



Photonics
and
Quantum

SHOWCASING THE

UK PHOTONICS AND QUANTUM INDUSTRY

Exhibitor Guide

*Wednesday, 6th July 2022,
08:30—10:00 hrs.
Cholmondeley Terrace Room, House of Lords*



PLG July 2021

£14.5bn

Photonics UK
Industry output



76,700

People employed
in UK Photonics



£6.5bn

Gross Value Added
to economy

£85,000

GVA per employee
economy

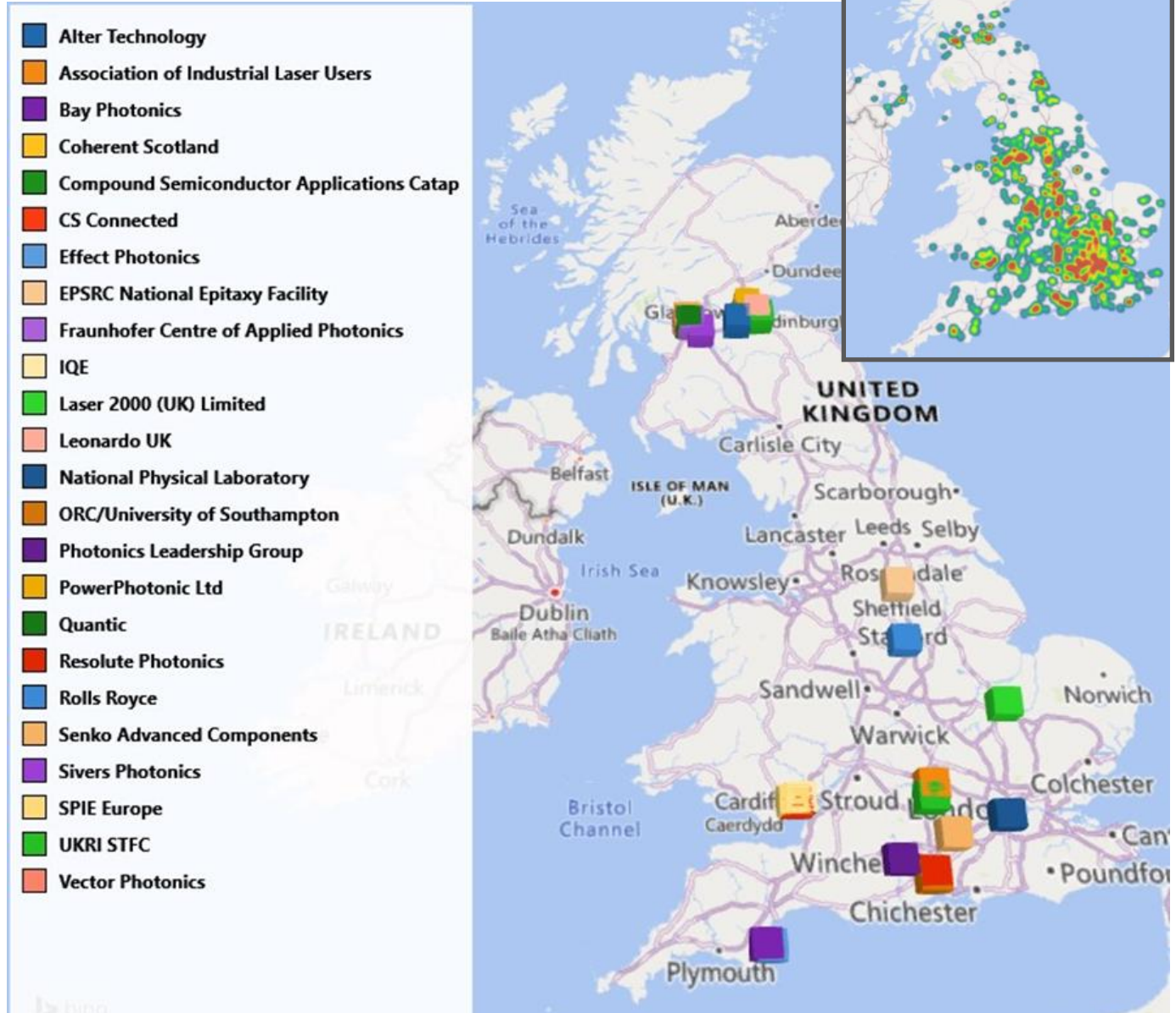
12%

Like for like growth
over 2 years
(5.8% CAGR)





