

# Jonte Roderick Hance

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## EXPERIENCE

### Senior Lecturer (Associate Professor)

Mar 2024–Now

*School of Computing, Newcastle University, Newcastle, UK*

Building a research group investigating applied quantum foundations, and developing teaching on quantum information. Senior Lecturer (Associate Professor) from March 2026; previously Lecturer (Assistant Professor) 2024–2026.

**Administration:** Founder and Group Lead for the Quantum Group in the School of Computing (primary research group affiliation for 3 academics and their teams, secondary affiliation for 4 other academics and their teams) (2026–Now). School of Computing (SoC) Rep on Faculty Working Group on Quantum Research and Teaching. Helped develop new [BSc Computing and Mathematics](#) Programme (SoC Lead for Quantum Information and Computing specialism). Previously: AI2030 Specialist Offering Sub-Group Lead; Staff Facilitator for SoC Student-Staff Committee for Taught Programmes (2024–25); SoC EDI Lead for Students (2024–25); Interim Group Lead of the [Advanced Model-Based Engineering and Reasoning \(AMBER\) Research Group](#), line-managing 7 Lecturers and 3 Senior Lecturers, despite being a Lecturer at the time (2025).

**Teaching:** Leading Quantum Topic for [CSC2034: Introducing Contemporary Topics in Computing](#). Reintroduced [CSC3132: Introduction to Quantum Computing](#), Module Leader 2025–26, now passed to Ittoop Puthoor. Developing [CSC3133: Quantum Algorithms](#) as Module Leader (to begin AY 2027–28). Passed [Newcastle Educational Practice Scheme \(NEPS\)](#), earning [Fellowship of the Higher Education Academy/Advance HE \(FHEA\)](#)—application later used on NEPS course as exemplar application.

**Supervision:** Currently supervising 5 PDRAs ([Nicolas Underwood](#) and [Peter TJ Bradshaw](#), funded through my EPSRC QTCa Fellowship, 2025–30; [Fionnuala Curran](#) and [Saheli Mukherjee](#), funded through my EPSRC NIA, 2026–29; and [Irina Basieva](#), funded through UKRI CRC grant, 2026–28), and one PhD candidate. Co-supervising 1 PDRA ([David Headley](#), funded through EPSRC Mathematical Sciences Small Grant, 2026). Previously supervised 3 [MSc Advanced Computer Science](#) project students, 1 [MSc Data Science and AI project student](#), 2 [MSc Computer Science](#) project students, 14 [BSc Computer Science](#) project students, 1 visiting [MSc Quantum Technologies](#) student from Politecnico di Torino, and 4 summer research interns (3 funded via my Royal Society Research Grant, 1 funded by EPSRC Edge AI Hub). Co-supervised 1 Licentiate student, and 7 [BSc Psychology](#) project students (cross-faculty). Examined 3 PhD theses, 17 MSc dissertations, and 23 BSc dissertations.

### Phoenix Postdoctoral Research Fellow

Apr 2023–Feb 2024

*Hiroshima University, Hiroshima, Japan*

Researching the interplay between quantum foundations and quantum technologies, focussing on the meaning and use of weak values. Awarded prestigious international research fellowship by Hiroshima University.

### Graduate Teacher Level 1 and 2

Sep 2020–May 2022

*University of Bristol, Bristol, UK*

Taught more than 400 hours over 2 years, across the Faculty of Engineering and School of Physics, on: Quantum Mechanics I & II (part of [PHYS20028](#) and [PHYS20029](#) respectively) (TA 2021–22); [EENG25000](#) (TA 2021–22); [EMAT10100](#) and [EMAT20200](#) (Senior drop-ins tutor 2020–22); [PHYS11400](#) (Seminar tutor 2020–21); [PHYS10005](#) and [PHYS10006](#) (Marker 2020–21)

### Research and Development Consultant

Sep 2018–Dec 2020

*dotQuantum, Bristol, UK*

Developed IP, specifically protocols for quantum key distribution. Co-inventor on pending patent [gb 1821135.9](#).

