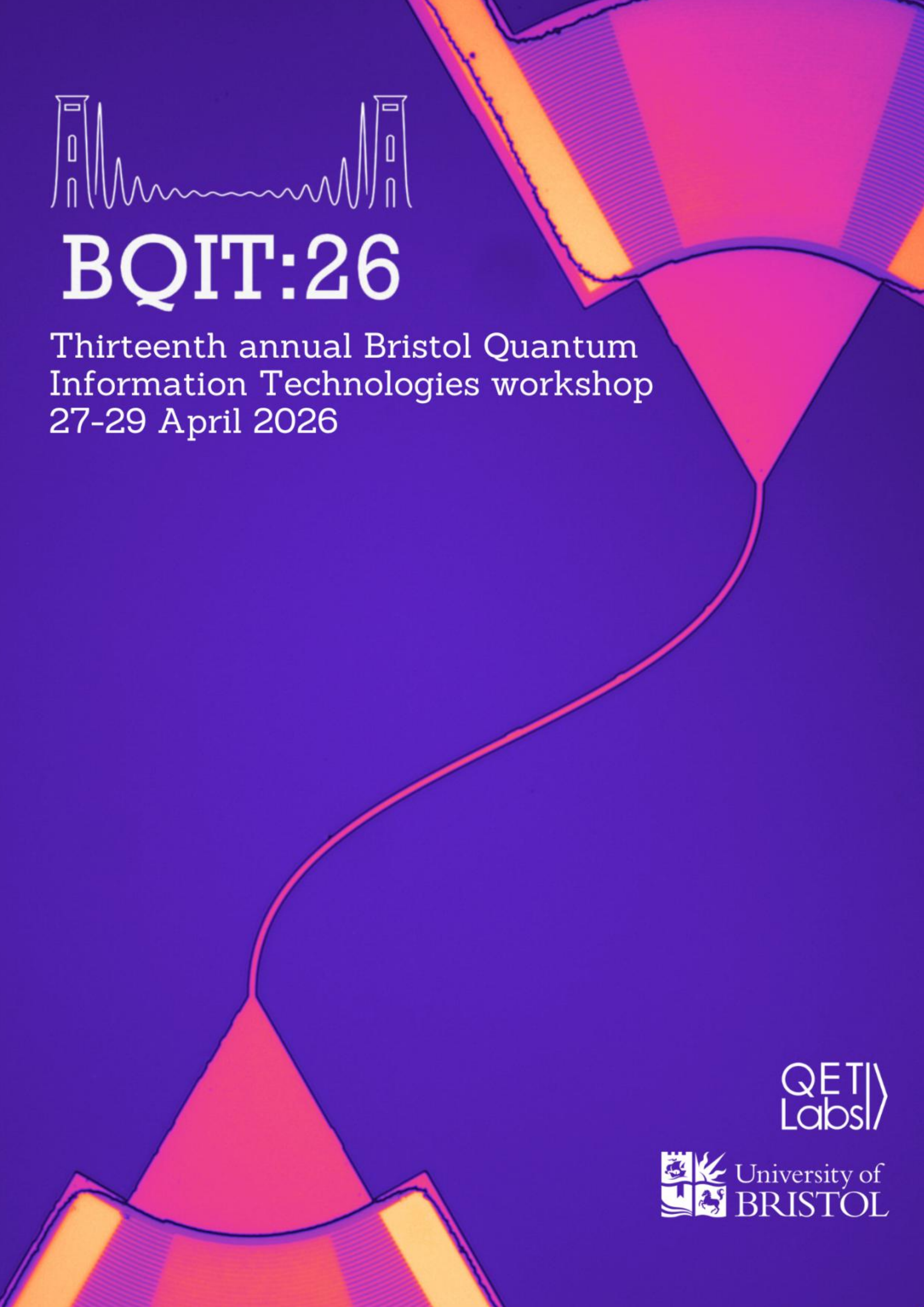

BQIT:26

Thirteenth annual Bristol Quantum Information Technologies workshop
27-29 April 2026

QET Labs

University of BRISTOL

CONTENTS

PROGRAMME COVER IMAGE: JAMES COCKBURN (UNIVERSITY OF BRISTOL)

CODE OF CONDUCT

The BQIT team is dedicated to providing a harassment-free hybrid conference experience for everyone, regardless of gender, gender identity and expression, age, sexual orientation, disability, physical appearance, body size, race, ethnicity, religion (or lack thereof) or technology choices. We do not tolerate harassment of workshop participants in any form. Sexual language and imagery are not appropriate for any workshop platform, including talks, panels, dinners, and online media. Workshop participants violating these rules may be sanctioned or expelled from BQIT:26 at the discretion of the workshop organisers. Full details can be found on pages 32-33.

WELCOME TO BQIT:26

Welcome all to BQIT:26, the thirteenth edition of the Bristol Quantum Information Technologies Workshop. It is an absolute pleasure to have you all here – both in person and online – at what we know will be an exciting few days of stimulating discussions, talks and posters.

Bristol has a rich history in quantum science and technology. In the early 20th century Paul Dirac studied engineering and mathematics here before going on to carry out his seminal work in atomic quantum theory and his prediction of antimatter, earning himself a Nobel Prize. Later, Lennard-Jones worked here on the early forms of quantum chemistry, while Walter Heitler and Hans Bethe were in Bristol during the mid-20th Century working on quantum electrodynamical forces. Around the same time, Nevill Mott carried out his seminal work on the quantum foundations of the theory of metals and semiconductors, for which he was awarded a Nobel Prize. In the 1950s David Bohm moved to Bristol with his then graduate student Yakir Aharanov, whose names are now combined in every physics textbook describing the interaction of charged particles with electromagnetic fields, the famous Aharanov-Bohm effect. In the 1960s Michael Berry joined the School of Physics here in Bristol, developing the theory behind geometric phases which have become hugely important in quantum processing schemes. At the end of the 20th Century, a number of academics were recruited to Bristol in quantum information theory, starting with Sandu Popescu, followed by hires in experimental quantum optics including John Rarity and Jeremy O'Brien. This resulted in the founding of the Centre for Quantum Photonics, which later evolved into the Quantum Engineering Technology Laboratories (QET Labs) that is currently home to thirteen principal investigators and host to BQIT's past and present.

This long academic history and its culmination in quantum technology development here in Bristol is accompanied by the history we have in running BQIT. A precursor to BQIT was the Quantum Photonics Workshop, which was held in the Nanoscience and Quantum Information Building in 2009. This was so successful that we knew we had to continue to provide a platform for world-leading researchers to share their work. With the continued growth of quantum technologies globally, we took the decision to expand the remit to the many technology platforms and applications being pursued, and this edition of BQIT is no different. We have speakers discussing technology platforms ranging from cold atoms and solid-state rare-earth ions through to single molecules and defects in silicon. We have talks and posters spanning the full gamut of quantum applications including communications, sensing, biomedical imaging, computing, and tests of fundamental physical phenomena. We are excited to see what new areas of overlap and ideas come from the discussions that BQIT enables.

Over the years we have worked to ensure that BQIT is as inclusive and accessible as possible, and have learnt a lot from taking BQIT virtual in 2020 and 2021, to hybrid since 2022. This year we continue that tradition and bring you a hybrid conference, allowing those that require it the ability to attend online as well as bringing others together in person. We trust that interactions between all attendees, both online and in-person, will be plentiful and fruitful, and that everyone has a thoroughly enjoyable week. We are also extremely grateful and happy to be hosting a large number of industrial sponsors for BQIT this year, and we hope you enjoy interactions with them as well.

With that, the only thing left to say is have a wonderful and productive week, and make the most of all that Bristol has to offer. We look forward to meeting you all and enjoying BQIT:26 together.

Alex Clark, QET Labs Director and Associate Professor in Quantum Technologies

Carrie Weidner, BQIT Board Chair, QE-CDT Director and QET Labs Senior Lecturer in Physics

VENUE & PARKING

We the Curious

1 Millennium Square, Anchor Rd, Bristol BS1 5DB

The in-person component of BQIT:26 will be held in the top floor event suite at We the Curious.

Parking is available at Millennium Square car park.

Drinks will be served at our event venue during the poster session on the first day of our workshop (Monday 27 April) at 4pm.

WORKSHOP DINNER

Harbour House

The Grove, Bristol BS1 4RB

If you have registered for this year's conference dinner, we invite you to join us at Harbour House following day two of our workshop (Tuesday 28 April). Drinks will be served at 6pm, with dinner at 7pm.

The Harbour House can be found a short 5/10 minute walk away, along the harbourside.

If you have not registered for our dinner, but are interested in attending, please speak to someone at our reception desk, or email us at bqit-admin@bristol.ac.uk.


