

## P43: Universita degli Studi Roma Tre – UNIROME3 (Italy)

## **Description of expertise & activities**

Roma Tre is the youngest university of Italy's capital. Founded in 1992, it now already is the home of 35.000 students distributed over 8 faculties ranging from the Arts and Economics to Science and Engineering. Research is grouped in 26 departments, with the Digital Signal Processing, Multimedia and Optical Communication Laboratory being part of the Department of Applied Electronics. Among the courses offered are Photonics, Photonics for Telecommunications, and Optical Fiber Communications. The main research topics of the Optical Communication Group are related to optical networking, optical signal processing, passive optical networks, planar lightwave devices, quantum dots and photonic crystal devices. The Optical Communication Group's expertise is focused on the design, numerical simulation, and characterization of sophisticated optical devices, as well as advanced optical transmission systems. The laboratory is equipped with simulation tools to design integrated optical and sub-wavelength scale devices, many of which were developed in-house. Prof. Gabriella Cincotti has a proven track record of supervising PhDs and Postdoctoral researchers in delivering demanding results against tough timelines. At the moment, the group consists of a post-doctoral researcher and three PhD students. More information on www.comlab.uniroma3.it

## Tasks within BONE

WP02	Contributions to organization of Summer/Winter school (e.g. in the 'Ettore Maiorana' centre, Erice Italy)
WP11	Optical packet switching (OPS) has been proposed as a key technology to realize huge capacity, ultra- high-speed hopping, and fine granularity networks. However, there is still a large mismatch between 40 Gbit/s OPS networks and current networks based on Internet protocol (IP) (e.g., 10Gb Ethernet). UNIROMA3 will investigate possible solutions to design efficient interfaces between OPS and IP-based networks.
WP13	Code division multiple access (CDMA)-PON is an emerging technology that has gained a lot of research interest during last years, thanks to its features of a large spectral efficiency and higher data confidentiality. A different code is assigned to each user to access the network in a complete asynchronous way. Hybrid WDM-CDMA transmission has been demonstrated, and UNIROMA3 will be involved in the design and optimization of optical resources in this type of PON.
WP14	Design of Photonic crystal (PhC) cavity coupled waveguides (CCW) slow light devices.
WP22	Studies on the feasibility of the implementation of MPLS protocol directly in the optical domain by using optical labels.
WP24	Physical layer issues related to OPS/OBS networks; in particular will investigate the simultaneous use of multiple optical labels, wavelengths and time slots to route optical packets and bursts.

## Key personnel

**Gabriella Cincotti** is Associate Professor at the University Roma Tre. Her research interests are in photonic networks and optical devices, and she has authored over 150 papers and presentations in international journals and conferences and hold an international and a Japanese patent. She has been Guest Editor of IEEE/OSA Journal of Lightwave Technology /Optical Signal Processing 2006, and is a Senior Member of IEEE Lasers and Electro-Optics Society (LEOS), and member of the National Inter-University Consortium for Telecommunications (CNIT), and the Inter-University Consortium for Matter Science (CNISM).

**Michela Svaluto Moreolo** received a PhD degree in Electronics, Biomedical, Electromagnetic and Telecommunication Engineering at University Roma Tre in 2007. At the moment she is a post-doctoral researcher at the Department of Applied Electronics. Her research interests are in the field of passive optical devices, planar lightwave circuits and photonic bandgap structures, as well as in all-optical signal processing. She is a member of IEEE Laser and Electro-Optics Society (LEOS), and of the National Inter-University Consortium for Telecommunications (CNIT).

**Gianluca Manzacca** is a Ph.D. student in Electronics, Biomedical, Electromagnetic and Telecommunication Engineering at University Roma, since November 2005. His research interests are in optical communications, photonic crystals, and quantum optics. He is a student member of the IEEE Laser and Electro-Optics Society (LEOS), and a member of National Inter-University Consortium for Telecommunications (CNIT).

**Valentina Sacchieri** is a Ph.D. student in Electronics, Biomedical, Electromagnetic and Telecommunication Engineering at University Roma, since November 2006. Her research interests are in optical communications systems. She is a student member of IEEE Laser and Electro-Optics Society (LEOS).