### Summer Research Intern

2018, 2019

*Quantum Engineering Technology Laboratories, University of Bristol, Bristol, UK*

Investigated counterfactual communication, first experimentally (measuring weak values using bulk optics), then theoretically. Funded to travel to Sydney for IONS KOALA 2018 to present research, and won Best Poster Prize.

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## EDUCATION

### PhD Electrical and Electronic Engineering

Oct 2019–Mar 2023

*Quantum Engineering Technology Laboratories, University of Bristol, Bristol, UK*

Thesis title: *The interplay between quantum foundations and quantum technologies*

Received UK Quantum Communications Hub/ University of York DTP Full Scholarship & Stipend. Supervised by Prof John Rarity FRS and Prof James Ladyman. More information available [here](#). Nominated for Faculty Thesis Prize.

### MSci (Hons) Physics and Philosophy

Oct 2014–Jun 2019

*University of Bristol, Bristol, UK*. Classification: First Class Honours

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## FUNDING

~£3.3 million awarded as **PI**, ~£16 million awarded as **Co-I**, ~£15 million at review.

**EPSRC Quantum Technologies Career Acceleration Fellowship** (**PI**, 2025–30): **£1,722k fEC** (£1,273k from funder), covering 50% of my time plus 2 PDRAs, all for 5 years, plus travel and consumables. Plus, £275k in-kind from Project Partners.

**EPSRC New Investigator Award** (**PI**, 2026–29): **£894k fEC** (£715k from funder). Covering 20% of my time, plus 2 PDRAs, all for 3 years, plus travel and consumables. Additionally, secured £310k in in-kind contributions from Project Partners.

**SPRIN-D Funke QuantumSense Exploration** (**PI**, 2026–27): **€450k** (~£360k) over 5 months, covering 50% of my time, plus 5 PDRAs, and travel and consumables.

**Royal Society Research Grant** (**PI**, 2025–26): **£28k** over 1 year, covering £18k travel and 3 2-month summer studentships.

**EPSRC National Edge AI Hub for Real Data (Co-I, 2024–29):** [Quantum Machine Learning Research Theme](#) Lead for **£12.85 million fEC** AI Hub (£10.28 million from funder). Joined as retroactive Co-I May 2025.

**UKRI Cross Research Council Responsive Mode** (**Co-I**, 2026–28): **£1,307k fEC** (£927k from funder). Covering 25% of [PI \(Barbara-Anne Robertson\)](#)'s time and 10% of my time plus 3 PDRAs, all for 2 years, plus travel and consumables.

**Innovate UK's UK-Germany Collaborative Innovation for Quantum Technologies 2026 (Co-I, 2026–28)** - Project Total **£1.97 million** from funder, (UK Team **£844k** from funder). Additional £528k contribution from UK Project Partners.

**EPSRC Mathematical Sciences Small Grant** (**Co-I**, 2026): **£111k fEC** (£80k from funder). Covering 5% each of my and [PI \(Nick Chancellor\)](#)'s time plus 1 PDRA, all for 9 months.

**Newcastle Internal:** ~£87k as **PI**, **£4.5k** as **Co-I**, plus **£31.5k** EPSRC Impact Acceleration Account Award (**PI**, 2026–27)

**Hiroshima University Phoenix Postdoctoral Fellowship for Research (Fellow, 2023–26):** Awarded one of four prestigious international fellowships. Total value (incl  $\leq 3$  years salary, research budget, and relocation) of **¥20 million** ( $\sim$ £100k).

**UK Quantum Communications Hub/EPSRC University of York Doctoral Training Partnership (Student, 2019–23):** Full 42-month DTP Home PhD studentship (with £5000 Research Training Support Grant). Worth **~£75k** total.

**At Review:** 2x EPSRC Hybrid Algorithms for Quantum Advantage Bids (Co-I) - £2.9 million and £2.6 million fEC respectively; ARIA Activation Partnership Funding (Co-I) - £9.2 million.

