

# Photonics Leadership Group Meeting Minutes

Tuesday 20 Feb 2018 13:00-16:00,  
Keltie LLP, 1 London Bridge, London

[www.photonicsuk.org](http://www.photonicsuk.org)

## Attendees:

Stuart Allan, Artemis Optical; Terry Boniface, BEIS; Mark Greenwood, SPI Lasers; Georgios Papadakis, InnovateUK; Ric Allott, STFC/Central Laser Facility; Simon Andrews, Fraunhofer UK; Tom Harvey, CPI/ Nat Healthcare Photonics Ctr; David Payne, University of Southampton; Jon Blackburn, TWI/AILU; Jon Heffernan, Uni Sheffield; Dave Rimmer, WOF / DREM; John Blomfield, Qioptiq; Jonathan Jessop, Thorlabs; Karin Burger, SPIE; Andrew Kearsley, Oxford lasers; Stephen Taylor, Technology Scotland; Thomas Butcher, STFC/Central Laser Facility; John Lincoln, Harlin /Future Photonics Hub; Sergei Turitsyn, University of Aston; Julian Heaton, Innovate\_UK; Anke Lohmann, Anchored In; Mike Wale, Oclaro; Iwan Davies, IQE; Kevin Mackrodt, Artemis Optical; Matthew Wasley , KTN; Andrew Ellis, Aston Institute of Photonic Technologies; Nick Martin, BAE systems; Michael Willcocks, BEIS; Alastair Wilson, CST Global; Robert McDougall\*, Keltie; Colin Paterson\*, Keltie; Luigi Distefano\*, Keltie; Carol Monaghan, MP\*.

\*attending in part

## Apologies:

Ian Alderton, Alrad / UKIVA; Christopher Leburn, Chromacity; Roy Sambles, IOP / Uni of Exeter; Gary Mackay, EW Simulation Technology Ltd; Andrew Scott, QinetiQ; Duncan Hand, Heriot-Watt University; Laura Cadman, EPSRC; Gordon McKenzie, ; Martin Sharp, AILU/ Liverpool John Moores); Allan Colquhoun, Leonardo; Wyn Meredith, CSC; Chris Sorsby, Vitritech / GTS; Chris Dorman, Coherent Scotland; John Parsons , Thales UK; Mark Thompson, IPG Photonics; Geoff Duggan, Lumerical; Richard Pitwon, Xyratex / Seagate; Ian White, University of Cambridge; Antony Hurden, Grounded Innovation; Nigel Rix, KTN; Dan Daly, Lein Applied Diagnostics; Robert Lamb, Leonardo; Michael Robertson, CIP/Huawei; Stefano Taccheo, University of Swansea; Alwyn Seeds, UCL.

*Post meeting and editorial input in italics*

## 1) Previous Minutes, apologies and welcomes

Previous minutes from meeting 11 October accepted, with note that initials MW are ambiguous between Mie Wale, Mat Wasley (&Michael Willcocks) additional differentiating identifiers to be used in future Welcomes extended to new attendees Michael Willcocks (BEIS), Terry Boniface (BEIS), Tom Butcher (STFC) , Jon Jessop (Thor Labs), Kevin Mackrodt (Artemis Optical), Julian Heaton (Innovate\_UK) & Carol Monaghan, MP

Julian Heaton has joined Innovate (as of Feb19) as Innovation Lead Electronics, Sensors and Photonics alongside Georgios Papadakis adding significant additional bandwidth in Enabling & Emerging at Innovate. Profiles of attending organisations and individuals present were distributed to introduce new and raise awareness of those attending in lieu of a round-table introductions.

## 2) Photonics Grand challenges

➤ JL presented current four photonics challenges identified at previous PLG meeting

Affordable, accurate location information

Overcoming security threats and enabling autonomous vehicles with instantaneous awareness of rapidly changing local surroundings

Delivering Internet 5.0,

Where data delivery is ubiquitous, invisible and instantaneous to all people and all factories, no matter where they are or what they are doing

Enabling UK manufacture of the car of the future,

Using light to digitally process, monitor and control cutting, joining, marking and assembly for lighter weight, safer, more efficient vehicles

Making home healthcare as effective as hospital care by 2030,

Providing simple pre-clinical diagnoses and health screening tools for use in the home and pharmacy, decreasing the load on primary and hospital

Notable strong alignment to the four headline challenges identified in the industry strategy white paper:

- Artificial intelligence and the data economy
- Clean Growth
- Future of Mobility
- Ageing population

Noted that there is not a photonics challenge that is heavily focused on clean growth (*although all contribute to area, and this could be taken to include all manufacturing and thus laser processing*).