Organisations represented at today's Showcase:



ALTER TECHNOLOGY

Alter Technology, TÜV Nord (UK) Ltd, Livingston

Photonics and microelectronics packaging, OEM supplier of photonic devices

ALTER TECHNOLOGY is the leading provider of micro and optoelectronics services for space and harsh environment markets. We provide contract package design and precision assembly services for a wide range of optoelectronic and microelectronic devices, including end to end semiconductor manufacturing from wafer singulation to assembled product.

Our expertise in semiconductor packaging solutions spans the full product life-cycle: from design through prototyping, process optimisation, product qualification, failure analysis, volume manufacturing and transfer to low-cost volume manufacture.

Alter has a long and well-established legacy in packaging and test for space and quantum applications and has developed a suite of products to serve these markets.

Representative: Una Marvet, Head of Design Centre

www.wpo-altertechnology.com



AILU, Abingdon

Association of Industrial Laser Users

The Association of Industrial Laser Users (AILU) was founded in 1995 and seeks to grow laser adoption in manufacturing, by connecting, empowering and guiding new and existing users of industrial lasers.

To achieve this AILU raises awareness of laser technologies and applications as well as fostering research and development of new/existing laser technology and applications. The Association is based in Abingdon near Oxford and has over 300 members.

Representatives: Dave MacLellan, Executive Director; Clive Grafton-Reed, Rolls-Royce

www.ailu.org.uk



Bay Photonics Ltd., Paignton

Photonics Packaging & Design

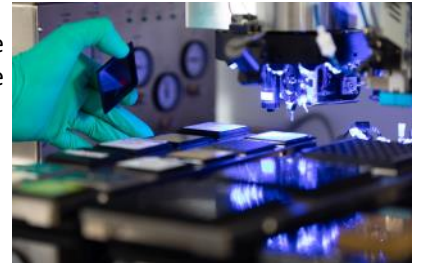
Bay Photonics are an independent, flexible design and build facility offering solutions to provide reduced time to market, technical risk and product development for new product developments in Photonic and Quantum Technology packaging projects.

These products are driving the future of big data technologies which provide low carbon (low Size Weight and Power LoSWaP) solutions for autonomous vehicle (LIDAR & Single Photon detectors), Health (OCT and wearables), Space (CubeSAT) and Security (Quantum Random Number Generator).

Located in Paignton, Devon at the Electronics & Photonics Innovation Centre (EPIC), we are housed with other members of the Torbay Photonics Cluster ecosystem where we have a rich history of Photonics & communications technological advancement.

Representative: Dr Andrew Robertson, CTO

www.bayphotonics.com



Coherent, Glasgow

Ultrafast Lasers for various applications including microelectronics and life sciences

Coherent Scotland has **grown** considerably since its formation in 2000.

At our purpose built facility in Glasgow we primarily specialise in the development and manufacture of ultrafast laser systems for scientific, instrumentation and microelectronic markets. Expanded in 2020 the facility also supports the manufacture of Ultrafast products from across Coherent.

Representative: Donald Mackay, Head of HR

www.coherent.com



CS Applications Catapult, Cardiff

Compound Semiconductors

Compound Semiconductor Applications (CSA) Catapult is focused on bringing compound semiconductor applications to life in three key areas: the road to Net Zero, future telecoms and intelligent sensing.

CSA Catapult is a Not for Profit organisation headquartered in South Wales. It is focused on three technology areas: Power Electronics, RF & Microwave and Photonics. As well as the three technology areas, CSA Catapult is also working in Advanced Packaging for these high-power innovations.

