

Photonics Leadership Group

Meeting Minutes

Tuesday 12 April 2022, 14-17:00, 1 Vic St London and Virtually by Teams

www.photonicsuk.org

Attendees (All or in part, in person and on-line):

Ian Alderton, Alrad; Stuart Allan, Artemis Optical; Ric Allott, STFC; Yann Amouroux, OSA; Simon Andrews, Fraunhofer UK; Ali Anjomshoaa, Compound Semiconductor Centre; Terry Boniface, BEIS; Dom Brady, Fibercore; Karin Burger, SPIE Europe; Allan Colquhoun, Leonardo; Iwan Davies, IQE; Chris Dorman, Coherent Scotland; Geoff Duggan, Lumerical; Joe Gannicliffe, CS Applications Catapult; Glenn George, Bay Photonics; David Gillett, Laser 2000; Mark Goossens, CS Applications Catapult; Caroline Gray, OptiC Technology Centre; Tom Harvey, Nat Healthcare Photonics Ctr; Jon Heffernan, University of Sheffield; Shahida Imani, Chromacity; Louise Jones, Photonics Connected; Stratos Kehayas, GandH; John Lincoln, Harlin; Anke Lohmann, Anchored In ; David MacLellan, AILU; Iain Mauchline, InnovateUK; Rachel Maze, BEIS; Owen McGann, GTS; Alison McLeod, Technology Scotland; Chris Meadows, CS Connected; John Nolan, First Mile Networks; John Parsons, Indigo Consulting; Stephen Pegrum, Sorrento Networks; Graham Peters, Arqit; Richard Pitwon, Resolute Photonics; Richard Pitwon, Resolute Photonics; Graham Reed, University of Southampton; Rob Scudamore, TWI; Jianming Tang, University of Bangor; Malcolm Varnham, Trumpf UK; Mike Wale, UCL; Philip White, DIT

Direct Apologies:

Jason Buck, Torbay Development Agency; Paola de Bono, TWI; Clive Grafton-Reed, Rolls-Royce; Antony Hurden, Grounded Innovation; Wayne Loschi, EPIC (Torbay); Carol Monaghan, MP; Mark Naples, Umicore Coating Services; David Payne, University of Southampton; Michael Robertson, CIP Huawei; Alwyn Seeds, UCL; Chris Sorsby, Vitritech; Matthew Wasley, KTN (Apologies to anyone missing from apologies)

**Post meeting and editorial input in italics*

1) Previous Minutes and welcomes

Those attending their first PLG meeting formally welcomed including Stephen Pegrum, Sorrento Networks and Graham Reed University of Southampton

Previous minutes from meeting 14 January 2022 were accepted.

2) On-going External impact on Photonics Industry – roundtable.

Discussion covered impact on UK photonics of the cumulative effect of multiple external macro events including Ukraine conflict, supply chain challenges, Covid, Brexit and the National Security and Investment (NSI) Act.

Those involved in semiconductor production (including compound semi) noted number effects including rapid rise in price of Gallium impacting GaAs costs – up 3X+ fold. Oil/Energy prices impacting hydrogen supply. Palladium shortages impact production of highest purity hydrogen used in semicon production and Neon used in previous generation lithograph tool lasers. Neon supply impact noted as widely reported in press (2 of 3 global production facilities were in Ukraine), 30% Palladium for purifying H₂ was sourced from Russia). Neon the impact most likely in previous generation >20nm semiconductor production that used Excimer lasers not in the very latest semicon lithography that uses different laser tech for Extreme UV. Net result will be more impact in power electronics, defence automotive and industrial electronics that use earlier generations, slightly lower speed ICs.

Others noted that supply of optics, optical crystals and optical blanks risks being impacted by the strict regional Covid lockdowns increasingly being applied in China, with impact across broad range of photonics industry from lasers applications to cameras and imaging systems. Supply of non-standard substrates is already being impacted. Independently Ukraine conflict risks impacting supply of low expansion glass used in manufacture of large format optics (~>600mm diameter) or particular relevance to astronomical and scientific applications.

Noted the European list of critical raw materials at geopolitical risk has increased significantly in recent years and now covers many photonics semiconductor raw materials e.g Ga, In, Ge. Many of these are seeing wide, rapid and unpredictable price fluctuations. One positive result is wide use of in process recovery of such materials and increasingly focus on the complex process of end of life recovery

Supply of integrated electronics chips continues to be an issue in some areas, but notably inconsistent with lead time impact on notionally similar devices varying between nothing to more than +6 months. Plenty of examples of shortages of fairly simple of chips delaying complex machinery deliveries.