➤ Interest poled on developing a separate challenge in the clean tech area – insufficient support from those present to take forward.

Anticipated that there will be an open call for wave 3 of the Industry strategy challenge fund opening shortly. In preparation further detail is need in each challenge area addressing:-

- Strength of UK industry & growth in area
- Global market opportunity
- Industry backing & demand in £ and leadership
- Evidence of UK strength – patents publications
- Alignment to industry strategy (above challenge areas + key themes of ideas, people, infrastructure, bus environ, places)
- Potential Speed of action
- Impact – economic social environmental ...

➤ Volunteers sort, with industrial lead, to further detail photonics challenges with a 1 and 4 pager within next 2 months covering above areas. Volunteers stepping forward at meeting below with lead in **Bold..** Any addition please contact JL or lead in area.

Affordable, accurate location information (LIDAR)	Delivering Internet 5.0	Enabling UK manufacture of the car of the future	Making home healthcare as effective as hospital care by 2030
<b>Simon Andrews</b> Nick Martin John Heffernan Sergei Turitsyn Kevin Mackrodt	<b>Mike Wale</b> Alastair Wilson Iwan Davies Jon Heffernan	<b>Jon Blackburn</b> Ric Allott <i>Duncan Hand</i>	<b>Tom Harvey</b> Dave Rimmer Kevin Mackrodt

➤ AL will provide additional guidance to all on the key requirements/ area to be covered in document to all groups.

➤ MWale & others emphasis potential to leverage the latest Photonics21 vision paper which has foci on analogous areas. Recommended to leverage in preparation of detail in above areas.

### 3) Sector deal and ISCF developments and updates

Sector deals in life-science, Ai, automotive, construction, nuclear announced in industry strategy white paper are slowly emerging. Guidance on what look for in a deal was also included in industry strategy, but process is complex and developing.

TB note initial draft Photonics proposition was seen as too tech push. Deals need to focus on how a sector can reorganise, restructure to be more effective.

Forecast that Innovate will reorganise around the themes identified in the Industry strategy e.g AI/data economy, Clean Growth, Future of Mobility, Ageing population rather than current pillars of Lifescience, Material & adv Manufacturing etc. How cross cutting enabling sectors will be included unclear.

With Innovate funding trend is to more Open competitions with frequent and regular closes cf response mode in research councils *or previous SMART award* rather than the specific themed competitions currently called twice / year. Noted that lack of hard deadline for a specific theme may negatively impact company's ability to finalise submissions. Competition likely to increase.

