

**HOW THE LIGHT GETS IN: THE ATOM AND THE ORGANISM, ARTISTIC
REFLECTIONS ON THE COMPLEMENTARITY OF BEING**

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EXHIBITION ABSTRACT

Humanity has long sought to understand itself by looking outward at the universe, inward at existence's building blocks, and beyond comprehension toward consciousness. Existentialist philosophy deeply resonates with me, as it emphasizes finding meaning within individual experiences in an indifferent world. This perspective offers solace, placing the responsibility to create meaning on me.

How the Light Gets In invites introspection on our embodied existence and connections to the world. Through interactive, immersive installations that challenge typical rules and expectations of the white cube gallery, the work encourages investigation, reflection, and play while pausing to consider broader dimensions of being. By navigating scale—from the vastness of space to the minuteness of particles—the pieces provoke shifts in perception, eliciting responses ranging from awe to intimacy. This body of work aims to inspire a deeper understanding of our relational existence, fostering a space for meaning-making in the everyday.

HOW THE LIGHT GETS IN: AN EXHIBITION DESCRIPTION

The exhibition *How the Light Gets In* will run from April 7th to 11th, 2025, in York University's Special Projects Gallery (SPG). This exhibition is the research-creation project for my MFA, and this paper is the support document for the exhibition. Walking into SPG, the viewer directly encounters an interactive floor piece of approximately twenty rounded, baseball-to-toddler-sized, stone-like objects in mottled greys. These forms, somewhere between egg and oyster, are meant for physical engagement.

On the wall behind this field of forms, a 44-inch round painting in dark grey, deep purple, dark blue, red, and ultramarine conveys a surprising depth of field. Upon closer inspection, the painting's waxy surface has been carved into and embedded with a ground mirror. It glitters and sparkles as the viewer moves in physical relation to it.

A pair of bronze feet emerge from the wall near the floor. One foot is almost wholly visible, the other little more than toes protruding from the wall. Around the corner is a bronze hand holding an old waxed rope at approximately waist height. The rope has oddly shaped bronze handles on each end. One end of the rope dangles from the hand, and the other pools on the floor.

Filling the large corridor of SPG is an installation of grey fabric hanging from the ceiling that presents a clear opening inward. Its horizontally transparent middle section is a subtle collage of digital imagery. The light and airy fabric stretches from the floor almost to the ceiling. Lit only at the centre and from the ambient light so that the transparent fabric is seen with greater clarity, the viewer can enter the pathway, which spirals toward the centre and out again along a different path, its exit curtained to signify the exit in relation to the path's opening.

Finally, in the window, a long, narrow table lined with a rich ultramarine velvet paper holds smaller, palm-sized versions of the rock-like forms from the floor piece, except these are a glossy collection of natural colours: yellow, green, blue, beige, and opalescent grey.

ACKNOWLEDGEMENTS

To the adage, “We stand on the shoulders of giants,” paraphrased from Isaac Newton’s comment, “If I have seen further, it is by standing on the shoulders of Giants,” I would add that from that privilege and perspective, it is our responsibility to hold each other up. Thank you to all who have supported me during this journey. There are far too many to name individually, but I hope that, in some small way, I have reciprocated.

Thank you to my family for their unwavering support and encouragement. Specifically, I extend my gratitude to my children, Leia and Logan Nolan, for their patience while I undertook this challenge, which took me away from home more than before. To Chad and Patsy Nolan, thank you for your understanding and for supporting me in following my dream.

To my friends who are like family—Abby Kettner and Anthony Zuppinger—who showed up time and time again with knowledge and support, I am deeply grateful. Thank you for always being the smartest people in the room and for pushing me to think beyond my limits.

A heartfelt thank you to my York University thesis committee: Professors Brandon Vickerd, Archer Pechawis, and Wendy Taylor. Archer, thank you for recognizing the heart and spirit of my work when others did not. Brandon, I appreciate your guidance in keeping me on track and your sound advice throughout this process. Wendy, thank you for taking a chance on advising an artist who struggles with math and for helping me navigate the complexities of science. Your patience and enthusiasm for my work meant more than you know. I thoroughly enjoyed your lectures—apologies for all the interruptions! Your guidance made me feel safe to move forward.

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To my MFA cohort members—Andrew Atanasoff, Colin Arthurs, Heather Rattray, Samantha Newton, Shannyn Reid and Shannon Garden-Smith—thank you for making my time at York University easier, lighter, and full of shared knowledge and authentic feedback.

Lastly, I extend my gratitude to artist John Notten for his generous donation of key materials and thoughtful conversation. I also acknowledge the profound influence of theorist and physicist Karen Barad, inventor Paul Schatz, and artist Robert Morris on my thesis.

PERSONAL STATEMENT

I do my best to live in alignment and respect for all that surrounds me. It is important to note that although I was born here, I am a settler who is deeply grateful to live and work in Tkaronto, Canada. This land is the traditional territory of the **Anishinaabe** peoples, including the **Mississaugas of the Credit**, the **Haudenosaunee**, and the **Wendat**. This acknowledgement is not just a formality, and certainly not a move to innocence (Tuck, 2012), but a profound recognition of the enduring relationship that Indigenous peoples have with this land, one that I attempt to honour by educating myself about Indigenous culture, traditions, and concerns, and listening to learn when given the opportunity. I am committed to unlearning the cultural propaganda of my youth. True decolonization requires 'land back' as a literal action, and though I do not understand how that would work, I understand why it is requested. Our society is on the path of acknowledgement. However, it may take a generation or more to sink deep enough that the socio-political landscape is prepared for meaningful reparation and reconciliation.

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HOW THE LIGHT GETS IN

Humanity has long sought to understand itself by looking outward at the universe, inward at the building blocks of existence, and beyond the boundaries of comprehension. This project is an invitation to pause and consider the smaller, quieter dimensions of being. *How the Light Gets In* seeks to inspire introspection on our embodied existence and our relational connections to the world.

This research-creation project merges scientific insights and philosophical inquiry with artistic expression to evoke an embodied understanding of our interconnected existence. Artist Robert Morris's observations on scale provide a useful framework: he argues that our physical relation to art impacts how we experience it. Sculptures much larger than us evoke monumentality, those much smaller invite intimacy, and works in between relate directly to the scale of our bodies. My work intentionally challenges perception in subtle ways, navigating these scales to provoke a range of responses—from awe to intimacy—mirroring the contrast between the vastness of space and the minuteness of particles.

The consideration of our particle nature raises profound questions about what it means to inhabit a body as a perceiving being. If all matter is inherently entangled, does this diminish the significance of individual perspective, or does it make it even more essential? I explore the notion that a relational reframing of self—as an entangled entity—fosters deeper communal connections, extending beyond the human to encompass the nonhuman and more-than-human.



Even as the Dust Moves (detail) 2023, bronze, jute string, copper coloured wire, sand. Installation variable.

One of the most impactful pieces from my BFA exhibition was *Even as the Dust Moves*, one of three cast-metal works exploring our relationship to time. The piece is a meditation on linear time, consisting of three strings of bronze maple keys suspended over beds of sand. I chose maple keys because they are ephemeral seeds of immense potential, which I cast in a material that conveys monumentality.



Even as the Dust Moves 2023, bronze, jute string, copper coloured wire, sand. Installation variable.

In creating this piece, I reflected on our *significant insignificance*—the fragility and brevity of our lives, yet the incredible potential within each of us and within each day. I considered the possibility held in every breath, every action taken or not taken, and how these moments shape the landscape of our lives across linear time.

Although I did not originally intend for *Even as the Dust Moves* to be interactive, the work itself demanded engagement. When viewers move the strings through the sand, they create a sparkling, hopeful sound. A video of the work in motion can be viewed at the following link:

<https://youtube.com/shorts/UqNqyTUA8dA?si=mLbtFyjh7lq-CDgQ>.



Even as the Dust Moves (detail) 2023, bronze, jute string, copper coloured wire, sand.
Installation variable.

Understanding that we are both significant and insignificant offers me solace, as well as emotional and psychological balance, as I reckon with my personal experiences.

I carried seeds of research and the sprouts of ideas from my BFA thesis directly into my MFA research. Applying to an MFA program at York immediately after completing my BFA was a natural decision for a mature student eager to continue making work and begin teaching. I knew I remained deeply interested in human perspective, existential thought, and the culturally ingrained separations between humanity, nature, science, and spirit. Materially, I knew I was hooked on interactive art and wanted to further explore its possibilities, primarily within sculpture and installation.

The themes of scale and perception that emerged in my BFA thesis continued to percolate in my mind, feeding my intuitive and iterative creative process. I also delved into quantum physics, examining the physicality of scale—from the atom to the organism—as another lens through which to investigate our perceptions of being.

