪？像什么颜色？何种味道？哪种声音？

闭上眼，它在身体的哪处留下了印记？

视觉，比起浅色系，我更喜欢深色的底色，
这件作品的蓝色和橙色都有一种更加
浓郁深邃的感觉。

它让你想起什么？ (可考虑的方向)

一段记忆，某个场景，某个情境又或是某个人？

这感觉是靠近而柔和的，还是遥远而闪回的？此刻它和你的生活有何悄悄相连？

看完作品后我再看作品，有“烟困烟
的感爱在喉咙中，上半部分圆形牙面
和一部分逐渐变细，更加流畅有从开始
的吞因困难到最后流畅，底部又是比较
宽的圆柱，像是圆柱的事物被吞下后，后来
想象它的动态 (可考虑的方向)

像一口呼吸？一段旋律？一阵风？一湾水？

这运动唤起了你何种反应？靠近触碰，还是退后？

它此刻正与你身体的哪一部分对话？

像无法永久的东西被固态
后来看似流走了
但仍在而且永远保留
还会沉入，留下越来越厚重的痕迹

这体验属于你自己。

无须急着解读或判断，感知本身就是语言。

它不只是通向作品的路径，也可能是你通往自己的入口。

AIRS TC101 SPACE SHCO

香港中文大学(深圳) UAC

与赵瑾雅的作品共处时，请放慢节奏，放下“观看”的习惯，邀请你的身心一同参与。

允许色彩唤起气味，形状引发声音，静止激起流动，你所感受到的一切，都是真实的。

请选择一个作品或空间，静静驻足，你无需解读，只需感受：

你感受到了什么？ (可考虑的方向)

身体的哪一部分最先感知？(眼睛的停留？呼吸的变化？手指的跃动？)

目光最先被它哪一部分吸引？

它唤起怎样的情绪？像什么颜色？何种味道？哪种声音？

闭上眼，它在身体的哪处留下了印记？

被切割面花市和年初复吸引(非常像海南和青提)
看起来很有趣，让人心情很好
有一种春夏之交的感觉

它让你想起什么？ (可考虑的方向)

一段记忆，某个场景，某个情境又或是某个人？

这感觉是靠近而柔和的，还是遥远而闪回的？此刻它和你的生活有何悄悄相连？

很神秘
很神秘
有一种在海湾中或海边沙洲的感觉
(因为画色) 其更像个沙漠

想象它的动态 (可考虑的方向)

像一口呼吸？一段旋律？一阵风？一湾水？

这运动唤起了你何种反应？靠近触碰，还是退后？

它此刻正与你身体的哪一部分对话？

看起来很沉稳的感觉
虽然是想象动态
但一下子安静下来了

2025.7.12

这体验属于你自己。

无须急着解读或判断，感知本身就是语言。

它不只是通向作品的路径，也可能是你通往自己的入口。

AIRS TC101 SPACE SHCO

香港中文大学(深圳) UAC

与赵瑾雅的作品共处时，请放慢节奏，放下“观看”的习惯，邀请你的身心一同参与。

允许色彩唤起气味，形状引发声音，静止激起流动，你所感受到的一切，都是真实的。

请选择一个作品或空间，静静驻足，你无需解读，只需感受：

你感受到了什么？ (可考虑的方向)

身体的哪一部分最先感知？(眼睛的停留？呼吸的变化？手指的跃动？)

目光最先被它哪一部分吸引？

它唤起怎样的情绪？像什么颜色？何种味道？哪种声音？

闭上眼，它在身体的哪处留下了印记？

宁静，视觉的震撼，心灵的净化。

它让你想起什么？ (可考虑的方向)

一段记忆，某个场景，某个情境又或是某个人？

这感觉是靠近而柔和的，还是遥远而闪回的？此刻它和你的生活有何悄悄相连？

想起儿时住过的家，温暖明亮。

想象它的动态 (可考虑的方向)

像一口呼吸？一段旋律？一阵风？一湾水？

这运动唤起了你何种反应？靠近触碰，还是退后？

它此刻正与你身体的哪一部分对话？

轻柔，想去拥抱

这体验属于你自己。

无须急着解读或判断，感知本身就是语言。

它不只是通向作品的路径，也可能是你通往自己的入口。

AIRS TC101 SPACE SHCO

Figure C13. Sample exhibition guide responses scans in Chinese (unedited representative responses).