EXTERNAL SERVICE, ESTEEM & OUTREACH

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**Equity, Diversity, and Inclusion:** Invited Speaker and Panellist (“A Diverse World” Panel) at IOP’s [Quantum Science and Technology Conference 2025](#) (Royal Institution); APS Forum on Diversity and Inclusion (FDI) Executive Committee Member-at-Large 2024–26; APS Career Mentoring Fellow 2023–24; QETLabs DEI Committee Member 2022–23

**In the Media:** Interviewed for and mentioned/quoted in six New Scientist articles ([12/5/2021 - Cover Story](#); [12/2/2024; 4/9/2024 - Cover Story](#); [11/1/2025 - Cover Story](#); [31/5/2025](#); [14/8/2025](#)) and four Physics World articles ([29/4/2025 - Cover Story](#), [27/5/2025](#), [23/9/2025](#), [24/9/2025](#)); quoted in [Scientific American](#) and [Spektrum der Wissenschaft/Spektrum.de](#); featured on Hiroshima TV’s Nightly News Programme ([4th Dec 2023](#)); quoted/work mentioned in articles on online science news sites (incl VICE, IFLScience, Phys.org, Heise/c’t).

**Policy Work:** Co-organiser and contributor to the [Quantum Technologies APPG](#)’s first white paper; [EPSRC Quantum Technologies Early-Career Forum](#) Member 2025–2028; Contributor to [Labour Tech](#)’s white paper “Fund or Fade: Powering a Sovereign Quantum Britain”; Contributor to UK Parliamentary Office of Science and Technology’s [POSTNote on Quantum Computing, Sensing, and Communications](#); DSIT/IOP Quantum Skills Taskforce Workshop Member (10/5/2024)

**Committee Membership:** [IOP QQQ Group](#) Committee Member 2025–28; [IOP North East Branch](#) Committee Member 2025–28; [IOP Mathematics and Theoretical Physics Group](#) Committee Member 2025–28; [Philosophy of Physics Society](#) Ordinary Trustee 2025–27

**Conference Organising:** IOP Photon Organising Committee Chair 2028 and [2026](#) (250 attendees, 4 days, 4 parallel streams); [SAGe Faculty Research Conference](#) Organising Committee Chair 2026 (327 attendees, 2 days, 4 parallel streams); NEWTON-Q Organising Committee Member [2026](#) and [2025](#); [IOP QuAMP 2025](#) Organising Committee Member; APS April Meeting 2024 Undergraduate Poster and Talk Reviewer; APS March Meeting DQI Abstract Sorter (2024, 2025); [BQIT:22](#) Programme Committee Lead and Conference Board Member

**Conference Sessions Chaird (13):** [QIP26](#) (12th June, Session 2); [SAGe Research Conference 2026](#); IOP QuAMP 2025 (3rd September, Session 3); APS Global Physics Summit 2025 ([VIR-K01: Quantum Information Processing](#); [VIR-G05: Virtual Poster Session II](#); [VIR-A08: Virtual Undergraduate Research I](#)); APS April Meeting 2024 ([DD03 V: Data Science and AI/ML in Physics](#); [JJ01 V: Forums & GPER II](#)); APS March Meeting 2024 ([PP01 V: Quantum Annealing and Quantum Foundations](#); [AA06 V: General Physics](#); [NN00 Virtual Poster Session III](#)); [Bonn Superdeterminism and Retrocausality Workshop 2022](#); [BQIT:22](#)

**Journal Editorship:** *Phil. Trans. Roy. Soc. A* Guest Editor (Theme Issue “New Approaches to the Foundations of Quantum Mechanics”); *J. Phys. Commun.* Editorial Board Member (2024–26); *J. Phys. Photonics* Guest Editor ([Focus Issue on Photonics for Quantum Foundations](#))