A RHIZOME, AN OCTOPUS, EVERYTHING EVERYWHERE ALL AT ONCE: METHODOLOGIES IN ART AND THEORY

Just as a rhizome branches endlessly, my research and creative practice extend in multiple directions simultaneously. I value material as much as method and form, finding threads of meaning throughout each, particularly in how they correlate.

In this research-creation project, I began by asking: *What is a particle? What is a neutrino? What lies within the vast emptiness of the electron cloud? How can I abstract these scientific mysteries for viewers? What are the implications of quantum entanglement on time and consciousness? How might this inform an entangled, holistic comprehension of being—one that is inclusive of spirit?*

In my creative process, I lean into poetry and abstraction because the alternative—especially when attempting to distill complex scientific concepts—runs the risk of being overly didactic, so direct that it loses the qualities of openness that elicit connection. This work is a hybrid of scientific understanding—the quantifiable—and human experience—the qualitative. As such, it must straddle both.

Artistically, I grapple with whether immersive or interactive works are more effective in conveying these ideas, constantly experimenting and iterating to find answers. This approach resonates with Deleuze and Guattari's concept of the rhizome: "A rhizome has no beginning or end; it is always in the middle, between things...The tree imposes the verb 'to be,' but the fabric of the rhizome is conjunction, 'and...and...and...'" (Deleuze 1987, 25).

These ideas reflect the overlapping, non-linear nature of my work, where each choice opens new connections rather than closing possibilities. My practice unfolds rhizomatically, refusing to settle into a single material or form. This approach mirrors the theoretical framework of my research-creation project, which weaves together Posthumanism, New Materialism, Agential Realism, quantum mechanics, physics, philosophy, and consciousness studies. These threads converge on questions of being and relationality, offering fertile ground for the exploration and consideration of the interconnectedness of existence.

My methodologies are grounded in *making-as-meditation* and *making-as-healing*. I create from a place of reflection, in relation to my experiences, thoughts, feelings, and the world around me. As such, my methods are inherently embodied.

Relationality as a methodology is discussed in depth in Shawn Wilson's book *Research is Ceremony*. Similar to physicist and feminist theorist Karen Barad's notion of response-ability—where response is an innate action rather than something we are compelled to do—Wilson's concept of relationality is equally embodied: "Rather than viewing ourselves as being in relationship with other people or things, we are the relationships that we hold and are a part of" (Wilson 2008, 80).

Professor Stephanie Springgay's concept of *feltness* also describes relational engagement. She defines it as a methodology of "intimate pedagogies of touching, of transcorporeal-affective force" (Springgay 2022, 3). Feeling and feltness, in this sense, are ways of being in relation.

My interactive works invite viewers to engage relationally—with the art, their bodies, and their phenomenological sense of being. I hope they find an embodied experience in relation to the materials and forms. By prioritizing feltness through abstraction rather than narrative representation, I aim to spark connections that bypass cognition and tap into the relational, emotional core of experience—a deeper knowing.

I strive to engage with these principles in ways that are both respectful and decolonial. Doing so requires consciously situating my practice within a broader framework of relationality while acknowledging the ongoing generativity of Indigenous knowledge—such as the understanding of the interconnectedness of all things—despite centuries of colonial oppression.



Oloid engagement during December 2024 critique in SPG.

DANCING WITH MY SHADOWS: MAKING AS HEALING

I grew up in a middle-class family in the suburban—though thankfully not overly white—neighbourhood of Scarborough, Ontario. While growing up in the eighties, free from digital distractions and with the freedom to roam, had its advantages, the darker sides of ingrained misogyny, rape culture, and the neglectful parenting that earned Generation X the label of *the lost generation* weighed more heavily than the idyllic simplicities with which nostalgia paints that era. Despite having the basics—food, clothing, shelter, birthday parties, and summer activities—I lived in a constant state of fight or flight, experiencing multiple traumatic events that placed my life in jeopardy and compromised my personhood and agency.

By the time I was 16, I was suicidal. I had already endured two medical traumas, several sexual assaults of varying “seriousness” (all from different perpetrators), multiple car accidents, and an attack outside my front door. I made the choice to live, but the roadblocks I encountered—combined with my psychological conditioning and the long, unsupported journey of healing—left me continually wrestling with why I wanted to live and how to make the best of my situation. I came to understand that time was not something I could recoup; I could only move forward, one moment, one response at a time. I found echoes of this hard-earned wisdom and great solace in the words of T.S. Eliot’s *Burnt Norton*:

"Time past and time future

What might have been and what has been

Point to one end, which is always present." (Eliot 1963, 190)

As I grew and healed (an ongoing process), I began questioning why we are here and the ways in which we exist. These questions, I later realized, aligned with classic existentialist inquiries into authenticity—being faithful and accountable to oneself and one’s actions—alienation and isolation, the search for meaning in a world often devoid of it, and, ultimately, the recognition of death as a central aspect of human existence that gives life its weight and urgency.

We live our human lives in the lacuna between truth and meaning, between objective reality and subjective sense-making laced with feeling. All of our longings, all of our despairs, all of our reckonings with the perplexity of existence are aimed at one or the

other. In the aiming is what we call creativity, how we contact beauty—the beauty of a theorem, the beauty of a sonnet. (Popova 2024, 1)

Existentialism asks us to find our purpose in a world that offers no universal answers, urging us to confront life's uncertainties, choices, and inherent lack of meaning. Most of my reflections led me to one realization: tomorrow is not promised. Each day's actions present a gift—an opportunity to effect change.

Working through my trauma instilled in me a pro-social disposition and a deep fixation on existential thought: What does it mean to be alive, to be conscious, to be in a body, to be in time, to be in connection? A key way I have processed—and continue to process—my trauma is through making.

Many artists create as a means of processing trauma, employing embodied, reflective, and meditative methodologies. Writer Kathy Acker compares repetitive, focused actions to entering a sacred space, like crossing the threshold of a gym, where meditative states are achieved through visualization and effort (Acker 2018). This resonates with my labour-intensive methods, such as repetitive mark-making and the creation of multiples. In Vedic texts, meditation is described as expanding consciousness, dissolving duality, and fostering unity—an experience that transcends the individual self and occurs without the mind's direct intervention (Sharma 2015). Similarly, repetitive, labour-intensive tasks function as meditation for me, immersing me in my body and the present moment, allowing thought to dissolve into a state of being. Through these meditative states, my practice facilitates healing and insight, dissolving the individual self in order to connect with something larger.

Yayoi Kusama's philosophy of repetition aligns with my own approach to making. Her meticulous repetition of dots symbolizes both unity and obliteration, dissolving boundaries between self and environment. Through repetition and the closed form of the circle, I explore cycles, portals, and unity as well.

Kusama views her polka dots as a representation of infinity and entanglement: "Our earth is only one polka dot among a million stars in the cosmos. Polka dots are a way to infinity. When we obliterate nature and our bodies with polka dots, we become part of the unity of our environment." (Yoshimoto 2005, 72)

She has explored this theme throughout her career, shifting between abstraction, didactic figuration, performance, and happenings. While she looks outward, I look inward—where every atom is a star, every being a galaxy within the infinite.



Yayoi Kusama. *Self-Obliteration*, 1966-1974. Painted mannequins, table, chairs, wigs, handbag, mugs, plates, pitcher, ashtray, plastic plants, plastic flowers, and plastic fruit. Dimension variable (Woo 2023).



Yayoi Kusama. *Accumulation of Stardust*, 2001. acrylic on canvas, three panels. 194 × 390 cm. (Corder 2017)

Karen Barad echoes this sentiment, emphasizing that the self is dispersed, entangled, and threaded through with what lies outside it:

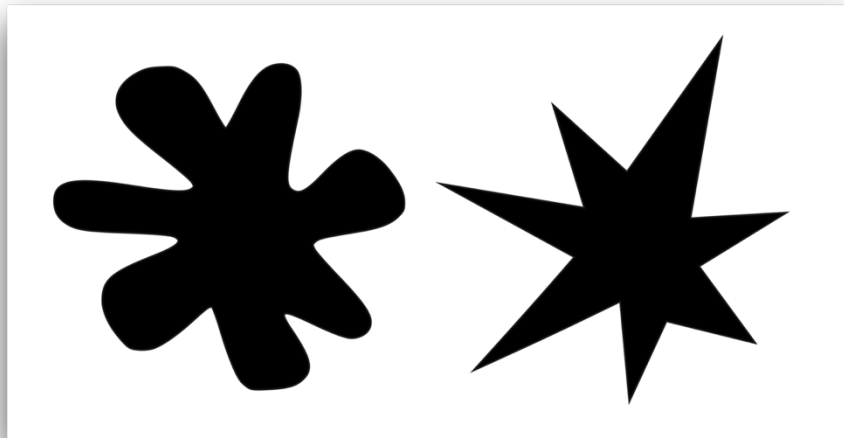
The self doesn't hold; the self is dispersed in an un/doing of self as a result of being threaded through by that which is excluded. There is no absolute outside; the outside is always already inside. In/determinacy is an always already opening up-to-come.