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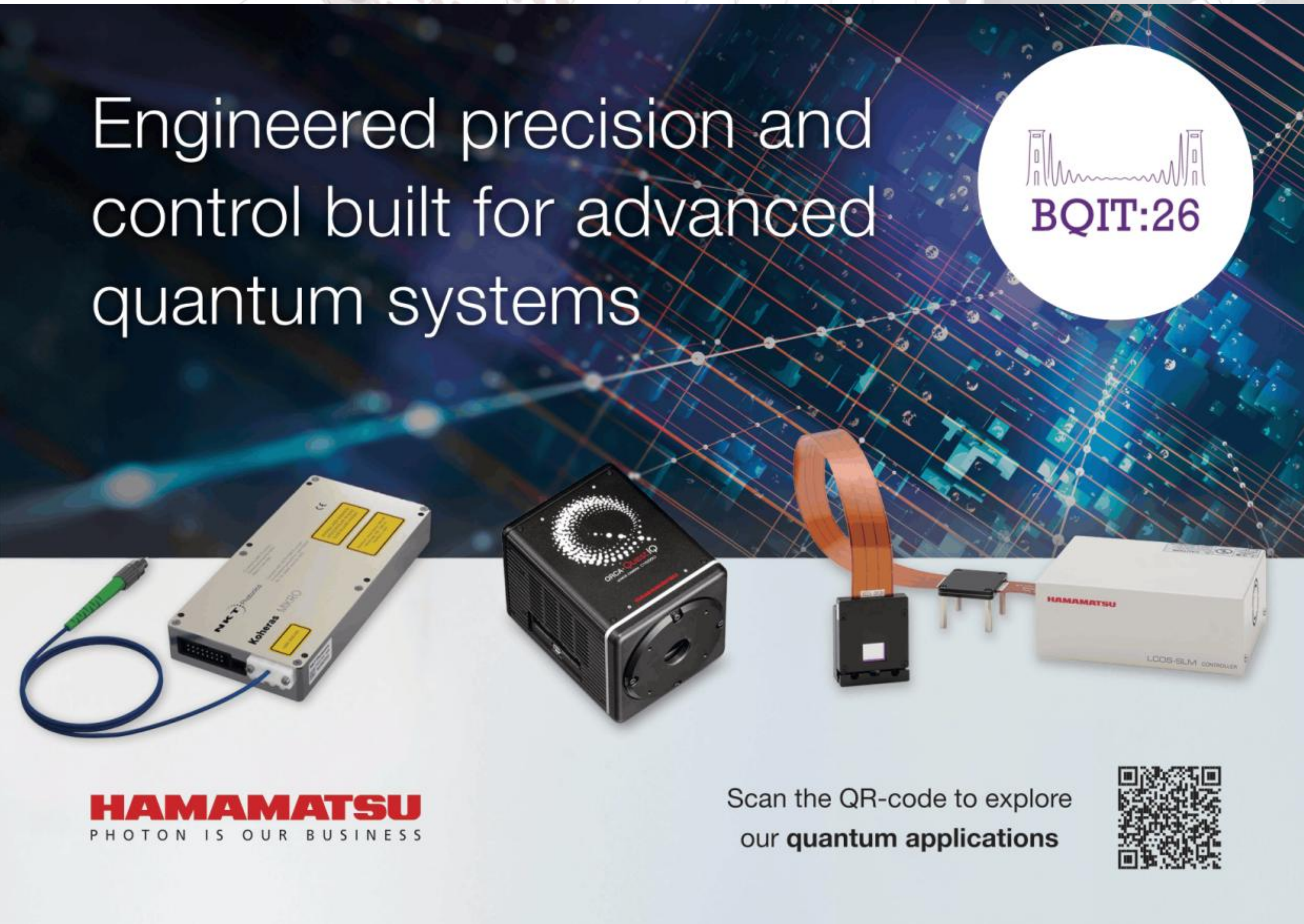
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- Total tag rate:
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- Does not require internal calibration
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  650 nm 70%
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- **DCR:** 25 counts/s
- **Dead Time:** 65 ns
- **Timing jitter:** 160ps

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- **Quantum Efficiency:**
  80% at 1550 nm
- **PDE:** 1-22%
  at 1550 nm, adjustable
- **DCR:** 675 cps@10%
  1000 cps@15%,
  1500 cps@20%
  from 100cps with min PDE
- **Dead Time:** The detector's dead time is adjustable. Value is 1us - 1ms

DAY ONE AGENDA
MONDAY
APRIL 27

TIME	EVENT	LENGTH
09.30	Carrie Weidner (University of Bristol) *Welcome and opening of the workshop*	15 min
	Session One: chaired by Sanna Al-Abdally (University of Bristol)	
09.45	Yannik Fontana (University of Basel) *From weak emitter to efficient spin-photon interface: a single NV in a microcavity*	25 min
10.10	Patrick Ledingham (University of Southampton) *Building hybrid quantum networks with single photons and atomic memories*	25 min
10.35	Elisa M Sala (University of Sheffield) *Exploring the MOVPE growth of droplet epitaxy InAs/InP quantum dots for quantum photonic applications*	25 min
11.00	Thomas Produit (ID Quantique) *Sponsor talk*	10 min
	Session Two: chaired by Petros Androvitsaneas (University of Bristol)	
11.30	Holger Hofmann (Hiroshima University) *Particle delocalization and the measurement dependence of reality*	25 min
11.55	Ivette Fuentes-Guridi (University of Southampton) *Quantum technologies for fundamental physics at the interface of quantum theory and gravity*	25 min
12.20	Hannah Seabrook (University of Bristol) *Closing the closed-labs loophole in device-independent tests of indefinite causality*	25 min
12.45	Nicolas Underwood (University of Newcastle) - **poster upgrade** *The quantum plumber game*	15 min

Session Three: chaired by Reece Boulton (University of Bristol)

14.00	Zeki Shaw (University of Glasgow) - **poster upgrade** *Inverse design of photonic cavities for enhanced spontaneous emission*	15 min
14.15	Nicole Metje (University of Birmingham) *Quantum sensing for civil engineering applications*	25 min
14.40	Emma Pearce (University of Glasgow) *Imaging with undetected photons: infrared information, visible light*	25 min
15.05	Qizhong Liang (CU Boulder) - **virtual talk** *Modulated ringdown comb interferometry*	25 min

Session Four: Poster session

15.50	Poster session (with drinks and canapes)	70 min

17.00	**Optional networking event at We the Curious ground floor exhibition space**

Welcome drinks at We the Curious

Drinks and canapés will be served at our event venue during the poster session at 4pm.

Yannik Fontana

University of Belfast

From weak emitter to efficient spin-photon interface: a single NV in a microcavity

The electronic spin of the nitrogen-vacancy (NV) centre in diamond has a proven track record as a highly coherent solid-state qubit. Unfortunately, modest optical properties limit the efficiency of an NV-based spin-photon interface: natively, only 3% of the emission is composed of coherent zero-phonon-line photons. We demonstrate that the optical transitions of a single NV can be selectively coupled to the resonant modes of a high-finesse open microcavity. We measure Purcell enhancement up to 1.8, approaching the threshold of cooperativity C = 1 and boosting the ZPL fraction by a factor >10. This improvement allows us to directly observe resonance fluorescence (RF), free from any temporal filtering. The RF spectra reveal linewidths close to the Fourier-transform limit. We further identify and address, through the cavity, spin-conserving and spin-flipping optical transitions, opening a pathway toward efficient, high-fidelity spin initialization and readout. Combined with the observation of coherent optical driving dynamics, these results establish our platform as an efficient spin-photon interface with potential applications in quantum networking and quantum-enhanced distributed sensing.

Patrick Ledingham

University of Southampton

Building hybrid quantum networks with single photons and atomic memories

Quantum networks promise transformative capabilities in secure communication, distributed quantum computing, and precision metrology. A key challenge to realising such networks is the deterministic interfacing of disparate quantum systems, particularly bridging solid-state single-photon sources with atomic quantum memories that can synchronise and buffer photonic quantum states.

I will present results demonstrating deterministic storage and retrieval of single telecom photons from quantum dots in an atomic quantum memory. I will discuss how the Off-Resonant Cascaded Absorption protocol enables low-noise, broadband storage within a scalable warm atomic vapour platform. I will then outline strategies to extend storage performance via Doppler-rephased approaches, enabling multi-temporal-mode operation at the single-photon level. This work demonstrates key capabilities required for the deployment of quantum memories in future large-scale quantum communication networks.

Elisa M Sala

University of Sheffield

Exploring the MOVPE growth of droplet epitaxy InAs/InP quantum dots for quantum photonic applications

We study the Droplet Epitaxy (DE) in Metal Organic Vapour Phase Epitaxy (MOVPE) environment of InAs/InP quantum dots (QDs) for applications in quantum photonics at the telecom C-band. Among III-V QDs, InAs/InP are very attractive as high-performance single and entangled photon sources. Here, we investigate their growth dynamics in MOVPE on different surfaces and present detailed morphological and optical characterizations, revealing bright single-dot emission covering the C-band. Recently, the Purcell enhancement of single photons at the C-band from such InAs DE QDs has been reported, alongside the first demonstration of both Stark tuning and charge state control of individual QDs. We also present a novel approach of site-control of such QDs by DE in nanohole arrays, showing localization of droplets and their subsequent crystallization into QDs. Such method is decoupled from strain and thus differs from the traditional Stranski-Krastanov (SK). Finally, we present preliminary results on local droplet etching (LDE) studies on bare InP by using Indium droplets for the first time in MOVPE. Our studies explore the flexibility of the droplet epitaxy in the MOVPE environment for the large-scale fabrication of a broad range of high-quality nanostructures for quantum photonics at the telecom C-band.