The next wave of emerging applications will have an enormous impact on our lives. Compound semiconductors will enable a host of new and exciting applications in the electrification of transport, clean energy, defence and security and digital communications markets.

CSA Catapult exists to help the UK compound semiconductor industry grow and collaborates across the UK and internationally.

Representative: Dr Andrew Sellars, Strategic Development Director

www.csa.catapult.org.uk



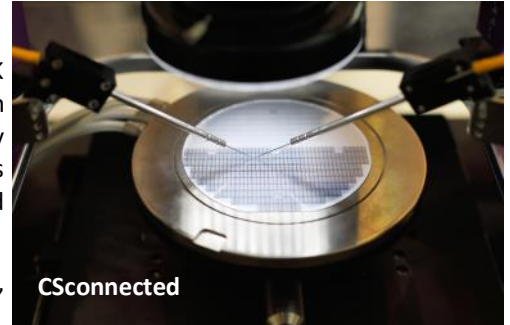
CSconnected, Cardiff

Compound Semiconductors

CSconnected is the collective brand for a growing number of advanced semiconductor related activities in Wales, home to a unique community of academic institutions, prototyping facilities and global, high-volume manufacturing capabilities that collaborate across a range of research and innovation programs. CSconnected is uniquely positioned to develop a global advantage in a sovereign, key enabling technology which will allow Wales and the UK to increase trade globally in critical sectors such as 5G communications, autonomous and electric vehicles, advanced medical devices, and consumer electronics of the future.

In 2020, CSconnected received government funding provided through UK Research and Innovation's flagship Strength in Places Fund (SIPF). The 55-month CSconnected SIPF project has a total value of £43million, supported by £25million of UKRI funds. It builds on Wales's regional strengths and integrates research excellence with a unique regional supply chain in compound semiconductor manufacturing.

Representatives: Philip Cornish, Business Development Manager; Mohsin Haji, Principal Scientist, NPL; Chris Measdowns, Director;



www.csconnected.com

Effect Photonics, Brixham



Telecommunications development and manufacture

EFFECT Photonics is a highly vertically integrated, independent leader in integrated optics, addressing the need for high-performance, affordable solutions driven by the ever-increasing demand for bandwidth and faster data transfer capabilities.

EFFECT Photonics is headquartered in Eindhoven, The Netherlands, with additional facilities in the UK, the US and Taiwan, and a worldwide network of sales partner.

EFFECT Photonics Ltd is based in South Devon, with development, reliability testing and manufacturing facilities, initially focused on modules for the roll out of the 5G system. The development of these modules was supported by two IUK projects led by EFFECT Photonics Ltd. We are part of the Hi-Tech Cluster of Torbay.

Representative: Tim Durant, Senior Program Manager

www.effectphotonics.com



Fraunhofer UK Research Ltd, Glasgow

UK Applied R&D services for Industry—all quantum areas and photonic systems

Fraunhofer Centre for Applied Photonics, UK, is a world-leading centre in the field of applied laser research and development, doing projects for industry. We are an external, flexible, R and D resource in laser, optical and quantum technologies for industry.

Established 2012, 70 staff and students. Legally independent affiliate of Fraunhofer Gesellschaft.

Fraunhofer CAP develops lasers and optical systems for applications including energy, security, environment, sensing, space, lifesciences and quantum technologies.

The core competencies at Fraunhofer CAP extend from applied research and development through to design, testing and characterisation of systems and modules as well as building pre-production prototypes.

Our principle aim is to perform industry driven research to enable new or improved products and processes for industrial partners. Photonics and optical technologies are enabling technologies which address a wide range of markets.

Since opening in 2012 Fraunhofer CAP has worked on more than 200 diverse projects with 100+ companies, other Research and Technology Organisations (RTOs) and universities in contract and collaborative R and D projects.

