

# Jonte Roderick Hance

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## EXPERIENCE

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### 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 5 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 a Lecturer at the time (2025).

**Teaching:** Leading Quantum Computing Topic for [CSC2034: Introducing Contemporary Topics in Computing](#). Reintroduced [CSC3132: Introduction to Quantum Computing](#), currently Module Leader. Developing [CSC3133: Quantum Algorithms](#) as Module Leader (to begin AY 2026-27). 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 two PDRAs ([Nicolas Underwood](#) and [Peter TJ Bradshaw](#), both funded through my EPSRC QTCA Fellowship, 2025–30), one PhD candidate, and 11 [BSc Computer Science](#) project students. Co-supervising one PDRA ([David Headley](#), funded through Nick Chancellor and my EPSRC Mathematical Sciences Small Grant, 2026). Previously supervised 3 [MSc Advanced Computer Science](#) project students, 2 [MSc Computer Science](#) project students, 3 [BSc Computer Science](#) project students, and 3 summer research interns (funded via my Royal Society Research Grant). Co-supervised 1 Licentiate student, and 7 [BSc Psychology](#) project students (cross-faculty). Examined 2 PhD theses, 15 MSc dissertations, and 10 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 one 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

~£2 million awarded as PI, ~£14 million awarded as Co-I, ~£3 million at review.

**UKRI Cross Research Council Responsive Mode** (Co-I, 2026–28): £1,307k fEC (£927k from funder). Covering 20% of PI ([Barbara-Anne Robertson](#))’s time and 10% of my time plus 3 PDRAs, all for 2 years.

**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.

**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. Additionally, secured £275k in in-kind contributions from Project Partners.

**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.

**Internal (£91k):** *NU SAgE Faculty Policy Fund* (PI, 2026) - £5000 for white paper for [Quantum Tech APPG](#); *NU SAgE Faculty People Fund* (PI, 2025) - £600 for travel to EPSRC Quantum Fellows Event; *NU SAgE Faculty People Fund* (Co-I, 2025) - £4.5k to cover organising costs for NEWTON-Q Workshop 2025; *NU Horizon Europe Travel Fund* (PI, 2024) - £1.2k to co-develop Horizon applications; *Newcastle University Start-Up Package* (PI, 2024–27) - £5k start-up funding, plus fully-funded 36-month ( £75k) Home PhD studentship (used to recruit my PhD candidate Viktorija Bezganovic).

**Hiroshima University Phoenix Postdoctoral Fellowship for Research** (Fellow, 2023–26): Awarded one of four prestigious international fellowships. Total value (incl ≤ 3 years salary, research budget, and relocation) of 20 million JPY (~£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:** Currently have £3 million of grants at review as PI ([EPSRC NIA: £894k fEC](#); [QuantERA 2025 \(UK Node PI\)](#): Project total €2.4 million (£2.1 million), of which UK Node is €520k (£454k) fEC).

## 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:** [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 2026](#) Conference Chair; [SagE Faculty Research Conference](#) Chair (294 registrants, 4 parallel sessions); [NEWTON-Q 2025](#) Organising Committee Member; [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 Chaired (12):** [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–Now); *J. Phys. Photonics* Guest Editor ([Focus Issue on Photonics for Quantum Foundations](#))

**Journal Peer Reviews (101):** *Phys. Rev. Lett.* (2); *Nat. Commun.* (2); *Quantum Sci. Technol.* (10); *Rep. Prog. Phys.* (3); *Brit. J. Philos. Sci.* (1); *Quantum* (3); *npj Quantum Inf.* (3); *APL Quantum* (1); *New J. Phys.* (5); *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* (4); *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* (13); *IEEE Trans. Instrum. Meas.* (2).  
Awarded Institute of Physics Trusted Reviewer status in 2021. [Quant. Sci. Technol. Outstanding Reviewer 2024](#).

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

**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?](#); Honorary Lecturer (Dept. of Electrical and Electronic Engineering, University of Bristol)

**Outreach:** 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;

## PUBLICATIONS (30)

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† denotes corresponding author(s).

*Research Articles (19)*

### Quantum Contextuality Requires Counterfactual Gain

[Sagawa, Y.](#), [Hance, J.R.†](#), [Hofmann, H.F.†](#), & [Ono, T.†](#) (2026). *Phys. Rev. A* **113**(1), 012221.

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

[Tezzin, A.†](#), [Amaral, B.](#), & [Hance, J.R.†](#) (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.†](#), [Amaral, B.](#), & [Hance, J.R.†](#) (2025). *Phys. Rev. A* **112**(5), 052208.