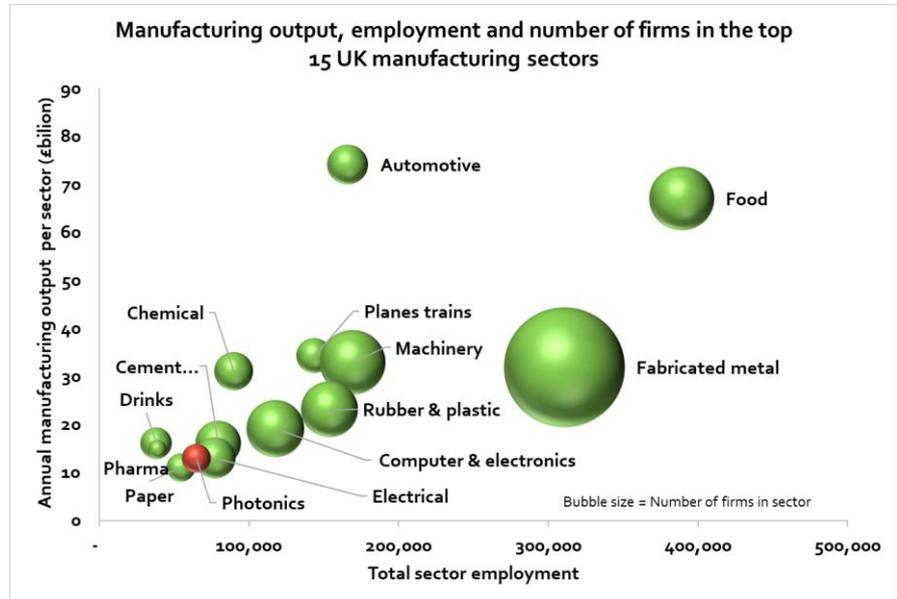
#### 4) Size of UK photonics

In response to publication of UK photonics output figures of £12.9bn, 65k employees, 1500 firms, £62k value add /head, last June, a number of agencies have request a full report detailing the methodology such that figures can be fully quoted.

A report **UK Photonics: the hidden economy** is therefore in preparation by the KTN and the Future Photonics Hub. In addition to previously published data and methodology, report will provide further context on UK photonics vs other key UK manufacturing sectors and the international photonics market. For national context JL prepared comparative analysis (right) using gov data from Office of national statistics for other sectors.

Shows if photonics was counted separately it would be the 14<sup>th</sup> largest manufacturing sector in the UK, 12<sup>th</sup> largest by employment.

International UK 8<sup>th</sup> largest photonics producer with 3-8% of global production.



- Noted that in photonics sub-sectors UK share may be much higher (*lasers*) or lower (*PV/ displays*). In detailing of individual photonics challenges the relative importance of UK in those sectors needs to be emphasised.
- Noted above graph doesn't show the higher productivity of UK photonics (~3X national average GVA/head), in part because compares only to the top 15 UK manufacturing sectors, not all sectors. JL to investigate was to display this.
- TH noted there are parallel efforts to quantify photonics production and sub-sectors across EU enabling further comparison of UK position in the future.
- All PLG stakeholders requested to provide high resolution pictures of photonics applications (at least 300dpi) so they can be including in library of pictures to be used in the publication layout of the report. All will be credited.

#### 5) Additional/ ongoing PLG activities

Since Oct meeting there has been a significant No. of gov publications, consultations and activities PLG has engaged with including:-

- Industry strategy White paper commentary
- Elect Tech roadmap
- Budget commentary
- Defence Science and Technology Strategy 2017 commentary
- Industrial digitisation in UK- Made Smarter review commentary
- National security infrastructure investment review input
- SPIE Engineering, Science & Technology Policy (ESTeP) Committee
- DIT and Consular support for Photonics West

- Additional inputs for the PLG blog welcome.

A comparison with the Electech council presented, generating discussion that photonics qualitatively appears to have a better gender balance than other areas of Engineering, based on experience of employers present.

- Evidence to support a potential claim of improved gender balance in photonics sort for **UK Photonics: the hidden economy report**. From SPIE salary survey KB has data showing in Eu 20% of survey respondent female. AE should have reference for balance in overall Engineering for comparison.

## 6) Insights into the UK Photonics IP landscape

Luigi Distefano at Keltie presented preliminary results on analysis of patent landscape in UK on Lidar and optical range finding, in response to challenge of providing evidence of the UK knowledge base in this hot growth area

Keltie have developed a methodology that overcomes a number of challenges in identifying the country of origin of knowledge captured in IP, using applications where UK is the first priority filing location as the strongest indicator of the innovation taking place in the UK. Results were for all time, but as reliant on published patent data do not reflect any activity in the last 18 months. For initial study analysis was confined to G01 patent category, measuring instrument patent area excluding G02 optics and other area and thus likely to be confined to systems rather than components.

Initial analysis shows BAE Systems, Roke Manor research and JLR as some of the top filers in the area in the UK. Further analysis also shows many companies filing follow-on applications in USA, China EU Australia Japan and Korea, illustrating the importance of the UK market to people filing in this area.

Whilst initial analysis provides indicative results further in depth study would be required to broaden the patent classification covered and cross reference e.g. to families of patent cited by others in area.