Representative: Simon Andrews, Executive Director

Twitter @FraunhoferUK

www.fraunhofer.co.uk



IQE plc

Photonics & Quantum Technology Compound Semiconductor wafers and application

Founded by the present management in 1988, the company was created to provide a foundry service for advanced compound semiconductor wafers. Headquartered in Cardiff, UK, IQE plc is now the parent body of 10 subsidiary units, seven of which provide pure-play foundry III-V epitaxial services to a worldwide client base of many hundreds of academic, research and commercial organizations. The group has an annual turnover of ~£170M and employs roughly 700 people worldwide. IQE plc specializes in the growth of III-V epitaxial layer structures using both the MOVPE and MBE techniques for a wide variety of compound semiconductors (GaAs, InP and GaN) with a strong focus on manufacturing epitaxial wafers for photonic and microelectronic applications. Typical end-markets include wireless and optical telecommunications, sensing and imaging, energy and displays, medical, industrial and consumer markets amongst others. The company has multiple epitaxial growth systems across its global sites and comprehensive in-house characterization equipment for fast and reliable evaluation of the grown wafers, for flexible and customer-specific epitaxial solutions.

Representative: Dr Iwan Davies, Group Technology Director

www.iqep.com



Laser 2000 (UK) Limited, Huntingdon

Photonics value-added reseller

Laser 2000 are a leading value-added reseller (VAR) of photonics. Designing photonics based solutions incorporating emerging technologies, our solutions give UK manufacturers competitive advantage in markets ranging from point-of-care medical diagnostics (including testing for Covid-19); industrial metrology instrumentation; fibre to the home optical communications; national security interests; defence technologies; to analytical instruments onboard rovers on Mars.

Representatives: Alan Hughes, Director New Markets & Suppliers; David Gillett, Group Managing Director; Geoff Mudge, Director Government Communications & Security

www.laser2000.co.uk



Leonardo Systems, Edinburgh

Defence & Security—advanced systems engineering, electronics and cyber

Leonardo is a leading UK engineering company, one of the country’s biggest suppliers of defence and security equipment, making a £2bn contribution to the UK economy around 50% of which is in export. The company employs 8,000 highly-skilled people across 7 major UK sites, with 500 young people developing engineering skills through their apprenticeships, placements, and graduate schemes. Each site has a distinct role within the company, as an important part of its local economy as well as providing national capabilities to the UK and in export from the UK, directly supporting 26,600 UK jobs. The British Chambers of Commerce recognised Leonardo UK as a UK Business Hero for supporting local communities during the Coronavirus pandemic.

The demonstration today shows Leonardo’s flexibility in Photonics. It is an infra-red detection integrated system with Android based electronics to provide user programmable ‘in-camera’ processing. The unit – researched, designed and manufactured in UK - has low size, weight, and power, so can be deployed in handheld or drone mounted equipment.

Representatives: Clive Arthurs, Product & Research Engineering; Philip Pratley Director Trade & External Relations

@Leonardo_UK

www.uk.leonardocompany.com



National Epitaxy Facility, Sheffield

Semiconductor Materials and Devices

The EPSRC National Epitaxy Facility is a research council-funded national research facility supporting the UK Semiconductor community. It is a world-leading centre of excellence for the development of innovative semiconductor materials and devices, providing bespoke semiconductor wafers to a broad range of R&D projects spanning, photonics, quantum technologies, electronics and fundamental science. The Facility plays a pivotal role in creating transformative R&D that will underpin technologies of the 21st century; addressing areas of critical importance to the UK economy such as Net Zero, Electrification, Telecommunications, Healthcare, Security and Quantum Technologies.

Representatives: Zoia Bishop, Operations and Business Development Manager; Alwyn Seeds, Professor of Optoelectronics

www.nationalepitaxyfacility.co.uk

If ever a blueprint was needed for entrepreneurial spirit, look no further than the Optoelectronics Research Centre (ORC) at the University of Southampton. Formed in 1989, the ORC is one of the world's leading institutes for photonics research and has been at the forefront of photonics research and innovation in the UK for over 30 years.

