P22: National and Kapodestrian University of Athens - UOA (Greece)

Description of expertise & activities

The optical communications group of the University of Athens is active in the field of photonic components, subsystems as well as optical communications and networks, the last twenty years. The group consists of four University professors, five post-doc researchers, twelve PhD students as well as supportive personnel.

The resources available include extensive computer infrastructure with a number of software packages installed, in order to model optical networks, systems and photonic components. In this context, a broad range of mathematical software tools are also available for the development of own software.

The Laboratory of the group is fully equipped for measurement and characterization of optical communication systems at bit rates up to 10 Gb/s. Optical components and subsystems are also characterized at frequencies up to 40 GHz, using the appropriate spectrum/network analysers, a number of optical sources CW and pulsed (sub-ps with variable repetition rate) etc. Specific equipment is available for development and characterization of secure, optical chaos encoded, communications systems.

The group participates in European R&D projects since the late 80's (Race definition phase). Since that time and todate the group has participated in more than fifteen European project (mainly STREPs). Currently, apart from the e-Photon/ONe, it participates in the IST - STREP "WAPITI" being WP leader responsible for theory and design. Moreover, the group coordinates the IST – STREP "PICASSO" aiming at the development of secure communications systems and networks by encryption at the physical layer of the network.

Activities of the Group

- Optical Node Architecture: Novel optical components and subsystems are developed allowing the design of efficient, compact and flexible optical node architectures
- Very high bit rate optical transmission systems:Special focus in the recent years has been given to optical parametric amplifiers acting as multifunctional regenerators, switches and ultrafast optical gates
- Optical access networks: Low cost methods for more efficient utilization of the optical access infrastructure is investigated
- Transmission impairment mitigation by electronic means: Electronic equalizers are developed mainly for applications in POF based fiber optic links
- Encryption at the physical layer of the optical networks: Optical chaos encryption methods are investigated capable of seamless integration to the existing network infrastructure.

Tasks within BONE

WP13	Cheap multifunctional devices for access network systems
WP14	Research on ultra-fast switching techniques based on fibre devices and quantum dot materials
WP15	Mitigation of transmission impairments adopting electronic signal processing
WP16	High capacity data transfer over silica/plastic multi-mode optical fibre

Key personnel

Dimitris Syvridis obtained the BSc. Degree in Physics and MSc. In Telecommunications from University of Athens Greece in 1982 and 1984 respectively. In 1988 he received his PhD degree in Physics from the University of Athens. From 1990 to 1994 he was researcher in the Institute of Quantum Electronics, Swiss Federal Institute of Technology (ETH-Zurich). Since 1994 he is in the Department of Informatics and Telecommunications of the University of Athens where he is presently an Associate Professor. He has participated in many European Research projects in the field of optical communications. His research interests cover the areas of optical communications and networks, photonic devices and subsystems as well as photonic integration. He is author and co-author of more than 90 articles in international scientific journals and conferences.

Adonis Bogris was born in Athens, Greece, on June 16, 1975. He received the B.S.degree in informatics, the M.Sc. in telecommunications, and the Ph.D. degree in all-optical processing based on fiber-based devices from the National and Kapodistrian University of Athens, Athens, Greece, in 1997 and 1999, and 2005 respectively. He is a research assistant working for the Optical Communications Laboratory of the National and Kapodistrian University of Athens participating in local and European projects. His research interests include high-speed all-optical transmission systems, non-linear effects in optical fibers, semiconductor lasers dynamics and chaotic optical cryptography.