## 7) Photonics APPG and Westminster activities.

Carol Monaghan, MP briefed by PLG asked question in recent debate on electric and autonomous vehicle legislation on Gov support for translation of UK >100 year track record in remote sensing to autonomous vehicles – see <http://parliamentlive.tv/event/index/b99ce24b-7d37-4792-b808-3c5ffd9e741a?in=20:55:32>

**Lasers for Productivity: A UK Strategy** will be launched in Westminster by AILU on 6 March

- Those involved in laser processing and manufacture and dev of lasers for manufacturing are encouraged to attend and invite their MP, making clear link to the company activity in the constituency, including inviting MPs to encourage participation. – registration [http://www.ailu.org.uk/laser\\_technology/events/2018-03-06/national\\_strategy\\_launch.html](http://www.ailu.org.uk/laser_technology/events/2018-03-06/national_strategy_launch.html)

The next Photonics APPG will be on 20 March on **Sensors – the missing link in safe affordable Unmanned Autonomous Vehicles**. CM emphasised the need for companies to make contact with their MP to encourage participation in the Photonics APPG. Making a clear link between constituency activity e.g. inviting MP to visit photonics.org or following up to visit and asking to attend Westminster Photonics APPG for more info on support their local company(s).

- For those organisations developing or interested in developments around photonics sensors from Lidar to imaging for Autonomous vehicles please invite them to 20 March meeting. (pro forma invite will be attached to minutes)
- Those interest in presenting to MPs at this meeting please contact JL.

To further engage Westminster a monthly Photonics APPG newsletter will be sent to MP's who have appended photonics events in Westminster. These will feature brief (50 word) summaries + photo of photonics application case studies relevant to upcoming debate(s)

- Please forward any application case studies inc photo, ideally those already prepared and published online, to [karinb@spie.org](mailto:karinb@spie.org) for potential including in APPG newsletter.
- If you have MPs visiting, please let KB know so we can include in newsletter and further spread word.

AW highlighted visit last week of [Ged Killen to CST lobar](#), who prior to visit was unaware of the a photonics APPG but following exposure to successful local photonics company is interested in engaging in future.

Current review of **higher education and student funding** in England is considering different levels of fees based on the cost of course. This could make photonics related course in e.g. Physics substantially more expensive than e.g. law. May require a robust response as consultation develops.

## 8) Report from PLG CEO working group

In response to request from gov for direct access to Photonics CEOs Chris Dorman has put together a high level UK Photonics CEO group including Mark Webster, Lawrie Gloster, Neil Martin, Andy Carter, Mark Greenwood, Mark Gubbins, Paul Loeffen, Andrew Rickman, Andrew Kearsley, Graeme Malcolm, Chris Leburn. Initial meeting of those present was held at Photonics West.

Majority of those contacted have agreed to make themselves available for discussion with gov – welcomed by BEIS.

CEOs also poled for their priorities from gov with feedback focusing on CD

- Provision of skilled people
    - Key output of Universities, even more critical post Brexit
    - Current system of apprentices and CPD training for photonics not working
    - Tailoring course content to local industry, creating demand for courses
  - Streamlined access to markets post Brexit, Especially Asia
  - Large scale translational organisations / projects, rather than proliferation of small projects focused on application of photonics to new areas
  - Spreading best practice from other industries (automotive, aero) e.g. lean manufacturing and Sharing in Growth Initiative
- AE highlighted Aston and Southampton were keen to engaged with any companies interested in developing degree level apprenticeships in photonics customised to their needs

## 9) Topic & time of the next meeting

Suggested that next meeting be held jointly with Sensor Industry Leadership Committee (SLIC). Majority agreed. Will look schedule for April/ May

Subsequent PLG meeting will be a10 Oct at Photonex.

## 10) Funding activities & AOB (roundtable), not covered above

### Funding and related events

- Innovate [emerging and enabling competition](#) is currently open – closing 28 March.
- Innovate [loans for manufacturing and materials](#) readiness opens 25 Feb closed 25 April
- First wave of calls from the ISCF Faraday battery and Robotics ISCF challenges are also open.
- [Analysis for innovators](#) will open 5 Mar closing 4 April giving companies access to start of art public measurement facilities. Briefing event <https://ktn-uk.co.uk/events/analysis-for-innovators-a4i-programme-2018-roadshow-london>
- [Intelligent imaging](#) Glasgow 15 March
- [Future Computer Paradigms](#) London 16 March, including optical computing
- UK opportunities for LIDAR in transport - April 18th London. Registration site to come, details on KTN website, UK Photonics LinkedIn group and PLG website, register interest with [matthew.wasley@ktn-uk.org](mailto:matthew.wasley@ktn-uk.org)

