



To Photonics21Secretariat  
via eMail: [secretariat@photonics21.org](mailto:secretariat@photonics21.org)

Milano, 31 July 2020

Dear Photonics21 Secretariat

We herewith submit the nomination of the following Photonics21 Board of Stakeholder candidate  
**Politecnico di Milano** / representative **Prof. Paola Taroni**.

**- Letter of Nomination -  
Photonics21 Board of Stakeholders  
Election 2020**

## Photonics21 Board of Stakeholders - Letter of Nomination

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

Politecnico di Milano

### 2. Full contact details of the affiliation (street, postal code, country) nominated as BoS Member and invoice address

Piazza Leonardo da Vinci 32, 20133 Milano - Italy

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

Paola Taroni

### 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 (candidates organization) will bring to the BoS<sup>1</sup>

**Politecnico di Milano** was established in 1863 as a public institution of higher education and research (<http://www.polimi.it/en/>). It is the biggest technical university (46000 students, 1400 teaching staff) and ranks first in Italy (1st in Italy in 10 research areas in QS Rankings 2019-2020).

Politecnico di Milano is committed to achieving **excellence in research** through: support of advanced and fundamental research activities, development of strategic partnerships with academia and industry around the world to make significant contributions to society, development of new interdisciplinary research lines to tackle societal challenges, embedding of scientific developments and research results into university education.

Research is carried out in several areas, spanning from engineering to architecture and industrial design. **Photonics** is playing a **key role** in all strategic areas. As representative examples, it is worth mentioning: the research performed for the development of new laser applications for manufacturing and services that are offered through the development of new industrial laser processes; the development of innovative photonic approaches for non-invasive medical diagnostics, from the investigation of the underlying physics and the method development to the design and realization of prototypes validated in clinical studies; the design of novel integrated optical circuits aiming at high scalability and reduced design complexity; the use of light for non-destructive diagnostics in several application domains, from automotive to cultural heritage.

Politecnico aims at playing a **driving role in research and innovation**. Its main objectives include a consolidated relationship with enterprises, also by supporting enterprise development. The results achieved can be summarized as follows: 16.283 publications since 2012; over 100 million € in third-party cash flow; 363 projects financed within H2020; 2084 patents, 77 spin-off activities; 139 start-ups.

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<sup>1</sup> The candidate is aware and accepts that according to the Photonics21 Terms of Reference a service agreement and a service fee invoice is to be signed / paid with the Photonics21 association.

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The priority commitment of always keeping research linked to **education** has allowed Politecnico di Milano to achieve high quality results at an international level as to connect the university to the business world. Politecnico strongly supports **internationalization** in education. Many programs are taught in English. More than 20% of students in MS programs, and more than 30% in PhD programs are from foreign Countries. Politecnico is part of several strategic alliances among top international universities, such as IDEA league, Unitech, Alliance4Tech, T.I.M.E. (Industrial Managers in Engineering), MEDesMagalhães Association, Pegasus, Global Engineering Education Exchange (E3), and Athens.

Politecnico works to promote **gender inclusion and equal opportunities** in STEM studies. Starting from gender identity, POP, Pari Opportunità Politecniche (Politecnico Equal Opportunities) is organised along five lines of action: attracting girls towards STEM subjects, fostering educational initiatives, and entering the job market (e.g. through the GIRLS@POLIMI program to invite companies to donate scholarships to support students enrolled in Bachelor's degree courses, especially those that currently enrol less than 20% women).

Continuing to **be part of Photonics 21 BoS** would be a unique opportunity for Politecnico to help shape the future of the photonic research activities (both basic and applied research) and education programs in Europe, with strong industrial connections. In turn, the BoS would maintain an expert and reliable partner to define, pursue, and implement the objectives of the Photonics 21 platform.

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

**Paola Taroni** is full professor at the Department of Physics of Politecnico di Milano (<https://www.fisi.polimi.it/en/people/taroni>).

Her research activity, performed over the last 30 years, has concerned mainly the development of laser systems for time-resolved spectroscopy and imaging, and their applications in biology and medicine, including: time-gated fluorescence spectroscopy with picosecond resolution for the photophysical characterization of endogenous and exogenous pigments and photosensitizers for the photodynamic therapy of tumors (PDT); the optimization of therapeutic protocols for PDT; the detection of tumors with fluorescence lifetime imaging; the "in vivo" optical (absorption and scattering) characterization of biological tissues over a broad spectral range through diffuse optical spectroscopy, and the non-invasive estimate of tissue composition (water, lipids, collagen) and physiologic parameters (blood volume and oxygenation level). Her interests focus specially on the use of diffuse optics in breast cancer management: diffuse optical tomography combined with shear wave elastography and ultrasound imaging for the non-invasive discrimination between malignant and benign breast lesions; the monitoring of neoadjuvant breast chemotherapy and prediction of its effectiveness; and the estimate of breast density, major risk factor for the development of breast cancer.

Major professional activities and honors:

- Head of the PhD Program in Physics at Politecnico di Milano (2013-2018).
- Member of the Advisory Board of the European Society for Photobiology (2007-present).
- Council officer of the American Society for Photobiology (2000-2003), of the European Society for Photobiology (2005-2009), and of the Italian Society for Photobiology (1998-2004).

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- Conference Chair of: "Diffuse Optical imaging", part of the European Conferences on Biomedical Optics (ECBO, 2011, 2013, 2015); Laser Applications in the Life Sciences (LALS, 2014); Gordon Research Conference on Lasers in Biology and Medicine (2016); "Optical Tomography and Spectroscopy of Tissue XIII" (Conference 10874), part of BIOS (Photonics West, 2019, 2021). Program Chair of the European Conferences on Biomedical Optics (ECBO, 2017); General Chair of the European Conferences on Biomedical Optics (ECBO, 2019).
- Associate Editor of Photochemical and Photobiological Sciences (2003-present), Optics Express (2008-2014), Biomedical Optics Express (2010-2014), JNIRS-Journal of Near Infrared Spectroscopy (2016-present).
- Fellow of the Optical Society of America (OSA) since 2017 and of the International Society for Optics and Photonics (SPIE) since 2020.
- Associated researcher of the Institute of Photonics and Nanotechnology of CNR (National Research Council), with headquarters in Milano.

Since 2013, Paola Taroni has taken active part in the activities of Photonics 21 Work Group 3 - Life Science and Health.

In line with the actions previously carried out by Prof. De Silvestri as a representative of Politecnico di Milano, if elected Paola Taroni will:

- promote, support and implement research in Photonics
- bring the experience in education and training of a large technical University
- help in expanding the network of national and international collaborations
- help Photonics to keep the position of major enabling technology in Europe
- as a woman in science, she will also work to offer equal opportunities to female and other under-represented students and young researchers for a balanced and stronger development of the field of Photonics.