Quantum Crossroads: At the Intersection of Arts, Culture, and Quantum Science & Technology

Event Report – July 7–9, 2025 | Tūhura Otago Museum & Puketeraki Marae

Introduction

Quantum Crossroads convened artists, scientists, technologists, and cultural practitioners in Dunedin to explore how quantum science can be understood, challenged, and advanced through art and culture. The gathering opened with a pōwhiri at Puketeraki Marae, setting a relational and values-based foundation for the three days of lightning talks, roundtables, and public engagement. The programme structured discussion around three themes—Art in Quantum, Quantum in Art, and Art + QST[1] for Society—with working sessions and a public event at Tūhura's Barclay Theatre.

The relational foundation established through the pōwhiri continued to guide discussions, emphasizing reciprocity, humility, and cross-cultural respect as core principles for future quantum–art collaborations.

Highlights from Thematic Discussions

Art in Quantum

Participants examined how artistic questions and methods can function as modes of quantum research and discovery—from embodied workshops translating talks into dance and poetry, to DIY experimentation that blurs boundaries between lab and studio. They noted how art has historically grappled with quantum-like ideas through abstraction and conceptual work, and that art has the power to inspire new avenues of research or challenge scientists to think in different ways. Practical tactics included residencies modelled on the Arts at CERN program, outreach requirements in fellowships, artistic components in research grants, and shared language initiatives to connect writing, film, and physics.

Beyond communication, participants highlighted that art functions as a strategic driver for innovation, offering frameworks for ethical reflection, futures thinking, and conceptual exploration. Artistic practices were seen as capable of opening new scientific questions and helping society imagine possible quantum futures.

[1] Quantum Science and Technology.

Quantum in Art

Similar quantum methods can serve as new approaches to create art. A working framework emerged through analysing the relationship between music and quantum research, distinguishing between Quantum Music (analogy/sonification), Quantum Computer Music (direct use of quantum hardware), and Quantum-computing Aided Composition or QAC (art with the help of quantum computing). This spectrum clarifies authenticity and intention while encouraging multiple entry points for artists and audiences. Discussions noted the need to make quantum tools and technologies more accessible to artists, ask who gets to be in the room, and respect that metaphors can be deeper than analogy when thoughtfully embedded in creative practice.

Art + QST for Society

Participants noted that art already plays a crucial and expanding role in shaping public perception of quantum science and technology (QST), something with great potential to grow as quantum technologies increasingly interface with society. Conversations focused on countering dystopian narratives and cultivating hopeful futures informed by Te ao Māori and other indigenous perspectives. Proposals included Quantum Sister Cities, UNESCO-supported residencies, and Qamp Quantum—localised camps engaging communities and youth. Participants discussed post-quantum cryptography transitions as a cultural topic for exhibitions or hackathons, noting the importance of public understanding during standards adoption.

Participants emphasized that advancing quantum literacy will also require developing quantum terminology in minority and Indigenous languages and embedding culturally grounded metaphors into engagement activities. Doing so ensures that quantum concepts are accessible across worldviews and aligns with the values-based foundation established at Puketeraki Marae.

Strategic Recommendations & Roadmap

A recurring theme across discussions was the need for stronger global infrastructure to connect currently fragmented art–science efforts. Participants recommended developing a shared online platform and network of venues to host residencies, exhibitions, and collaborative experimentation, ensuring long-term continuity beyond individual events.

The primary recommendation is that quantum-art approaches should be embedded in educational curricula across diverse contexts. A core element of this should be supporting minority language and indigenous vocabulary development in the context of QST, developing agile cross-technology skillsets through the sharing of making-of processes, and balancing collabothons[2] with exhibitions and performances.

A suggested timeline and mechanism for implementing these recommendations is:

[2] In-person collaboration events

Near term (2026–2028): Summer Course Pilot, curriculum integration, residencies with teaching release, virtual exhibition platforms, and social media visibility.