Noted all business with CIS states (Russia, Belarus, Ukraine) has ceased not least because facilitating payments in either direction no longer possible.

Number requested clarity and additional guidance from Gov on how much due diligence to what depth they should be undertaking on suppliers and customers in relation to Ukraine conflict sanctions. Avoiding trade in goods with directly sanction individuals and organisation clear – less clear how to approach services and trade which organisation who e.g. may have a sanctioned non-controlling investor. Noted the Department of International trade export control team have been leading on advising compliance with sanctions and have been highly responsive to enquiries.

NSI legislation noted as having impact on investment despite the long notice period for NSI act coming into force. Actual investor behaviour and caution regards investments in firms working in the notifiable sectors (includes some aspect of photonics) not necessarily aligning with gov desire for act to have min impact on majority of investments.

ACTION > Request BEIS/ DIT for clearer guidance on depth of due diligence companies should be applying to supply chain in relation to sanctions applied as a result of Ukraine conflict.

ACTION all> Provide direct early input to Phil White / Terry Boniface on any materials/ raw materials shortages / supply issues

3) UK Quantum Strategy update (Rachel Maze)

Development of new UK Quantum strategy on-going in a context where the UK is putting significantly more emphasis on science and innovation leadership including gaining strategic advantage through science and technology, yet also understanding that there are now a large number of ambitious national quantum programs around the globe.

A cross government approach is being taken with inputs from BEIS, UKRI, MOD, DCMS and others. Currently consolidating the evidence from the open call for inputs, undertaking number of 1:1 interviews and workshops, looking at skills innovation ecosystem investment and standards before stress testing recommendations a prior to publication late in 2022. A number of broader issues around skills and scale-up emerging. BEIS QT team working with office of science and technology strategy to see what broader recommendations can be made.

The need to consider overlap and synergies between the QT strategy and the UK semiconductor strategy concurrently being developed was flagged by several folks

The need for action in the skills area was highlighted. BEIS noting that responses to past surveys on skills (QT focus?) have had low response rates with little coherence hence current 1:1 and IOP workshops. Emphasised by industry that action in skills arena is needed to maintain and grow pipeline of people to support on-going industry growth across enabling tech (including photonics and not confined to quantum).

A number noted the importance of early engagement with teachers, parents and students at KS2 level to driver interest in STEM careers and the difference pursuing STEM careers can make.

The PLG response to the Quantum strategy consultation is available to anyone interested and has been shared with the IOP and others.

Those wishing to make further representations welcome to contact Rachel Maze (intros available via John L if required)

4) Feedback from and low forward to in-person events (Photonics West, OFC etc) round table comments

Generally agreed that although attendance numbers have been down at in-person events the quality of customer/ face-to-face interactions has been high i.e quantity down, quality up. Given the extra effort people are making to attend in-person all are keen to extract maximum value.

Looking forward to Laser world of Photonics in Munich noted there will be a whole hall dedicated to quantum. There will also be a [Quantum and photonics integrated circuits partnering event](#) in anticipation of an EU QPIC call later in the year. (contact Anke Lohmann or Mike Wale for more info)

- 27 April 14:30 - 17:00, Hall A Room A51/A52

For those attending Laser world of Photonics PLG is organising an informal pay as you go dinner on Wed 27 April 19:30 @ Zum Dürnbräu, Dürnbräugasse 2. Please confirm if you would like to attend to john.lincoln@photonicsuk.org, guests welcome, as are late beer drop-ins

For those not attending Laser Munich the [UKIVA Machine Vision conference](#) is on 28 April at Marshall Arena Milton Keynes

a) Horizon Europe

The UK's status as an associate member of Horizon Europe (HEU) is still pending ratification and caught in wider political developments. Alongside ratification delays, it was noted that there is a more general trend in the EU commission to try and reduce the role of any associate members (Switzerland, Israel, UK etc) in Horizon and EU innovation programmes as part of the overall drive to increase native EU capability.

Discussions emphasised the need for UK organisations to be more proactively engaged in Photonics21, P21 working groups and joint program initiatives such as QPICs. This is particularly important to counter negative perceptions about UK participation in EU collaborations including, in some instances, commission representatives indicating it would be easier to replace UK partners in some consortia.

The UK government's extended guarantees for underwriting HEU project participation welcomed. However agreed that this message would be much more effective if communicated direct to the wider EU photonics innovation community, with the P21 annual meeting representing an ideal opportunity to do so.