In/determinacy is the surprise, the interruption, by the stranger (within) re-turning un-announced. (Barad 2014, 178)

This philosophy informs my practice, which seeks to reflect the entanglement of existence—both within and beyond the self. It also echoes many ancient traditional philosophies.

Through a *rhizomatic methodology*—expansive, iterative, and deeply relational—I strive to reveal the interconnectedness of being. I offer viewers a space where art becomes a conduit for healing, reflection, and entanglement, bridging scientific, philosophical, and spiritual perspectives on existence. By inviting engagement through feeling and relationality, my practice aspires to open portals to understanding that transcend the limits of language or thought.

The *Takete-Maluma Phenomenon* is a linguistic phenomenon in which certain nonsense words are consistently associated with specific shapes (Neilsen 2011, 115). The most well-known example is the *Bouba-Kiki Effect*, where participants, when given a sharp, angular shape



Bouba and Kiki, these shapes illustrate and define this effect (Marian 2023)

and a rounded, bulbous one, overwhelmingly assign *Bouba* to the round form and *Kiki* to the sharp one. "Researchers have demonstrated a correspondence between words and shapes. Dubbed the 'Bouba-Kiki' effect, these auditory-visual associations extend across cultures and are thought to be universal." (Fryer 2014, 164)

In light of this, I propose that while material holds meaning through its signification, the abstraction of form may elicit a more universal response—much like *Bouba* and *Kiki* do linguistically.

My natural inclination toward *rhizomatic methodologies* has been reinforced by bridging scientific and spiritual understandings of existence, weaving together theory, materiality, and process to create works that invite immersive, relational engagement with the world and oneself.

I am a survivor and an artist who knows a little about a lot of things. I am not a scientist or philosopher, but I deeply respect and appreciate the long-scaffolded lineage of knowledge built by those who are. My interests and experiences converge to produce art that responds to philosophical questions about being—questions that, like a rhizome, continue branching into new explorations.

Are we the universe made conscious?

Are we, then, the universe engaging with itself?

If so, let this body of work be an invitation to play.

CONSCIOUSNESS MATTERS AND MATTER MATTERS

I am not the first to explore the application of quantum physics concepts across disciplines. My research has shown that ideas and implications of quantum physics are being drawn upon in various fields, including sociology, psychology, social justice activism, and facilitation. Investigating this cross-disciplinary richness, I first turned to adrienne maree brown's *Emergent Strategy: Shaping Change, Changing Worlds*, a book on social justice and grassroots change that metaphorically applies principles from physics—such as fractals and emergent patterning—to illustrate how change occurs in complex adaptive systems without a singular body in control (Brown 2021). In relation to my research, what could be more grassroots than the emergence of individual perspectives shifting toward collectivity and connectivity?

Regarding the role of consciousness in inhabiting a body as a perceiving being, I found Robert Lawrence Kuhn's comprehensive paper, *A Landscape of Consciousness: Toward a Taxonomy of Explanations and Implications*, particularly illuminating. Kuhn introduces theories of consciousness and their connections to philosophy and quantum physics (Kuhn 2024). Theories such as Panpsychism, Monism, and Dualism explore the connectivity of our existence at a subatomic level and present different notions of how quantum physics and the fundamental fabric of matter relate to consciousness.

- Panpsychism posits that “the essence of mentality, awareness, and experience is a primitive, non-reducible feature of each and every part or aspect of physical reality, similar to the fundamental fields and particles in physics” (Kuhn 2024, 100).
- Monism asserts that all of reality is, in some sense, one concrete object or entity (Kuhn 2024, 104).
- Dual aspect monism distinguishes between the material and mental (or consciousness) aspects of reality (Kuhn 2024, 106).
- Dualism suggests that the human mind, or consciousness, is independent of the body and separate from the physical world.

In the chapter on monisms, neuroscientist V.S. Ramachandran questions the role of consciousness in relation to physics:

Physics, by definition, is a third-person description of the world; its laws have no subjective quality at all...How can physics, including neuroscience, be a complete description of the world if it excludes my primary sensory experience, if it does not admit a first-person perspective? ... Consciousness is part of reality, but how it entwines with physical laws needs to be explored. (Kuhn 2024, 108)

Kuhn's paper presents a network of possibilities regarding the role of quantum mechanics in the study of consciousness and being. It has been an invaluable resource in understanding how quantum physics helps define the connectivity of our existence with everything around us.

Reflecting on and drawing from principles of quantum physics—particularly through the mirroring lenses of entanglement and complementarity—I have been creating works that consider form, colour, scale, and texture, exploring the tensions between our physical nature and conscious experience as they exist in contrast and indeterminacy.

My larger installation work, *Landscapes of Consciousness*, explores our state of embodied consciousness and its inherent indeterminacy. This work evolved from a previous piece, *Under the Sun*, which I created for the 2023 Artist Project OCADU Career Launcher commission.

A key aspect of *Under the Sun* involved digitally printing on crinkled chiffon, a process that challenged my experience of visual perception. Though it is possible to see both the print and



Under the Sun 2024, bronze, jute string, copper coloured wire, sand, painted tondo, crinkled chiffon, steel rod, cedar, Toja Grid system, 8'H x 12'L x 6'W.

what lies beyond it simultaneously, I found that to see the print clearly, one must consciously shift focus toward the printed image, and the same applies when trying to see beyond the print. To me, this represents the importance of awareness in shaping our perspectives. It acknowledges that without conscious participation—without openness to perspective shifts—we may never *see the forest for the trees*. Attempting to see everything at once only reveals indeterminacy.

In *Landscapes of Consciousness*, swaths of semi-transparent crinkled chiffon hang from the ceiling, forming a spiral walking path that doubles back on itself. Digital printing on the fabric obscures transparency, inviting participatory, embodied investigation and reflection on the limitations of perception within our semi-permeable bodies of energy and matter. The piece references analogies to entanglement and quantum indeterminacy.



Landscapes of Consciousness, 2025, digitally printed crinkled chiffon, polyester, steel, wire.



Digital collage for Panel 3 of *Landscapes of Consciousness*.



Digital collage for Panel 11 of *Landscapes of Consciousness*.

A horizontal transparent section—comprising digitally printed images from the James Webb Space Telescope (JWST), my personal photographs, and blackboard drawings of electron orbital shapes—runs throughout the walking path. Dark grey opaque fabric extends approximately two feet above and four feet below the transparent section.

As an object, the installation provides a simplistic visual that changes as one moves through it, yet it transforms entirely when another person is encountered on the other side of the veil. How do visual and emotional perception, as well as personal comfort, shift when another consciousness enters one's perspective?

Consciousness is intimately tied to our emotions and energy fields. We have all experienced how some individuals bring light into a space, while others bring tension or the weight of ego. While consciousness extends beyond us, our thoughts and feelings remain cloaked in the perceived boundary of individuality. *Landscapes of Consciousness* provides an abstracted experience of consciousness within the semi-permeable bounds of the body, considering the entangled permutations and limitations of intra-actions.

Through this work within my research-creation project, I investigate the complementarity of human existence—how we simultaneously exist as entangled networks of matter at a subatomic level and as seemingly solid, individualized beings in our conscious perception. This contrast invites reflection on the nature of being, challenging us to embrace both perspectives and consider the richness of collectivity and entanglement.

KEY MATTERS OF REFLECTION

All things on Earth, including us, are made up of matter. Matter consists of atoms, each containing a nucleus and an electron cloud. Electron clouds are probability fields indicating where electrons might be in relation to the nucleus. The nucleus itself contains neutrons and protons—subatomic particles that break down into even smaller components (Still 2018, 16–17). Atoms have different numbers of electrons, neutrons, and protons, which determine their placement on the periodic table. Humans are primarily composed of carbon, hydrogen, oxygen, and nitrogen atoms.

A turning point in my work occurred when I realized—through my research and discussions with my advisor, Professor of Physics Wendy Taylor—that I was not fully grasping the infinitesimal size of an atom and the vast expanse of "empty" space that an electron cloud forms around the nucleus, the main matter within an atom. With wonder and curiosity, I pursued this insight, as it helped me better understand the fluid nature of our particle composition, challenging the perception of solidity. It allowed me to imagine my physical existence at a subatomic scale—a reality beyond the capabilities of my phenomenological perception.