Concluding Note

The guide responses demonstrate how audiences articulated their perceptual experiences through reflective and interpretive language. Many accounts were elaborate and metaphor-rich, showing how vision was consistently translated into tactile, temporal, or bodily registers. These responses foreground the analytical and cognitive dimensions of perception, evidencing how audiences actively constructed meaning and connected their impressions to broader concepts of colour, layerspace, site, and synaesthetic touch.

Section B. Visitor Book Entries

Methodological Note

The visitor book collected spontaneous, unstructured comments during the exhibition (c.150 pages of entries). Unlike the guide responses, which were more analytical and metaphorical, these entries were typically short and emotive, sometimes accompanied by small sketches or doodles. They provide insight into the immediate affective atmosphere generated by the works and reveal how audiences translated perception into states of calm, awe, healing, or resonance.

High-frequency Words

Table 8. Visitor book entries high-frequency words, with Chinese originals, English translations, illustrative quotations, and research relevance.

| High-frequency words (Chinese / English) | Frequency | Sample answers (Chinese + English translation) | Research Relevance |
|--|-------------|--|---|
| 美 / Beautiful | Very high | “好美！” <i>So beautiful!</i> | Indicates immediate aesthetic impact and sensory appeal |
| 感动 / Moved, touched | High | “很感动” <i>Very moving</i> | Shows emotional resonance and affective engagement |
| 平静 / Calm, peaceful | High | “心是平静的” <i>My heart feels calm</i> | Highlights atmosphere of stillness and affective regulation |
| 安静 / Quiet, tranquil | High | “好安静” <i>So quiet</i> | Demonstrates contemplative, reverie-like atmosphere |
| 梦幻 / Dreamlike | Medium–High | “像梦境一样” <i>Like a dream</i> | Supports perceptual ambiguity and imaginative immersion |
| 温暖 / Warmth | Medium | “温暖的感觉” <i>A warm feeling</i> | Suggests intimacy and comfort created by glass and light |

| | | | |
|-----------------------------------|------------|---|--|
| 震撼 / Powerful, striking | Medium | “好震撼” <i>So powerful</i> | Reflects intensity and dramatic impact of the works |
| 抽象 / Abstract | Medium | “很抽象” <i>Very abstract</i> | Indicates non-representational perception and conceptual openness |
| 艺术改变世界 / Art transforms the world | Low–Medium | “艺术可以改变世界” <i>Art can change the world</i> | Shows audience attributing transformative, social potential to art |
| 投入、被包围 / Immersed, enveloped | Low–Medium | “像被包围” <i>As if being surrounded</i> | Describes spatial immersion and bodily resonance |
| 呼吸 / Breathing | Low–Medium | “好像在呼吸” <i>As if it is breathing</i> | Bodily metaphor linking perception to life rhythms |
| 不抑郁了 / Not depressed anymore | Low | “不抑郁了” <i>Not depressed anymore</i> | Suggests positive emotional regulation; art as affective relief |
| 治愈 / Healing, therapeutic | Low–Medium | “很治愈” <i>Very healing</i> | Indicates art perceived as therapeutic, beyond aesthetics |
| 希望 / Hope | Low | “有希望感” <i>It gives me a sense of hope</i> | Links art experience to positive future-oriented emotions |
| 自由 / Freedom | Low | “很自由” <i>It feels free</i> | Connects spatial openness with affective freedom |
| 能量 / Energy, vibration | Low | “有能量” <i>It feels full of energy</i> | Shows works experienced as dynamic, resonant forces |
| 自然 / Nature metaphors | Low–Medium | “像水/像风/像云” <i>Like water/like wind/like clouds</i> | Demonstrates audience framing perception through environmental metaphors |