**Journal Peer Reviews (115):** *Phys. Rev. Lett.* (5); *Rev. Mod. Phys.* (1); *Nat. Commun.* (2); *Quantum Sci. Technol.* (10); *Nat. Photonics* (1); *Rep. Prog. Phys.* (3); *Brit. J. Philos. Sci.* (1); *Quantum* (3); *npj Quantum Inf.* (3); *New J. Phys.* (5); *APL Quantum* (1); *AVS Quantum Science* (1); *J. Phys. A: Math. Theor.* (3); *Proc. R. Soc. A* (2); *Phil. Trans. R. Soc. A* (1); *J. Phys. Photonics* (3); *Mater. Quantum Technol.* (2); *Opt. Lett.* (1); *Optica* (2); *Opt. Quant. Electron.* (1); *Phys. Rev. Research* (6); *Phys. Rev. Applied* (2); *Phys. Scr.* (5); *Sci. Rep.* (6); *Found. Phys.* (5); *Stud. Hist. Philos. Sci.* (2); *Euro. Jnl. Phil. Sci.* (2); *Am. J. Phys.* (6); *Mod. Phys. Lett. A* (1); *J. Phys. Commun.* (8); *Phys. Rev. A* (14); *IEEE Trans. Instrum. Meas.* (5); *Quantum Stud.: Math. Found.* (2).

Awarded Institute of Physics Trusted Reviewer status in 2021. *Quant. Sci. Technol.* Outstanding Reviewer 2024.

**Grant Reviews (14):** UKRI Talent Peer Review College Member (1); EPSRC Peer Review College Member (4); British Council ISPF College of Reviewers Member (9)

**Outreach:** NQCC Hackathon 2026 Judge; AIoT Quantum Edge Roundtable Panellist; Sigma Xi High School Student Research Showcase 2024 Judge; [The Quantum Horse: The Pantomime](#) Guest Quantum Scientist; [It’s About Time](#) Podcast Guest Speaker

**Industry Engagement:** Invited Speaker, Unisys Future Matters EMEA 2026

**Other Esteem Indicators:** Invited Member of [Foundational Questions Institute \(FQxI\)](#); Named one of the “Quantum 100” for the UN’s International Year of Quantum; Invited Discussant, [Oxford Quantum Centenary Conference: What Quantum?](#)

PUBLICATIONS (35)

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Corresponding authorship: <sup>§</sup> denotes submitting author, <sup>†</sup> denotes email address on paper.

*Research Articles* (23)

**Phase-Space Representations of Quantum Error-Correcting Codes**

Bozetto, E., Hance, J.R.<sup>†</sup> (2026). *Phys. Rev. Res.* (Accepted, In Press)

**The burden of Fundamentality: Metaphysical ambiguities and the issue of Superdeterminism**

Cafiero, G., Molinari, L., Hance, J.R.<sup>§,†</sup> (2026). *Philos. Sci.* (Accepted, In Press)

**External quantum fluctuations select measurement contexts**

Hance, J.R.<sup>§,†</sup>, Ji, M., Matsushita, T., & Hofmann, H.F.<sup>†</sup> (2026). *Quantum* **10**, 2106.

**Limits of Absoluteness of Observed Events in Timelike Scenarios: A No-Go Theorem**

Mukherjee, S.<sup>†</sup>, Hance, J.R.<sup>§,†</sup> (2026). *Phys. Rev. Res.* **8**(2), 023066.

**Quantum Contextuality Requires Counterfactual Gain**

Sagawa, Y., Hance, J.R.<sup>†</sup>, Hofmann, H.F.<sup>†</sup>, & Ono, T.<sup>§,†</sup> (2026). *Phys. Rev. A* **113**(1), 012221.

**Incompatibility of Deterministic Underlying States with a Counterfactual account of Lüders’ rule**

Tezzin, A.<sup>†</sup>, Amaral, B., & Hance, J.R.<sup>§,†</sup> (2025). *Phys. Rev. A* **112**(5), L050202. (Letter)

**Sufficiency of the counterfactual account of Lüders’ rule to rule out ontological models of quantum mechanics**

Tezzin, A.<sup>†</sup>, Amaral, B., & Hance, J.R.<sup>§,†</sup> (2025). *Phys. Rev. A* **112**(5), 052208.