The nucleus is minuscule in comparison to the electron cloud, and the electrons are even smaller than the nucleus. Grasping the scale of the nucleus within the atom and the vastness of the electron cloud relative to the minute amount of actual matter in the nucleus was surprisingly difficult. The relational scale is challenging to comprehend. The clearest representation I have encountered compares the nucleus to a peanut at the centre of a baseball field, which represents the electron cloud.

But how small are atoms exactly? The estimated number of atoms in the human body is staggering—7 billion billion billion—an inconceivable figure for those without an affinity for mathematics (Dove 2023). To put this in perspective, if we were to disregard the "empty space" in each atom, the total matter of humanity (mainly the nuclei of all human atoms) would fit inside a slightly oversized sugar cube (Dove 2023).

Nevertheless, we perceive ourselves as solid because of our Umwelt—the framework that defines the limitations of our physical perception. Our Umwelt encompasses the phenomena we experience through our five senses: sight, sound, taste, touch, and smell. These sensory inputs are processed by our consciousness.

In *An Immense World*, Pulitzer Prize-winning author and scientific journalist Ed Yong writes:

The Umwelt concept can feel constrictive because it implies that every creature is trapped within the house of its senses. But to me, the idea is wonderfully expansive. It tells us that all is not as it seems and that everything we experience is but a filtered version of everything that we could experience. It reminds us that there is light in darkness, noise in silence, richness in nothingness (Yong 2022, 14).

Light in darkness. Richness in nothingness. Perspectives like these are the ultimate in inclusivity, complementarity, and connectivity—holding contrasting realities and truths simultaneously. They open the door to prosocial perspectives.

T.S. Eliot observed, "Humankind cannot bear very much reality" (Eliot 1963, 190). Life is experienced through both a socio-ontological and a phenomenological lens, creating a rich tapestry of individuality within our collective humanity. This philosophy informs my practice. I aim for my work to foster connection and to be felt before it is understood, creating an emotional impact that lingers in memory. Art is experienced through an individual's senses, but without considering the secondary filter of individual consciousness and personal experience, its effect may become utilitarian and sterile. Art's strength lies in its ability to transcend language, offering experiences that resonate on an instinctual level—perhaps easier to bear if they are not didactically clear. By encouraging reflection on the complementarity and interconnectedness of our existence through form and embodied experience, I aim to create not just art but an experience—a moment where science and poetry meet, resonating within each viewer as a deeply felt understanding of our shared reality.

Rather than directly illustrating scientific principles, I strive to create works that resonate on an existential level, encouraging reflection on what it means to *be*. As Ursula K. Le Guin eloquently states: "Science describes accurately from outside, poetry describes accurately from inside. Science explicates, poetry implicates. Both celebrate what they describe" (Le Guin 2016, ix). I aim to create works that hold both perspectives simultaneously—acknowledging scientific

principles while resonating poetically—crafting a space where science and visual poetry converge.

One of my key entry points into scientific inquiry, which triggered significant existential reflection, was reading *Underland* by Robert MacFarlane. In his exploration of the subterranean world, he describes how countless particles pass through our bodies every second, including *100 trillion neutrinos* (MacFarlane 2020, 69). While interviewing a young physicist researching dark matter at Boulby Laboratory—over a kilometre beneath the Earth’s surface—MacFarlane asked: “Does it change the way you feel about matter—about what matters?” (MacFarlane 2020, 69). The physicist's response resonated deeply with me:

When I am out for a walk with my wife along the clifftops near here on a sunny day, I know our bodies are wide-meshed nets, and that the cliffs we’re walking on are nets too. Sometimes, it seems as miraculous as if, in the everyday world, we suddenly found ourselves walking on water, or air. And I wonder what it must be like, sometimes, not to know that. ... But mostly, and in several ways, I’m amazed I’m able to hold the hand of the person I love (MacFarlane 2020, 69).

The concept of particles constantly flowing through us captivated me, leading to one of my first discussions with Professor Taylor. While neutrinos provide fascinating threads for future investigation—including neutrino-emitting bananas—the deeper value of this research lay in expanding my perception of our existence, incorporating an awareness of our permeable materiality. Scientists accept this reality but may not always connect it to existential, philosophical, or metaphysical concerns. People often carry immense knowledge within their specialized fields, yet much of it remains unknown to the broader world.

This inquiry into the physical nature of our being led me to phenomenology. Philosophically, phenomenology examines how consciousness filters our perception of the world, while scientifically, it considers phenomena independent of nature itself. Historically, humanity has often positioned itself as separate from nature.

“And whereas it had been believed that knowledge is to be acquired through nature and the meanings discernible therein, it is now believed that knowledge of Nature results from applying human reason to discern the necessary form of Nature” (Evernden 57).

This perceived separation—as though we are not animals or part of nature’s fabric—has led to profound disruptions. This ideology, which positions humanity outside of nature, is one of my biggest philosophical critiques of science. While such a perspective may hold logical merit, when applied universally, it creates unnecessary barriers and hierarchical thinking. In reality, we are an integrally entangled part of the world, not apart from it.

In relation to the land, we live brief lives, yet our collective impact reverberates across generations—within hearts, minds, bodies, and environments. Generational trauma influences individuals and cultures just as the physical environment bears the lasting imprint of human activity. Consider the politically debated origins of the “Golden Spike”—a geological marker defining humanity’s lasting impact on the Earth’s strata. After an extensive global search, Ontario’s Crawford Lake was identified as the site for this marker, signifying the transition to the Anthropocene epoch (Mitchell 2024). However, the designation was denied, seemingly due to political considerations. Regardless of the formal classification, the reality remains: irrevocable change has sedimented itself into the land and our very cells (Murphy 2017).

My father, a biology teacher, often took me to educational retreats at conservation centres. These experiences—group night walks to learn about the stars, fall forest walks to explore the connectivity of ecosystems—shaped my profound connection to the land. They were not just formative memories; they established part of the foundation of my artistic and philosophical inquiries. Making art and engaging with the land were the most meaningful parts of my childhood.

LOOKING OUT WHILE LOOKING IN

While wrapping up my BFA, I watched with wonder as images emerged from the James Webb Space Telescope (JWST). Just as it is incomprehensible to grasp the nature of our physical structure at an atomic and subatomic scale, it is equally challenging to conceptualize how telescopes like the JWST not only look outward into space but also back in time. Launched on December 25, 2021, the JWST allows us to see further back toward the Big Bang. Alongside the wealth of new and exciting data it has provided, it offers refined imagery and deeper insights into regions of the galaxy—and beyond—that we have studied for decades. The JWST enables scientists to examine not just the materials that exist in space, but also how they exist across time.

Physically, we are composed entirely of stardust. By looking out and back, we are also, in a poetic sense, looking within—toward the origins of all life.

Inspired by the imagery emerging from the JWST and my BFA thesis, *Significant Insignificance*, my encaustic piece *Cartographies of Perspective* began to take shape. Though I started working on it as my BFA was concluding, it became a foundational seed in my MFA body of work. I completed the piece during my first year of my MFA, just in time for it to be exhibited in *Light Years* at York University's Gales Gallery in September 2024.

Cartographies of Perspective is a tondo (round canvas) covered in encaustic paint, with embedded layers of ground mirror forming a textured cartography. It is a meditation on perspective—on how we look outward to the cosmos and inward to our consciousness, discovering reflections of the same profound truths in both realms. The piece explores the convergence of cosmic wonder, embodied experience, and technology through materiality and reflection, situating the viewer at the intersection of these explorations. It challenges them to navigate landscapes that are simultaneously physical, metaphysical, and technological.

The work began with encaustic layers in red, purple, blue, and black—colours evoking the celestial images captured by the JWST. Encaustic paint, with its luminescence and physical depth, creates a tactile, almost bodily presence. As I progressed, reflecting on the telescope's images, I began to imagine the stars as something even more sculptural than the wax itself.

