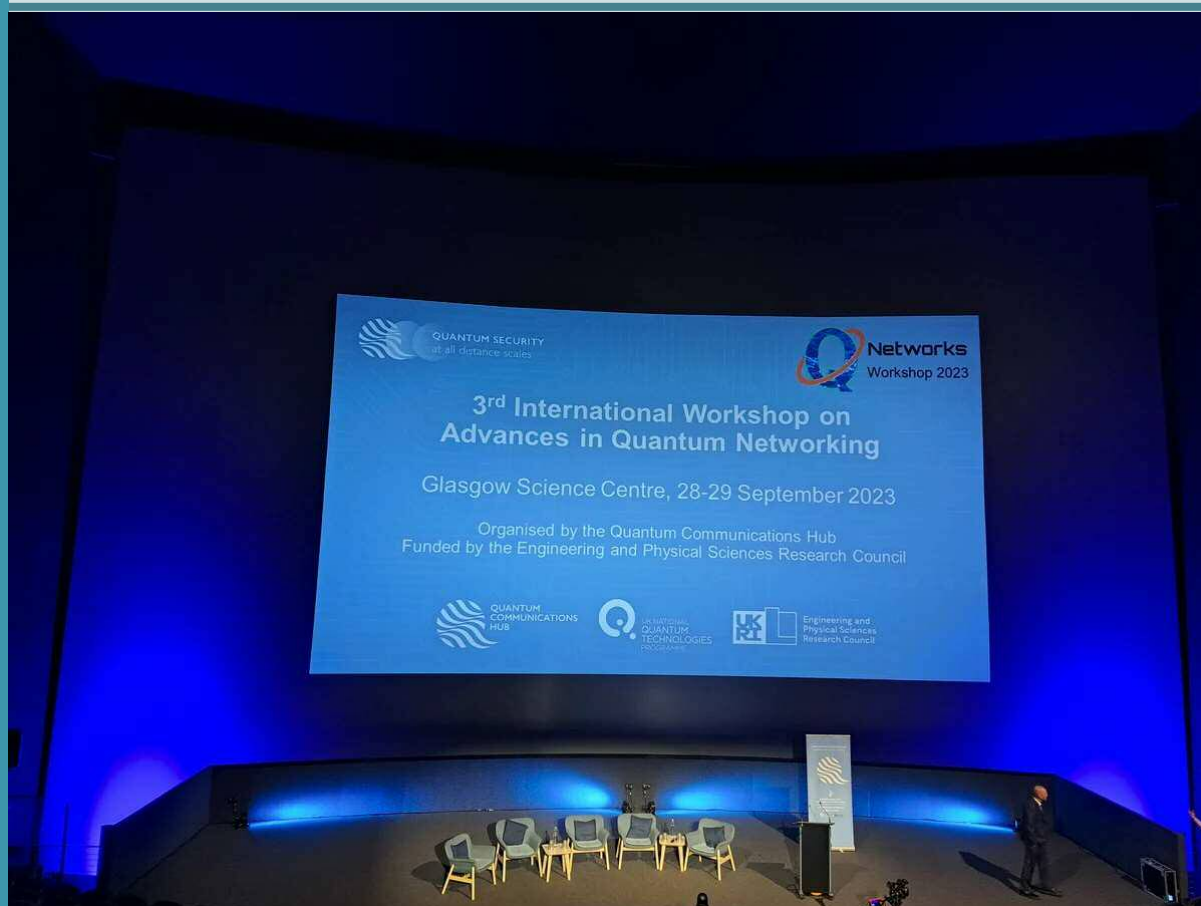


Welcome to the autumn edition of the Quantum Communications Hub project newsletter! In this issue, we are celebrating two scientific milestones, reflecting on our QNetworks23 international workshop, looking forward to the forthcoming showcase and other upcoming events, and more!

