

PHOTONEXT

The Inter-Departmental Center
on Applied Photonics
at Politecnico di Torino

1st PhotoNext Researchers' Day

2023, June 19th



Why this event?

- An opportunity for all PhD students working in PhotoNext to present their research activities
 - To their peers
 - To the faculty members and to external people
 - ... and mainly: to create a network!
- We have been thinking about it since the beginning of PhotoNext (end of 2017)
 - But then in the first 2 years we were fully booked in organizing the Center and acquiring the new lab instruments
 - ... then COVID came ☹️
 - ... then we had to catch up with all delays generated by COVID lockdown



- Pitch presentation for 5-6 minutes per each PhD student
 - Followed by 2-3 minutes of Q&A
 - Please try to give the "application scenario" of your PhD research
 - Not the technical details (!!)... almost no one will understand it in 5 minutes ☺
 - Apart (maybe!) your supervisor
- We need to STRICTLY respect this timing since we have MANY presentations
- **NO TIMING... no "aperitivo" at 6:00 pm ☺**
- ... and thanks a lot to Alberto Tibaldi for the organization of the event!

VCSELS

- 14:10 Valerio Torrelli VCSELS for single-mode high-power applications
14:20 Alberto Gullino Physics-based simulations of VCSELS
14:30 Martino D'Alessandro Physics-based modeling of high-speed VCSELS
14:40 Andrea Marchisio VCSEL model parameter extraction: deep learning vs. evolutionary algorithms
14:50 Leonardo Minelli Nonlinear Digital Pre-Distortion for high speed VCSEL-MMF Data Center Intra-connects

Optical communications

- 15:00 Giuseppe Caruso Ultra-high bitrates Next Generation Optical Architectures and Passive Optical Networks
15:10 Lorenzo Andrenacci Longitudinal Power Monitoring
15:20 Lorenzo Tunesi Photonic Integrated Switching and Routing
15:30 Mariacristina Casasco TDEC metric in 50G-PON: analytical and experimental investigation on several implementation aspects

Optical components

- 15:40 Mohammad Heydari Numerical modelling of mode-locking at low repetition rate in Quantum Dot lasers
15:50 Francesco Mercinelli Modeling InGaN LEDs and solar cells with quantum corrected drift diffusion.
16:00 Matteo Cavaghetto Femtosecond written Fiber Bragg Grating

16:10 Break (20 minutes)

Optical Sensing

- 16:30 Saverio Pellegrini Vibration Sensing over Metropolitan Fibers
16:40 Chiara Bellezza Prinsi Fiber optic water monitoring
16:50 Aurora Bellone Innovative Fiber Optic Sensors

Biomedical applications

- 17:00 Malhar Nagar Optical fiber sensors for intravital monitoring
17:10 Serafini Valentina Yellow lasers for biomedical application
17:20 Jawad Talekkara Pandayil Multifunctional bioresorbable optical fiber for cancer theranostic application

Silicon photonics

- 17:30 Stefania Cucco Design of Si/polySi microrings with complex waveguide cross-sections and minimal non-linearity.
17:40 Marco Novarese Non-linear effects in silicon photonic devices: modelling and experiments
17:50 Matteo Alasio Modeling of Ge-on-Si photodetector for wide-band Silicon Photonics applications