Metaphoric Responses

Although most visitor book entries were brief and emotive, a small number of comments employed metaphorical or cross-sensory language. Phrases such as “好像在呼吸” (as if breathing), “像被包围” (as if being surrounded), and “像水/像风/像云” (like water/like wind/like clouds) suggest that audiences sometimes translated their immediate impressions into bodily or environmental metaphors. These instances, though fewer than in the guide responses, demonstrate that even spontaneous reactions could extend beyond the visual register, reinforcing the claim in the thesis that glass evokes embodied and multisensory perception.

Sample Visitor Book Scans

Representative scans are provided below.

毕业新展上开展也太幸运！超好看！
希望未来的生活也丰富着各种色彩质感 and 结构
2025.6.17

I hope the world can be surrounded by Art!!!

世界が芸術に囲まれることを願う！

希望世界被艺术包围

세계가 예술에 둘러싸여 있기를 바랍니다.

6월 28일 토요일

6월 28일 토요일

name: 양병신

世上只有发明创造, 才能有程的梦想加
一切

杨炳新

♡ 一种冷与艳, 妖的结合。

一种高处俯视的定和傲。

写得好!

一种朦胧的美学启迪。

玻璃的质感如坠云端。

— from CRY2



不焦虑了, 至少在当下,
眼里都是彩色的, 心是平静的。

我在走一条与自我和解的路,
没有什么人可以理解, 但我一定会
胜利的, 是吧!

我已经战胜抑郁症了, 焦
虑症也只是时间问题。

我还会再来的, 看更多的展

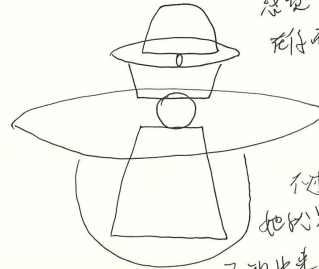
♡♡♡

加油加油!!!

2025.7.6

色彩的渐变符合规律的美感,
让人感觉是美的。玻璃这一材料的
运用让我很喜欢, 可透明可隐藏,
也许就值人类的复杂。包括在制作
过程中的湿度的掌握以及对最终呈现形
态的控制, 对观者的矛盾又在最终的作品中的
统一, 这都是更复杂且奇妙的。

看这册子, 作者说的某些话似乎与我的感知不
那么相符合。我在初看时有一种扑面而来的
感觉, 它是那样真实地呈
现在面前, 但是任何感
到的似乎没有办法
用言语表达出来。



不过作者在册子中这
她比是想把看到的真实
展现出来, 引导的也
呢个展好好睇!
祝展览圆满成功
2025.7.7

Figure C14. Sample visitor book responses scans in Chinese (unedited representative responses).

Concluding Note

The visitor book entries capture the immediacy of audience experience. Expressed in short phrases, exclamations, or sketches, they highlight affective states such as beauty, calm, a dreamlike atmosphere, and emotional resonance. A few entries invoked metaphors of breathing, immersion, or natural elements, but the prevailing emphasis was on spontaneity and mood. These responses foreground the emotional and atmospheric register of perception, revealing how the exhibition produced immediate and restorative effects.

Section C. Comparative Summary of Audience Data

The two strands of audience data, the structured exhibition guide responses and the spontaneous visitor book entries, reveal complementary registers of audience experience.

The responses in the exhibition guide were reflective and analytical. Audiences frequently articulated their impressions through extended explanations and metaphoric language, translating visual qualities into tactile, temporal, and bodily registers. This discursive richness evidences how perception was cognitively framed and conceptually elaborated.

Visitor book entries, by contrast, were brief, emotive, and immediate. They highlighted affective states such as beauty, calm, a dreamlike atmosphere, and healing, occasionally accompanied by sketches or simple metaphors. These comments demonstrate how perception unfolded as an atmospheric and emotional encounter.

