Title: **Broadband Chromium-Doped Fiber Amplifiers for Next-Generation Optical Communication Systems**

Speaker:
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Abstract:
We report the first experimental breakthrough of a net gain of optical signals in a broadband chromium-doped fiber amplifier (CDFA) for next-generation optical communication systems. Current fiber amplifiers, including commercial erbium-doped fiber amplifier, cover only a relatively small portion of the entire transmission bandwidths (1300-1600 nm) of the low-loss windows of silica fibers. The newly developed CDFAs have opened up the possibility of utilizing the 300-nm entire spectrum of the low-loss fibers to further increase the transmission capacity. In this paper, we present the experimental demonstration of a net gain of 1.2 dB employing gain enhancement technique. With the help of an optical-fiber system examination for the CDFA, a 40-Gb/s error-floor free data transmission was successfully demonstrated by realizing the high-speed transmission of signal with gain through the chromium-doped fiber (CDFs). Further gain improvement in the CDFAs employing few-mode or single-mode CDFs will be presented and discussed.

Biography of the speaker:
Wood-Hi Cheng received the Ph.D. degree in physics from Oklahoma State University, Stillwater, in 1978. He is a Chair Professor at National Sun Yat-sen University, Kaoshiung, Taiwan, where he founded and became the Director of the Institute of Electro-Optical Engineering (1994-2000), and Dean of College Engineering (2002-2005). In 2007 he chaired the Southern Taiwan Opto-Electronics Center of

Excellence. Presently he is a Program Director of Optoelectronics in the National Science Council of Taiwan providing research grants and direction.

Professor Cheng's research and development is contributions to photonic package technology and technology transfer to industry (Quarton). Quarton then became the first solid-state laser company in Taiwan, and is currently the top-five sale for green laser pointer in world since 1993. He has been focused on the design and fabrication of high-speed semiconductor lasers for lightwave communications, high-coupling devices and modules packaging employing fully automated process, the passively mode-locked fiber lasers employing carbon nanotubes or graphene, the high-reliability glass-doped phosphor-converted high-power white-light-emitting diodes, and the 300-nm ultra-broadband Cr-doped fiber amplifier for broadband transmission. Prof. Cheng's most significant R&D is the demonstration of record ultra-broadband 300-nm Cr-doped fibers (CDFs). The CDFs have been used for the first time as a broadband Cr-doped fiber amplifier (CDFA). With the help of optical-fiber system examination for the CDFA, a 40-Gb/s error-floor free data transmission is successfully demonstrated on fiber-optic transmission.

Prof. Cheng is a Fellow of IEEE and OSA. He served as a Chair for the IEEE Photonics Society, Taipei Chapter, during 1999–2000, and served as a Chair for the OSA, Taipei Chapter during 2005–2006. He was recipient of the IEEE Photonics Engineering Achievement Award in 2010 for his contributions to design, development and commercialization compact solid-state laser modules, and the 2011 IEEE Photonics Society Distinguished Lecturer Award.

Organizer: Dr. K.K.Y. Wong