The ORC has a rich history entrenched in industry collaboration and houses one of Europe's premier academic clean room facilities, accommodating a unique range of photonics and fabrication capabilities.

The ORC has delivered technologies such as fibre optics which underpin the internet, fibre lasers used in eye surgery and green manufacturing and 5D data storage in silica glass. It's also pioneering next-generation technologies such as environmental sensing, silicon photonics and new metamaterials.

Today, the ORC spans the innovation chain from 'photons to production' securing around 15 patents annually and having spun out 11 companies that employ several more than 800 people in the region.

Representatives: Alice Iles, Postgraduate Researcher; Callum Littlejohn, Principal Enterprise Fellow; Prof Dave Richardson, Deputy Director & Head of the ORC Fibre and Laser Group www.orc.soton.ac.uk



Power Photonics, Dalgety Bay, Fife

Advanced precision wafer-scale optics

PowerPhotonic are industry leading experts in high precision optics. We design, manufacture & validate beam shaping and image enhancing optics for the most demanding applications in:

- Industrial Laser Material Processing
- Medicine and life sciences
- Laser projection displays
- Defense and Science
- Telecom

PowerPhotonic was a spin-out from Heriot-Watt University in Edinburgh 15 years ago. We have a global customer base and have recently announced we are building another factory in Arizona, USA.

Representative: Dr Steve Kidd, Head of Sales and Marketing

www.powerphotonic.com



QuantIC – Quantum Imaging (National Quantum Technology Programme), Glasgow

Research, Innovation, and Commercialisation of Quantum Technology

QuantIC aims to commercialise world-leading imaging research to pioneer a family of optics operating across a range of key wavelengths and timescales. We combine single photon sensing with nonlinear optics, computational methods, and a range of specialised devices to advance imaging technology.

Established in 2014, QuantIC is part of the UK National Quantum Technologies Programme. A dynamic collaboration between industry, academic and government designed to create a global centre of excellence for quantum science and innovation.

QuantIC's is accessible to industry through a collaborative fund offering a mechanism to integrate state-of-the-art quantum technology with UK businesses. QuantIC also offers Studentships to develop the next generation of quantum engineers.

Representatives: Graeme Johnstone, Post-Doctoral Research Associate; Christopher Payne-Dwyer, Business Development Manager

www.quantiac.ac.uk



© Kevin Mitchell, Quantic



Resolute Photonics, Belfast

Device Design and Development

Resolute Photonics develops optical, photonic and quantum subsystems for future hyperscale data centres and High Performance Computing environments. Resolute Photonics will also develop international standards (IEC) to accelerate adoption of its subsystems.

Representative: Richard Pitwon, CEO

www.resolutephotonics.com

SENKO[®] Senko Advanced Components, Basingstoke

Advanced Components Fibre Optic Connectivity

Senko Advanced Components is a wholly owned subsidiary of the SENKO Group of companies headquartered in Yokkaichi, Japan. From its humble beginnings in 1946, the SENKO Group currently has an estimated annual revenue of \$1.4 billion globally. SENKO Advanced Components itself has 14 offices and a number of design and manufacturing facilities internationally providing local support to all customers around the globe.

Senko Advanced Components are the world's leading Fibre Optic connectivity specialist. Our products are instrumental in powering the internet and connecting people. This includes Data Centres, telecommunication infrastructure and indeed the connection at an individual's home.

Senko are also pioneering the next generation of connectivity which will enable progressive environmental, green energy and enhanced digital security policies to be more readily adopted

Representative: David L. Aspray, European Sales Manager

www.senko.com

Sivers Photonics, Glasgow



Semiconductor Laser Devices

Sivers Photonics is the world's most advanced supplier of customised III-V semiconductor laser devices and a key partner to many Fortune 100 and Silicon Valley customers. With in-house capability from design to volume production, our next generation InP100 product platform supports innovation across high growth application areas, including data centre, autonomous vehicles, and artificial intelligence.