Thomas Produit

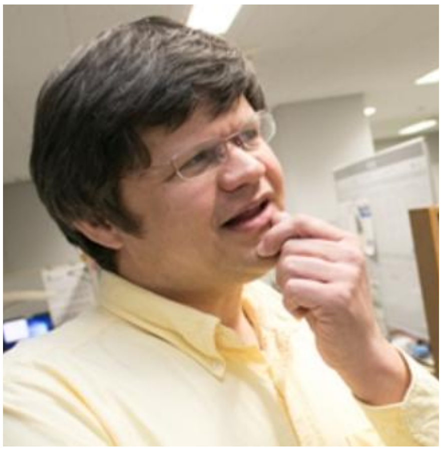
ID Quantique

Sponsor talk

In our digital society, sharing data is risky. Networks have become complex to secure and new invisible threats arise every day.

At ID Quantique, we believe that the ability to trust networks and communicate securely is a fundamental human right. We therefore have developed the key components of a stronger cyber security ecosystem to ensure all over the world, workers, officials, security forces but also citizens and families collaborate and exchange information safely.

We also empower researchers to create the quantum photonic building blocks of the quantum internet, the ultra-fast and safe communication network of the future.



Holger Hofmann

Hiroshima University

Particle delocalization and the measurement dependence of reality

In our recent work, we introduced a method that can determine the delocalization of a particle based on the magnitude of weak effects of a path-dependent quantity. The essential misconception that prevents us from understanding this physical effect is the assumption that eigenvalues represent the only possible values of an observable. Here, I explain why this assumption is wrong and how a proper quantitative understanding of physical interactions explains the measurement dependence of reality.

Ivette Fuentes-Guridi

University of Southampton

Quantum technologies for fundamental physics at the interface of quantum theory and gravity

The unification of quantum mechanics and general relativity remains one of the central challenges in fundamental physics. While theoretical frameworks have advanced considerably, experimental input has been scarce. Quantum technologies are now changing this situation by enabling precision tests at the interface of quantum theory and gravity.

In this talk, I will show how space-based quantum technologies can probe the effects of Earth’s spacetime curvature on quantum information protocols such as teleportation and quantum cryptography. These experiments not only inform the design of global quantum networks but also provide new opportunities to test possible modifications of gravity.

I will further discuss how phonons in Bose–Einstein condensates can serve as sensitive probes of gravitational phenomena, opening avenues to search for signatures of dark matter, dark energy, and high-frequency gravitational waves, while advancing the development of compact quantum gravimeters and gradiometers.

Together, these approaches demonstrate how quantum technologies are becoming experimental tools for exploring gravity itself.

Hannah Seabrook

University of Bristol

Closing the closed-labs loophole in device-independent tests of indefinite causality

Over the past decade, indefinite causal order (ICO) has emerged as a promising paradigm in quantum information science. By challenging the assumption that events occur in a fixed temporal sequence, ICO highlights that quantum mechanics allows processes where operations occur in superpositions of different orders. Such processes enable new possibilities, with experimental demonstrations already reporting advantages in quantum communication, computation, and sensing.

For both foundational and practical applications, ICO must be certified without trusting the internal functioning of the devices used. Ideally, this would follow a device-independent (DI) approach, analogous to Bell tests and their role in DI quantum key distribution. However, unlike Bell scenarios—where loopholes can be closed—DI certifications of ICO necessitate an additional assumption: “closed laboratories” (CL), whereby each party interacts only once with signal-mediating systems. This prevents two-way signalling from reproducing correlations compatible with ICO.

In this talk, I show that this assumption introduces a fundamental loophole: untrusted devices could covertly violate CL and simulate ICO via hidden signalling. I will present a method to overcome this limitation using a minimal set of components with well-defined operational roles, enabling a direct test of the CL assumption within existing DI protocols. Our framework enables robust DI certification of ICO suitable for technological and cryptographic applications.

Nicolas Underwood

University of Newcastle

The quantum plumber game

We make a significant extension of the Elitzur–Vaidman bomb-tester, through a problem we style as The Quantum Plumber Game.

In the game, the player is presented with a d-path black box interferometer (as currently being employed in a number of linear optical quantum computers) in which there is a blockage at an unknown location.

The players job is to determine the location of the blockage, but they may interact with the interferometer only by preparing and entering individual arbitrary qudit photon states, and by recording the response of d photon detectors attached to the interferometer outputs.

Each photon entered is deemed a turn, and the goal of the game is finish in as few turns as possible.

We develop a overall strategy of recursive information gain, are able to compare quantum and classical information gain, and are able to make a correspondence with expected utility theory.

We also discuss turn-by-turn tactics, analysing which input states are likely to lead to the optimal gain.

The game is sufficiently rich that a number of different player approaches are possible; we compare the relative merit of each we discuss.

A GUI version of the game is in development, so the community can attempt to beat our scores.

Zeki Shaw

University of Glasgow

Inverse design of photonic cavities for enhanced spontaneous emission

High-performance single-photon sources are essential for quantum photonic information processing. Efficient control of spontaneous emission, achievable using photonic cavities, is critical for device performance. Traditional cavity design relies on intuition and tuning a limited set of parameters, whereas inverse design explores the full allocated design space to identify geometries optimised for a specific observable, such as the spontaneous emission rate.

We employ a density-based topology optimisation framework, in which the design region is discretised into a grid of pixels that are iteratively adjusted between dielectric and air. By optimising the local density of optical states, we achieve strong Purcell enhancement, surpassing the performance of previously reported designs. Notably, the cavities often exhibit large-scale symmetric designs despite no prior symmetry constraint.

These results demonstrate that density-based topology optimisation is a powerful tool for designing photonic cavities, enabling enhanced single-photon emission and revealing structural features that improve light–matter interaction.

Nicole Metje

University of Birmingham

Quantum sensing for civil engineering applications

Utilities are often buried in the ground with an 'out of sight, out of mind' approach. Our current knowledge of where these legacy assets are buried is very limited with statutory records often out by several metres. In the UK, the buried asset infrastructure ownership is fragmented which means that there are potentially >150 owners which can have assets in the ground. Existing sensing technologies can have limited penetration depth or resolution. Quantum technology gravity gradient sensors might overcome this limitation as a passive technique which does not send electromagnetic waves into the ground.

The presentation will cover the ongoing research into quantum sensing applications in the field of infrastructure monitoring.

Emma Pearce

University of Glasgow

Imaging with undetected photons: infrared information, visible light

Infrared (IR) light reveals information that is inaccessible at visible wavelengths, providing access to chemical composition and material properties. As a result, IR imaging and sensing underpin a wide range of applications, from gas detection and biomedical microscopy to materials analysis and cultural heritage conservation. However, IR cameras remain expensive, noisy, and limited in resolution compared to their visible-wavelength counterparts.

Imaging with undetected photons provides a route around this constraint by transferring information carried by infrared light to the visible, without ever detecting the infrared photons themselves. Non-degenerate photon pairs are generated in a nonlinear interferometer, where interference between photon pairs is recorded at visible wavelengths, with infrared transmission and phase imprinted onto the observed interference.

In this talk, I will review recent experimental progress in this technique, including the development of practical, compact systems and emerging approaches to introduce new imaging modalities based on spatial control within the interferometer.

Qizhong Liang

CU Boulder

Modulated ringdown comb interferometry

We present a method to measure gas samples with unknown and complex molecular contents. Based on laser absorption spectroscopy, we achieve an absorption path length of 5 km and a mid-IR spectral coverage of 1000 cm^{-1}. We demonstrate with simultaneous quantification of 20 distinct molecular species in exhaled breath samples at above 1-part-per-trillion sensitivity varying in concentrations by seven orders of magnitude.

DAY TWO AGENDA
TUESDAY
APRIL 28

TIME	EVENT	LENGTH
Session Five: chaired by Freddie Burns (University of Bristol)		
09.30	Ivan Kassal (University of Sydney) - **virtual talk** *Analog quantum simulation of chemical dynamics*	25 min
09.55	Hugh Burton (UCL) *Fermionic wavefunction theory for quantum computation*	25 min
10.20	Monika Aidelsburger (MPQ/LMU) - **virtual talk** *Quantum simulation – Engineering & understanding quantum systems atom -by-atom*	25 min
10.45	Richard William Nock (RedWave Labs) *Sponsor talk*	10 min
Session Six: chaired by David Dlaka (University of Bristol)		
11.15	**Equity, Diversity & Inclusion session: Supporting international colleagues** Co-chaired by Sanna Al-Abdally, Deepak Bhardwaj, Nicole Luc, and Carrie Weidner (all University of Bristol) **Panellists:** Gosia Drewniok (University of Bristol) Marija Radulovic (Hartley Ultrafast) Belinda Sharpe (Duality Quantum Photonics)	105 min

Session Seven: chaired by Siddarth Joshi (University of Bristol)

14.00	Karl Michael Ziems (University of Southampton) *Molecular property simulations on quantum computers through tiled error mitigation*	25 min
14.25	Isabelle Heuze (UCL) *Tensor network based active space selection*	25 min
14.50	Yudai Suzuki (EPFL) *Double-bracket quantum algorithms for imaginary-time evolution and connections to Grover's algorithm*	25 min
15.15	Simone Angelozzi (University of Southampton) - **poster upgrade** *Quantum Reservoir Computing on Pasqal neutral atoms platform*	15 min

Session Eight: chaired by Weijie Nie (University of Bristol)

15.50	Maria Chekhova (Max Planck Institute for the Science of Light) *Ultrathin sources of entangled photons*	25 min
16.15	Quntao Zhuang (University of Southern California) - **virtual talk** *Quantum spectroscopy enhanced by quantum frequency combs*	25 min
16.40	Pablo Poggi (University of Strathclyde) *Entangled resource states for quantum sensing using neutral atoms with sparse coupling graphs*	25 min
17.05	Sam Harding (University of Bristol) - **poster upgrade** *A Platform for Evanescently Trapping Rb-87 Using Silicon Nitride Strip Waveguides Buried in Silica*	15 min
18.00	**Drinks and dinner at Harbour House**	

Dinner at Harbour House

If you have registered for this year's conference dinner, please make your way to Harbour House.