### AOB

- New restriction on hazardous materials covering InP are being proposed, that could have major impact on laser integrated photonics orgs. Contact Iwan Davies (IQE) to be involved in developing a response
- 2019 will be the 25<sup>th</sup> anniversary of the Scottish Optoelectronics Association (*JL recalls it like yesterday!*) Technology Scotland proposing to bring the EPIC AGM and International Optoelectronics Association AGM to Glasgow. Local Gov support secured. Company sponsorship requested contact [stephen.taylor@technologyscotland.scot](mailto:stephen.taylor@technologyscotland.scot)
- [Photonics21 annual meeting 8-9 March in Brussels](#). Full day of workshops on the regular 7 P21 working group areas plus automotive / transport and photonics in agritech and food. Focus is on preparing for the next framework to follow-on from H2020. Strong support need to ensure continuation of photonics as a strong theme in next framework.

- As per previous P21 annual meeting we request those attending different workshop session at P21 annual to submit a summary of activity in their working group to be compile with other and distributed to PLG and UK participants. If you are attending please complete <https://doodle.com/poll/9ne8rcpbkfmf55hy2> to indicate which session you will be attending if happy to submit a short summary.
- A global roadmap on integrated photonics is being prepared by Photon Delta (Netherlands) in collaboration with AIM (USA) covering all sectors and all applications of integrated photonics with aim of generating roadmap with similar influence to the ITRS semiconductor roadmap. MWale is overseeing InP portion contact to be involved.
- Mark Zuckerberg's Starshot program is supporting feasibility research in development of Gigawatt laser for space propulsion. Southampton 5D storage element were also on recent high profile Falcon Heavy launch by Elon Musk.
- [19th International Symposium on Laser Precision Microfabrication \(LPM 2018\)](#), June 25-28, 2018 in Edinburgh with local organisation by AILU jointly with the Japan Laser Processing Society
- Currently open call from Europe on InP pilot lines contact [alastair.wilson50@btopenworld.com](mailto:alastair.wilson50@btopenworld.com) for more info.
- CST global [announced doubling of turnover and a NASDAQ First North listing](#).
- BAE is working with the aerospace technology institute and others on a strategy for autonomous vehicles in aerospace, including photonics sensor for civilian aviation AV applications. Contact [nick.j.martin@baesystems.com](mailto:nick.j.martin@baesystems.com) for more info.
- Next [international meeting on laser peening](#) will be in Singapore 17-22 June co chaired by Michael Fitzpatrick, Coventry Uni
- Work is underway at STFC to develop commercial version of their 100J pulsed laser. Those interest contact [ric.allott@stfc.ac.uk](mailto:ric.allott@stfc.ac.uk)
- AL is coordinating an interest group in high energy particle physics those intersted in photonics application in space contact [anke.lohmann@anchoredin.uk](mailto:anke.lohmann@anchoredin.uk)
- General data protection regulation from EU comes into force 25Mar organisation should ensure they are compliant. [Guidence at ICO office](#)
- Meeting of Mersey Dee Alliance at St Asaph 16 Feb highlighted application of photonics to broad manufacturing community.
- 22 March 2018, [UK space industry - - investment, infrastructure and international competitiveness forum](#)
- EU CSA [EPRISE](#) will be holding number of roadshows around EU including 16 May Florence on Photonics for agriculture and 11-12 June in Stockholm on photonics for Pharma and Med Tech. Currently seeking expert to speak on the challenges in entering these markets in these areas. Contact [Tom.Harvey@uk-cpi.com](mailto:Tom.Harvey@uk-cpi.com)
- Fraunhofer has won Scottish Enterprise support for continuation of core funding following review SA offered thanks to all who have supported Fraunhofer CAP.
- [IOP Photon18](#) will be hosted by Aston 3-6 September 2018 with workshops on photonics in food / agritech and engagement with local policy makers

**A great many thanks to Robert McDougall, Adam Watson and Keltie LLP for hosting in such a superb venue and providing lunch and follow-on refreshments**