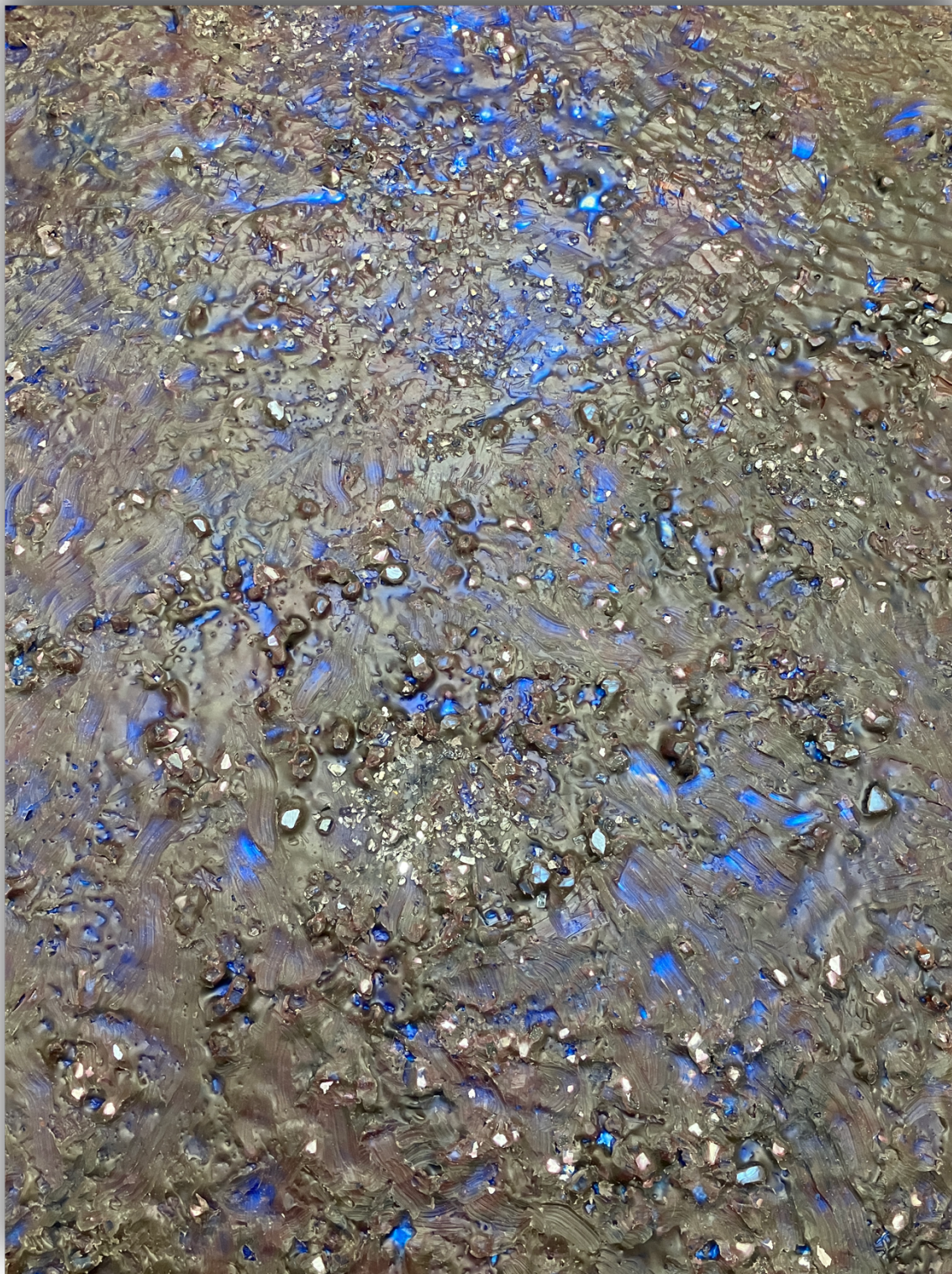
Shortly afterward, while cleaning my studio, I came across a container of crushed and ground mirror. Intuitively, I knew these fragments would become my stars. There was a

conceptual poetry in using mirrors to represent stars in a work about looking out while looking in.



Cartographies of Perspective 2024, wood panel, encaustic paint, ground mirror. 44" tondo.

After initial material research, I realized that smaller pieces of mirror would be more effective. Using a sieve, I separated the finer shards. Once I had applied most of the mirror pieces, I layered additional encaustic paint to secure them in place. This set the stage for the intensely laborious and meditative process of excavating the mirror surfaces—a process that, in itself, mirrored the act of looking outward and inward.



Cartographies of Perspective (detail) 2024, wood panel, encaustic paint, ground mirror. 44" tondo.

The transformative act of excavation plays a pivotal role in this piece. Using a wooden carving tool, I scraped away layers of wax to expose the embedded mirror shards, occasionally digging deep enough to reveal glimpses of the wooden substrate beneath. This process of excavation mirrors the way we uncover truths about ourselves and the universe—through removal, revelation, and reflection.

The exposed mirrors, shimmering within the encaustic layers, evoke celestial landscapes and vast star fields. They invite both close observation and broad perspective, embodying the intimate yet infinite nature of existence. The mirror, as an object, inherently reflects the viewer, subtly positioning them within the piece. If we look deeply enough, the mirror allows us to regard *the other within*. But can we ever truly see ourselves clearly from within?

This question applies as much to the individual as it does to the collective. Here, we encounter the hard problem of consciousness—the question of how subjective experiences arise from the physical and chemical workings of the brain. Writer and knowledge curator Maria Popova, creator of *The Marginalian* (Popova 2025), which explores intersections between art, science, and philosophy, poetically touches on this challenge in her recent book, *The Universe in Verse*:

It is an incomprehensible notion for the human mind to grasp—the human mind, itself made of atoms that were once part of particular stars, now constellating into molecules and cells firing electrical charges between neurons at eighty feet per second to produce the spark of thought, thought that cannot apprehend how everything we know, everything we love, everything that ever was and ever will be, was once compressed into a sideless, senseless dot. To come to terms with this elemental fact is to see ourselves—our inheritance and our interbelonging, our insignificance and our sanctity—with cleansed eyes, lensed with wonder and tenderness (Popova 2024, 6).

The hard problem of consciousness—the fundamental question of *being*—remains a significant challenge in understanding our existence. In many ways, we are unable to see the forest for the trees. Much like how we struggle to fully grasp a moment while we are living in it,

we cannot entirely comprehend our *Being* because we are integrally part of it. However, by acknowledging the inherent indeterminacy of our perception, we might move closer to understanding. Even an absence should be counted.

My artistic practice often follows this logic. I respond intuitively to form and material, only fully comprehending what I have created through reflective distance—when my work reveals an inner knowing I may not have immediately recognized. Trusting my artistic instincts is a kindness I have cultivated over time, even when it brings fear or feels overwhelming.

With each new process I learn, I find reassurance in knowing that my technical skill will support me where other aspects falter. Perseverance is another strength I rely on, guiding me through uncertainty. But above all, I have learned not to move into action until I feel an undeniable inner pull—a knowing that overrides the doubts that arise as I begin to create.

During the artistic process of ideation and material research, the rivers of possibility often feel more overwhelming than the intuitive path itself. Yet, when the moment of action arrives, it is unmistakable. That moment—when instinct, material, and vision align—is when the work truly begins to unfold.

FOLLOWING THE INTUITIVE PATH

Within my research-creation project, a prime example of my intuitive methodology—based on recognizing and responding to a deep inner knowing—is the development of my electron cloud painting, *The Heart of the Matter*. Consider the single peanut on a baseball field as a representation of the scale of a nucleus to its electron cloud. As a one-to-one visualization, this comparison becomes entirely impractical and unreadable—especially within the size constraints of gallery walls, where the nucleus would be reduced to an imperceptible pinprick. My conversations with my advisor, Professor Taylor, were instrumental in coming to this realization. Even with the elevated wall height of Gales Gallery, the nucleus would still appear as a mere dot.

I then understood that abstraction would be necessary and deepened my research into atomic structures, electron cloud patterning, and carbon atoms—the fundamental building blocks of life. I explored layering paints, spray, and acrylic on wood tondos (round substrates) and then deconstructing them to evoke a sense of space through hazy layers. I considered working on wood tondos using pyrography and gold leaf. I also contemplated the conceptual clarity of using charcoal directly on the gallery wall as the most direct material representation of a carbon atom. Over a year and a half, I mulled over these and other possibilities, yet no single approach compelled me to action.

At one point, I mentioned to Wendy that the electron cloud painting would be a welcome addition to the show, but given the number of works already in progress, it was not a necessity—despite originally being one of the first pieces I had conceptualized. Despite extensive conceptual and material research, I felt completely stuck. Several potential pathways toward completing the work existed, yet none felt quite right.

Over Christmas break, I secured the use of SPG to take measurements and experiment with my works in progress within the space. While sourcing materials for another project, I purchased a felt carpet underlay—an option that quickly proved unsuccessful. It was the last object I was clearing out of the gallery before the holiday ended, but instead of discarding it, I found myself on my hands and knees, attempting to cut a balanced oval. Though I had no clear direction, I knew instinctively that my first cut was too large. Adjusting it to the correct size, I immediately felt that the grey was too light. I took it home, unsuccessfully attempted to dye it, and eventually returned to the gallery to coat it in black gesso. Since the felt was still damp in

some areas, the gesso soaked through unevenly, creating a lighter horizontal band across the middle.