Drinks begin at 6pm, with dinner at 7pm.

DAY TWO ABSTRACTS

Ivan Kassal

University of Sydney

Analog quantum simulation of chemical dynamics

Most work on applying quantum computing to chemistry has focused on using digital quantum computers to solve the electronic-structure problem of finding energies of stationary states. By contrast, we describe an analog approach to the quantum simulation of chemical dynamics that uses bosonic degrees of freedom of trapped ions to represent nuclear motion. This approach enables the simulation of ultrafast chemical processes, which are among the most difficult simulation problems in chemistry because they involve the entangled motion of both nuclei and electrons. The framework can be used to simulate arbitrary forms of molecular spectroscopy through time-domain simulations. We describe our experimental implementations, which are the first quantum simulations of chemical processes carried out, and include the first direct observation of interference caused by wavepacket dynamics around a conical intersection. Our approach is particularly powerful if injected noise is used to simulate open chemical systems. Its resource requirements are orders of magnitude less than those of digital simulation; for example, the simulations we experimentally carried out would have required, at the same error, 11 logical qubits and over 10^5 logical CNOT gates on a digital device. This advantage over digital simulators grows significantly with system size and especially when injected noise is used to natively simulate open systems.

Hugh Burton

UCL

Fermionic wavefunction theory for quantum computation

The ability of quantum computers to overcome the exponential memory scaling of many-body problems has the potential to transform quantum chemistry. Quantum algorithms require accurate representations of electronic states on a quantum device, but current approximations struggle to combine chemical accuracy and gate-efficiency while preserving physical symmetries, and rely on measurement-intensive adaptive methods that tailor the wave function ansatz to each molecule. In this talk, I will present a spin-symmetry-preserving, gate-efficient ansatz that provides chemically accurate molecular energies with a well-defined circuit structure. Our approach exploits local qubit connectivity, orbital optimisation, and connections with generalised valence bond theory to maximise the accuracy that is obtained with shallow quantum circuits. Numerical simulations for molecules with weak and strong electron correlation, including benzene, water, and molecular singlet-triplet gaps, demonstrate that chemically accurate energies are achieved with as much as 84% fewer two-qubit gates compared to the current state-of-the-art.

Monika Aidelsburger

MPQ/LMU

Quantum simulation – Engineering & understanding quantum systems atom-by-atom

The exponential complexity of quantum many-body systems limits our ability to understand their properties using classical methods. Quantum simulation offers an alternative approach by engineering well-controlled quantum systems whose properties can be studied experimentally.

In this talk, I will introduce quantum simulators based on ultracold atoms in optical lattices, where control at the level of individual particles can now be achieved in systems of several thousand atoms. I will discuss how these platforms enable the exploration of topological phases of matter and non-equilibrium quantum spin liquids, and their connection to lattice gauge theories.

Finally, I will highlight recent experimental advances that provide new ways to prepare and probe complex quantum states, opening routes to the study of strongly correlated and out-of-equilibrium many-body physics, where neutral-atom platforms not only emulate but are starting to enable new discoveries of complex quantum phenomena.

Richard William Nock

RedWave Labs

Sponsor talk

Precise timing is a cornerstone of modern quantum technology experiments. We present a suite of time-tagging electronics and single-photon detectors for demanding time-correlated measurements.

Key capabilities include picosecond precision, low conversion dead time, and high-rate, multi-channel event acquisition. Complementing these systems, we provide Si and InGaAs single-photon detectors for efficient detection across a broad spectral range.

These technologies support applications including quantum optics, fluorescence lifetime spectroscopy, time-correlated single-photon counting, and LiDAR. In particular, the time taggers are well suited for detector arrays and high-count-rate experiments.

Karl Michael Ziems

University of Southampton

Molecular property simulations on quantum computers through tiled error mitigation

Molecular simulation has been identified as one of the first practical applications where quantum computers could demonstrate utility. However, demonstrations on current devices are strongly limited by noise level and fluctuations.

We present tiled M0, an extension to readout error mitigation tailored to tiled Ansätze. By incorporating the quantum chemical Ansatz into the construction of assignment matrices, tiled M0 enables additional gate-level noise characterization, while a locality approximation exploiting the tiled structure renders the noise characterization cost constant, independent of qubit number and circuit depth. We validate the method for molecular ground-state energy calculations on noisy simulator and demonstrate its performance on quantum hardware, achieving experiments with up to 12 qubits and 300 CZ gates using only five minutes of noise characterization.

Furthermore, we showcase the performance of this approach for molecular property simulations for ground and excited states using our quantum linear response algorithm and the orbital-optimized state-averaged variational quantum eigensolver.

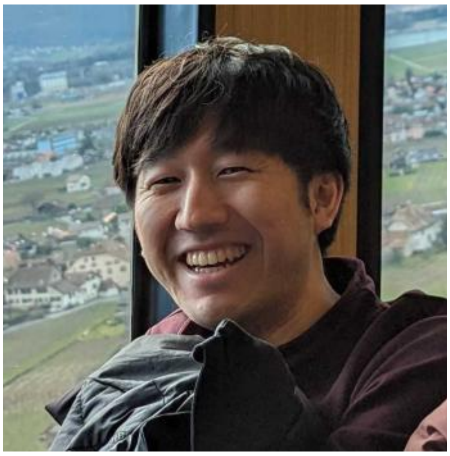
Isabelle Heuze

UCL

Tensor network based active space selection

Many electronic structure approaches rely on active space methods. By restricting the treatment of strong correlation to a carefully chosen subset of orbitals, these methods allow the simulation of systems at different levels of theory. However, active spaces are often selected manually, a process that not only depends on chemical intuition but also lacks a rigorous and reproducible foundation.

In this talk, I will present recent work using tensor network methods to construct and optimise a maximally self-contained active space. This approach replaces human intuition with a gradient-based optimisation, providing a consistent and systematic foundation for electronic structure calculations.



Yudai Suzuki

EPFL

Double-bracket quantum algorithms for imaginary-time evolution and connections to Grover's algorithm

Imaginary-time evolution (ITE) is a thermodynamically inspired approach to ground-state preparation that aims to emulate cooling processes and has been widely used in areas such as quantum many-body physics and optimization. Despite its effectiveness, efficiently synthesizing quantum circuits that implement ITE is itself difficult. In this work, we employ the framework of double-bracket quantum algorithms to develop an algorithm termed double-bracket quantum imaginary-time evolution (DB-QITE), which coherently implements an approximation of ITE on a quantum computer. This derivation is motivated by the observation that ITE is a solution of a differential equation known as double-bracket flows that generate steepest-descent dynamics on the relevant manifold. Crucially, DB-QITE inherits the cooling properties of ITE, including energy reduction and improved fidelity with the ground state. Furthermore, we demonstrate that the same framework naturally reproduces the structure of Grover's algorithm, which exhibits a quadratic advantage over classical methods, by revealing it as a product-formula approximation of ITE applied to unstructured search. These results provide a systematic route to improving the approximation of a ground -state using shallow circuits and could offer new insights into quantum algorithm design from thermodynamic and geometric perspectives.

Simone Angelozzi

University of Southampton

Quantum Reservoir Computing on Pasqal neutral atoms platform

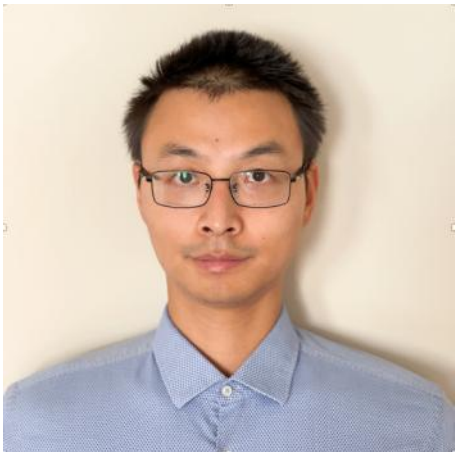
The advent of NISQ devices and Artificial Intelligence has fostered hybrid quantum-classical approaches. While Variational Quantum Algorithms (VQAs) are widely used, they face severe scalability challenges, such as local minima and barren plateaus during gradient-based training. Quantum Reservoir Computing (QRC) emerges as a promising alternative. By coupling complex quantum dynamics with a simple linear classical readout layer, QRC completely circumvents costly optimisation and avoids barren plateaus, providing an efficient machine learning framework for current quantum hardware. In this work, we present the implementation of a QRC pipeline on the Pasqal neutral-atom quantum platform. Developed within the Pulser-Pasqal environment, our approach encodes classical inputs into global or local detuning waveforms and extracts embeddings from quantum measurements for a supervised learning task. The obtained QRC embeddings demonstrated a robust improvement over classical baselines, achieving higher test accuracies across different data encoding strategies and using a small-scale neutral-atom setup as the quantum reservoir. We validate the effectiveness of our implementation through systematic comparisons across encoding schemes, outline future directions to enhance QRC performance on real quantum processors, and demonstrate the viability of quantum machine learning on near-term quantum devices.

