To Photonics21 Secretariat
via eMail: secretariat@photonics21.org

Dear Photonics21 Secretariat,

We herewith submit the nomination of the following Photonics21 Board of Stakeholders candidate Tyndall National Institute/ Paul Townsend.

- Letter of Nomination -
Photonics21 Board of Stakeholders
Election 2024

Photonics21 Board of Stakeholders - Letter of Nomination

1. **Full legal name of the affiliation nominated as BoS Member (candidate's organisation):**

   Tyndall National Institute

2. **Full contact details of the affiliation (street, postal code, country) nominated as BoS Member and invoice address** *(In accordance with the Terms of Reference §5, which the Affiliation acknowledges having received, an Annual Service fee will be invoiced every year during the first quarter to the BoS Member. By signing the present letter, the BoS candidate agrees to pay this Membership Fee. The Fee will be considered an asset of the Photonics 21 AISBL in accordance with its statutes (article 12b).) - [Signature below]*

   Tyndall National Institute, University College Cork, Lee Maltings, Dyke Parade, Cork, T12 R5CP, Ireland

3. **Name of the suggested BoS Representative (the personal candidate)**

   Paul Townsend

4. **Information about the BoS candidate and the BoS representative**

a) Description of the activities and information about the expected contribution and value added the nominated BoS member (candidate's organisation) will bring to the BoS[1]

Tyndall National Institute at University College Cork (UCC) is one of Europe's leading semiconductor technology R&D centres and the largest research facility of its type in Ireland. At Tyndall, world-class research teams perform ground-breaking research using state-of-the-art infrastructure, with an "excellent impact from excellent research" philosophy. Tyndall addresses electronics and photonics technologies across the value chain: from materials and devices to circuits and systems. The Institute hosts over 600 researchers, engineers and support staff, including a full-time postgraduate cohort of 130 students, as well as approximately 90 industry researchers in residence. Our research is enabled by the presence of full CMOS, Micro-Electronic-Mechanical Systems (MEMS) and III-V Wafer Semiconductor fabrication facilities on-site. Central to the continuous sustainable growth of Tyndall are the industrial partnerships with ICT market leaders such as ams-Osram, ST Microelectronics, Analog Devices, Intel and Meta, MedTech leaders such as Stryker and J&J, and European SMEs and start-ups, such as Eblana, Pilot Photonics and Synergia Medical. In addition, the Institute hosts spin-in companies to facilitate their set-up in Ireland, with recent examples including X-Celeprint and ficonTEC.

In the EU, Tyndall's extensive network builds on partnerships with over 600 organisations to deliver value across several European programmes, including Horizon Europe, Digital Europe, Public-Private-Partnerships (including the Chips JU), Erasmus+ and the Life programme. Tyndall is currently involved in many European projects and initiatives not only in the microelectronics and photonics sectors, but also in telecommunications, agriculture, energy, health, and

[1] The candidate is aware and accepts that according to the Photonics21 Terms of Reference (§ 5 (10) a member ship fee - as determined by the General Assembly of the Association - needs to be paid to the Photonics21 association.

advanced manufacturing. With a network of 200 industry partners and customers worldwide, Tyndall generates 85% of its €50M income each year from competitively won contracts.

We are also a lead partner in European research programmes in smart system integration, electronics and photonics, with applications in health, transport, mobility, agri-food and energy. We partnered with over 700 organisations in 50 countries to deliver scientific and industrial outputs worth €780 million in H2020. In that programme, we led 19 out of the 111 projects in which we were involved, bringing €115 million in investment to Ireland. In Horizon Europe, Tyndall has 60 projects to date (14 coordinated), totalling over 45M€. Key successes include the Tyndall coordinated projects INFRACHIP, BIOSENSEI, HERIT4AGES, INFERNO, Adoption, Photonic Leap and QCEED as well as other projects such as PhotonHub Europe, Protemic, QPIC1550, MWP4Space, EPIQUE and Inphomir. Tyndall is also a partner in the Phorwards21 programme, which provides support to the European Photonics21 community to develop a European industrial strategy to 2030 and beyond.