Once I had the piece in my studio, I knew it was meant to become the electron cloud painting. Yet, what happened next surprised me even further: I painted my children—though they are teenagers now. I selected two recent photos of them, each taken in good lighting while they were alone, and in both images, they were deeply engrossed in their phones. As I painted, I continuously questioned what I was doing but still trusted the process.



The Heart of the Matter in process.

As the piece evolved, I began reflecting on the electromagnetic fields surrounding people, the waves emitted by their devices, and the electromagnetic cloud around a nucleus. It was then that I realized I could visualize these phenomena through embroidery. The interplay of embroidery and painted felt created a distinct visual frequency that pleased me.

I embroidered a small red heart between my children—representing the nucleus, though it is subtle enough that few will notice. Over the entire composition, I will embroider a representation of an electron cloud. I have sacrificed a great deal for my studies over the past seven years, particularly with the demands of my MFA. I miss my children, and I am becoming too skilled at parenting from a distance. This is why I included them in this work and one of several reasons I titled it *The Heart of the Matter*.

Currently, the work is in its early embroidery stage. The painted felt has a beautiful static fuzziness that evokes a sense of perspective and indeterminacy, while the embroidery appears to hum atop it. I am unsure whether the piece will be included in the exhibition, but I am grateful that it has finally taken form. Now, I just need to finish it!

Sometimes, artworks do not emerge fully formed. Some fail, some are shelved for later, and some remain unfinished indefinitely. Occasionally, a work is created in tandem with others that share the same conceptual or material roots, yet diverge enough in execution that they become the foundation for a separate body of work.

One such work within my MFA research-creation project is *The Unboxing of Man*. This piece involves deconstructing Da Vinci's *Vitruvian Man* by creating nearly 100 organic, tree-inspired forms enclosed within circles. These forms, cast in a diverse range of materials—including porcelain, bronze, felted and flocked PVA plastic, and wax—invite materially rich reflections on specificity within collectivity and interconnectedness. The forms are designed to be nestled within an entwined body of copper, symbolizing



Process work for *The Unboxing of Man*.

a loose notion of quantum entanglement and corresponding physical and sociocultural entanglements imagined as a discursive network of relationality.

“Each bit of matter, each moment of time, each position in space is a multiplicity, a superposition/entanglement of (seemingly) disparate parts. Not a blending of separate parts or a blurring of boundaries, but in the thick web of its specificities” (Barad 2014, 176).

Superposition suggests that quantum systems exist in multiple states simultaneously until measured—a concept rich with analogy to *Being*.

Aesthetically, *The Unboxing of Man* is more colourful than the rest of my work. Conceptually, it leans further into historical and political social constructs rather than phenomenology, placing it outside the primary scope of my MFA body of work.

Most importantly, throughout its evolution, I realized that the nature of the copper body is crucial to the work’s success. However, developing the necessary skills for torching and weaving copper rods and wire is not feasible within my current time constraints. Despite the extensive effort and research I invested—particularly over the summer—I have decided to set this project aside to revisit later.

THREADS OF KNOWLEDGE AND KNOWING

When it comes to following an intuitive path, Karen Barad states:

“Practices of knowing and being are not isolable; they are mutually implicated. We don’t obtain knowledge by standing outside the world; we know because we are of the world. We are part of the world in its differential becoming” (Barad 2007, 185).

Barad’s writing on quantum physics opened a door for me, prompting numerous exciting questions. Barad is recognized for the posthumanist concept of *agential realism*, a perspective in which the world is continually engaged in its own becoming. Their work extends into feminist, philosophical, and sociological theory (Hollinger 2020, 23).

My first introduction to Barad’s work was through reading *On Touching—The Inhuman That Therefore I Am* during a *Life Studies* class at OCAD University (Barad 2012). This essay, both enchanting and mind-boggling, explores the nature of touch, which, at the molecular level, is fundamentally impossible. Since electron clouds surround all matter, actual physical contact never occurs, despite our perception to the contrary.

Reading *On Touching* as an artist rather than as a scientist, I became fixated on the cognitive dissonance inherent in the idea that touch does not involve actual contact between matter. Despite our perception of physical solidity and sensation, electrons—as point particles—exist within an electron cloud so vast in relation to the nucleus that the actual matter of every atom never collides.

“All we really ever feel is the electromagnetic force, not the other whose touch we seek” (Barad 2012, 209).

My favourite passage from the essay is Barad’s notion that the void is full:

“Particles no longer take their place in the void; rather, they are constitutively entangled with it. As for the void, it is no longer vacuous. It is a living, breathing indeterminacy of non/being” (Barad 2012, 210).

I find this perspective on the void both hopeful and expansive. It honours entanglement and indeterminacy while embracing the possibility of expansion rather than contraction—acknowledging *nothingness* as *something*.

For years, like a hangnail catching on a sweater, my mind kept returning to the realization that not only could I never truly touch anything or anyone, but I also could not even touch myself. Barad articulates this beautifully:

“What is being called into question here is the very nature of the ‘self,’ and in terms of not just being but also time. That is, in an important sense, the self is dispersed/diffracted through time and being” (Barad 2012, 213).

This cognitive dissonance disrupted my deeply ingrained perception of individuality and led me toward an understanding of being as *consciousness constitutively entangled at a particle level*. It raised countless questions about consciousness, spirit, and soul.

From a socio-ontological perspective, having experienced hyper-sexualization and multiple sexual assaults, I reflected on how my body—my *matter*—was consistently foregrounded over my personhood. I suffered so much at the literal hands of others. Yet, as a thought experiment, I began considering what my therapist once said: *They never actually touched you—not the real you*. Of course, this is not entirely true. And yet, it raises profound questions: What is truly *touched* and *altered*—physically, energetically, consciously, and subconsciously? The answer is paradoxical: *all of it and none of it*. The physical, the energetic, the conscious, and the subconscious are all undeniably in play.

Inspired by this inquiry, I created a work titled *Forget Your Perfect Offering*, a whimsical consideration of the contradictions between our existence as a composite of particles and our



Forget Your Perfect Offering 2025, bronze, oiled manilla rope. Dimensions variable.

perception of solidity. The piece references quantum entanglement while exploring embodiment and consciousness.

Cast in bronze, a set of feet—one severed at the ankle, the other at the arch—emerges from the wall just above floor height. Around the corner, a bronze wrist protrudes at waist height, holding a long jute rope with bronze handles, questioning the nature of solidity. The handles are casts of the negative space within the grasp of my fist, referencing the concept that bodies never actually touch. These forms were made from casts of my own body using skin safe silicone. The negative space in the silicone moulds were then filled with wax to create positive forms to be used in the lost wax casting process resulting in the bronze forms. Though the work



Forget Your Perfect Offering (detail) 2025, bronze, oiled manilla rope. Dimensions variable.

is designed for interaction, the rigidity of gallery etiquette might prevent viewers from physically engaging with the rope. I see this as both a qualitative and quantitative research opportunity.

The title *Forget Your Perfect Offering* is also a nod to Leonard Cohen’s song *Anthem*. Aside from the stanza these words are taken from:

Ring the bells that still can ring,
Forget your perfect offering.
There is a crack in everything,
That’s how the light gets in (Cohen 2019).

There is another line that resonates deeply:

“You can add up the parts,
But you won’t have the sum” (Cohen 2019).

This speaks directly to the indeterminacy of conscious and emotional experience.

Along with the title of this exhibition, *forget your perfect offering* also serves as a commentary on the disproportionate value society places on the body over the soul. I was reflecting on the importance of connection beyond the physical form, the weight of energy exchange, and the intimacy of play. Does this figure offer an invitation to play, or does it hope to be pulled from the wall? Regardless, the rope is as much a symbol of *connection* as it is of *restraint*.

The work considers Einstein’s concept of quantum entanglement—what he famously called *spooky action at a distance* (Musser 2024). In this state, everything everywhere is *local to all* (Theise 2023, 82), forming a quantum entanglement so encompassing that: “We have arrived at the level of the boundless body” (Theise 2023, 84).

Separated quantum particles interact instantaneously and simultaneously, regardless of distance. A change to one entangled particle determines the state of the other, as they must always energetically equal the whole from which they were created.

“Those particles might zip off to opposite sides of the universe, and still they act in unison. The particles violate locality—they transcend space” (Musser 2024).

Only when influenced by their environment do entangled particles cease to be connected. To me, this highlights the primacy of *energy* over *matter*. My intent is for the bronze hand and feet to emerge from different sections of the wall yet still insinuate a whole *Being*.