Maria Chekhova

Max Planck Institute for the Science of Light

Ultrathin sources of entangled photons

Entangled photons, generated through spontaneous parametric down-conversion (SPDC) or spontaneous four-wave mixing (SFWM), are one of the main resources in photonic quantum technologies. In my talk I will show the advantages of SPDC and SFWM implemented in nano- or microscale nonlinear films. Due to the small thickness, the phase matching, which otherwise restricts the experimental conditions, is satisfied automatically, which enables the use of strongly nonlinear materials. For the same reason, thin-film SPDC and SFWM emit entangled photons into a very broad range of angles and frequencies, forming sources with very high degree of entanglement. Moreover, the 'loose' phase-matching condition allows one to pump SPDC or SFWM at several wavelengths or in several directions simultaneously, creating complex quantum states. Finally, the list of materials known to generate entangled photons through SPDC was recently expanded to include liquid crystal. While the efficiency of SPDC in liquid crystal is almost as high as in lithium niobate of the same thickness, such a source is tuneable: both the emission rate and the polarization state of entangled photons can be varied by applying a few volts of electric field.



Quntao Zhuang

University of Southern California

Quantum spectroscopy enhanced by quantum frequency combs

In this talk, we will discuss recent advances in quantum engineering of frequency-combs and the signal-to-noise ratio advantage. Theory framework for the sensing paradigm will be presented as well as some experiments. [arXiv:2508.01513; Physical Review X 15 (4), 041009 (2025); npj Quantum Information 9, 91 (2023)]

Pablo Poggi

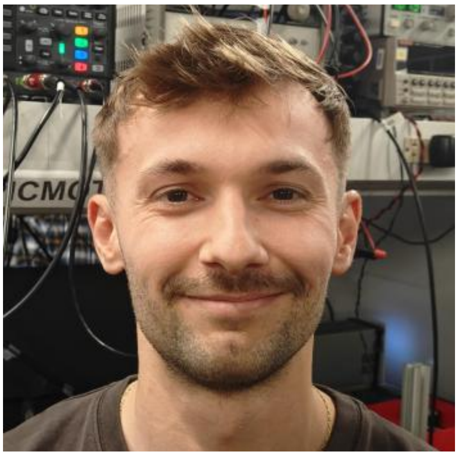
University of Strathclyde

Entangled resource states for quantum sensing using neutral atoms with sparse coupling graphs

Quantum states featuring extensive multipartite entanglement are a resource for quantum-enhanced metrology, with sensitivity up to the Heisenberg limit. However, robust generation of these states using unitary dynamics typically requires all-to-all interactions among particles.

In this talk I will present a method to generate optimal states for quantum sensing using sparse interaction graphs featuring only a logarithmic number of couplings per particle. I will show that specific sparse graphs with long-range interactions can approximate the dynamics of all-to-all spin models, such as the one-axis twisting model, even for large system sizes. The resulting sparse coupling graphs and protocol can also be efficiently implemented using dynamic reconfiguration of atoms in optical tweezers.

If time allows, I will discuss other interesting properties of these models connected with quantum information scrambling and collective behaviour.



Sam Harding

University of Bristol

A Platform for Evanescently Trapping Rb-87 Using Silicon Nitride Strip Waveguides Buried in Silica

The scalability of photonic integrated circuits (PICs) has transformed quantum technologies, yet their potential for cold-atom systems remains largely unexplored. Miniaturising atomic systems is an essential step towards deployable quantum positioning, navigation, and timing devices. We present a chip-scale architecture to trap, manipulate, and interrogate an Rb-87 Bose-Einstein condensate (BEC) using the evanescent optical potential of a silicon nitride PIC, connecting these technologies.

Atoms are first captured on-chip via grating magneto-optical trapping and cooled to quantum degeneracy using an on-chip magnetic microtrap formed by current-carrying wires, building on prior work in chip-scale trapping. The resulting BEC is then transferred to a photonic trap formed by the evanescent optical fields of the waveguide. By combining red- and blue-detuned fundamental and higher-order modes, we can engineer 3D tuneable potentials with control of trap depth and atom-surface separation.

This platform establishes a viable route towards scalable AMO chips for BEC-based work in quantum science and technologies.

ED&I SESSION INFORMATION SHEET

Supporting international colleagues

What is ED&I?

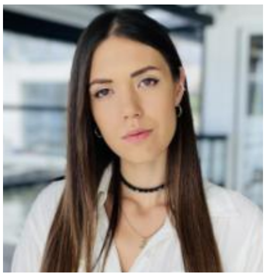
ED&I stands for "equity, diversity, and inclusion". Often, this is also written as "equality, diversity, and inclusion". Equity/equality mean that one's identity should be independent of the opportunities available to them. In our context, this ensures that those from disadvantaged backgrounds get the tools they need to access the same opportunities as their peers. "Diversity" is often thought of as highlighting what makes people different, but it really means that instead of putting the spotlight on our differences, we should respect and celebrate what makes us different and what common ground exists across people from different groups. "Inclusion" effectively means that within diverse teams, people from different backgrounds are not segregated off in their own little bubble, nor integrated into the wider team but seen as obvious outliers, but truly included in that they feel a sense of belonging within the group. In practice, what this means is that all members of a team feel that their contributions matter. In the context of this workshop, this means that while a PhD student may have less experience than a postdoc, they should feel that they can freely offer suggestions without being made to feel less than or excluded.

Code of conduct

This workshop will discuss how to support our international colleagues. In keeping with the above on what ED&I is, the theme of the workshop is respect. That is, efforts should be taken to ensure that everyone that has something to say is allowed to say their piece, and disagreements should be handled professionally. Many people have strong opinions about the topics that will be discussed today. A healthy debate is encouraged. However, unprofessional behaviour will not be tolerated. Everyone at the workshop is required to abide by the BQIT Code of Conduct outlined on pg. 32-33 of the programme.

Our panellists

Gosia Drewniok
University of Bristol
Assistant Director, International Student Success



Marija Radulovic
Hartley Ultrafast
Technology Partnership Manager

Belinda Sharpe
Duality Quantum Photonics
Operations Director

DAY THREE AGENDA
WEDNESDAY APRIL 29

TIME	EVENT	LENGTH
Session Nine: chaired by Haoyang Li (University of Bristol)		
09.30	Leonardo Midolo (Niels Bohr Institute) *Nanomechanical tuning of quantum dot-waveguide systems for adaptive photonic circuits*	25 min
09.55	Roy Zektzer (Bar-Ilan University) *Strong light–matter interactions in integrated photonics with atomic vapors: toward single-photon operation*	25 min
10.20	Mohan Wang (University of Oxford) *Scalable sapphire integrated photonics enabled by laser direct writing*	25 min
10.45	Siddarth Joshi (University of Bristol) *SPOQC launch special*	10 min
Session Ten: Poster session		
11.15	Poster session	60 min (continues into lunch)

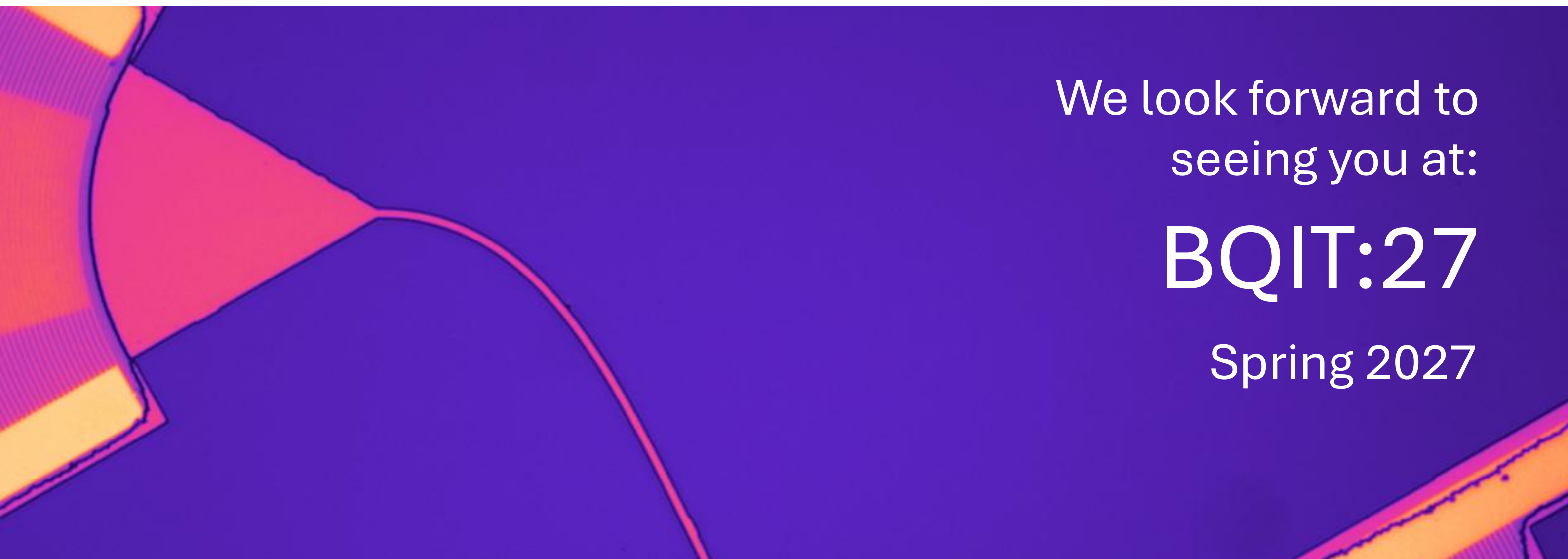
Session Eleven: chaired by Deepak Bhardwaj (University of Bristol)