Taken together, the two datasets illuminate distinct yet interconnected modes of audience engagement: reflective interpretation and affective immediacy. Their convergence substantiates the central claim of this thesis that glass operates as a perceptual engine, mobilising both thought and feeling, analysis and atmosphere, cognition and affect.

Exhibition 7: ‘EN ROUTE II’: Group Exhibition

Date: 5 July – 4 September 2025

Venue: HdM Long Room, 798 East Road, No.2 Jiuxianqiao Road, Chaoyang District, Beijing

Type: Group Exhibition

Curatorial Context

‘EN ROUTE II’ is the second iteration of HdM Gallery’s summer group show series, continuing the conceptual momentum of 2024’s ‘EN ROUTE’. Through the lenses of fluidity, processuality, and materiality, the exhibition investigates how contemporary artists negotiate identity, making, and perception amidst constant movement, geographic, emotional, and epistemological.

This iteration brings together twelve artists from China, France, Italy, the United Kingdom, Australia, Mexico, and beyond, fostering transcultural dialogues across media and sensibility. The exhibition is structured around three interrelated sections:

- **Fluidity: Shaping Selves** explores identity as mutable and contingent, shaped by memory, geography, and the body.
- **Processuality: Evolving Expression** engages the act of making as the artwork itself, a gesture of continual becoming.
- **Materiality: Living Matter** highlights the sensory, affective, and symbolic dimensions of matter as both form and vessel for perception. This third section features works by Zhao Jinya, Hugo Servanin, Silvia Capuzzo, and Yu Wenjie, focusing on the dynamic relationship between material and emotion, and treating materiality as a medium with sensory potential. Each artist externalizes inner

experience through a distinct and nuanced material language: the transparency and fragility of glass, the fissures and density of ceramics, and the expansion and deformation of texture in painting and installation become sites where perception and psychological states reside. By engaging both the physical properties and symbolic resonances of materials, the artists construct experiential spaces that transcend sensory boundaries: color grows through light and shadow, texture evokes bodily memory, and the processes of fragmentation, sedimentation, fermentation, and transformation evolve into a visual language for articulating individual, historical, and collective experience.¹⁸⁵

Audience Engagement and Observations

Audience engagement throughout ‘EN ROUTE II’ reflected a strong sensorial and emotional responsiveness to material nuance, spatial presence, and perceptual instability. Visitors entered the exhibition with an openness to affective and cross-modal readings, many engaging not only with the visual qualities of works but with their implied tactility, rhythm, and spatial pacing. This was particularly apparent in the third section, ‘Materiality: Living Matter’, where sensory interaction often transcended observation and became a bodily act of orientation, movement, and recollection.

Zhao Jinya’s *In the Absence of Time* (Figure C15) became a focal point of such embodied encounters. Installed in a quiet recess of the gallery, the glass sculpture’s layered transparency and spatial suspension invited viewers to shift their positions in order to follow the modulation of opacity and light. The work’s perceptual instability, fluctuating with environmental illumination and bodily proximity, elicited lingering attention. Audiences circled the work slowly, bending to peer into its depths, or stepping back to witness how its edges dissolved into shadow. This movement activated what Jinya terms *synaesthetic touch*, a kind of tactile imagining through vision, in which material, memory, and emotion intersect.

¹⁸⁵ “EN ROUTE II,” HdM Long Room, Beijing, accessed August 30, 2025, https://hdmgallery.com/exhibitions/101-en-route-long-room-beijing/press_release_text/.



Figure C15. In the Absence of Time, 40 × 20 × 20, 2025. Photo Credit: He Junjie.

Multiple viewers remarked on the emotional quality of the piece. Some described feelings of stillness, melancholy, or suspension, while others noted how it reminded them of memories ‘half-formed’ or ‘hovering’. As one participant observed: ‘It feels like it’s holding something in – like the moment before something disappears.’ Such feedback evidences the work’s capacity to stage affective delay, echoing the artist’s intent to treat absence not as void but as presence deferred.

