P30: POLITO (Italy)

Description of expertise & activities

Politecnico di Torino is one of the leading Italian technical universities. PoliTO staff involved in BONE has a strong background in research and educational activities in the area of optical communications systems and networks. Two groups from the Electronics Department are involved: the optical communications group, led by P. Poggiolini (WP leader of VD-T in e-Photon/ONe+), and the optical networks group, led by F. Neri (project leader of e-Photon/ONe+). The former is mainly concerned with the transmission system and physical layer part of optical networks, with specific interests in polarization and non-linear effects, electronic equalization, 100 Gb/s systems and plastic optical fibers for short-haul and in-home. The latter focused its research on different aspects related to optical networking: algorithms for logical topology design, access protocols for metropolitan optical networks, scheduling algorithms for broadcast and select networks, and experiments on optical packet-switched metropolitan rings. A recently established 250 m^2 experimental facility in clean air with state-of-the-art equipment, called PhotonLab, is available to the two groups. More information in www.polito.it (for Politecnico di Torino), www.tlc-networks.polito.it (for the networks group), www.opticom.polito.it (for the optical transmission group), and www.photonlab.org (for PhotonLab).

Tasks within BONE

WP00	Contribution to project coordination in continuation with e-Photon/ONe.
WP01	Contribution to the organization of the project website. Organization of dissemination events at major conferences. Hosting in Torino of ECOC 2010.
WP02	Generation of teaching material to be shared in the NoE, and use of the NoE teaching material in optics courses at PoliTO. Possible contributions to Summer/Winter schools.
WP03	Contribution to the website taskforce. Implementation of automatically generated mailing lists at PoliTO.
WP11	Design, performance evaluation, and prototyping of innovative WDM packet metro network architectures. Comparison of optical networking architectures for metro applications. Design of WDM wavelength-routing networks.
WP13	Study of architectures and resource allocation strategies in WDM PONs, with particular attention to video multicasting and peer-to-peer applications.
WP14	Design and performance evaluation of all-optical and hybrid electro-optical packet switching architectures. Definition of the role of optics in IP routers and Ethernet switches.
WP15	WP leadership by Pierluigi Poggiolini. 100 Gb/s technologies. Electronic mitigation of transmission impairments.
WP16	Comparison and performance evaluation of the use of Plastic Optical Fibers (POFs) for next-generation in-building networks.
WP21	Experimentation of resources virtualization in broadband networks.
WP23	Contribution to defining optical switching architectures capable of supporting mobility.
WP25	Architectures and control strategies for optical interconnections among chips and subsystems. Ongoing collaboration with researchers at Columbia University (L. Carloni and K. Bergman). Optics-empowered large switching fabrics, with prototyping.
WP26	Contribution to the definition of multi-layer network protocol architectures.

Key personnel

Fabio Neri is full professor at the Dipartimento di Elettronica of Politecnico di Torino. His research interests are in the fields of performance evaluation of communication networks, high-speed and all-optical networks, packet switching architectures, discrete event simulation, and queuing theory. He leads a research group on optical networks at Politecnico di Torino, which has recently been involved in several European and national Italian research projects. He was the project leader of the FP6 NoE e-Photon/ONe.

Pierluigi Poggiolini is associate professor at Politecnico di Torino. He has been working on optical transmission systems and networks since 1989. Between 1990 and 1995 he spent a total of three years at Stanford University. Since 1996 he has been with Politecnico, working in the framework of several national and international projects. He was work-package leader in the FP6 NoE e-Photon/ONe. His main current interest is transmission issues in optical networks.

Roberto Gaudino is associate professor at Politecnico di Torino since 1999. He is the project coordinator of the FP6 STReP POF-ALL.