13.00	Juhi Singh (Planqc Gmbh) *Quantum control for neutral atoms*	25 min
13.25	Roberto Bondesan (Imperial College London) *Learning to encode and decode quantum information: Neural network approaches to quantum error correction*	25 min
13.50	Tim Freegarde (University of Southampton) *Quantum control for fidelity, robustness and calibration*	25 min
14.15	Georgia Booton (University of Bath) - **poster upgrade** *Cavity-based high-speed low-loss optical switching in rubidium vapour*	15 min

Session Twelve: chaired by Nicole Luc (University of Bristol)

14.50	Hobbs Willett (University of Bristol) - **poster upgrade** *HedgehQGS - a mobile quantum ground station*	15 min
15.05	Li Qian (University of Toronto) *Entanglement and hyperentanglement generation in periodically poled silica fiber*	25 min
15.30	Zhiliang Yuan (Beijing Academy of Quantum Information Sciences) *From coherence to entanglement: a pure-state model of resonance fluorescence and its implications*	25 min
15.55	Natalia Herrera Valencia (Heriot Watt/Intertangle) *From high-dimensional entanglement control to scalable quantum networking*	25 min
16.20	Carrie Weidner (University of Bristol) *Workshop close*	10 min

16.30 WORKSHOP CLOSE



DAY THREE ABSTRACTS

Leonardo Midolo

Niels Bohr Institute

Nanomechanical tuning of quantum dot-waveguide systems for adaptive photonic circuits

Solid-state quantum emitters embedded in nanophotonic structures are key building blocks for scalable quantum information processing. InAs/GaAs quantum dots provide high-quality single photons across near-infrared and telecom wavelengths, but their intrinsic spectral and spatial variability limits large-scale integration. Recent advances in nanomechanical engineering offer powerful tools to address this challenge. In this talk, I will present our work on integrating suspended GaAs waveguides with electromechanically tunable components that enable dynamic control of emitter-waveguide coupling. By introducing mechanically driven phase tuning and local field shaping, these devices compensate for emitter randomness and unlock new functionalities. This hybrid approach provides a versatile platform for reconfigurable quantum photonic circuits, supporting applications ranging from single-photon routing to on-chip quantum communication. Our results highlight how combining mechanical, optical, and electrical control can significantly enhance the scalability of solid-state quantum technologies.

Roy Zektzer

Bar-Ilan University

Strong light–matter interactions in integrated photonics with atomic vapors: toward single-photon operation

Achieving coherent light–matter interactions at the single-photon level in thermal atomic vapors remains a central challenge for scalable quantum technologies, due to short interaction times, decoherence, and atomic motion. In this talk, I will present two complementary approaches we have developed to enhance coherence in hybrid atomic–photonic systems integrated on a chip.

First, I will discuss our recent work demonstrating cavity quantum electrodynamics with thermal atomic vapors coupled to high-Q nanophotonic microresonators. By confining optical fields to ultra-small mode volumes while maintaining high quality factors, we achieve large cooperativities and observe nonlinear saturation effects at near single-photon intracavity energies. This regime enables strong, coherent atom–photon interactions without the need for laser-cooled atoms, opening a practical pathway toward chip-scale cavity QED.

Second, I will present an alternative and complementary strategy for enhancing coherence by engineering extended optical modes on a photonic chip. By expanding the interaction length between guided optical modes and moving atoms, we increase the effective interaction time and suppress transit -time broadening, leading to enhanced spectral coherence and robust light–vapor coupling.

Together, these approaches highlight how nanophotonic design—through both strong confinement and controlled mode expansion—can be used to tailor coherence in thermal atomic systems, enabling compact quantum devices for metrology, communication, and information processing.

Mohan Wang

University of Oxford

Scalable sapphire integrated photonics enabled by laser direct writing

Integrated photonic circuits are key building blocks for scalable quantum technologies, providing compact and stable optical platforms. Single-crystal sapphire offers a wide transparency window from the ultraviolet to the mid-infrared, a high damage threshold, and excellent environmental stability in cryogenic and other harsh environments. These properties make sapphire an attractive substrate for quantum communication, computing and sensing.

This talk reports a scalable sapphire integrated photonics platform based on single-mode waveguides fabricated by adaptive-optics-assisted femtosecond-laser direct writing. Three-dimensional devices up to 10 cm in length and written at depths of up to 800 μm are realised, with propagation losses of ~0.6 dB/cm at 780 nm and ~0.7 dB/cm at 1550 nm.

On this platform, a range of polarisation-independent devices is demonstrated, including Y-branch splitters, 2×2 directional couplers, evanescently coupled waveguide arrays, Mach–Zehnder interferometers and waveguide Bragg gratings, with measured performance in good agreement with simulations. The fabrication method can be flexibly adapted to different wavelengths and extended to other crystalline substrates by tailoring the waveguide geometry. These results highlight femtosecond-laser direct writing in sapphire as a potential route towards compact, 3D integrated photonic circuits for future quantum applications.

Siddarth Joshi

University of Bristol

SPOQC launch special

SPOQC (Satellite Platform for Optical Quantum Communications) is an UK-developed research collaboration bringing together the Universities of Bristol, Heriot-Watt, Strathclyde and York, alongside the Science and Technology Facilities Council's RAL Space.

Emerging from research and development efforts led by the preceding Quantum Communications Hub and later advanced by Heriot-Watt's IQN Hub - both funded by the EPSRC - the mission brings together five UK research institutions working to strengthen the UK's leadership in space-based quantum communications, addressing cybersecurity threats posed by emerging quantum computing technologies.

The SPOQC CubeSat was launched aboard a SpaceX Transporter-16 rocket from Vandenberg Space Force Base in California, USA on 30 March 2026. The satellite is now in the final stages of "commissioning" - the setup and performance testing - after which, it will begin transmitting quantum signals to special receivers installed on a state-of-the-art facility, the Hub Optical Ground Station (HOGS), based at Heriot-Watt University in Edinburgh.

The University of Bristol has built a dual wavelength quantum communication transmitter that is now on board the SPOQC mission launched this week. This payload uses discrete (i.e., one or the other) polarisations of photons to encode information for unhackable data transfer.

This mission, which has been about ten years in the making, represents a quantum leap in UK's national capability.

Juhi Singh

Planqc Gmbh

Quantum control for neutral atoms

Quantum control plays a central role in harnessing neutral atoms for scalable quantum computing and simulation. This talk presents recent advances in optimizing and characterizing control in ultracold and Rydberg-atom platforms. Using quantum optimal control within a Fermi–Hubbard framework, we design fast, high-fidelity two-qubit gates by exploiting higher-band dynamics and time-dependent lattice depths. We further develop a nonlinear transfer-function estimation technique to correct experimental field distortions, enhancing model accuracy and control robustness. Finally, we analyze ground-state reachability in variational quantum eigensolvers for Rydberg systems through symmetry-based criteria. Together, these results outline a unified approach that integrates control optimization, system identification, and reachability analysis to advance the fidelity and scalability of neutral-atom quantum technologies.

Roberto Bondesan

Imperial College London

Learning to encode and decode quantum information: Neural network approaches to quantum error correction

Quantum computing and artificial intelligence represent two of the most transformative technological paradigms of our era, each poised to redefine the boundaries of scientific discovery. A growing body of research has explored whether these technologies can be synergistically combined.

In this talk, I will examine the application of classical AI algorithms to quantum computing, with a particular focus on quantum error correction. Errors in quantum hardware are inevitable at the atomic scale at which qubits operate, making quantum error correction one of the most critical directions in the field. AI-driven approaches offer a promising avenue for optimising error correction protocols to the device-specific noise patterns of real quantum hardware.

I will present our recent work on neural network decoders and Bayesian optimisation algorithms to discover good quantum error correction codes, explaining how exploiting the mathematical structure of quantum codes in the AI algorithms design can improve error correction.

I will conclude with a forward-looking discussion on the path towards scalable, AI-driven quantum error correction.

Tim Freegarde

University of Southampton

Quantum control for fidelity, robustness and calibration

Quantum technologies depend upon the precise control of quantum states, commonly using optical or radiofrequency fields. In practice, variations in system, environment and field result in aberrations that affect the efficiency, timing, phase and final state, with corresponding impacts upon the performance of sensing and computational applications. Optimal quantum control techniques, borrowed from the field of magnetic resonance spectroscopy, can improve the fidelity, robustness and noise immunity of quantum control operations and the scale-factor stability of quantum sensors, and be extended to optimise whole sequences and potentially the overall design of a quantum device.

Georgia Booton

University of Bath

Cavity-based high-speed low-loss optical switching in rubidium vapour

Optical switching remains a key outstanding challenge for scalable photonic quantum computing due to the trade-off between speed, bandwidth, and loss. Quantum photonics demands all three, to enable high computational clock rates and resource-efficient scaling to large systems. Optically controlled phase modulation in warm atomic vapour offers a promising route.

