# **Quantum Chaos Series**



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http://www.visiblespace.com

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A paradigm shift is occurring, away from the concrete and indivisible towards uncertainty. Thomas's art is grounded in the contention that the quantum 'turn' in theoretical physics is reflected in experimental contemporary art.

The quantum world is fiendishly difficult to comprehend—physicist Richard Feynman remarked, "If you think you understand quantum mechanics, you don't understand quantum mechanics."

What we do understand is that it is fundamental to existence. Thomas's current research questions quantum and nanotechnologies that are utilised as part of his concepts of capturing reality in the act of happening. New emergent technologies and traditional materials are explored in his work in relationship to how he visually expresses an alternative comprehension of the invisible, inaudible and intangible phenomena studied in physics.

'Quantum Chaos Series' is a visualisation of the shift in our cultural understanding of what exists in terms of the difference between the classical ("real world" experience) and the quantum world of uncertainty. Thomas's experimental artworks explore the liminal space between classical and quantum chaos. This space is a conceptual and contextual location of a permeable membrane, paradoxically existing between the two worlds. If a small drop of ink is placed into a glass of water, the immediate visualisation of classical chaos takes place. When the classical chaotic ink particles continuously bifurcate, at some subatomic point, classic theory is abandoned in favour of a new set of quantum rules informed by Werner Heisenberg's uncertainty principle (1927). (Thomas 2018 p 71)

The 'Quantum Chaos Series' paintings in this catalogue are central to Thomas's processes of attempting to explore the potential of visualising quantum phenomena. The paintings utilise four different laser cut squeegees one with teeth 3 mm, 6 mm, 9 mm and 12 mm apart routed on the edge of each 120x900x15 mm lengths of plywood. The squeegees enable the recreation of an analogue reference to the digital grid exploiting the imperfections and irregularities of the painted surface. Each painting is a confluent overlay of gestured brush marks, which are then squeegeed to produce multiple layers. Each layer is then partially erased to expose spaces and qualities that are tangentially linked to revealing liminal spaces between worlds. The artwork transcends the scientist's diagrams and analogies to reflect an internalised view, a sensation happening faster than thought at infinite speed.

An electron is seen as being analogous to the movement of a spinning top. When a spinning top goes out of its spin cycle, it falls into chaos in the same way an electron in a quantum position is governed by its spin. The series draws from the analogy of the axis of a spinning top that creates a cloud of points that disappear and reappear based on the probability data from Professor Andrea Morello's lab at University of New South Wales, developed by PhD students Serwan Asaad and Vincent Mourik. In Thomas's digital artwork, a sorting algorithm developed in collaboration with artist Jan Andruszkiewicz in 2019, utilises speculative quantum data to transform a photographic image. In the artwork, data affects the materiality of photographic images of felt fibres, referencing Gilles Deleuze's and Felix Guattari's concept of smooth and striated space. The smooth space of felt is not woven, knitted, knotted, intertwined or laced. It is not a striated space where the woven fabric measures the boundary of the body's movement in space. It has its own integrity; its tensile strength is born of chaos. The material becomes a second skin between the body and the world.

> 'Felt is a supple, solid product that proceeds altogether differently, as an anti-fabric. It implies no separation of threads, no intertwining, only an entanglement of fibres obtained by fulling (by rolling the block of fibres back and forth). What becomes entangled are the microscales of the fibres. An aggregate of intrication of this kind is in no way homogeneous is nevertheless smooth, and contrasts point by point with the space of fabric (it is in principle infinite, open, and unlimited in every direction; it has neither top nor bottom nor center; it does not assign fixed and mobile elements but rather distributes a continuous variation).' (Deleuze and Guattari 1987)

This fibrous character becomes reconfigured by the speculative quantum chaos data using a sorting algorithm to reposition every pixel in the photograph of felt fibres. The program when executed randomly selects one of ten images and Husimi quasi-probability distribution data a text file from 223,966 samples—transforming by rearranging in real-time the digital photographic images' fibrous character of felt. An accretion of animated motion evolves over time as the fibrous image is sorted from its classical chaos to one born out of quantum chaos. Each sort of the data weaves a series of linear transformations of the felt fibres to reveal new patterns that correspond to a probability of meaning: chaos begetting chaos as an ongoing, entangled real-time process visualising a liminal space between worlds.