### Experimental Tests of Invariant Set Theory

[Hance, J.R.†](#), [Palmer, T.N.](#), & [Rarity, J.](#) (2025). *Phys. Scr.* **100**(6), 065123.

### Deterministic Teleportation and Universal Computation Without Particle Exchange

[Salih, H.](#), [Hance, J.R.†](#), [McCutcheon, W.](#), [Rudolph, T.](#), & [Rarity, J.](#) (2025). *J. Phys. Commun.* **9**(4), 045004.

### Is the dynamical quantum Cheshire cat detectable?

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

### Taxonomy for Physics Beyond Quantum Mechanics

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

### Tracing quantum correlations back to collective interferences

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

### Contextuality, Coherences, and Quantum Cheshire Cats

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

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

[Hance, J.R.†](#), [Rarity, J.](#), & [Ladyman, J.†](#) (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 (3)*

**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

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25 Invited Talks, 31 Contributed Talks

**External Quantum Fluctuations select Measurement Contexts:** QIP26 (Invited); FQMT26 (Invited); Lakeside Quantum Dialogue 2026 (Invited); Oxford Philosophy of Physics Seminar (Invited); 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:** 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 (10)

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

[Cafero, G.](#), [Molinari, L.](#), [Hance, J.R.](#)<sup>†</sup> [arXiv:2601.14316](#)

**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](#).

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

[Mukherjee, S.](#)<sup>†</sup>, [Hance, J.R.](#)<sup>†</sup> [arXiv:2510.26562](#).

**External quantum fluctuations select measurement contexts**

[Hance, J.R.](#)<sup>†</sup>, [Ji, M.](#), [Matsushita, T.](#), & [Hofmann, H.F.](#)<sup>†</sup> [arXiv:2501.04664](#).

**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](#).

OTHER PUBLISHED CONFERENCE ABSTRACTS

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**Implementation of nonlocal multiphoton interference by mode swapping:** SPIE Optics + Photonics 2025 ([136180H](#))

**Counterfactual control and quantum contextuality in multi-mode interferometers:** SPIE Optics + Photonics 2024 ([13148-19](#))

**Contextuality, Coherence, and Quantum Cheshire Cats:** Quantum 2.0 2024 ([QW3A.7](#))

**Interaction-Free Polarimetry:** CLEO Pacific Rim 2022 ([P-CTh6-13](#)); Quantum 2.0 2022 ([QW2A.18](#))

**Counterfactual Ghost Imaging:** CLEO 2021 ([JTU3A.14](#))

**Counterfactual Communication On-Chip Proposal:** OSA QIM V 2019 ([T5A.50](#))

SKILLS

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**Programming:**  $\LaTeX$ , Wolfram Mathematica (Intermediate), Python (Basic), MatLab (Basic)

**Languages:** English (Fluent), Japanese (CEFR B1), French (CEFR A2), Italian (CEFR A1), German (CEFR A1), Spanish (CEFR A1)

**Other:** Microsoft Office, Lumerical, KLayout, Inkscape

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](#)

EXTRA-CURRICULAR

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**University Fire Warden, First Aider:** 2020–2023, University of Bristol.

**Freeman:** 2018–Now, City of London Corporation; Worshipful Company of Clockmakers.

**Sound Designer/Engineer:** 2018–20, University of Bristol Stage Technicians’ Association.

**Company Director:** 2017–22, Kings Court (Bristol) Management Co. Ltd.

**University of Bristol Pantomime Society Treasurer:** 2017–19; 2021–22 (led successful Bristol SU Group Grant application for £1800 for new costumes).

**Paradox (University of Bristol Physics and Philosophy Society) President:** 2017–18.

**Deputy Head Boy:** 2013–14, John Hampden Grammar School.

**Beaver Scout Leader:** 2010–14, 1<sup>st</sup> Bourne End Scout Group.

**Duke of Edinburgh’s Bronze Award:** Awarded 2011.

**Public Speaking:** Bar National Mock Trial Competition 2012/13: Regional Heat Winner, National Final Participant (role: defence barrister). National Public Speaking Competition for Schools 2011/12: Runner Up (First Round—3rd Heat); Best Chairperson (Second Round—Branch Final). Rotary International Youth Speaks Competition 2011: District 1090 Heat Senior Section Winner. Awarded John Hampden Grammar School’s Full Colours (Honours) 2014, Half Colours 2013, Junior Colours 2012 for representing the school at public speaking/debating.