Number noted the importance of fostering EU collaborations and the risk of waning collaboration to UK's future competitiveness and position and a global science and technology leader.

The [priority areas proposed for support](#) under the 2023/2024 HEU photonics theme were agreed by the Photonics21 Board of Stakeholders and are now with the Commission for consideration

Action BEIS > request to UK's HEU Guarantee team for Gov representation at P21 annual meeting 30/6-1/2 to reassure EU photonics industry about UK to innovation collaboration and underwriting HEU projects.

5) UK Telecommunication Innovation Network

DCMS have launch a £5-£10m competition to establish a new [UK telecommunications information network](#) (UKTIN). The top objective is to create a common front door to navigate funding for comms R&D, provide a intelligence on the latest innovations and input into where gov interventions would be most effective in supporting telecoms diversification. UKTIN will build on the world of UK5G innovation network, but with an expanded remit to cover the whole of telecoms, including fibre, the fixed network and data infrastructure, with increased focus on supplier diversification and promotion of open interfaces rather than on establishing use cases for 5G. UKTIN will not be to distribute R&D funding, or manage funding programmes, rather inform the focus for funding interventions in comms R&D, encourage strong consortia and expanded participation plus increase awareness of the UK comms capability encourage investment etc.

Consortia are invited to form to run UKTIN over a 3 year period, submitting 2 proposals each one for £5m one for £10m. Proposed that the PLG join bidding consortia as a minority partner to provide voice and connectivity to the photonics and UK optical comms community, which is noted as currently concentrated low in the supply chain with little visibility. Such participation would make a significant change in PLG activity level. Noted and acknowledged that this would raise number of challenge on long term sustainability, operational capacity, managerial overhead and potentially distracting PLG from providing balance across all areas of photonics. Agreed participation would be in-line with the PLG long term objectives and clear there needs to be a strong voice for the role of optical comms in such a network

PLG will continue to discuss with number of consortia that are forming to be included as a minor partner – they have been approached by two to date following competition launch and pitch session last week.

Anticipated ask in £150-250k range per annum, 7-9% of total UKTIN budget. More detailed discussion on deliverables from PLG are anticipated. PLG directors will be asked to input on operational issues and comfort with any additional responsibilities that may result.

6) Closing supply and demand loop for new talent

The Photonics jobs market continues to be robust, with the majority of firms at Photonics West hiring. The big tech companies (Google, Amazon, Facebook, Apple, and Microsoft etc) have also been noted as being

very active in hiring photonics skills. The latest UK data (11 April) shows this is not confined to photonics or even tech sectors with a report from [Universities UK](#) highlighting there are ~16 million graduate level jobs in the UK, a 1 million more than the number of people in the UK with degrees or equivalent qualifications. Growth has been particularly strong post Covid with 20 % more graduate vacancies than 2019 and 22% growth forecast for 2022. All indications are that we will continue to see a shift from a buyers to sellers job market, especially for higher skilled technical roles, with vacancies potentially exceeding applicants and increased focus on employers having to actively the attractiveness of their career opportunities. In parallel, there are indications that students and graduates are modifying their career plans, post Covid with more focus on [making a difference](#) and [prospects for career progression](#). Although many still report difficult finding positions in industry

In such context John L floated the early concept of the PLG hosting a talent board, for graduates and postdocs to advertise they are looking for a position in photonics as a juxtaposition to the jobs boards that are more common in a sellers job market. Leveraging knowledge gained from constructing the PLG company directory, a talent rather than a jobs board has potential to create a shop window for talent.

A number of potential challenges were identified in discussions including the need for critical mass / network effect, need to have support from student networks and leading academic groups, potential overlap / leverage with existing solutions e.g. LinkedIn, the need to focus on graduates (post / undergrad) making first move to industry, ensuring timeliness. Whilst some of these concerns are well addressed with standard directory tools, the cost of implementing would be dominated by the need to proactively engage and communicate with student groups across the UK.

Recommended that further comparisons, feasibility checks are undertaken. The potential to support with the UKTIN initiative was noted.

Discussions also highlighted alternatives and related challenges e.g.

- Potential for PLG taking stands at careers fayres on behalf of whole industry
- The need to increase the pipeline of UK photonics talent with broad practical optical and laser skills and protect this pipeline from potential dilution/ distraction caused by heavy funding in particular specialist niches.
- How to ensure, in such a dynamic employment market, the implicit 'contract' between industry providing careers and academia in providing training is maintained. The academic research community noting increased challenges with PhD / Postdoc recruitment and difficulty in keeping top research talent. Industry was particularly encouraged to support PhD studentships, to make them more attractive to candidates and ensure the talent pipeline in being continually backfilled.