Much of my exploration delves into how this mirrors other forms of relational entanglement—to people, situations, customs, and objects. And yet, knowing that the physicist Richard Feynman once wrote:

“I think I can safely say that nobody understands quantum mechanics” (Feynman 1965, 129), somehow eases my mind.

COMPLEMENTARITY AND PLAY WITH OLOIDS

Between entanglement, indeterminacy, and complementarity—the main concepts from quantum physics that I have drawn upon—the potential of complementarity as an applicable analogy holds the greatest promise for opening new perspectives.

With their directionally opposing edges, my collections of oloids, *Imperfect Oloids: The Weight of Perception* and *Imperfect Oloids: The Weight of Action*, invite investigation and reflection on complementarity. Oloids are a geometric curiosity developed in 1929 by inventor and sculptor Paul Schatz during his research on inverting a cube (Heidelberg Institute for Theoretical Studies 2019; Schatz Foundation 2024).

Imperfect Oloids: The Weight of Perception consists of smaller versions, crafted from glazed porcelain, that fit comfortably in the palm of a hand. These intimate objects encourage personal engagement, fostering introspection and relational connection.



Imperfect Oloids: the Weight of Perception 2024, porcelain clay on velvet liner.
Dimensions variable.

In contrast, *Imperfect Oloids: The Weight of Action* comprises larger oloids, constructed from Styrofoam and Winterstone, ranging in size from that of a baseball to that of a toddler.



Imperfect Oloids: the Weight of Action 2025, Styrofoam and Winterstone. Dimensions variable.

These lightweight yet durable materials allow the forms to be cradled, stacked, rolled, or turned over—activities that embody Barad’s concept of “re-turning.” This term does not merely signify a return to the past but an iterative process of “turning it over and over again... in the making of new temporalities (spacetime-matterings), new diffraction patterns” (Barad 2014, 168). The oloid, with its opposing directional edges, is a form that requires time to observe and reconsider—re-turning to fully comprehend it rather than reducing it to a single perspective, such as a teardrop, a rounded parallelogram, a rock, or an oyster.

Initially, I intended to enhance the interactive and symbolic nature of these forms by engraving their surfaces with symbols from quantum physics, equations related to movement or superposition, portents, poetic musings, or coded instructions. These markings were meant to guide the viewer’s interaction and underscore the conceptual underpinnings of the forms.

However, I ultimately found the forms themselves compelling enough without such embellishments.

I first encountered the oloid form on Instagram and was immediately intrigued by its unique movement. A perfect oloid wobbles in a continuous path, making it an ideal shape for water filtration plants and chemical solutions that require constant stirring (Schatz Foundation 2024, 45). Upon closer inspection, I was struck by its mirroring quality and the way it embodies the notion of complementarity—the simultaneous holding of contrasting or opposing truths.

My initial research into constructing oloids led me to a few resources. I created a prototype using stiff, thin plastic and Monster Clay and adapted a YouTube tutorial on making wooden oloids to create a second prototype in porcelain clay (Stith 2017). I began producing multiple palm-sized oloids in porcelain clay, which were then kiln-fired and glazed.

A proper oloid follows a precise geometric form that allows it to roll continuously on all edges. However, I quickly realized that due to the malleability of my chosen materials, the oloids I was making would be inherently imperfect. Achieving the precise balance and sharp edges of a mathematically exact oloid through hand-forming and hand-carving in clay or Winterstone is theoretically possible but practically unattainable within the time constraints of the project and the volume I sought to produce. Because I view these oloids as beings meant for interaction,



Imperfect Oloids: the Weight of Perception, in progress. These begin as porcelain clay rectangular prisms.



Imperfect Oloids: the Weight of Perception, in progress. A gradual process of hand carving.

imperfection became essential—it keeps the forms organic and open rather than rigid and closed like machine-precision objects.

To create larger oloids, I drew inspiration from a tree stump sculpture I had made in 2021 using Winterstone with a Styrofoam core. A serendipitous studio visit with Toronto artist John Notten, who has used Styrofoam extensively in his projects, led to a discussion about its environmental impact. He explained that he had sourced Styrofoam reclaimed from building demolitions and generously donated his remaining supply to my project. As a result, 95 per cent of the stone-like oloids were built with this reclaimed material as their core. Their stone-like finish comes from layers of Winterstone, a cement/plaster-like material. The variations in their surfaces, ranging from white to black, emerge as I sand down the top layers during shaping, revealing the layers below. These layers contain varying amounts of carbon black concrete powder, producing different values in greyscale.



Imperfect Oloids: the Weight of Action, in progress.

Initially, I aimed to create a perfectly imperfect oloid. However, as I made more, I realized that the variations and imperfections of each form were essential in representing individuality within collectivity, so I ceased polishing them to a smooth surface.

York University's Professor Brandon Vickerd observed that the Styrofoam core of the larger oloids creates a feeling and sound of hollowness, which contrasts with their seemingly solid, rock-like appearance. This duality serves as a poetic analogy for the perceived emptiness within atoms—structures that, despite their apparent solidity, are composed mostly of voids. This void, however, may contain something beyond our perceptual field. The contrast between expectation and experience invites reflection on the contradictions inherent in perception and reality. This contradiction is also echoed in the way these oloids reference the simulacrum, with their almost rock-like appearance.



Imperfect Oloids: the Weight of Action 2025, Styrofoam and Winterstone.
Dimensions variable.

While the palm-sized versions foster introspection through their small scale and tactile quality, the larger Winterstone oloids demand physical engagement, drawing the entire body into the act of holding, turning, or repositioning them. This shift from the intimate to the embodied echoes Robert Morris's theories from *Notes on Sculpture 1*, which examine how scale alters perception and response—underscoring the need to investigate how we relate to the subatomic scale, the very fabric of our form.

Robert Morris's *Notes on Sculpture* has deeply informed my approach to scale and its relationship to perception. As Morris writes, "Simplicity of shape does not necessarily equate with simplicity of experience" (Morris 1966, 228). Though my works may appear simple in form, they aim to create layered, relational experiences that resonate on both a personally reflective and a publicly interactive level.

Morris offers crucial insights into how scale shapes our perception of art. He argues that smaller objects evoke intimacy, whereas larger ones convey monumentality, creating "a continuum of sizes" where the human body serves as the constant for comparison. This relational dynamic informs my sculptural practice, where I explore how varying scales shape our experiences of space, proximity, and relationality:

One knows immediately what is smaller and what is larger than himself. It is obvious, yet important, to take note of the fact that things smaller than ourselves are seen differently than things larger. The quality of intimacy is attached to an object in a fairly direct proportion as its size diminishes in relation to oneself. The quality of publicness is attached in proportion as the size measures in relation to oneself... The intimate mode is essentially closed, spaceless, compressed, and exclusive... The awareness of scale is a function of the comparison made between that constant, one's body size, and the object (Morris 1966, 230-231).

My exploration of the oloid form seeks to bridge the realms of interactive art, philosophy, and quantum physics. In *Oloid: Form of the Future*, the Schatz Foundation introduces the oloid's movement as a broad source of inspiration:

Each time, the starting point is the rigid solid with its inverted movement in space that, in the case of the oloid, affects its environment in a completely new and surprising way: in water and in the air, as a light source or organically designed ‘worry stone’; as a source of inspiration for dance choreographies or musical compositions, as a perfect three-dimensional rhythm for mixing liquids, as encased space or as a floating object reminiscent of zeppelins. Finally, the oloid gave and continues to give impulses for philosophical projections since it unites two fundamental aspects of time and thus existence: point zero and infinity (Schatz Foundation 2024, 11).

From one perspective, the oloid appears as a teardrop; from another, it is a rounded parallelogram—an elegant analogy for holding multiple realities simultaneously. As such, the oloid offers profound opportunities for both tactile and conceptual engagement, mirroring the principles of complementarity and superposition.

Superposition is most commonly illustrated by Schrödinger’s Cat, a thought experiment in which a cat is enclosed in a box with a lethal mechanism randomly triggered by a radioactive decay source. The randomness introduces an indeterminacy within the system, where the cat is considered simultaneously alive and dead until the box is opened and its state is measured. Before measurement, a superposition of states exists within the waves of possibility and probability, rendering the question of whether the cat is alive or dead indeterminate and undefined. Like the shifting form of the oloid, it is both, simultaneously.

This paradox challenges classical notions of identity and existence by foregrounding the constancy of indeterminacy. As Barad explains, “Quantum superpositions radically undo classical notions of identity. Quantum superpositions tell us that being/becoming is an indeterminate matter” (Barad 2014, 176–177).

For humans, the process of being and becoming similarly disrupts societal and hierarchical boundaries, alongside the physical entanglement of particles and energy. Karen Barad underscores the ethical implications of entanglement, suggesting that responsibility is not a choice or calculation but an inherent aspect of existence in relation to everything we encounter.

