

**Call for application for research scholarships
for post-graduate international candidates
RESEARCH PROJECT N. 54**

Title:

PULL - Petabit Ultra-Long optical fiber Lines for the next decade internet

Scientific responsible (name, surname, role)

Pierluigi Poggiolini, Full Professor and Principal Investigator (pierluigi.poggiolini@polito.it)

Short description of the research activity (max 250 words)

Datacenter-to-DataCenter and in general machine-to-machine communications have been predicted (by Nokia Bell Labs, USA) to exhaust the capacity of current transnational and transcontinental optical fiber links in just a few years. This is a serious problem, since over 99% of the total world internet capacity travels over such links.

The PULL project will explore various new technologies in close cooperation with CISCO Systems, to deal with this impending capacity crunch. The investigation will be theoretical, numerical and experimental.

Experiments will be carried out at a state-of-the-art facility (PhotonLab) which has been recently heavily funded by Politecnico (the PhotoNext Initiative).

The theoretical and numerical investigation will explore new and more efficient ways to transmit information over the optical fiber, including advanced coding, fiber non-linearity modeling and mitigation techniques. The so-called "space division multiplexing" technology will also be heavily addressed.

The PI he has a well-established international reputation. He has authored or co-authored over 250 papers, earning over 4,000 citations and an h-index of 34 (Scopus). Four of his papers are listed as "highly-cited papers" (Thomson-Reuters), two have received the best-paper award of the IEEE/OSA Journal of Lightwave Technology (awarded in 2014 and 2015). He leads the OptCom group of Politecnico di Torino.

The cooperation of the OptCom Group with CISCO has been ongoing for ten years and has led to industry-shaping results, such as for instance the GN-model of non-linear propagation which is now a standard part of CISCO optical networking management and is being pushed forward as an international standard.

Specific requirements (experiences, skills)

A background in digital communications is a mandatory prerequisite.

Specific background in optical communications is highly valued.

Welcome, but not mandatory, is Information theory knowledge, optical and electro/optical component expertise and laboratory experience.

Website of the research group (if any)

www.optcom.polito.it

Keywords (min 3, max 6)

Optical Transmission, Non-Linearity Mitigation, Space-Division-Multiplexing, Probabilistic Shaping
Advanced Coding, Ultra-High Capacity

Research Area (max 1)

Electronics, Control and Telecommunication Engineering