Across the exhibition, Zhao’s works thus served as a microcosm of the show’s broader concerns with material sensitivity, temporality, and perceptual exchange. It not only exemplified the affective possibilities of glass, but also demonstrated how audiences, when given space and temporal permission, can form deeply resonant dialogues with material-based practices. This dynamic interplay between form, environment, and embodied viewer response lies at the heart of Jinya’s site-informed methodology, and was visibly enacted throughout the duration of ‘EN ROUTE II’.



Figure C16. Installation view at 'EN ROUTE II', HdM Gallery, Beijing. Photo Credit: He Junjie.

Research Outcomes

Jinya's participation in *EN ROUTE II* extended the transnational trajectory of her practice into the international contemporary art scene, offering a platform for exploring the perceptual logics of glass within a curatorial context that foregrounds material sensibility. Her inclusion in a group dialogue on materiality supported comparative readings of fragility, density, and transformation across multiple media. The installation context, alongside ceramic and painting-based explorations, enabled new conversations around sensory potential, stillness, and structural temporality in glass. Her contribution solidified the conceptual and perceptual continuity between her solo institutional exhibitions and broader group engagements.

Conclusion

EN ROUTE II served as a critical site for exploring how Zhao Jinya's materially grounded and environmentally responsive practice resonates within wider conversations on process and perception. In the context of an international group show, her work functioned as both a visual anchor and conceptual bridge, positioning glass not merely as medium, but as active threshold: between presence and absence, fragility and strength, sensation and memory. Her participation affirms the importance of materially attuned practices in reshaping how we understand art's relationship to place, body, and affect.

Bibliography

Books, Journals and Newspaper Articles

Adams, Frank M., and Charles E. Osgood. "A Cross-Cultural Study of the Affective Meanings of Color." *Journal of Cross-Cultural Psychology* 4, no. 2 (1973): 135–156. <https://doi.org/10.1177/002202217300400201>.

Adamson, Glenn. *Fewer Better Things: The Hidden Wisdom of Objects*. Bloomsbury Publishing, 2018.

Adamson, Glenn. *The Invention of Craft*. Bloomsbury Academic, 2013.

Albers, Josef. *Interaction of Color*. Yale University Press, 2013.

Bachelard, Gaston. *The Poetics of Space*. Translated by Maria Jolas. Beacon Press, 1994.

Batchelor, David. *Chromophobia*. Reaktion Books, 2001.

Benjamin, Walter, "The Storyteller: Reflections on the Works of Nikolai Leskov," in *Illuminations*, ed. Hannah Arendt. Schocken Books, 2007.

Bishop, Claire. *Artificial Hells: Participatory Art and the Politics of Spectatorship*. Verso, 2012.

Bowness, Alan. *Barbara Hepworth: Drawings from a Sculptor's Landscape*. Cory Adams & Mackay, 1966.

Brachlow, Heike. *Shaping Colour: Density, Light and Form in Solid Glass Sculpture*. PhD diss., Royal College of Art, 2012.

Callen, Anthea. *The Art of Impressionism: Painting Technique and the Making of Modernity*. Yale University Press, 2000.

Carman, Taylor. *Merleau-Ponty*. Routledge, 2008.

Carroll, John. "Colour Vision and Perception." In *Human Color Vision*, edited by Jan Kremers, Rigmor C. Baraas, and John Marshall, 93–118. Academic Press, 2021.
<https://doi.org/10.1016/B978-0-12-821377-3.00005-2>.

Casey, Edward S. "How to Get from Space to Place in a Fairly Short Stretch of Time: Phenomenological Prolegomena." In *Senses of Place*, edited by Steven Feld and Keith H. Basso, 13–52. School of American Research Press, 1996.

Casey, Edward S. *Getting Back into Place: Toward a Renewed Understanding of the Place-World*. Indiana University Press, 1993.

Casey, Edward S. *Remembering: A Phenomenological Study*. 2nd ed. Indiana University Press, 2000.

Casey, Edward S. *The Fate of Place: A Philosophical History*. University of California Press, 1997.