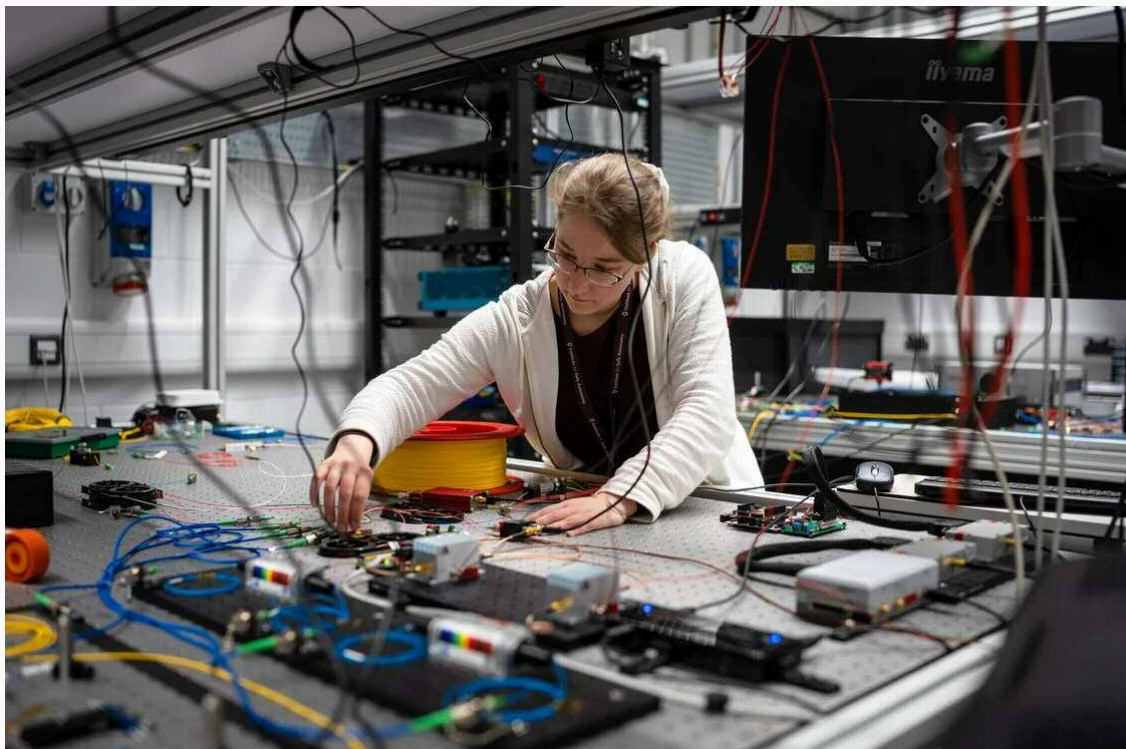


Researchers present progress on future quantum networks at Hub international workshop

The third instalment of the international Hub workshop on advances in quantum networking (QNetworks 2023) took place at the Glasgow Science Centre on 28-29 September. The two-day workshop aims to bring together researchers from the UK's Quantum Communications Hub programme and similar initiatives across the world as well as industry to discuss technological challenges and solutions for creating the next generation of quantum communication networks.

This year the particular focus was on challenges and possible solutions for building a quantum network that can support the rollout of a future quantum internet with applications beyond point-to-point security, such as distributed quantum computing. Additionally, the event included sessions on: the perspective from industry; international quantum networking initiatives; quantum communications in space; and approaches towards next generation quantum networks.

The workshop was attended by over 330 delegates in person and online, and received highly complimentary feedback. To find out more about the schedule of talks, click on the link below.

[Read More](#)

For the first time, researchers successfully demonstrate over euNetworks' fibre infrastructure that quantum communication is possible between the United Kingdom and Ireland

Researchers from The University of York in collaboration with the Quantum Communications Hub and euNetworks Fiber UK Limited ("euNetworks") have for the first time successfully demonstrated that quantum communication is possible over the long geographical distance that separates England from Ireland. The team, led by Professor Marco Lucamarini from the University of York, ran a series of experiments using bandwidth infrastructure provider euNetworks' subsea cable, named [Rockabil](#). This network is one of the newest commercial optical fibre systems in operation and connects Ireland to England in the United Kingdom, running 224 kilometres between Portrane and Southport cable landing stations. Until now, no quantum link has ever been established between the two countries, nor on a span stretching this length on a subsea fibre optic cable.

The series of experiments conducted on-site resulted in the successful transportation of single and entangled photons, as well as in the successful measurement of the optical phase exploited in twin-field and continuous-variable Quantum Key Distribution (QKD), over a longer continuous distance than had ever been established before in undersea optical fibres, devoid of 'trusted nodes' between the two endpoints of the communication channel. The success of the experiments was largely due to highly sensitive detectors deployed at the Southport endpoint of the cable to reduce environmental noise levels.

The project, funded by the EPSRC Quantum Communications Hub, will be presented at the NATO Symposium on Quantum Technology for Defence and Security in Amsterdam on 3 October. To read the full press release click on the link below or for the full results, read the [research publication](#).

Read More



Quantum Hubs organised summer school trains 60 promising researchers from the UK and Canada

The first International Summer School in Quantum Technologies (ISSQT23) took place at the University of Birmingham campus during early August. The primary aim of the School was to deliver world-class training to some of the most promising quantum technology researchers in the UK and Canada and, in doing so, nurture the development of talent in this area.

