

**Call for application for research scholarships
for post-graduate international candidates**

RESEARCH PROJECT N. 23

Title

OptNext: Next-generation solutions for ultra-broadband pervasive optical access networks

Scientific responsible (name, surname, role)

Roberto Gaudino (roberto.gaudino@polito.it)

Associate Professor at “Dipartimento di Elettronica e Telecomunicazioni”,
(<https://www.optcom.polito.it/people/associate-professor/roberto-gaudino>)

Principal investigator in the OptCom group <https://www.optcom.polito.it/> for Optical Access Networks

Short description of the research activity (max 250 words)

The OptCom group, an internationally renowned group for its advanced research in optical fiber communication, such as the discovery of the Gaussian Noise (GN) model for nonlinear crosstalk in long-haul optical fiber propagation and for its EU projects on optical access networks (POF-ALL, POF-PLUS and FABULOUS), has recently won an 1.8 M€ internal funding at POLITO for the “PhotoNext” Research Center. The research topics in Photonext carried out in the next three years will be at the boundary between three areas:

- Ultra-high bit rate optical fiber transmission for access, metro and long-haul
- Optical sensors
- Optical components

For this post-graduate international candidates POLITO call, we are looking for candidates for a project titled “OptNext: Next-generation solutions for ultra-broadband pervasive optical access networks”. The candidates should like to challenge themselves on topics at the boundary between optical access networks and fiber sensing. In particular, the candidate will work on:

- Latest trends in transmission over optical access networks, particularly using the Passive Optical Network (PON) architecture. This may involve simulations and experiments trying to reach 40 Gpbs per lambda using direct detection on PON networks, to be used in fronthauling applications in the area of fixed-mobile convergence.
- Development of innovative solutions for geosensing that take advantage of already existing telco fiber access networks to use them as distributed sensors for emergency surveillance

of special events such as anomalous vibrations and change of temperature in our urban environments.

The laboratory instrumentation available at PhotoNext will allow approaching these topics in an experimental way, using state-of-the-art test and measurement equipment. The experimental work will be complemented by theoretical and simulative analysis of the involved physical problems

Specific requirements (experiences, skills)

The candidate should have an Engineering Degree in areas relate to Telecommunications, Electrical Engineering or ICT in general.

Preferably, he/she should have a background on one or more of the following topics:

- Optical fiber communications and networking
- Digital signal processing
- Optical components
- Sensors and metrology

Website of the research group (if any)

- OptCom group web site: <https://www.optcom.polito.it/>
- PhotoNext center at POLITO: <https://www.linkedin.com/showcase/18122771/>

EU projects coordinated by Prof. R. Gaudino

- FABULOUS project http://cordis.europa.eu/project/rcn/104608_en.html
- POF-PLUS project http://cordis.europa.eu/project/rcn/86620_en.html
- POF-ALL project http://cordis.europa.eu/project/rcn/93666_en.html

Keywords (min 3, max 6)

Ultra-High Speed Fiber Transmission, Optical Access Networks, Passive Optical Networks, Distributed Optical Sensing, Optical Metrology

Research Area (max 1)

Electronics, Control and Telecommunication Engineering