7) APPG Photonics Parliamentary Showcase plans

The All Party Parliamentary Group on Photonics and Quantum remains keen to host a photonics showcase in Westminster. Format as pre covid i.e. your open drop in for MPs and Lords run over 2 hours with company displays of visually engaging, applications impactful examples of photonics.

Potential dates of 21 or 29 June being explored.

Due to the high popularity in returning o face-to-face events in Westminster the Thames pavilion/ Terrance areas are fully booked until September. We are currently looking at the potential of either 5 or 8 September and are getting our out of box thinking caps on- alt ideas welcome.

Action all> *emphasis will be on PLG members to invite their respective MPs to the showcase and encourage them to bring along a parliamentary colleague.*

Outside showcase it is proven harder to engaged MPs with APPG meetings during Covid, the Photonex visit being the notable standout success. The group will hold AGM on 25 April and look to refocus parliamentary engagement efforts.

Action all> *please do engage with your local MP and encourage them to take an active interest in the APPG to further understand what they can do for key growing photonics industries in their constituencies.*

8) Updates from communities and programs

a) AILU (David M)

- [Surface texturing](#) – 19 May
- Follow-up to the joint meeting with BLZ Bavarian cluster Wed 27 April, 11 am A5, booth 371 @ Laser Munich.

b) Photonics Scotland (Alison M)

- Current focus on skills and putting in place specific hands on training courses.
- Opening-Up photonics – currently putting in place advisory board
- Scottish technology sector export plan specifically highlights photonics

c) Photonics Connected (Louise J)

- Number photonics activities planned in Wales Tech week 12-16 September
- Working with Simon A and others on support for Photonex 2022 @ NEC

d) UK Quantum (Mark G)

- Still in set-up phase- working on the logistical issues with setting up formal organisation

e) UKIVA (Ian A)

- In person UK Machine Vision meeting planned for 28 April Marshall Arena Milton Keynes
<https://www.machinevisionconference.co.uk/>

f) Photonics21 (Mike W)

- [Preliminary priority list](#) for 2023/2024 HEU photonics calls passed to the Commission
- AGM planned in person 30 June-1 July Brussels. Will start the process of defining the 2024/25 work programme and the next multi-annual strategic roadmap.

g) PhotonHub (Tom H)

- Number of new online photonics training modules now available ranging from introduction to photonics to in-depth training in specific areas e.g. high speed silicon photonics modulators.
- Innovation funding support program from Photonhub remains open.

h) Centre for Photonics Expertise (Caroline G)

- CPE have been awarded a modest extension to expand and continue current ~70 collaborative R&D projects

i) Compound Semiconductor Centre (Ali A)

- CSC and a number of those working on compound semi are actively working with DCMS and senior Gov figures on development of UK Semiconductor Strategy.

j) Photonex 2022 6-8 December @ NEC (Simon A, Karin B)

- Simon working to put together a strong industrial program including sessions/panel on net-zero. Please contact Simon if interested in discussing either
 - What ones organisations is doing internally to support net-zero and/or
 - How ones products or services are supporting drive to net zero
- Opportunity for a careers fayre at Photonex, with a number of different formats possible according to demand.
 - Contact Karin B if interest in posting opportunities / leveraging careers fayre at Photonex

k) UK Semiconductors 6-7 July, Sheffield (Jon H)

- The [UK Semi meeting](#) will return as in person event in July

l) Cornerstone (Graham R)

- [Cornerstone](#) capabilities will be expanded in May with a new Germanium platform.

m) Future Photonics Hub (John L)

- Current Future Photonics Hub at Southampton & Sheffield is due to finish ~end of 2022. A pre-call for the '[Manufacturing research hubs for a sustainable future](#)' has been released by EPSRC. Extensive consultation likely in 2022 to formulate a photonics proposal

n) Richard P

- The NPL Joint Conference on Quantum Technologies will run 13-14 September 2022.

9) Next meeting

Next full PLG meeting will be fully virtual on Teams in early July 2022. Dates to be circulated, apologies to those in Scotland potentially on summer vacation.

An interim meeting of those involved in optical comms is likely before the UKTIN submission depending on inputs required

Updates of the date of the Westminster showcase will be provided as soon as available.