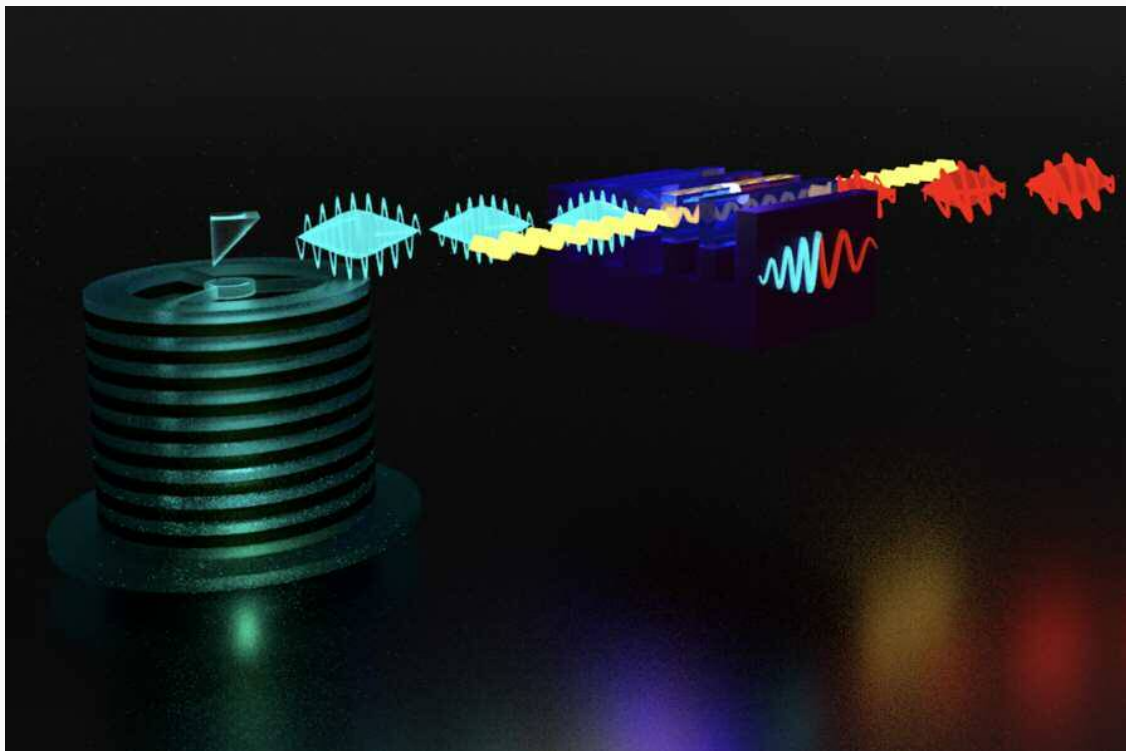
The 10-day residential event included technical lectures on all aspects of quantum technologies (communications, computing, imaging, sensing and metrology) with a focus on applications; sessions on transferable skills (delivered by Anchored In) and a number of social activities to promote community building. The technical talks covered a wide range of topics in the field and were delivered by a number of world leading experts: Sile Nic Chormaic (Okinawa Institute of Science and Technology, Japan), Daniel Higginbottom (Simon Fraser University, Canada), Elham Kashefi (University of Edinburgh and National Quantum Computing Centre, UK), John Kitching (NIST, USA), Jonathan Leach (Heriot-Watt University, UK), Norbert Lütkenhaus (University of Waterloo, Canada), Helen Margolis (National Physical Laboratory), Miles Padgett (University of Glasgow and EPSRC).

In terms of the transferable skills sessions, there was a strong student-led element

to the options covered, as a result of an online survey forwarded to all participants. The final programme included sessions on Collaboration and Networking, Driving Impact from Research, ED&I, Public Engagement, Careers Masterclass, How to Start a Business, and Grant and Fellowship Proposal Writing.

Student feedback was hugely positive with the overwhelming majority highlighting usefulness for networking, exposure to research areas, career insights, and skills development as reasons for their complimentary responses.

The ISSQT23 event was organised by the network of UK Quantum Technologies Hubs with generous funding provided by the EPSRC.



Quantum Nanomaterials Achieve Breakthrough Encryption Performance Over Conventional Optical Fibre

A group of researchers from Scottish Universities working alongside international collaborators have achieved remarkable new results in quantum secure encryption over standard optical-fibre networks. Led by Heriot-Watt and involving researchers from the Universities of Strathclyde, California and Leiden, the collaboration focused on the potential of ‘quantum dots’ – semiconductor nanostructures that behave like artificial atoms – to act as single-photon sources.