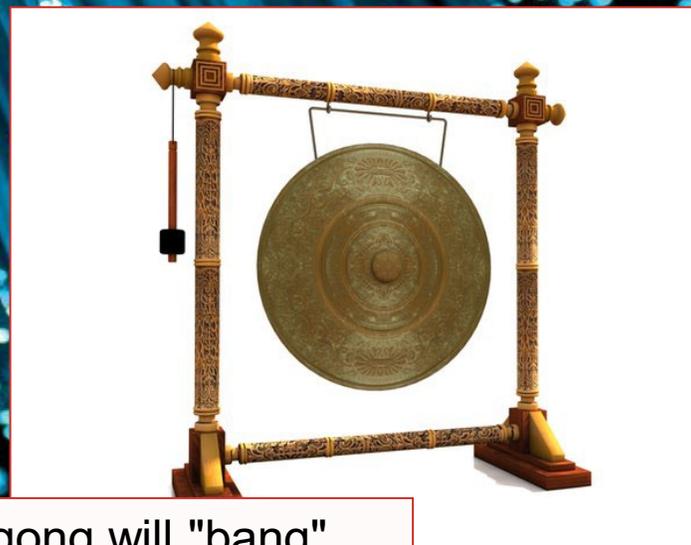
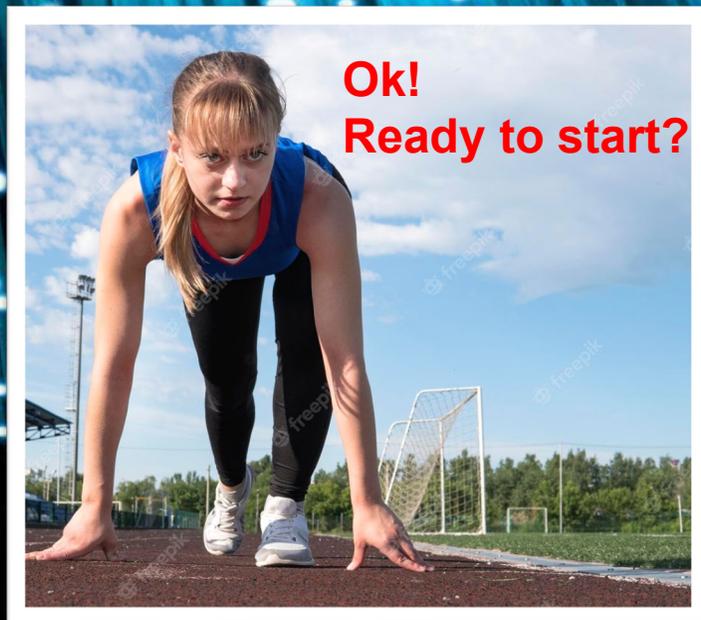
**18:00-19:00 Get together
drink "Aperitivo" in front of Sala
Maxwell**

Some further "opportunities" ...



- For the PhD students of the IEEC School, today presentation will be counted as 2 hard skill hours
 - We will send you a .pdf document to upload on the portal in the next few days
 - Remember... no upload no hard skill hours!
- We would like to put all presentations (in pdf) on the PhotoNext web portal
 - We need your authorization (we will handle this by email in the next couple of days)
- For everyone: if you prepare a 3 minute video in which you present your work, we will put it on the PhotoNext web site homepage
 - If you are interesting to this opportunity, please upload the video on YouTube and send the link to alberto.tibaldi@polito.it
 - The preparation of this video will be counted for an additional 1 hard skill hour

PHOTONEXT



... and remember that a gong will "bang" after 5 minutes of presentation!!
Then if you do not conclude in the following 1 minute... **NO aperitivo!**

Prof. Roberto Gaudino
Scientific Coordinator
roberto.gaudino@polito.it

For more information:

www.photonext.polito.it

info.photonext@polito.it

LinkedIn goo.gl/PVx4GY

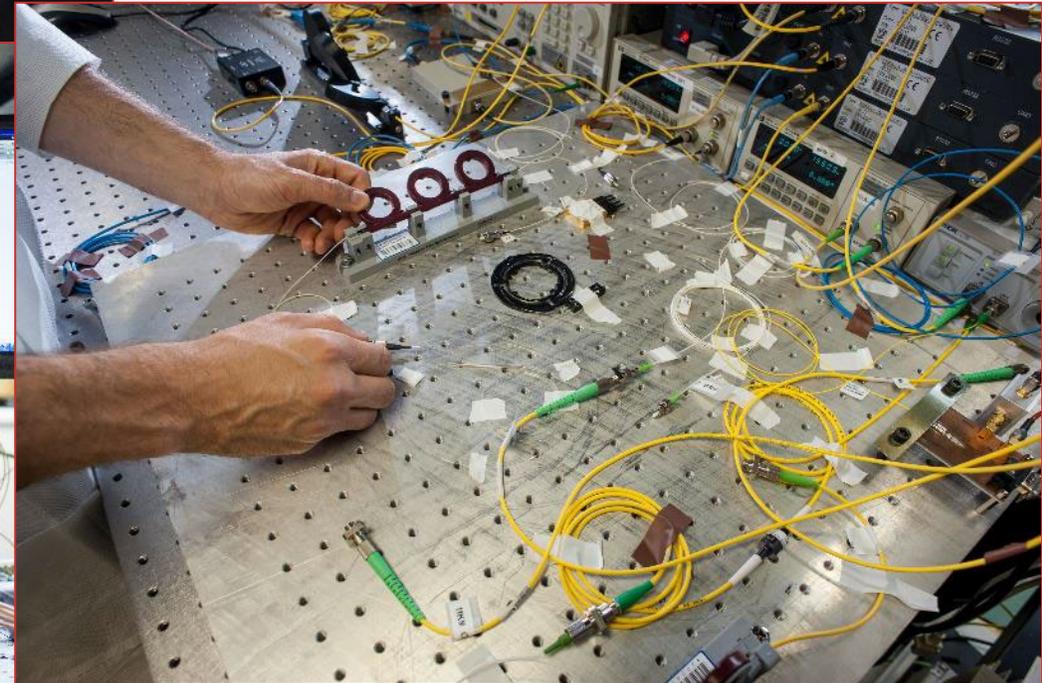
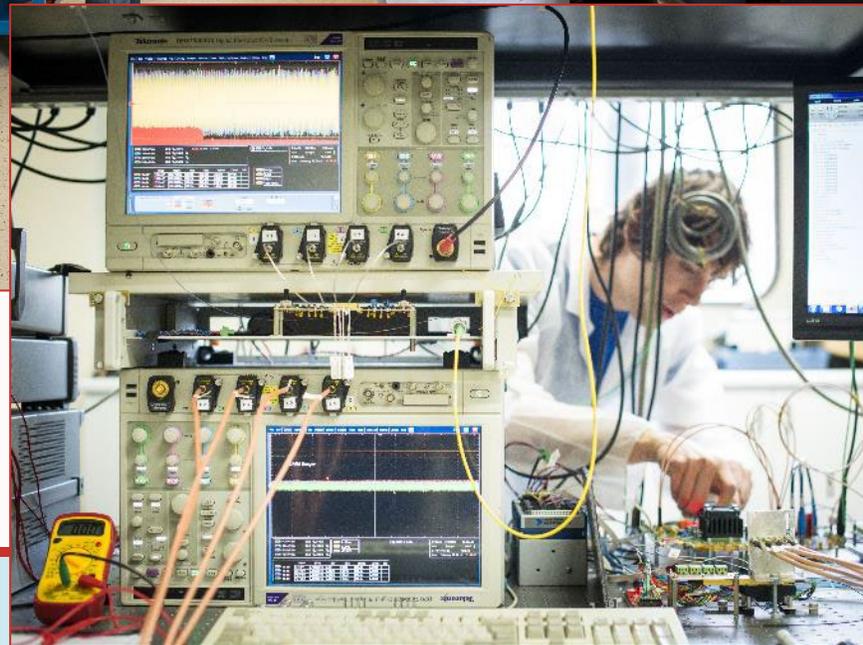
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PHOTONEXT

Mission

- What?
- Why?
- Where?
- Who?