Conway, Bevil R. "Color Vision, Cones, and Color-Coding in the Cortex." *The Neuroscientist* 15, no. 3 (2009): 274–290.
<https://doi.org/10.1177/1073858408331369>.

- Crichton-Miller, Emma. *The Value in Things*. Cromwell Place, 2023.
- Cytowic, Richard E. *Synesthesia: A Union of the Senses*. 2nd ed. MIT Press, 2002.
- Deleuze, Gilles, and Félix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia*. Translated by Brian Massumi. University of Minnesota Press, 1987.
- Deleuze, Gilles. *Francis Bacon: The Logic of Sensation*. Translated by Daniel W. Smith. 1st ed. Bloomsbury Academic, 2017.
- Deleuze, Gilles. *The Logic of Sense*. Translated by Constantin V. Boundas. Columbia University Press, 2003.
- Dormer, Peter. *The Culture of Craft: Status and Future*. Manchester University Press, 1997.
- Elliot, Andrew J., and Markus A. Maier. "Color Psychology: Effects of Perceiving Color on Psychological Functioning in Humans." *Annual Review of Psychology* 65 (2014): 95–120. <https://doi.org/10.1146/annurev-psych-010213-115035>.
- Elsen, Albert E. *Rodin's Art: The Rodin Collection of the Iris & B. Gerald Cantor Center for Visual Arts at Stanford University*. Oxford University Press, 2003.
- Fairchild, Mark D. *Color Appearance Models*. 3rd ed. Wiley, 2013.
- Farr, Ian, ed. *Memory: Documents of Contemporary Art*. Whitechapel Gallery; MIT Press, 2012.
- Feisner, Edith Anderson, and Ron Reed. *Color Studies*. 3rd ed. Fairchild Books, 2013.
- Feld, Steven, and Keith H. Basso, eds. *Senses of Place*. School of American Research Press, 1996.

Gage, John. *Color and Meaning: Art, Science and Symbolism*. University of California Press, 1999.

Gage, John. *Colour and Culture: Practice and Meaning from Antiquity to Abstraction*. Thames & Hudson, 2024.

Gallese, Vittorio, and Corrado Sinigaglia. "How the Body in Action Shapes the Self." *Journal of Consciousness Studies* 18, nos. 7–8 (2011).

Gombrich, E. H. *Art and Illusion: A Study in the Psychology of Pictorial Representation*. Millennium ed. Princeton University Press, 2000. First published 1960 by Pantheon.

Gombrich, E. H. *The Sense of Order: A Study in the Psychology of Decorative Art*. Cornell University Press, 1979.

Herz, Rachel. *The Scent of Desire: Discovering Our Enigmatic Sense of Smell*. William Morrow Paperbacks, 2008.

Howard, Ian. *Perceiving in Depth, Volume 1: Basic Mechanisms*. Oxford University Press, 2012.

Hull, John M. *Touching the Rock: An Experience of Blindness*. SPCK Publishing, 2016.

Ingold, Tim. *Bringing Things to Life: Creative Entanglements in a World of Materials*. NCRM Working Paper 05/10. ESRC National Centre for Research Methods, 2010.

Ingold, Tim. *Making: Anthropology, Archaeology, Art and Architecture*. Routledge, 2013.

Ingold, Tim. *The Life of Lines*. Routledge, 2015.

Jullien, François. *The Great Image Has No Form, or On the Nonobject through Painting*. Translated by Jane Marie Todd. University of Chicago Press, 2009.