With this nomination, Tyndall is seeking to expand and deepen its relationship with Photonics 21 by joining the BoS. Tyndall will bring important knowledge and insights to the BoS regarding models and processes for effective academic-industrial partnerships based on insights gained from working with companies ranging from global multi-nationals to SMEs and start-ups across multiple EU, US-Ireland and Irish national programmes. In particular, Tyndall will bring deep knowledge of the photonics and electronics needs of the industry sector in Ireland which includes, for example, ICT and MedTech clusters that are significant on a European scale. Finally, given the new supports offered by the EU Chips Act and the ongoing growing relationship of Photonics 21 with the Chips JU, we will be able to leverage the strong presence of Tyndall in the latter through both governance (i.e. via the industry-driven EPoSS association) and implementation (e.g. pilot lines and competence centres). Tyndall is a partner in two existing pilot lines and co-lead in an application to the recent call for a Pilot Line on Advanced Photonic Integrated Circuits. Hence the Institute will play a significant role in these initiatives which aim to help bridge the gap between lab demonstrations and full-scale manufacturing and provide the means for industry to test and validate novel prototype system designs and breakthrough technologies.

b) Description of the activities and information about expected contribution and value added the BoS Representative (candidate / person) will bring to the BoS.

Paul Townsend has more than 25 years' experience as a scientist and research leader, working in leading industrial laboratories in the US and UK, including Bellcore, BT and Corning, and, since 2003, at Tyndall and UCC, where he is currently Head of Photonics Research and Director of IPIC, Ireland's National Photonics Research Centre. He is also Professor of Photonic Systems Research in the School of Physics at UCC and Co-Director of the UK-Ireland PIADS Centre for Doctoral Training, a partnership involving IPIC, Queen's University Belfast, the University of Glasgow and anchor industry partner, Seagate. Paul is an internationally recognised expert in advanced photonic communication systems. He is particularly known for his pioneering work on quantum key distribution in optical networks, and for developing novel concepts in high-capacity broadband optical access networks. His group's work has led to approximately 250

peer-reviewed journal and conference publications including 40 invited contributions, and 30 registered patents. He has a PhD in Physics from the University of Cambridge and is a Fellow of the Institute of Physics. His recent external engagements include member of the Photonics 21 Board of Stakeholders (2015-2023) and member of the UK Quantum Communications Technology Hub Advisory Board (since 2014). He is also co-founder of the Photonics Ireland National Technology Platform, which aims to drive academic, industry and government coordination to promote the development of the photonics industry in Ireland. In 2019 he was Co-Chair of the European Conference on Optical Communications, the first time this prestigious annual event was held in Ireland.

Paul Townsend will actively participate in the Photonics 21 Board of Stakeholders and will coordinate the contributions of the wider Tyndall and IPIC team to Work Group 1 (Digital Infrastructures), Work Group 3 (Health). Work Group 4 (Climate, Mobility and Energy), Work Group 5 (safety, Security, Space and Defence) and Work Group 7 (Core Photonics). Tyndall and IPIC have significant activities in each of these areas, including the development of energy efficient optical communication devices and systems, low cost biophotonic diagnostic instruments and smart surgical instruments, PIC and PIC packaging technologies and the training of photonics-skilled PhDs and postdocs as well as a vibrant and growing science outreach programme.

Townsend and his team will actively support Photonics 21 and its initiatives that aim to sustain and grow the photonics industry and associated R&D provider community in Europe. To do this we will leverage our extensive European industry and academic networks, with a particular value add being our ability to act as a gateway to Ireland which is playing an increasingly important role in the overall European photonics landscape, both through its public sector R&D at Tyndall and IPIC as well as through its significant relevant industry clusters. For example, Ireland is home to 16 of the top 20 global ICT technology companies in a sector that employs 106,000 people and accounts for €117 billion in annual Irish exports. The Semiconductor sector in Ireland includes 15 of the top 30 global companies and employs 20,000 people. Ireland is also home to Europe's most advanced Semiconductor Fab, Intel's facility in Dublin, which represents a cumulative investment of over €30 billion. Ireland's MedTech sector includes 14 of the world's top 15 companies and is one of the leading medical device manufacturing hubs in Europe (the second largest next to Germany) employing some 40,000 people in more than 300 companies, generating €13 billion of annual exports. All of these sectors include companies with rapidly growing needs for new photonic technologies and for trainees with advanced photonics skills. We aim to meaningfully contribute to the European ambition for large-scale technological capacity building and the strengthening of innovation.

In conclusion, Townsend and his team will act as national champions and a gateway to evangelise and support the participation of the Irish academic and industry communities with Photonics 21, Horizon Europe, Digital Europe and other EU programmes including the Chips JU, as well as with the wider European academic and industrial photonics network.

Paul Townsend