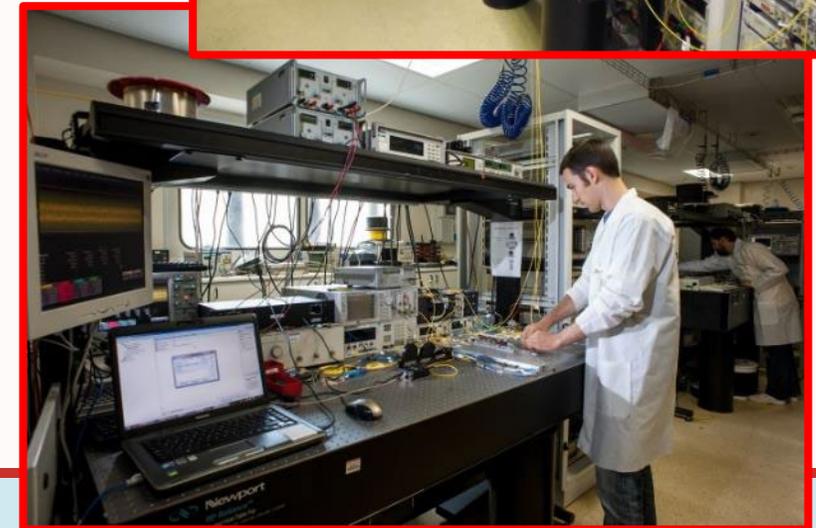


- **PhotoNext is a large experimental laboratory on Applied Photonics at Politecnico di Torino (POLITO)**
- **It is inserted in the POLITO Inter-Departmental Center initiative**
 - **The goal is to create a critical mass of expertise in the area of Photonics**
 - **The infrastructure received the following institutional funding**
 - **2001: 1.6M€ by POLITO, for the laboratory “bootstrap”**
 - **2017: 1.8M€ by POLITO, for its expansion**
 - **2018: 0.9M€ by the Piedmont Regional Government**
- **These institutional grants were instrumental to create a state of the art experimental facility on Photonics**
 - **Besides institutional funding from POLITO, the different groups working in PhotoNext have a long term tradition of industrial and EU research fundings (more than 1.5M€ per year overall)**

WHERE?



- PhotoNext uses the same spaces of the previously existing PhotonLab laboratory
 - PhotonLab was opened in 2001
- PhotonLab has a strong synergy with the LINKS Foundation (previously named ISMB)
 - A non-profit research center on ICT
 - POLITO is one of the two key founders
 - LINKS Foundation is focused on technology transfer (toward TRL 5-6)



Four POLITO Departments involved



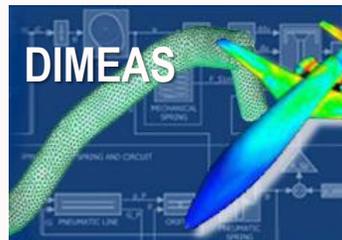
- The Mission of the PhotoNext center is to bring together different expertises in the area of applied photonics, involving research staff from four different Departments and several different research groups



Coordinator:

- **Prof. Roberto Gaudino**

Dipartimento di Elettronica e
Telecomunicazioni



DIMEAS

- **Prof. Paolo Maggiore**

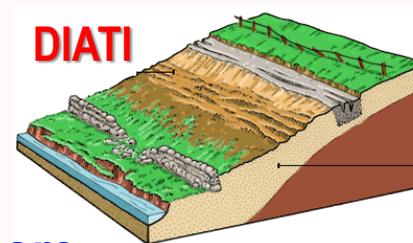
Dipartimento di Ingegneria Meccanica e
Aerospaziale



DISAT

- **Prof. Davide Janner**

Dipartimento Scienza Applicata e Tecnologia

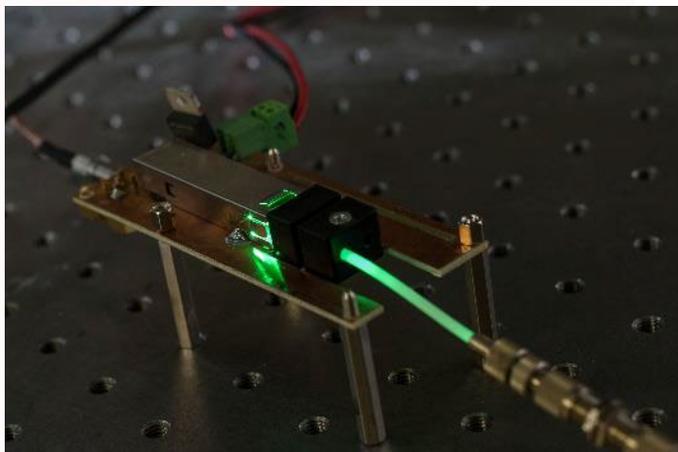


DIATI

- **Prof. Alberto Godio**

Dipartimento di Ingegneria dell'Ambiente, del
Territorio e delle Infrastrutture

PhotoNext three main pillars: optical Telecommunications, Sensors, Components



Three areas of photonics focused on the use of optical fibers