**Experimental Tests of Invariant Set Theory**

Hance, J.R.<sup>§,†</sup>, Palmer, T.N., & Rarity, J. (2025). *Phys. Scr.* **100**(6), 065123.

**Deterministic Teleportation and Universal Computation Without Particle Exchange**

Salih, H., Hance, J.R.<sup>§,†</sup>, McCutcheon, W., Rudolph, T., & Rarity, J. (2025). *J. Phys. Commun.* **9**(4), 045004.

**Is the dynamical quantum Cheshire cat detectable?**

[Hance, J.R.<sup>§,†</sup>, Ladyman, J., & Rarity, J.G. \(2024\). \*New J. Phys.\* \*\*26\*\*\(7\), 073038.](#)

**Counterfactuality, back-action, and information gain in multi-path interferometers**

[Hance, J.R.<sup>§,†</sup>, Matsushita, T., & Hofmann, H.F.<sup>†</sup> \(2024\). \*Quant. Sci. Technol.\* \*\*9\*\*\(4\), 045015.](#)

**Taxonomy for Physics Beyond Quantum Mechanics**

[Adlam, E.C., Hance, J.R.<sup>§,†</sup>, Hossenfelder S., & Palmer, T.N. \(2024\), \*Proc. R. Soc. A\* \*\*480\*\*\(2294\), 20230779.](#)

**Tracing quantum correlations back to collective interferences**

[Ji, M.<sup>§,†</sup>, Hance, J.R.<sup>†</sup>, & Hofmann, H.F.<sup>†</sup> \(2024\). \*New J. Phys.\* \*\*26\*\*\(6\), 063021.](#)

**Contextuality, Coherences, and Quantum Cheshire Cats**

[Hance, J. R.<sup>§,†</sup>, Ji, M., & Hofmann, H. F.<sup>†</sup> \(2023\). \*New J. Phys.\* \*\*25\*\*\(11\), 113028.](#)

**Weak values and the past of a quantum particle**

[Hance, J.R.<sup>§,†</sup>, Rarity, J., & Ladyman, J.<sup>†</sup> \(2023\). \*Phys. Rev. Res.\* \*\*5\*\*\(2\), 023048.](#)

**Supermeasured: Violating Bell-Statistical Independence without violating physical statistical independence**

[Hance, J.R.<sup>§,†</sup>, Hossenfelder S., & Palmer, T.N. \(2022\). \*Found. Phys.\* \*\*52\*\*\(4\), 81.](#)

**The wave function as a true ensemble**

[Hance, J.R.<sup>§,†</sup>, & Hossenfelder S. \(2022\). \*Proc. R. Soc. A\* \*\*478\*\*\(2262\), 20210705.](#)

**The laws of physics do not prohibit counterfactual communication**

[Salih, H.<sup>§,†</sup>, McCutcheon, W., Hance, J.R., & Rarity, J. \(2022\). \*npj Quantum Inf.\* \*\*8\*\*\(1\), 60.](#)

**Could wavefunctions simultaneously represent knowledge and reality?**

[Hance, J.R.<sup>§,†</sup>, Rarity, J., & Ladyman, J. \(2022\). \*Quantum Stud.: Math. Found.\* \*\*9\*\*\(3\), 333-341.](#)

**Counterfactual Ghost Imaging**

[Hance, J.R.<sup>§,†</sup>, & Rarity, J. \(2021\). \*npj Quantum Inf.\* \*\*7\*\*\(1\), 88.](#)

**Backscatter and spontaneous four-wave mixing in micro-ring resonators**

[Hance, J.R.<sup>§,†</sup>, Sinclair, G.F., & Rarity, J. \(2021\). \*J. Phys. Photonics\* \*\*3\*\*\(2\), 025003.](#)