- Klein, David, and William Lloyd. *The History of Glass*. Little, Brown, 2000.
- Kwon, Miwon. *One Place After Another: Site-Specific Art and Locational Identity*. MIT Press, 2002.
- Livingstone, Margaret. *Vision and Art: The Biology of Seeing*. Harry N. Abrams, 2002.
- Lord, James. *Giacometti: A Biography*. Farrar, Straus and Giroux, 1985.
- Madoff, Steven Henry. *Christopher Wilmarth: Light and Gravity*. Princeton University Press, 2004.
- Manning, Erin. *Always More Than One: Individuation's Dance*. Duke University Press, 2013.
- Marks, Laura U. *Touch: Sensuous Theory and Multisensory Media*. University of Minnesota Press, 2002.
- Marriott, Hannah. "The Met Exhibition's Unexpected New Feature: Smell." *Financial Times*, May 7, 2024. Accessed August 16, 2025. <https://www.ft.com/content/a1e17d84-74e4-4440-a763-9579ebdb5585>.
- Massumi, Brian. *Parables for the Virtual: Movement, Affect, Sensation*. Duke University Press, 2002.
- Maurer, Daphne, and Charles Maurer. *The World of the Newborn*. Basic Books, 1988.
- Merleau-Ponty, Maurice. *Phenomenology of Perception*. Translated by Colin Smith. Routledge, 2005. Originally published 1945.
- Merleau-Ponty, Maurice. *The Visible and the Invisible*. Edited by Claude Lefort. Translated by Alphonso Lingis. Northwestern University Press, 1968.

- Nachmanovitch, Stephen. *Free Play: Improvisation in Life and Art*. J.P. Tarcher, 1990.
- Newton, Isaac. *The Correspondence of Isaac Newton*. Vol. 1: 1661–1675. Edited by H. W. Turnbull. Cambridge University Press, 1959.
- Nunn, J., L. Gregory, M. Brammer, et al. "Functional Magnetic Resonance Imaging of Synesthesia: Activation of V4/V8 by Spoken Words." *Nature Neuroscience* 5 (2002): 371–375. <https://doi.org/10.1038/nn818>.
- O'Shaughnessy, Brian. *Consciousness and the World*. Oxford University Press, 2000.
- Pink, Sarah. *Doing Sensory Ethnography*. Sage, 2015.
- Rothko, Mark. *The Artist's Reality: Philosophies of Art*. Edited by Christopher Rothko. Yale University Press, 2006.
- Tait, Hugh. *Five Thousand Years of Glass*. University of Pennsylvania Press, 2004.
- Tolman, Edward C. "Cognitive Maps in Rats and Men." *Psychological Review* 55, no. 4 (1948): 189–208. <https://doi.org/10.1037/h0061626>.
- Vanderstukken, Koen. *Glass: Virtual, Real*. Black Dog Publishing, 2016.
- Ward, Jamie. *The Frog Who Croaked Blue: Synesthesia and the Mixing of the Senses*. Routledge, 2008.
- Werner, John S., and Leo M. Chalupa, eds. *The New Visual Neurosciences*. MIT Press, 2013.
- Wertheimer, Max. "Laws of Organization in Perceptual Forms." In *A Source Book of Gestalt Psychology*, edited by William D. Ellis, 71–88. Routledge & Kegan Paul; Harcourt, Brace, 1938.

Exhibitions and Workshops

1979 Gallery. "Sattvic Beings." Chen Lizhu & Zhao Jinya Duo Exhibition. Sea World Culture and Arts Centre, Shenzhen. Accessed August 30, 2025.

<http://1979gallery.dome.me/portal/en-US/Exhibition/Detail/14459cea-ef3f-93cc-9f5d-d1948eefe66e>.

Alÿs, Francis. *The Green Line*. Performance. Jerusalem, 2004.

Coe, Katye. Somatic Movement Workshop. Royal College of Art, London, 2023. Artist-led workshop attended by the author.

Gormley, Antony. "Blind Light." Antony Gormley. Accessed June 2, 2022.

<https://www.antonygormley.com/projects/item-view/id/241>.

Hauser & Wirth. "Strange Friends." *Make: Summer Exhibition*. London. Accessed August 30, 2025. <https://www.hauserwirth.com/make/42104-strange-friends/>.

HdM Gallery. "EN ROUTE II." HdM Long Room, Beijing. Accessed August 30, 2025.

https://hdmgallery.com/exhibitions/101-en-route-long-room-beijing/press_release_text/.