Despite steering our own ships, so to speak, we are affected, altered, and responsible to all around us—including the probability of chaos. Responsibility, Barad writes, is

not an obligation that the subject chooses but rather an incarnate relation that precedes the intentionality of Consciousness. Responsibility is not a calculation to be performed. It is a relation always already integral to the world's ongoing intra-active becoming and not-becoming (Barad 2014, 183).

She presents indebtedness and responsibility to one another as fundamental conditions of Being, treating entanglement as a priori (Barad 2012, 214). This perspective resonates deeply with my lived experience of *response-ability* and inspires my commitment to authenticity in both life and art. For me, authenticity requires holding space for both light and shadow, moment by moment, within myself and for others.

Barad's reflections on entanglement and response-ability provide the conceptual framework for the oloid. She writes, "We are being churned by the soil, the wind, the foggy mist. A multiplicity, an infinity in its specificity, condensed into here-now... Responding – being responsible/response-able – to the thick tangles of spacetime-matterings... is perhaps what returning is about" (Barad 2014, 184). Through their interactive and reflective design, the oloids embody these entanglements, inviting participants to engage with the layered complexities of identity, temporality, and materiality.

Complementarity involves precisely this capacity to hold multiple or contradictory truths. In physics, complementarity describes how "two contrasting theories are necessary to explain a phenomenon, such as wave-particle duality" (Ramlo 2021, 226). Wave-particle duality demonstrates how light behaves both as a wave and as a particle (photon), yet these characteristics cannot be measured simultaneously. "In other words, classical physics (e.g., wave theory) applies to the macro world but cannot explain observations in the micro world (e.g., particle theory)" (Ramlo 2021, 234). Similarly, neither our physical reality—comprising seven billion billion billion atoms within an electromagnetic field—nor our conscious experience as seemingly contained individuals provides a complete picture of existence. By considering both perspectives, we open the door to rich, poetically engaging questions:

How do we navigate the tension between the vast, interconnected reality of our material existence—where we are energetically and physically permeable—when our phenomenological experience is that of a solid, compartmentalized being? How do we reconcile the deeply personal and subjective nature of consciousness when our perspective can feel so certain, so black and white?

My iterative process of making and engaging with oloids at varying scales creates a space for both personal reflection and collective exploration. Through their symbolic form and material presence, they serve as a bridge between the tangible and the conceptual, inviting us to hold, turn, and *re-turn* our understanding of reality itself.

LANDSCAPES OF PERSPECTIVE KNOWLEDGE

Much of what we have built—both in material and in knowledge—is scaffolded upon our observations of the world. The deeper we look outward into space and inward toward the most minute components of our being—the particle, the atom, the electron, the neutrino, the muon—the more impossible, miraculous, and profoundly interconnected we appear to be.

Everything is fundamentally connected, with no true separation between mind and matter. At one level, our bodies are composed not only of human cells but also of bacterial and fungal cells, forming a complex symbiotic system. This understanding represents the first layer of a micro-perspective on being. A deeper layer reveals that atoms constitute the fabric of our material existence, and as such, we—and everything we encounter—are predominantly *empty* space, despite our perception to the contrary. This challenge of comprehending the micro-perspective of being finds equivalency in the deep-time perspective of existence: How do we internalize and act upon an awareness of our generational impact when our individual lives are so brief? How do we reconcile our seemingly insignificant lifespans with the vast scale of our social, genetic, and ecological influence? Equally, how do we navigate the tension between individuality and interconnectedness on both a personal and collective level?

Through the interplay of scale, form, colour, and texture, my work seeks to transcend language, creating a space for resonance and reflection—one that invites viewers into a poetic engagement with the perceptual and existential contrasts embedded within these perspectives on being. While my sculptures do not explicitly convey scientific concepts, they are deeply informed by them, as well as by my reflections and *response-ability* to them. Rather than functioning as direct scientific translations, the works strive to evoke the *feeling* of being itself. The scientific principles underpinning the work may not be immediately legible without further explanation, yet they are embedded within the experience of engagement—both through phenomenological perception and through the layers of conscious and subconscious interpretation. The works encourage lingering, reflection, and, in some instances, physical interaction. Through abstraction, the visible trace of the artist's hand, and the research and meaning embedded in each piece, viewers are invited to explore these ideas in a tactile and conceptual manner.

This body of work seeks to extend insights into the interconnectedness of existence. I anticipate a diversity of responses, shaped by viewers' individual backgrounds, knowledge, and

experiences. Its impact will vary depending on one's proximity to art or science, but the work also engages with a deeper, intuitive understanding—one that transcends words and reason. For each viewer, the space of understanding will be unique, determined by their own perspective. Some may find a sense of playfulness in the work, while others may encounter an uncomfortable reckoning. Some will perceive its poetry, while others may not. Ultimately, these sculptures function as an invitation to engage bodily and introspectively, with meaning unfolding differently for each person.

Humanity has constructed much of its knowledge by looking at the world around us, within us, and beyond us. Light enters when we acknowledge the existence of shadows. It shines through the cracks in vessels we perceive as whole. Indeterminacy exists in the grey areas, in the shadows—neither fully light nor fully dark. We may never fully grasp the thoughts and feelings of others, the simultaneous measurement of an electron's position and momentum, or the nature of consciousness itself. As individualized beings within a complex adaptive system, we struggle to reconcile our simultaneous significance and insignificance, to perceive ourselves as both micro and macro-operators—developing specificity within our collectivity, as part of an emergent whole where multiple, and occasionally oppositional, truths must be held simultaneously.

While the nature of being—of embodied consciousness—is inherently individualized, the science of our quantum existence affirms entangled connectivity, aligning with long-suppressed paradigms of interconnectedness. My gestures toward interactive works are inspired by concepts in quantum physics that resonate as analogous to *my* lived experience of being. Hopefully, through the thoughtful and *felt* use of multiplicity and materiality within immersive and interactive works, these sculptures will create openings—cracks in the illusion of individualism—allowing space for both individual specificity and collective experience. They serve as invitations to reflect on what it means to be *embodied*.

We need *time* to think smaller.

We are connected—particle matter, nature, and consciousness—learning to fly, listening to portents, *time and being*, *being in time*, and finding patterns of coherence within chaos.

GLOSSARY

AGENTIAL REALISM - developed by Karen Barad, this philosophy views the ontology (study of Being) the axiology (study of value), and the epistemology (study of knowledge) as aspects of a whole, describing how everything is intra-acting.

COMPLEMENTARITY - In physics complementarity is the concept of how two contrasting aspects or theories are required to fully explain a set of phenomena, ie., wave particle duality, when each individually only accounts for some aspects.

Generalized - two aspects that though different, are useful when combined.

ENTANGLEMENT - Quantum Entanglement - when a pair of (daughter) particles are generated together in a single physical process, and in a manner where the quantum states of each are indefinite yet correlated. Once one state is measured, the state of the other is automatically known even at a distance from each other. They become unentangled when one or both interact with their environments.

Generalized - being connected, or wrapped within, either positively or negatively.

INDETERMINACY - is a state undefined or vague, where *quantum indeterminacy* is an inherent incompleteness in realizing physical systems due to the indeterminate states of particles.

MORE-THAN-HUMAN - A philosophical concept common to philosophy, political activism and the arts referencing the non-hierarchical idea that humans and other beings are interconnected and considers how humans impact the non-human world and vice-versa.

NEW MATERIALISM - an interdisciplinary area of concern built on philosophy, cultural theory and science. One of its primary concerns is the separation of nature and culture. Like “more-than-human”, it presents a non-hierarchical view that suggests we reconsider how we engage with the material world and our relation to matter.

ONTO-EPISTEMOLOGICAL - refers to the relationship between ontology, the study of Being, and epistemology, the study of knowing.

PHYSICS - the study of the make-up, motion and behaviour of matter in relation to energy, force, space and time.

Quantum physics - is the study of subatomic matter and energy, the building blocks of our world.

POSTHUMANISM - A philosophical movement that subverts humanity's self proclaimed hierarchy, challenging our idea of exceptionalism, and suggests importance within other Beings and technologies, encouraging an integration into new forms.

PHENOMENOLOGY - the perception of the world filtered through consciousness and the limitations of the body of the perceiving mind.

Scientifically - the consideration of phenomena, or observations, separate from nature.

QUANTUM MECHANICS - a branch of physics studying the probability fields for the motion, matter and energy of atomic and subatomic particles. It explains phenomena such as wave-particle duality.

SUPERPOSITION - Quantum superposition: Particles can exist in more than one state at the same time until they are measured.

Generalized - one thing on or above another.

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