

A Special Issue on Semiconductor Optoelectronics Dedicated to Prof. Dexiu Huang's 80th Birthday

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Prof. Dexiu Huang is a well-known expert in the field of semiconductor optoelectronics, especially semiconductor optical amplifier (SOA) and its applications. He is also famous for presenting the first proposal to establish high-technology zone of optoelectronic industry in Wuhan City, which is known as Wuhan Optics Valley of China. Thanks for the support from the editorial board of the *Frontiers of Optoelectronics*, we are honored to organize this special issue with emphasis on the current hot topics and future trends in the field of semiconductor optoelectronics to celebrate Prof. Dexiu Huang's 80th birthday.

Started from 1980s, Prof. Dexiu Huang has been dedicated himself to develop SOAs for about thirty years. Collaborated with his colleagues, he invented a novel reflected SOA with bulk materials in the late 1980s, then successfully developed a strained multiple quantum well (MQW) SOA with more than 23 dB small signal gain and 1 dB polarization dependence in the mid-1990s. After that, he also exploited SOAs to realize some signal processing functions, such as wavelength conversion. He edited a textbook on Semiconductor Optoelectronics, which has been widely used in the major of Optoelectronics all over the China. Acted as founding associate editor-in-chief of the *Frontiers of Optoelectronics*, he dedicated himself to improve the academic quality of this journal through inviting well-known scholars to submit papers and organize special issues.

This special issue includes 21 excellent scientific reviews, original research papers and tutorial paper with authors from China, Denmark, Singapore, France, Ireland, USA and UK. **Regarding SOA related topics**, Prof. Connelly, which is a well-known expert of SOA, reported a 40 Gb/s non-return-to-zero differential quadrature phase shift keying (NRZ-DQPSK) wavelength conversion with quantum dash SOA; Prof. Xuelin Yang numerically analyzed the SOA-based turbo-switches with time-domain and frequency-domain SOA models; Tong Cao, Prof. Xinliang Zhang's PhD student, presented a scheme for performance improvement of SOA by enhancing the well-barrier hole burning. **Regarding all-optical signal processing topics**, Yunhong Ding from Denmark presented a review paper about linear signal processing functions with silicon micro-ring resonators; Prof. Xinliang Zhang and his PhD student presented a theoretical analysis paper in which a completed model was developed to analysis linear signal processing functions with different optical filters; Xiong Meng from Denmark compared wavelength conversion efficiency between silicon waveguide and micro-ring resonators, while Yi Yu from Denmark analysis switching dynamics of InP photonic-crystal nanocavity; Prof. Jianji Dong demonstrated a large range tunable fractional-order differentiator and theoretical analyzed an optomechanical all-optical transistor. **Regarding key optoelectronic devices**, Prof. Yongzhen Huang's group presented a paper about mode characteristics of rectangular microresonators; Prof. Hongbo Sun's group reviewed the progress of microcavity lasers with femtosecond laser processing method; Prof. Damin Zhang presented a research article about cross-cascaded arrayed waveguide gratings (AWG)-based wavelength selective optical switching optical cross-connect (OXC) modules; Prof. Daoxin Dai from Zhejiang University gave two excellent review articles about silicon photonics; and Prof. Wei Lei reported an interesting work on liquid crystal photonic bandgap fibers. **Regarding applications of optoelectronic devices in the field of optical fiber communication and**

microwave photonics, Prof. Jianping Chen reported microwave photonic phase shifters with microring coupling modulation; Prof. Jianji Dong reported a fiber-chip-fiber optomechanical system for isolator; Prof. Shilong Pan presented a review paper about GaAs-based polarization modulators; Prof. Lilin Yi gave a review paper about key technologies in chaotic optical communications; Prof. Xinlun Cai reviewed photonic integrated devices for exploiting orbital angular momentum (OAM) of light in optical communications; and Prof. Zhaohui Li from Jinan University reported an in-band optical signal-to-noise ratio (OSNR) monitoring technique with high resolution and large measurement range.

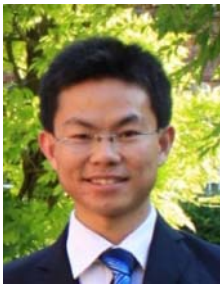
It is a good way for us, Prof. Dexiu Huang's students and friends, to express our admiration and thanks to Prof. Dexiu Huang through reporting our research progress. We hope this would be a valuable present to greet Prof. Dexiu Huang's 80th birthday and publication of this special issue could also promote academic exchange and cooperation.

We would sincerely appreciate all the authors for their excellent contributions and the managing editors and other editorial office members of the *Frontiers of Optoelectronics* for their valuable efforts in publishing this special issue.

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Prof. Xinliang Zhang received the B.S. and Ph.D. degrees from Huazhong University of Science and Technology (HUST), China, in 1992 and 2001. He became a full professor of HUST in 2004. Currently, he is the dean of the school of optical and electronic information, and the deputy director of the Wuhan National Laboratory for Optoelectronics. His research areas cover semiconductor optoelectronic devices for optical interconnection and optical signal processing. He has over 300 publications in prestigious international journals and conferences, including over 160 IEEE Letters/Journals, *Optics Letters* or *Optics Express* papers and 30 OFC/ECOC papers. He holds 10 Chinese patents and 1 US patent. He is a senior member of IEEE and also a member of OSA.



Jianji Dong is professor in Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology (HUST), Wuhan, China. He is working on the silicon photonics, photonic computing, and microwave photonics. He is an Editorial Board Member of *Scientific Reports*. He received the National Best Dissertations Award in 2010 and the first award of Natural Science of Hubei Province in 2013.