The series builds on this history of making the invisible visible by taking the information gathered from scientific experimentation and speculation. Thomas's artwork translates his internalisation of these speculations into aesthetic visual sensations.

### Bio:

Honorary Professor University of New South Wales, Sydney: Art and Design is coordinator of the Studio for Transdisciplinary Art Research (STAR) as well as the Chair of the Transdisciplinary Imaging Conference series 2010-2020. In 2000 He instigated and was the founding Director of the Biennale of Electronic Arts Perth 2002, 2004 and 2007. As an artist he is a pioneer of transdisciplinary art practice. His practice led research takes not only inspiration from nanoscience and quantum theory, but actually operates there currently exploring concepts of visualising the liminal space between the classical and quantum world. Thomas's current practice led research projects have been exploring quantum phenomenon developing the artworks 'Quantum Chaos and Quantum Consciousness'. These artworks were related to experiments done in collaboration with Professor Andrea Morello, Centre for Quantum Computation and Communication Technology, UNSW. Thomas's current publication Quantum Art and Uncertainty (published October 2018) and Nanoart: The Immateriality of Art, (2013).

#### References:

Deleuze, G., & Guattari, F. (1987). A Thousand Plateaus: Capitalism and Schizophrenia (B. Massumi, Trans.). Minneapolis: University of Minnesota Press. Thomas, P. (2018). Quantum Art and Uncertainty. Bristol, Intellect Ltd.



Paul Thomas, Quantum Chaos Set, 2020, digital photograph. © Paul Thomas



Paul Thomas, Quantum Chaos Weave, 2020, Screen capture digital photograph. © Paul Thomas



QUANTUM CHAOS SERIES



Paul Thomas, Dark Eden, 2020, acrylic, digital print, canvas on aluminium, 1542 x 1152 mm. © Paul Thomas



Paul Thomas, Quantum Divide, 2020, acrylic, digital print, canvas on aluminium, 1542 x 1152 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No14, 2020, acrylic on plywood,1200 x 900 mm.  $\mbox{\sc C}$  Paul Thomas



Paul Thomas, Quantum Chaos Series No15, 2020, acrylic on plywood,1200 x 900 mm.  $\mbox{\sc B}$  Paul Thomas



Paul Thomas, Quantum Chaos Series No16, 2020, acrylic on plywood,1200 x 900 mm.  $\bigcirc$  Paul Thomas



Paul Thomas, Quantum Chaos Series No17, 2020, acrylic on plywood,1200 x 900mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No18, 2021, acrylic on plywood,1200 x 900 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No19, 2021, acrylic on plywood,1200 x 900 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No1, 2020, acrylic on plywood, 600 x 450 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No2, 2020, acrylic on plywood, 600 x 450 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No3, 2020, acrylic on plywood, 600 x 450 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No4, 2020, acrylic on plywood, 600 x 450 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No5, 2020, acrylic on plywood, 600 x 450 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No6, 2020, acrylic on plywood, 600 x 400 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No7, 2020, acrylic on plywood, 600 x 400 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No8, 2020, acrylic on plywood, 600 x 400 mm. © Paul Thomas







Paul Thomas, Quantum Chaos Series No10, 2020, acrylic, wax varnish on plywood, 600 x 400 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No20, 2021, acrylic on plywood, 600 x 400 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No21, 2021, acrylic on plywood, 600 x 400 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No11, 2020. acrylic on plywood, 900 x 600mm, © Paul Thomas



Paul Thomas, Quantum Chaos Series No12, 2020, acrylic on plywood, 600 x 400 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Series No13, 2020, acrylic on plywood, 600 x 400 mm. © Paul Thomas



Paul Thomas, Quantum Chaos Weave, 2020, Rayon, Cotton, 1830 x 1200 mm. © Paul Thomas