**How Quantum is Quantum Counterfactual Communication?**

[Hance, J.R.<sup>§,†</sup>, Ladyman, J., & Rarity, J. \(2021\). \*Found. Phys.\* \*\*51\*\*\(1\), 12.](#)

**Exchange-free computation on an unknown qubit at a distance**

[Salih, H.<sup>§,†</sup>, Hance, J.R., McCutcheon, W., Rudolph, T., & Rarity, J. \(2021\). \*New J. Phys.\* \*\*23\*\*\(1\), 013004.](#)

*Review Articles (4)*

**Warring Contextualities – Provably Classical vs Provably Nonclassical**

[Bozetto, E., Hance, J.R.<sup>§,†</sup> \(2026\). \*Phil. Trans. Roy. Soc. A\* \(Accepted, In Press\).](#)

**Fermion and Boson Pairs in Beamsplitters and MZIs**

[Hance, J.R.<sup>§,†</sup> \(2025\). \*J. Phys. Photonics\* \*\*7\*\*\(1\), 012001.](#)

**Counterfactual restrictions and Bell's theorem**

[Hance, J.R.<sup>§,†</sup> \(2024\). \*J. Phys. Commun.\* \*\*8\*\*\(12\), 122001.](#)

**What does it take to solve the measurement problem?**

[Hance, J.R.<sup>§,†</sup>, & Hossenfelder S. \(2022\). \*J. Phys. Commun.\* \*\*6\*\*\(10\), 102001.](#)

*Comments and Replies (5)*

**Reply to “Comment to ‘The laws of physics do not prohibit counterfactual communication’ ”**

[Salih, H., Hance, J.R.<sup>§,†</sup>, McCutcheon, W., and Rarity, J.<sup>†</sup> \(2025\). \*npj Quantum Inf.\* \*\*11\*\*\(1\), 100.](#)

**Comment on “Experimentally adjudicating between different causal accounts of Bell-inequality violations via statistical model selection”**

[Hance, J.R.<sup>§,†</sup>, & Hossenfelder S. \(2024\). \*Phys. Rev. A\* \*\*109\*\*\(2\), 026201.](#)

**Reply to Comment on “Weak Values and the Past of a Quantum Particle”**

[Hance, J.R.<sup>§,†</sup>, Rarity, J., & Ladyman, J.<sup>†</sup> \(2023\). \*Phys. Rev. Res.\* \*\*5\*\*\(4\), 048002.](#)

**Bell's theorem allows local theories of quantum mechanics**

[Hance, J.R.<sup>§,†</sup>, & Hossenfelder S. \(2022\). \*Nat. Phys.\* \*\*18\*\*\(12\), 1382.](#)

**Comment on “Scheme of the arrangement for attack on the protocol BB84”**

[Hance, J.R.<sup>§,†</sup>, & Rarity, J. \(2021\). \*Optik\* \*\*243\*\* 167451.](#)

*Opinion Pieces (3)*

**Why I stopped submitting my work to for-profit publishers**

[Hance, J.R.<sup>§,†</sup> \(2025\). \*Physics World\* \*\*38\*\*\(7\), 17. Republished in \[University World News\]\(#\).](#)

**Why academia should be funded by governments, not students**

[Hance, J.R.<sup>§,†</sup> \(2025\). \*Physics World\* \*\*38\*\*\(1\), 21.](#)

**Can mass and momentum separate? Probably not. Is it worth reading about? Definitely!**

[Hance, J.R.<sup>§,†</sup> \(2024\). \*Quantum Views\* \*\*8\*\*, 83. \(Invited Perspective\)](#)

RESEARCH TALKS

25 Invited Talks, 32 Contributed Talks

**External Quantum Fluctuations select Measurement Contexts:** [Testing Quantum Foundations in the 2025 Quantum Year](#); 3rd Kyushu-Hiroshima QJM Workshop (2025); [QuAMP 2025](#); [FOUNDATIONS2025](#); [QIP25](#) (Invited); 2nd FoQaCiA Workshop