We present a cavity-based system that enables all-optical switching of a signal field with minimal loss by leveraging strong two-photon absorption in warm rubidium vapor. Using a three-level atomic ladder configuration in rubidium vapour, the signal field experiences a phase shift conditioned on a counter-propagating control field. The phase shift modifies the cavity resonance, enabling re-routing of photons between transmitted and reflected ports. Confining the interaction within a resonant ring cavity enhances the phase accumulation, leading to a greater switching efficiency. We demonstrate 22 ns rise time, insertion loss of 2.4 dB, and an extinction ratio of 17.5, which bridges the gap between speed and efficiency in photonic switching. We discuss measurements on the single photon-level that probe the noise floor of our switch and projections to simultaneously improve the speed and loss through cavity miniaturisation. The ultimate performance of our switch, combining both speed and efficiency, will find applications in active multiplexing, loop-based quantum memory, and feed-forward for quantum error-correction protocols.

Hobbs Willett

University of Bristol

HedgehQGS - a mobile quantum ground station

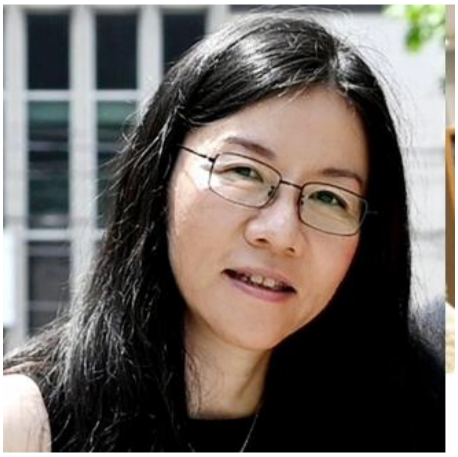
We present HedgehQGS – a van-portable optical ground station for satellite quantum key distribution (QKD).

While fibre based QKD can achieve very high key-rates, without quantum repeaters the photons must traverse the whole fibre length, and is therefore limited by loss. At a long enough distance, or to access users without fibre connections, like ships and planes, satellite QKD can give access to secure cryptographic keys.

Our portable ground station is multi-mission, compatible primarily with OPS-SAT VOLT (ESA) and SPOQC (UK Quantum Comms Hub). Portability allows you to test potential sites, avoid poor weather and move with other portable assets.

The telescope will support multiplexed NIR polarisation satellite QKD sources. With live QKD post-processing with integrated CCSDS-compliant free space optical communications.

The ground station also supports a fast polarisation-compensation scheme, supporting low Size Weight & Power (SW&P) QKD satellite sources connected internally by optical fibre for modularity.



Li Qian

University of Toronto

Entanglement and hyperentanglement generation in periodically poled silica fiber

Entangled photon pair sources are crucial and indispensable components in quantum applications. Entangled photon sources based on nonlinear crystals or waveguides require bulky free-space optics and precision alignment. In contrast, fiber-based entangled photon sources, where entangled photon pairs are directly generated in an optical fiber, make quantum technologies less costly, more practical and accessible, as well as compatible with telecom fiber network infrastructure. In this talk, we review the development of fiber-based entangled and hyper-entangled photon pair sources based on the periodically-poled silica fiber (PPSF). We demonstrate practical and high quality entanglement sources at room temperature, compact and alignment free. The technology has now been commercialized. My talk will reveal the key technological advantages of using PPSF as a nonlinear material for entangled photon generation, as well as remaining challenges. If time permits, I will discuss more advanced topics such as tunable entangled sources utilizing nonlinear interferometers, the applications of polarization-frequency hyper-entanglement, and entanglement witnesses of high-dimensional system.

Zhiliang Yuan

Beijing Academy of Quantum Information Sciences

From coherence to entanglement: a pure-state model of resonance fluorescence and its implications

Resonance fluorescence from a coherently driven two-level emitter is traditionally described using mixed states and stochastic emission. In this talk I present a unified pure-state model that treats the emitter and its emitted field as a joint quantum state. This framework naturally explains the laser-like first-order coherence with antibunching and provides testable predictions for how coherence and higher-order correlations evolve with excitation strength, detuning, and interferometric phase control. I then show how these predictions motivate entanglement generation from resonance fluorescence using linear-optical interference of phase-referenced fields. Finally, I highlight our recent work on quantum-dot photonics, where device-level advances open improved regimes of quantum light generation and control.

Natalia Herrera Valencia

Heriot Watt/Intertangle

From high-dimensional entanglement control to scalable quantum networking

Entanglement distribution will underpin next-generation quantum-secured communications, distributed quantum computing and sensing. Realising this vision requires densely connected quantum networks in which multiple users share entanglement in a reconfigurable and multiplexed manner, with long-distance links established through entanglement swapping. While fully connected local multi-user networks have recently been demonstrated, extending these capabilities to scalable architectures of interconnected networks remains an outstanding challenge.

In this context, complex mode mixing has emerged as a powerful resource for both the transport and manipulation of quantum states of light. By harnessing this process through inverse-design techniques, optical transformations can be programmed to realise high-dimensional, reconfigurable optical circuits. This circuit architecture breaks away from conventional planar integrated photonic platforms and bypasses key control and fabrication limitations.

Using this approach, we have recently demonstrated a prototype large-scale reconfigurable entanglement network interconnecting two four-user local networks. A programmable fibre-based multiport circuit performs on-demand high-dimensional operations on photons encoded in eight transverse spatial modes, enabling flexible, multiplexed routing and entanglement swapping. This demonstration highlights the potential of this architecture to realise the next generation of quantum networks, offering versatile connectivity and scalability enabled by high-dimensional operations.

POSTER SESSION

1. Mijwad Ahmed (online)
City St George's, University of London
How to optimise a Quantum Computer using AI: Understanding Google's Alpha Tensor approach

2. Sanna Al-Abdally
University of Bristol
Towards Distributed Quantum Computing with Non-Local CNOT Gates on Silicon Photonic Circuits

3. Eesa Ali
University of Bristol
Two-Dimensional Spectroscopy of Rubidium Transitions

4. Simon Angelozzi
University of Southampton
Quantum Reservoir Computing on Pasqal neutral atoms platform

5. Yolan Ankaine
University of Bristol
Towards quantum sensing with ultracold atoms in optical lattices

6. Malte Arps
Heidelberg University
SeQuRe - Secure Quantum Receiver

7. Etienne Bargel
C2N, CNRS
Signatures of spin-optical phase entanglement generated by a spin-photon quantum-dot interface

8. Viktorija Bezganovic
Newcastle University
Tomography of Quantum Systems using SIC-POVMs

9. Natasha Bierrum
University of Bristol
Democratising optical orbital angular momentum: a set of cost-effective tools

10. Sebastien Bisdee
University of Bristol
Microcavities for molecular single photon sources

11. Georgia Booton
University of Bath
Cavity-based high-speed low-loss optical switching in rubidium vapour

12. Ekin Bircan Bosdurmaz
University of Twente
Thermally Stable Si3N4 Photonic Circuits Enabled by TiO2 Overlays and dn/dT Measurements

13. Enrico Bozzetto
Politecnico of Turin
Warring Contextualities - Provably Classical vs Provably Nonclassical

14. Peter Bradshaw
Newcastle University
How to map between any two pure states with a single unitary

15. Thomas Bryce
University of Bristol
Nuclear Spin Calming in QDs to Extend Electron Spin Coherence Times

16. Benjamin Butler
University of Strathclyde
Building nature-inspired models of computation

17. Asteria Chen
Imperial College London
Infrared imaging through thermal glow with quantum imaging with undetected photons

18. Shivani Datye
University of Bristol
Loss-Resilient Image Classification on a Photonic Chip

19. Edward Deacon
University of Bristol
Towards the monolithic generation and detection of squeezing in silicon nitride in the NIR

20. Benyam Dejen
University of Cambridge
Towards electron-spin single-shot readout of cavity-coupled GaAs/AlGaAs quantum dot

21. David Dlaka
University of Bristol
Aspheric lens design proposal for near-perfect mode-matching of a broadband quantum dot micropillar to a single-mode fiber

22. Arda Murat Edis (online)
École Polytechnique
Demonstrating Resonant Tunneling Diode Behavior in Aharonov–Bohm Ring Graphene Nanoribbons Using the IBM Qiskit Quantum Computing Framework and NEGF Simulations

23. Imogen Forbes
University of Bristol
Towards Integrated Quantum Photonic Devices for Simulating Neutrino Oscillations

24. Matt Garman
University of Exeter
Magnetic field sensing with a hybrid spin defect-magnon platform in Hexagonal Boron Nitride

25. Sam Harding
University of Bristol
A Platform for Evanescently Trapping Rb-87 Using Silicon Nitride Strip Waveguides Buried in Silica

26. Michael Lenard Hernandez Utto
University of Southampton
Towards Integrated Quantum Memories: Si_3N_4 Waveguides on Rare-Earth-Ion Doped Crystals

27. Aidan Higgins
University of Bristol
Cryogenic Third-Order Nonlinearities in Silicon SWIR Waveguides

28. Thomas Hird
University of Birmingham
Heralded Quantum Memories as a non-demolition photon detector

29. Isobel Jager
University of Bristol
Towards Inter-Satellite Quantum Key Distribution at Deep-UV Wavelengths

30. Matt Jones
University of Bristol
Flexible PCB Coils for Magnetic Field Control in Polarisation Self Rotation Squeezing

31. Harry Jones
University of Bristol
Asymmetric stimulated single-photon four-wave mixing

32. Romaric Journet (online)
Université Paris Saclay
Fast generation of coherent state superposition in free-space using a quantum cavity memory

33. Harikrishnan K J
Indian Institute of Technology Palakkad
Entanglement as a probe to the robustness of topological quantum codes

