Conference preview

From Colladon to ultrahigh capacity networks

The 37th edition of the European Conference on Optical Communication (ECOC) will be held this year in Geneva, Switzerland, from September 18th-22nd. The conference comes to Geneva exactly 170 years after Jean-Daniel Colladon's first demonstration of light guiding in a water jet at the Academy of Science, now the University of Geneva. This anniversary will be celebrated in a series of public lectures in the afternoon of Sunday, Sept. 18th on "Milestones in Light Guiding" featuring talks on Colladon (Jeff Hecht, USA), first fabrication of glass fibers (Don Keck, USA), fiber amplifiers (David Payne, UK), and photonic crystal fibers (Philipp Russell, Germany). A working demonstration model of the "Colladon fountain" will be shown during the conference in the entrance hall to the lecture room at the Palexpo conference center in Geneva. A second public event will address the evolution of cryptography: A talk on "The science of secrecy" will be given by Simon Singh (UK). This talk will feature the demonstration of a genuine World War II "Enigma".

The plenary talks after the opening ceremony on Monday morning (Sept. 19th) will include presentations on the FTTH activities in Switzerland and Japan, by Carsten Schloter (CEO of Swisscom) and Hiromich Shinohara (NTT), respectively, on optical communications in a trading Center (Andrew Bach, NYSE), perspectives of EU research in optical communications (Thomas Skordas, EC), and on quantum communication (Nicolas Gisin, U. Geneva).

With respect to last year's event the number of submitted regular papers increased slightly to 756. About 30% of the submitted papers could be accepted for oral presentations and another 20% for poster presentations. These top research results will be presented from Monday to Thursday (Sept. 19-22nd) in 38 regular sessions. Here is a selection of a few highlights from the different areas:

A new optical fiber with opto-mechanical or MEMS-type functionality based on two cores suspended in air has been fabricated for the first time by researchers from the Optical Research Center in Southampton. Colleagues from the Universities of Limoges and Paris Sud developed a novel ultra-compact light sources based on a stable Argon-microwave plasma in a hollow-core (100 um) photonic crystal fiber allowing preferential selection of spectral lines in the UV-VIS wavelength range.

The "Waveguide and Optoelectronic Devices" sessions will showcase new levels of photonic-electronic convergence. Novel hybrid integration concepts such as the InAs/GaAs QD lasers on Si substrate bonding or new techniques for InP photodiode bonding to a silica based platforms are shown to be key for the demonstration of latest ultra-compact coherent receivers operating at 28 Gbaud or optical interconnects providing 3.5 Tbit/s/cm2 transmission densities. New highly linear photodiodes with record high-speed RF output power of up to 1 W are essential for photonic microwave applications, for analog links with high dynamic range and for digital coherent optical links using advanced modulation formats with high local oscillator powers.

Presentations in the sessions on subsystems for optical networks will address challenging issues for the next generation ultrahigh data rate and spectral density with novel phase manipulation concepts for higher order modulation formats (e.g. phase stabilization based on higher order FWM, 16-ary constellation optimization, and carrier recovery). Groundbreaking achievements with advanced devices will be presented, including quantum dot devices for light processing (such as wavelength conversion) operating at an ultrahigh data rate of 320Gbit/s.

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In the field of transmission technologies, the interest in spatial multiplexing is confirmed this year, with one full session on mode division multiplexing and multi-core fibre transmission. The continued efforts on advanced modulation formats with coherent detection using digital signal processing will be well represented again, with a special focus on several experiments aiming at establishing the potential of the novel polarisation-switched quadrature phase-shift keying format. Studies on the evaluation of nonlinear impairments in coherent dispersion-uncompensated transmission will most certainly trigger interesting discussions. The demonstration of record receiver sensitivity and its use in unrepeatered transmission will also be one of the highlights of this year's conference.

Significant progress will be reported on flexible and elastic network solutions in the area of backbone and core networks. This includes a demonstration of an optical network supporting a record 1000-fold optical bandwidth granularities based on elastic allocation of spectral, time and space resources. Optical control plane research is maturing as demonstrated by the number of lab trials including examples such as OSNR-aware dynamic restoration and hierarchical path computation in multi-domain GMPLS-enabled translucent WSON. New results cover control plane extensions and experimental performance of GMPLS-controlled elastic optical networks and MPLS-TP networks. A number of papers attempt to position the optical network as a critical infrastructure for future internet applications. Examples consist of novel software-defined packet over optical networks solutions based on extensions of the Open-Flow protocol and research on optical layer virtualisation and virtual optical infrastructure composition.

Outstanding scientific results and technological innovations related to broadband optical access and local-area networks will be presented. Important topics include extended reach, high split ratio passive optical networks (PON), radio over fiber (RoF) systems, plastic optical fiber (POF)-based in-home networks, gigabit indoor optical wireless communications, and visible light communications, just to mention a few. As an example, innovative PON extenders will be presented, based on burst-mode automatic level controlling praseodymium doped fiber amplifiers (PDFA), Raman amplifiers with wavelength stabilized pumps, remotely pumped amplifiers, etc. New network and system demonstrations include hybrid ring-tree wavelength division multiplexed/time division multiplexing (WDM/TDM) fiber to the home (FTTH) networks, supporting broadband multimedia services, as well as hybrid WDM-OFDM-PON architectures with colorless optical network units.

The ECOC Exhibition will take place in the same building from Sept. 19th to 21st. It is the optimum networking and meeting place for the optical communications professional. Featuring approximately 300 exhibitors and 4,500 visitors you are guaranteed to meet and interact with your most active prospects at ECOC 2011. The show floor is also packed full of the latest industry presentations featuring companies such as Deutsche Telekom, Google and Huawei, product launches, demonstrations and training sessions. The exhibition and all feature areas are free to attend so you make the most of your stay in Geneva.

More details on the conference are available at http://www.ecoc2011.org.
For a full list of participants and further information on the exhibition please visit www.ecocexhibition.com.

René Salathé, Ursula Keller, Christoph Harder
ECOC 2011 chairs

Organisation:
Electrosuisse
ecoc2011@electrosuisse.ch