**Back Action and Quantum Counterfactual Effects:** [FQT Girtton \(Cambridge\) 2026](#); [FQMT26](#) (Invited); [QIP26](#) (Invited); [Lakeside Quantum Dialogue 2026](#) (Invited); [Oxford Philosophy of Physics Seminar](#) (Invited); [John Rarity FRS Symposium](#) (Bristol, Invited); [APS Global Physics Summit 2025 \(VIR-C01:9\)](#); [Oxford QITS Invited Talk](#); [Vadstena 2024](#); [Bristol Chaos](#) (Physics Society) Invited Talk; 2nd Kyushu-Hiroshima QJM Workshop (2024, Invited); [TMF2024](#); [QuaSIT 2024](#); [IOP Photon 2024](#); [NQM 10](#); [QIP24](#); 1st FoQaCiA Workshop

**Contextuality, Coherences, and Quantum Cheshire Cats:** APS DAMOP Meeting 2024 ([F11.00009](#)); Newcastle AMBER Group Seminar Talk 16/5/24 (Invited); Newcastle MSP Quantum Group Seminar Talk 8/5/24 (Invited); Vedral Group (Oxford) Seminar Talk 26/4/24 (Invited); DPG Berlin 2024 ([QI 1.6](#)); APS March Meeting 2024 ([PP01:00007](#)); Bristol Philosophy of Physics Weekly Seminar 6/3/24 (Invited); Bristol QIT Weekly Seminar 28/2/24 (Invited); IEICE QIT49 (OIST) 2023 ([Talk 26](#)); Chubu Quantum Workshop 2023 (Invited)

**“What is Bell’s Theorem, anyway?”:** APS April Meeting 2024 ([JJ01:00002](#)); 1st Kyushu-Hiroshima QJM Workshop (2023, Invited)

**Interaction-Free Metrology:** Newcastle Computing Scalable Group Research Seminar 17/1/2025 (Invited); IPAQS Heriot-Watt Weekly Theory Talk 25/9/2022 (Invited)

**Interaction-Free Polarimetry:** Optica APC 2022 ([NpW2G.5](#)); Optica OSSC 2022 ([STu4G.4](#))

**Supermeasured: Violating Bell-Statistical Independence without violating physical statistical independence:** Trieste Fundamental Problems in Quantum Physics 2022 (Invited); Åskloster Seminar 2022 (Invited); Bonn Superdeterminism & Retrocausality Workshop 2022 (Invited)

**Weak values and the past of a quantum particle:** Kyushu-Hiroshima QJM Online Monthly Talk 21/8/23 (Invited); [IEICE QIT48 Kyoto 2023](#); Vedral Group (Oxford) Seminar Talk 2/12/22 (Invited); [IOP Photon 2022](#); [BQIT:22](#); [DPG Heidelberg 2022](#); [ICQIF 2022](#)

**Backscatter and spontaneous four-wave mixing in micro-ring resonators:** IOP Silicon Quantum Information Processing Workshop 2021 (2-minute pitch presentation)

**Counterfactual Ghost Imaging:** OSA FiO+LS 2021 ([FM5C.2](#)); OSA OSSC 2021 ([SW5F.5](#)); CLEO/Europe-EQEC 2021 ([EB-7.3](#)); Bristol SCEEM PGR Conference 2021 (3rd Prize)

**Counterfactuality: From Foundational Issues to Practical Applications:** IPAQS Heriot-Watt Weekly Theory Talk 13/1/2022 (Invited); QETLabs/Photonics Bristol Weekly Talk 1/4/2021 (Invited)

**How quantum is quantum counterfactual communication?:** OSA IONS Exeter 2019

PREPRINTS UNDER REVIEW (16)

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#### The Quantum Plumber’s Problem

