

# Call for Papers

## **Special Section on Extremely Advanced Optical Transmission Technologies and Transmission Optical Fiber Technologies towards Exabit Era**

The *IEICE Transactions on Communications* announces that it will publish a special section entitled "Special Section on Extremely Advanced Optical Transmission Technologies and Transmission Optical Fiber Technologies towards Exabit Era" (**February 2011**).

Over the last twenty years, the optical communication technologies have seen an increase in transmission capacity per fiber by three orders of magnitude, achieving several Tbit/s transmission. If the data traffic continues to increase at a rate of 40%~70% per year, a capacity increase by three to five orders of magnitude is anticipated over the next twenty years. This means that in twenty years, the backbone transmission capacity should support well over Pbit/s per fiber and the core network should support Ebit/s throughput, where at home Tbit/s access handling 3D super-high definition stream videos will be a reality. The present optical technologies primarily based on WDM, however, have begun to see the ultimate physical limitations of the present systems, i.e., the transmission capacity imposed by Shannon's limit, the amount of optical power (bit/s rate) that can be transmitted safely in transmission optical fibers, the optical bandwidth for optical amplification, and the capacity of optical submarine cables systems now limited by the electrical power supplied to the optical amplifier repeaters. In order to go beyond these limits and to develop break-through technologies that will enable this dramatic leap, totally new multiplexing schemes beyond TDM/WDM, novel transmission optical fibers handling well over Pbit/s capacity as well as far-advanced optical submarine cables systems should be developed. Based upon the above background, a special section is being planned (scheduled to appear in the February 2011 issue) to further promote research and development of future "extremely advanced optical transmission technologies".

### 1. Scope

This special section aims at timely disseminating research activities in these areas. Topics include, but are not limited to:

- Novel transmission optical fibers towards Pbit/s transmission and beyond including photonic crystal fibers, photonic bandgap fibers, multi-core fibers, large-mode area fibers, multi-mode fibers etc.
- Advanced optical connectors, splicing and cabling technologies for the above novel transmission optical fibers
- Optical fiber fuse phenomenon, its mechanisms and halting/detection schemes
- Advanced multi-level modulation schemes (QAM, OFDM etc.) and demonstrations
- Novel multiplexing technologies such as SDM (Space-division Multiplexing), MDM (Mode-division Multiplexing), MIMO processing, etc.
- Novel optical signal processing schemes in the temporal, frequency and spatial domains
- Ultra-high capacity transmission experiments
- Novel optical amplifiers including broadband optical amplifiers, multi-core fiber amplifiers, parametric amplifiers, Raman amplifiers, etc.
- Novel optical node architectures towards Ebit/s throughput employing novel optical fibers and multiplexing schemes
- Advanced optical submarine cable systems and related technologies

### 2. Submission Instructions

The standard number of pages is eight for a PAPER and two for a LETTER. The maximum number of pages for the initial submission of a LETTER is four. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guidelines in the "Information for Authors". The latest version is available at the web site, [http://www.ieice.org/eng/shiori/mokuji\\_cs.html](http://www.ieice.org/eng/shiori/mokuji_cs.html). The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

This special section will accept papers only by electronic submission. Prospective authors are requested to follow carefully the submission process described below.

1. Submit a manuscript and electronic source files (TeX/Word files, figures, authors' photos and biography) via the IEICE Web site [https://review.ieice.org/regist\\_e.aspx](https://review.ieice.org/regist_e.aspx) **by June 30, 2010**. Authors should choose the [Special-EB] Extremely Advanced Optical Transmission Technologies and Transmission Optical Fiber Technologies towards Exabit Era as a "Type of Issue (Section)/Category of Transactions" on the online screen. **Do not choose [Regular-EB]**.
2. Send "Copyright Transfer and Page Charge Agreement" and "Confirmation Sheet of Manuscript Registration" by E-mail, FAX or postal mail to the following address (guest editor of the special section) by the above due date. We may withdraw the submission if these documents have not been received by the due date, even if the manuscript has been received by electronic submission. For additional guidelines on manuscript preparation, please visit [http://www.ieice.org/eng/shiori/mokuji\\_cs.html](http://www.ieice.org/eng/shiori/mokuji_cs.html)

#### **Send the above documents to:**

Toshio Morioka

NTT Network Innovation Laboratories

Address: 1-1 Hikar-no-oka Yokosuka-Shi Kanagawa 239-0847 Japan

Tel: +81- 46 859 2094, Fax: +81-46 859 5541, Email: ocs-exa2011@mail.ieice.org

### 3. Special Section Editorial Committee

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\* Please note that if the submitted paper is accepted, all authors, including authors of invited papers, are requested to pay for the page charges covering partial cost of publications. Authors will receive 50 reprints.

\* At least one of the authors must be an IEICE member when the manuscript is submitted for review. Invited papers are an exception. We recommend that authors unaffiliated with IEICE apply for membership. For membership applications, please visit <http://www.ieice.org/eng/member/OM-appli.html>