34. Sampreet Kalita (online)
University of Strathclyde
Exploiting Physics for Efficient Computing

35. Zeynep Karakayali (online)
Galatasaray University
Brain tumor classification with hybrid quantum classical neural networks

36. Vladimir Kornienko
Imperial College London
Wide-field imaging in the mid-infrared (6–10 µm) range with a nonlinear interferometer

37. Tom Lannon
Queen's University Belfast
Machine Learning-Enhanced Characterisation of Spectral Densities for non-Markovian Nitrogen-Vacancy Center Environments

38. Kunyuan Li
University of Twente
Boson sampling in a microring based spatiotemporally multiplexed interferometer

39. Zhaojin Liu
University of Bristol
Integrated Approaches to Photon Extraction, Encoding, and Stabilisation in Fabricated Quantum Photonics

40. Nicolo Lo Piparo
OIST
Bell Tests and Device-Independent QKD with Cavity-QED Cat States

41. Dayne Marcus Lopena
Imperial College London
Gaussian Boson Sampling for Clustering Financial Correlation Networks

42. Nicole Luc
University of Bristol
Parallel CHSH Games on a Multi-User Entanglement Network

43. Jesvita Menezes
University of Glasgow
On the Detection of Entanglement in Unknown States Using Bell Inequality Violations

44. James Miklaucich
University of Bristol
A foundry-integrated NV spin camera for parallel, spatially resolved magnetic imaging

45. Chazi Mwale
University of Bristol
Towards scalable opto-atomic neural networks

46. Daniel Nascimento Duplat
University of Twente
Integrated SiN source architectures for quantum light generation and on-chip control

47. Joseph Niblo (Online)
Heriot Watt University
Experimental multi-parameter estimation of the state of two interfering photonic qubits

48. Oliver Page
Heidelberg University
Spatially-Multiplexed Waveguide-Integrated SNSPDs for On-Chip Photon-Number Resolution

49. Kenny Campbell
Heriot-Watt University
Is distributed quantum computing worth it?

50. Rahul Kumar Pandey
UK Research and Innovation
Neutral Atom Tweezer Array Quantum Computing at NQCC

51. Boni Paul (online)
TCG Centres for Research and Education in Science and Technology
Direct Energy Gap Calculations in Heisenberg Spin Systems Using Superconducting Quantum Devices

52. Tom Reinacher
University of Bristol
Piezoelectric Microresonators for Sensitive Electron Spin Resonance Spectroscopy

53. Withdrawn

54. Tommy Roe
University of Southampton
Momentum State Quantum Computer

55. Himadri Sahoo
University of Twente
Entropy of time-domain Physical Unclonable Functions from spectral signatures

56. Violetta Sharoglazova
University of Twente
Energy–speed relationship of quantum particles challenges Bohmian mechanics

57. Zeki Shaw
University of Glasgow
Inverse Design of Photonic Cavities for Enhanced Spontaneous Emission

58. Reuben Sorsbie
University of St Andrews
Rydberg Polaritons - Towards Single Photon Nonlinearities

59. Naomi Spier
Eindhoven University of Technology
Certification of linear optical quantum state preparation

60. James Yeung Tai
University of Bristol
Active Temporal Multiplexing for Multi-Photon Entanglement Distribution in a Quantum Network

61. Alex Thomas
University of Bristol
Positive Effect of Incomplete Etching of Quantum Dot Micropillars

62. Molly Thomas
UCL
THz quantum technologies

63. Prashasti Tiwari (online)
UCL
Fast Many Body State Synthesis

64. Danilo Triggiani
Politecnico di Bari
On the Quantum Optimality of SPADE for Incoherent Optical Sources Discrimination

65. Withdrawn

66. Gururaja TS (online)
SASTRA Deemed to be University
Quantum secure image encryption using hybrid QTRNG and QPRNG

67. Nicolas Underwood
University of Newcastle
The Quantum Plumber Game

68. Rebecca Walters
University of Bath
Rubidium-filled hollow-core fibre for quantum technologies

69. Hobbs Willett
University of Bristol
HedgehQGS - A Mobile Quantum Ground Station

70. Michael Woodley
University of Bath
Quantum frequency conversion using photonic-crystal fibre

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CODE OF CONDUCT

BQIT:26 is a workshop intended for networking and collaboration in the quantum technology community. We value the engagement of each attendee and work to ensure all participants have an enjoyable and fulfilling experience. Accordingly, all attendees are expected to show respect and courtesy to other attendees throughout the workshop and at all workshop events. All attendees, speakers, sponsors and volunteers at BQIT:26 are required to agree with the following code of conduct. Organisers will enforce this code throughout the event. We expect cooperation from all participants to help ensure a safe environment for everybody. Thank you for helping make this a welcoming, friendly event for all.

THE SHORT VERSION

The BQIT team is dedicated to providing a harassment-free conference experience for everyone, regardless of gender, gender identity and expression, age, sexual orientation, disability, physical appearance, body size, race, ethnicity, religion (or lack thereof), or technology choices. We do not tolerate harassment of workshop participants in any form. Sexual language and imagery is not appropriate for any workshop venue or platform, including talks, panels, dinners, Twitter and other online media. Workshop participants violating these rules may be sanctioned or expelled from BQIT:26.

THE LONGER VERSION

Harassment includes, but is not limited to:

- Verbal comments that reinforce social structures of domination related to gender, gender identity and expression, sexual orientation, disability, physical appearance, body size, race, age, religion, or technology choices.
- Sexual images in public spaces.
- Deliberate intimidation, stalking, or following.
- Harassing photography or recording.
- Sustained disruption of talks or other events.
- Unwelcome sexual attention.
- Advocating for, or encouraging, any of the above behaviour.

Participants asked to stop any harassing behaviour are expected to comply immediately. Sponsors are also subject to the anti-harassment policy. In particular, sponsors should not use sexualised images, activities, or other material.

If a participant engages in harassing behaviour, the workshop organisers may take any action they deem appropriate, including warning the offender or expulsion from BQIT:26.

WHO TO CONTACT

If someone makes you or anyone else feel unsafe or unwelcome, please contact our team as soon as possible, either in person or through our email bqit-admin@bristol.ac.uk. Harassment and other code of conduct violations reduce the value of our event for everyone. We want you to be happy at our event. People like you make our event a better place.

The BQIT team will be happy to help participants contact local law enforcement or otherwise assist those experiencing harassment to feel safe for the duration of the workshop.

We expect participants to follow these rules in all workshop venues, platforms and workshop-related online social events.

ATTENDEE PROCEDURE FOR INCIDENT HANDLING

1. The BQIT team will be prepared to handle the incident. All our staff are informed of the code of conduct policy and guide for handling harassment at the workshop.
2. Report the harassment incident to a BQIT team member either in-person or through email at bqit-admin@bristol.ac.uk (this inbox will be frequently checked for the duration of the event). All reports are confidential. When taking a personal report, our staff will ensure this is confidential. They may involve other event staff to ensure your report is managed properly. During the reporting process, we'll ask you to tell us about what happened. This can be upsetting, but we'll handle it as respectfully as possible. You won't be asked to confront anyone and we won't tell anyone who you are.
3. We will only involve law enforcement or security at a victim's request. If you are not in the UK, please note that you can ask a member of the BQIT team to call the UK authorities on your behalf.

ATTRIBUTION

This Code of Conduct was adapted from confcodeofconduct.com and Geek Feminism Wiki.

BQIT:26 BOARD

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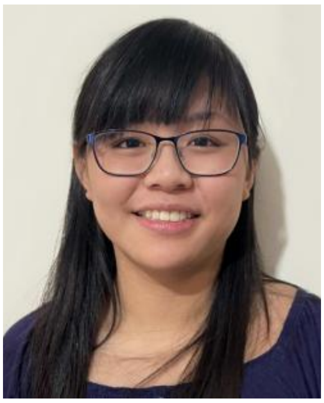

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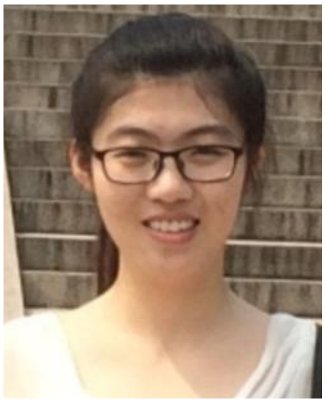
BQIT poster session team lead, EDI team advisor, and QET Labs PhD student



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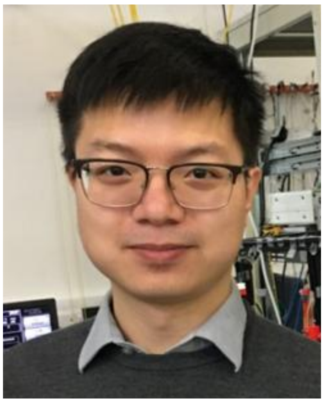

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THE BQIT TEAM WOULD LIKE TO THANK…

Our speakers and panellists for sharing their work and opinions on an expansive range of topics, and our sponsors for helping to make BQIT a continued success.

The BQIT board members, advisors and helpers for their innovative ideas and diligent work throughout the year. Thank you for your support and enthusiasm during the whole process.

And finally, all of our BQIT:26 attendees for participating. Thank you for joining us, and we look forward to welcoming you back to Bristol soon!

University of BRISTOL

QET Labs

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We look forward to seeing you at:

BQIT:27

26-28 APRIL 2027