He Art Museum (HEM). 'Roni Horn: A Dream Dreamt in a Dreaming World Is Not Really a Dream... But a Dream Not Dreamt Is'. Exhibition held at He Art Museum, Shunde, China, 7 June–7 October 2023. Accessed June 10, 2023.

<https://hem.org/exhibition/19>.

Höllner, Carsten. *Upside-Down Mushroom Room*. Installation. Fondazione Prada, Milan, 2000.

Jongerius, Hella. 'Breathing Colour'. Exhibition. Design Museum, London, 28 June–24 September 2017. Accessed August 13, 2023.

<https://designmuseum.org/exhibitions/breathing-colour-by-hella-jongerius>.

Liuli China Museum. "Nebulosity Walk in Thy Memory: Jinya Zhao Glass Art Exhibition." *The Touch of the Intangible*. Shanghai. Accessed August 30, 2025.

http://www.liulichinamuseum.com/news/jinya/jinya_zhao.html.

Los Angeles County Museum of Art. "James Turrell: A Retrospective." *LACMA*. Accessed June 2, 2024. <https://www.lacma.org/art/exhibition/james-turrell-retrospective>.

Royal College of Art. "Colour Made Manifest." Material Engagements Research Cluster (MERC) Exhibition. Pump House Gallery, London. Accessed August 30, 2025.

<https://www.rca.ac.uk/news-and-events/events/colour-made-manifest/>.

Serra, Richard. *Shift*. Sculpture. King City, Ontario, 1970–72.

Taste Contemporary. "Fluid Threads." Exhibition of Ptolemy Mann and Jinya Zhao. Geneva. Accessed August 30, 2025. <https://www.tastecontemporary.com/exhibition/ptolemy-mann-and-jinya-zhao/>.

The Chinese University of Hong Kong, Shenzhen. "'Before the Feeling Forms': A Practice-Based Research Exhibition by ZHAO Jinya." TC101 SPACE. Accessed August 30, 2025. <https://uac.cuhk.edu.cn/en/venue/807>.

White Cube. *Christian Marclay (Mason's Yard 2023)*. 2023. Accessed February 17, 2024.

<https://www.whitecube.com/gallery-exhibitions/christian-marclay-masons-yard-2023>.

Online & Museum Sources

Bard Graduate Center. "Dominick Labino – Voices in Studio Glass History." n.d. Accessed August 21, 2025. <https://exhibitions.bgc.bard.edu/studioglasshistory/artists/dominick-labino/>.

Cleveland Museum of Art. "Studio Glass in Focus." *Cleveland Art*, September/October 2012. Accessed August 21, 2025. <https://www.clevelandart.org/articles/studio-glass-focus>.

Corning Museum of Glass. "Studio Glass Movement." *Glass Dictionary*. 2025. Accessed August 21, 2025. <https://allaboutglass.cmog.org/definition/studio-glass-movement>.

Editions Jean Lenoir. "Handmade in France – Editions Jean Lenoir." n.d. Accessed July 18, 2024. <https://www.lenez.com/en/made-in-france>.

Galerie Max Hetzler. "Ernesto Neto." n.d. Accessed March 2, 2025. <https://www.maxhetzler.com/artists/ernesto-neto>.

Harvard Art Museums. "Special Collections: Christopher Wilmarth." n.d. Accessed July 7, 2024. <https://harvardartmuseums.org/publications/special-collections/christopher-wilmarth>.

San Francisco Museum of Modern Art. *Days on Blue*, 1974–77. The Doris and Donald Fisher Collection. Accessed March 21, 2025. <https://www.sfmoma.org/artwork/FC.686.A-C/>.

Studio Glass in The Metropolitan Museum of Art. New York: The Metropolitan Museum of Art, 1996. Accessed August 16, 2025. <https://www.metmuseum.org/met-publications/studio-glass-in-the-metropolitan-museum-of-art>.

Toledo Museum of Art. "Glass & TMA." 2024. Accessed August 21, 2025. <https://toledomuseum.org/collection/glass-tma>.