Medium/Long term (2029–2035): UNESCO City of Quantum designations, biennial showcases, new science residencies with Blue-Sky Prize, corporate arts programs in quantum divisions, and network growth metrics.

Participants also stressed the importance of developing metrics for evaluating the impact of quantum–art initiatives, not only in terms of audience numbers but also cultural value, community participation, and sustained cross-disciplinary relationships.

Engagement & Education Priorities

Embed quantum-art approaches in curricula, support minority language and indigenous vocabulary development, share making-of processes, and balance collabothons with exhibitions and performances.

Participants also noted the particular effectiveness of experiential and participatory approaches—such as performance-based workshops, community co-creation, and interactive installations—in building public trust and making quantum ideas feel tangible and relevant across diverse communities.

To sustain these initiatives, participants underscored the importance of adapting existing funding mechanisms. Recommendations included incorporating artistic components into research grants, supporting co-taught art–science programmes, and establishing dedicated resources for maintaining community platforms and global networks.

Conclusion

The discussions highlighted a shared desire for greater international coordination to align efforts across regions and ensure the longevity of emerging quantum–culture ecosystems. Quantum Crossroads demonstrated that the intersection of art, culture, and quantum science is a core pathway for democratising technologies, shaping public narratives, and expanding scientific imagination. By grounding programmes in care, reciprocity, and excellence in art, and by adopting a staged roadmap (2026–2035), the community can move from prototypes and workshops to city-scale designations, residencies, and biennial showcases that sustain global momentum.

Te Whai Ao Dodd-Walls Centre for Photonic and Quantum Technologies
Tūhura Otago Museum
International Year of Quantum Science and Technology

Appendix

Event committee

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Jessa Barder, Co-Chair (Tūhura Otago Museum, Te Whai Ao - Dodd Walls Centre, NZ)
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Hannah Andrews (British Council, UK)
Puah Xin Yi (Center for Quantum Technologies, Singapore)
Prof Hyuong Joon Choi (Yonsei University and AAPPS, South Korea)
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Event presenters and discussion leaders

Gabriela Barreto Lemos (Federal University of Rio de Janeiro)
Farai Mazhandu (Africa Quantum Consortium)
Xavier Davenport (University of Illinois)
Paul Thomas (University of New South Wales)
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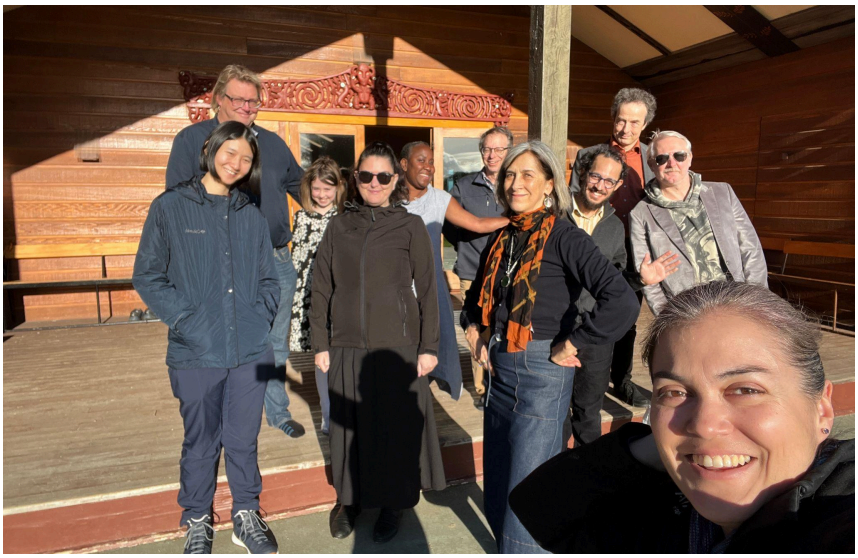

Public event - panel discussion

David Hutchinson (University of Otago)
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