Representatives: William McLaughlin, Managing Director; Graeme Urquhart, Director of Sales

www.sivers-semiconductors.com



UKRI Science and Technology Facilities Council, Didcot

Science Research and Facilities

The Science and Technology Facilities Council supports the UK's Particle Physics, Astronomy and Space Science researchers through the provision of funding and large scale facilities. Our major research Centres at Harwell and Daresbury, along with smaller sites in Edinburgh, Chilbolton and Boulby, support research and innovation in Academia and Industry.

We apply our technologies and skills to a huge range of areas across many other sciences including the natural environment and medicine.

STFC is part of UK Research and Innovation.

Representatives: Ric Allott, Director of Business Development, Space, Technology, and Facilities; Donald MacLeod, Business Development Manager

www.ukri.org/councils/stfc/



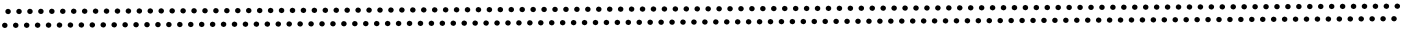
Vector Photonics, Glasgow

Semiconductors lasers for communications and industrial applications

Vector Photonics is a spin-out company from the University of Glasgow and is based in Glasgow, Scotland, one of the UK and world's Optical and Photonics centres of excellence. Vector Photonics has proven its revolutionary, proprietary, PCSEL technology in both an R&D, laboratory environment and in commercial fabs. The company is now transferring key design and process knowledge into an industrial environment, for high-volume manufacture in the UK and abroad.

Representative: Euan Livingston, Director of Sales and Marketing

www.vectorphotonics.com



The All-Party Parliamentary Group on Photonics is supported by:



The Photonics Leadership Group aims to:

1. Secure and raise the **UK's position** as one of the top 5 photonics manufacturers and innovators globally.
2. Foster a strong and dynamic UK photonics **supply chain** from components to integrated systems for applications from healthcare to defence and advanced manufacturing.
3. Provide a clear **voice** for the UK photonics industry emphasising the importance of photonics in solutions to societal challenges and productivity supporting continued economic growth.
4. Maximise new photonics innovation and its commercialisation in both established applications e.g. communications and emerging areas e.g. quantum, **strengthening UK industry, enhancing exports and attracting inward investment** to enhance the competitiveness and growth of the UK economy.
5. Foster continuous strategic **dialogue** between the photonics industry, government, academia and support agencies, in the UK and Europe, to create an efficient environment for innovation and translation into manufacturing

To achieve these aims the PLG works with senior stakeholders from across the UK industry, including major industrial manufacturers and exporters, globally leading researchers, high growth SMEs and support agencies.

<https://photonicsuk.org>



SPIE Europe Ltd, Cardiff, a subsidiary of SPIE, is a not-for-profit UK-registered company serving SPIE constituents throughout the UK and Europe. SPIE is the international society for optics and photonics, an educational not-for-profit organization founded in 1955 to advance light-based science, engineering, and technology. The Society serves 257,000 constituents from 173 countries, offering conferences and their published proceedings, continuing education, books, journals, and the SPIE Digital Library. In 2018, SPIE provided more than £3.2 million in community support including scholarships and awards, outreach and advocacy programmes, travel grants, public policy, and educational resources.

www.spie.org

- Chair: Carol Monaghan, MP
- Co-Chair: Stephen Metcalfe, MP
- Vice Chairs: Douglas Chapman, MP;
Margaret Ferrier, MP;
Anthony Mangnall MP;
Darren Jones, MP;
Ruth Jones, MP;
Baroness Neville-Jones, Life Peer;



Photonics and Quantum

Secretariat Details:

Karin Burger, SPIE Europe Ltd, 2 Alexandra Gate, Ffordd Pengam, Cardiff CF24 2SA; Tel: 029 2089 4749; Email: karin@spieurope.org