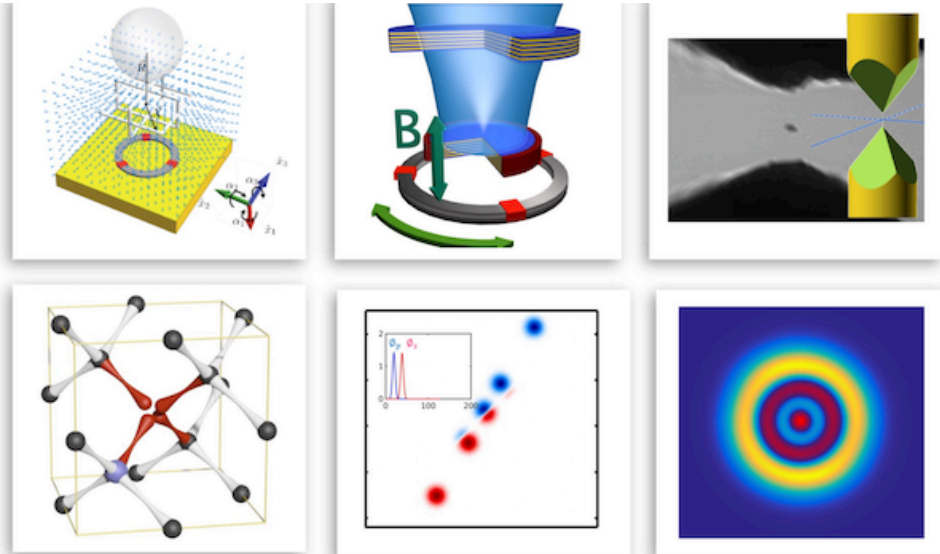




Jason Twamley

Professor, Director of the Quantum Machines Unit

Okinawa Institute for Science and Technology, Japan, [Website](#)



Hybrid Quantum Machines Research Unit

Education

- 1991: PhD University of Alberta, Canada, Thesis title: Quantum cosmology, Supervisor Prof DN. Page
- 1986: BA(Mod) Theoretical Physics, Trinity College Dublin, Ireland
- Citizen: USA and Ireland

Positions

2020-Present	Director of the Quantum Machines Research Unit Okinawa Institute for Science and Technology Graduate University, Japan
2005- 2020	Chair Professor in Quantum Information Science Department of Physics and Astronomy, Macquarie University, Sydney
2019	Member of the EPSRC UK National Quantum Technology Hubs Renewal Evaluation Panel
2018	Member of the Australian Research Council, Excellence in Research Australia Research Evaluation Committee for Physical, Chemical and Earth Sciences
2008-2015	Director of the Macquarie University Research Centre for Quantum Information Science and Technology
2011-2015	Node Manager ARC Centre of Excellence in Engineered Quantum Systems
2005-2010	Manager of Quantum Algorithms Programme, ARC Centre of Excellence in Quantum Computer Technology

OIST Quantum Machines Unit

Quantum science and technology seeks to develop new types of applications based on the properties and dynamics of the quantum world. We already know that using quantum science there is the potential to build enormously faster computers - quantum computers, but there are many other potential applications ranging from ultra-precise quantum assisted sensors through to new types of simulators of complex quantum phenomena. Our understanding of the quantum realm and engineering it to our design is just beginning. As our facility at controlling the quantum improves we will invariably seek to build **QUANTUM MACHINES**, machines made from disparate quantum sub-systems, all working together to achieve a designed goal which no individual sub-system can achieve.

The **Quantum Machines Unit** is a newly research centre established within the private graduate university of the Okinawa Institute for Science and Technology, Japan, and is led by Prof Twamley. This Research Unit seeks to understand how one can interconnect individual, sometimes very different, quantum systems - in order to achieve a new functionality not possible within each individual sub-system. The Research Unit undertakes both theoretical and experimental quantum research to develop new quantum sensors, interconnects and computation devices.

The **Quantum Machines Unit** includes nine research fellows (postdocs) - both theory and experiment, a Unit Administrator and PhD students.

Publications

Published ~90 publications in peer reviewed journals including one edited book. Selected high impact publications include (citations Google Scholar). See [Google Scholar](#) for full list. G-Scholar h-index: 32

[1] T. Gaebel, et al, “Room-temperature coherent coupling of single spins in diamond”, *Nature Physics*, 2, 408 (2006), **Cited by 703**;

[2] P. Neumann, et al, “Quantum register based on coupled electron spins in a room-temperature solid”, *Nature Physics*, 6, 249 (2010), **Cited by 551**;

[3] C. Bradac, et al, “Observation and control of blinking nitrogen-vacancy centres in discrete nanodiamonds”, *Nature Nanotechnology*, 5, 345 (2010), **Cited by 506**;

[4] J.O. Owens, M.A. Broome, D.N. Biggerstaff, M.E. Goggin, A. Fedrizzi, T. Linjordet, M. Ams, G.D Marshall, J. Twamley, MJ Withford, AG White, “Two-photon quantum walks in an elliptical direct-write waveguide array”, *New J Physics*, 13, 075003 (2011), **Cited by 187**;

[5] J. Twamley, “Quantum-cellular-automata quantum computing with endohedral fullerenes”, *Physical Review A* -, 67, 523181 (2003), **Cited by 160**;

Selected Research Funding (>50M\$)

- 2017-2023: Australian Research Centre of Excellence: *Engineered Quantum Systems* 35M\$AUD, Twamley is one of 17 CIs
- 2019: Australian Research Council Linkage Infrastructure, Equipment and Facilities Grant: Australian dark matter detector for high mass axions, with 11 CIs, 621k\$.
- 2011-2014: NSW State Gov Science Leveraging Fund: in support of ARC CoE *EQUS*: 500k\$, Twamley one of 9 CIs and Proposer.
- 2011-2017: ARC Centre of Excellence in *Engineered Quantum Systems*, 24M\$, Twamley is one of 16 CIs.
- 2010-'13: EC Future and Emerging Technologies: *Quantum Integrated Photonics*, Lead U Bristol UK, 2M€

Graduate Training

Trained 9 PhDs, 4 MSc, 5 Hons, 2 MRes, including Dr Paz-Silva, winner of MQ Excellence in Higher Degree Research (2014), Prof M. Nielsen (joint MSc with Prof. G. Milburn), Prof J. Fitzsimons (commenced PhD in 2005 before Twamley relocated to Macquarie). Currently training 2 PhD students in OIST.

Selected National/International Esteem

Invited Talks/Conferences Organised

- Quantum Engineering of Levitated Systems, Centro de Ciencias de Benasque Pedro Pascual, Spain, April, 2022, CoOrganiser
- Mini-Symposium on Quantum Sensors, OIST, Feb-March 2021, Japan
- Public workshop on Quantum Computer Programming, May 2019, Microsoft, Sydney, Australia
- Quantum Gates, Jumps and Machines, Brisbane 25 Oct 2018, Invited talk on Quantum Magneto-mechanics.
- Quantum Engineering of Levitated Systems, Centro de Ciencias de Benasque Pedro Pascual, Spain, Sept, 2018, CoOrganiser
- C3QS:Coherent control of complex quantum systems, April (2018), Okinawa Institute for Science and Technology Japan, Conference CoOrganiser.

A. Patents: 4 Patents Filed

B. Journal Editor: Member of the Editorial Advisory Panel for Scientific Reports (Area: Quantum Physics)

C. Max Planck Guest Professorship: Max Planck Institute for Solid State Research, Stuttgart [Feb-July 2012]