Quantum light sources that emit very faint signals are an essential component for achieving encrypted communications via quantum secure methods. Quantum dot

single-photon sources have the additional advantage of being compatible with so-called quantum memories, a key enabling technology towards the establishment of a future quantum internet. To date, though, this potential has been limited by practical performance issues, such as distance limitations due to photon loss in optical fibres, and unfeasibly long processing times to generate secure keys from real-world data.

The results of this new work overcome these limitations, achieving record key rates and distance results by converting the photons from a high-quality quantum dot to wavelengths used in low-loss telecom networks. A major development is a new security analysis of the amount of secure key distillable from practical amounts of raw data. Using techniques also utilised in satellite quantum communications, the researchers showed that they could generate robust encryption keys for fibre distances of up to 175km in just an hour, when previously achieving this kind of security guarantee over such length of fibre would have taken decades.

The feasibility study that led to this experimental demonstration was originally funded by the EPSRC Quantum Communications Hub project, that aims to develop and implement next generation quantum secure networks at all distance scales. These new results convincingly establish that the use of frequency-converted quantum dots is possible at high rates and encryption key acquisition times, relevant for metropolitan-scale quantum communications networks over conventional optical fibre. This breakthrough brings single-photon-based quantum security much closer to practical technology and application.

The full results were published in [Nature Communications](#)



Quantum Shorts flash fiction competition returns for one last call

The international Quantum Shorts flash fiction competition has opened a new call for entries. The contest is free to enter and is accepting submissions until 8 January 2024. Organised by the Centre for Quantum Technologies in Singapore, this is the final open call in the competition series which has alternated between annual calls for creative quantum films and flash fiction since 2012.

The UK National Quantum Technologies Programme through its public engagement initiative, Quantum City, supports the competition as a scientific partner along with other leading scientific institutions around the world. The competition is also supported by media partners Scientific American, the longest continuously published magazine in the U.S., and Nature, the international weekly journal of science.

To enter, writers must craft a story no longer than 1000 words that takes inspiration from quantum physics. The story must also incorporate the phrase “nobody said this was going to be easy”. The phrase comes from a quantum researcher in "Helping Hands", the last story to claim first prize in Quantum Shorts. In that story by Cora Valderas, the researcher was grappling with the unexpected outcomes of an experiment. Writers may empathise as they plot about the trials and tribulations of building quantum devices or the complexities and uncertainties that govern the quantum world.

Writers will stand to win a First Prize of USD 1500, a Runner Up prize of USD 1000 and a People's Choice prize of USD 500. Up to ten shortlisted entries will also win a USD 100 shortlist prize and a one-year digital subscription to Scientific American. A panel of distinguished judges will select the top two prizes.

The deadline to enter is 23:59 GMT, 8 January 2024. Entries can be submitted to Quantum Shorts via [its website](#), which also features a full set of rules. The website also has resources on quantum physics and writing.



Upcoming events!

The Quantum Communications Hub will be participating at this year's [national quantum technologies showcase](#), taking place at the Business Design Centre, London, and online on November 2nd! The Hub will be exhibiting its quantum networking technologies in its main stand (G1) and its SPOQC (Satellite Platform for Optical Quantum Communications) mission in stand S16, jointly with RAL Space. Secure your free ticket for the event today using the link above, and come and speak to our researchers about our work!

Hub senior investigators will also be visiting the US (12-17 November) as part of a specialist **quantum networking delegation**, jointly organised by Innovate UK and the Science & Innovation Network offices of Chicago and New York. The aim of the visit is to explore mutually beneficial collaborative opportunities. During the trip, the team will attend the **Chicago Quantum Summit**.

Towards the end of November, Hub researchers will participate at the [2023 UK Space Conference](#), taking place in Belfast (ICC, 21-23 November). The conference is a significant biennial event for the UK Space sector, uniting the UK and international space communities (government, industry, and academia). The conference provides a platform for the space sector to exchange ideas, plans, and partnerships that encourage development and success in the emerging space age. Hub investigators Buller (HWU) and Vick (RAL Space) will present talks on the UK's two satellite QKD missions and 3D models of the Hub's Optical Ground Station and CubeSat will be available to see at the exhibition space as part of the UKRI stand.

For more information on upcoming events of interest to the Hub, visit our project website at <https://www.quantumcommshub.net/>

If this email was forwarded to you, please sign up to receive our newsletter via [this form](#).

To Unsubscribe, click on the relevant option through [this link](#).



Quantum Communications Hub, Information Centre, Market Square, (Department of Physics), University of York, York, North Yorkshire, YO10 5DD

[Unsubscribe](#) [Manage preferences](#)

Send free email today

HubSpot