[Underwood, N.G.<sup>†</sup>](#), [Hofmann, H.F.](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2609.11416](#)

#### Why three? A two-level system with four mutually unbiased questions

[Hance, J.R.<sup>†</sup>](#) [arXiv:2609.10078](#)

#### Impact of Data Loss in Postprocessing on Training and Inference of Quantum Neural Networks

[Panambalom, S.V.<sup>†</sup>](#), [Altamura, E.](#), [Chancellor, N.](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2609.05060](#)

#### Convex conservation of von Neumann entropy implies unitarity or antiunitarity

[Underwood, N.G.<sup>†</sup>](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2608.29373](#)

#### What meter interference can tell us about the statistics of weak measurements

[Hofmann, H.<sup>†</sup>](#), [Matsushita, T.](#), [Isobe, M.](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2608.05494](#)

#### Modelling Emotional Memory in Children with Tensor Networks

[Groves, H.](#), [Jackson, L.F.](#), [Robertson, B.A.<sup>†</sup>](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2606.28470](#)

#### Classical Limit: Dissipation of Spekkens’ Generalised Contextuality under Decoherence

[Bozetto, E.](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2605.09558](#)

#### How to unitarily map between any two pure states with a single closed-form exponential

[Bradshaw, P.T.J.<sup>†</sup>](#), [Gouveia, M.](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2604.16285](#)

#### The non-local Hong-Ou-Mandel effect

[Kodama, Y.<sup>†</sup>](#), [Hance, J.R.<sup>†</sup>](#), [Hofmann, H.F.<sup>†</sup>](#) [arXiv:2604.10886](#)

#### Noncontextual versus contextual interferometry

[Hance, J.R.<sup>†</sup>](#), [Krnicek, J.](#), [Larsson, J.-Å.<sup>†</sup>](#) [arXiv:2601.13109](#)

#### Quantum-Like Correlations from Local Hidden-Variable Theories Under Conservation Law

[Garza, A.J.<sup>†</sup>](#), [Hance, J.R.<sup>†</sup>](#) [arXiv:2511.06043](#)

#### Interaction-Free Polarimetry

[Hance, J.R.<sup>†</sup>](#), & [Rarity, J.](#) [arXiv:2207.13539](#)

#### Comment on “Why interference phenomena do not capture the essence of quantum theory”

[Hance, J.R.<sup>†</sup>](#), & [Hossenfelder, S.](#) [arXiv:2204.01768](#)

#### Reply to arXiv:2111.13357 (“The Quantum Eraser Non-Paradox”)

[Bracken, C.](#), [Hance, J.R.<sup>†</sup>](#), & [Hossenfelder, S.](#) [arXiv:2112.00436](#)

#### The quantum eraser paradox

[Bracken, C.](#), [Hance, J.R.<sup>†</sup>](#), & [Hossenfelder, S.](#) [arXiv:2111.09347](#)

#### Properties of Invariant Set Theory

[Hance, J.R.](#), [Hossenfelder S.](#), & [Palmer, T.N.<sup>†</sup>](#) [arXiv:2108.08144](#)

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#### OTHER PUBLISHED CONFERENCE ABSTRACTS

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SPIE Optics + Photonics 2025 ([136180H](#)); SPIE Optics + Photonics 2024 ([13148-19](#)); Quantum 2.0 2024 ([QW3A.7](#)); CLEO Pacific Rim 2022 (P-CTh6-13); Quantum 2.0 2022 ([QW2A.18](#)); CLEO 2021 ([JTU3A.14](#)); OSA QIM V 2019 ([T5A.50](#))

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#### MEMBERSHIPS

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**Advance HE:** Fellow (FHEA) 2025–Now; prev Associate Fellow (AFHEA) 2021–25

**Institute of Physics:** Member (MInstP)

**Member of:** FQXi; London Mathematical Society; Center for SpaceTime and the Quantum; Philosophy of Physics Society; International Society for Relativistic Quantum Information; European COST Action in Relativistic Quantum Information