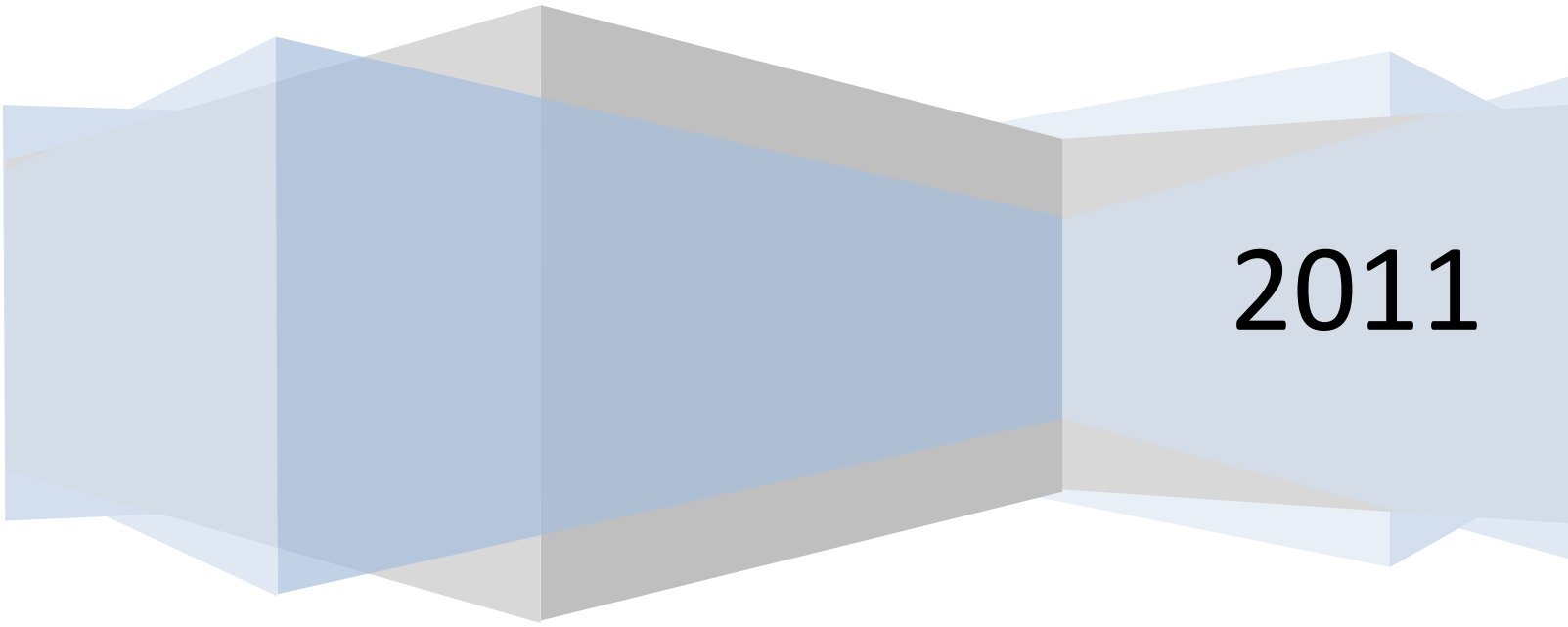
Photonics Society of Chinese-Americans

2011 PSC Annual Conference

Baltimore, MD

May 2nd



Meeting Notice on Photonics Society of Chinese-Americans (PSC) 2011 Annual Conference

Photonics Society of Chinese-Americans (PSC) will have its year 2011 annual conference on May 2nd, 2011 in Baltimore, MD, along with CLEO'2011.

Date:
May 2nd, 2011, Monday

Time:
Conference: 3:00 pm - 6:10 pm; Networking: 6:10 pm - 7:00 pm;

Location:
Room 329, Baltimore Convention Center, Baltimore, Maryland, One West Pratt Street, Baltimore, MD 21201

Conference Agenda:
3:00 pm - 3:30 pm Registration and networking
3:30 pm - 5:30 pm Annual conference workshop
5:30 pm - 5:40 pm Announcement for 2012 PSC officers
5:40 pm - 5:50 pm Scholarship award
5:50 pm - 6:10 pm Scholarship awardees speech
6:10 pm - 7:00 pm Networking

Workshop topic:
Nanophotonics and Its Applications: Silicon Photonics and Beyond

Guest speakers and their speech titles:

Prof. Shun Lien Chuang, University of Illinois at Urbana-Champaign, **"Nanolasers on Silicon Substrate - what is the smallest semiconductor laser one can make?"**
Dr. Haisheng Rong, Intel, **"A High Speed WDM Optical Link Based on Integrated Silicon Photonics"**
Prof. Qianfan Xu, Rice University, **"Silicon Photonics for On-Chip Optical Interconnections"**
Dr. Long Chen, Bell Lab, **"Opportunities and Challenges for Silicon Photonics in Telecommunications"**

Registration fee:
$10 on-site registration (Free for registration before April 28th, 2011 at xiuminliu@ieee.org with your title, contact info and major area)

Language:
English

Nanolasers on Silicon Substrate- What is the smallest semiconductor laser one can make?

Shun Lien Chuang
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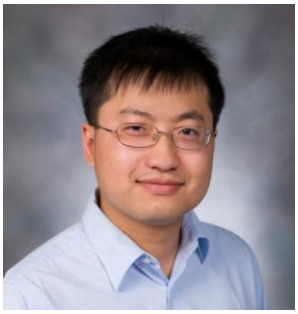
ABSTRACT:
Since the invention of the first ruby laser in 1960 and semiconductor lasers in 1962, the size of lasers has been reduced significantly. Semiconductor lasers such as VCSELs, microdisk lasers, and photonic crystal lasers have been realized toward nanoscales. Semiconductor nanolasers have potential applications for future photonic integrated circuits with applications to intrachip and interchip optical interconnects. Recently, metal-cavity nanolasers of subwavelength dimensions have been demonstrated with pulsed electrical injection at 298 K or optical pumping at low to room temperatures. Metal-cavity nanolasers have advantages such as subwavelength optical confinement, excellent isolation from device crosstalk, and excellent heat removal. At UIUC, with our collaborators at the Technical University of Berlin (Prof. Dieter Bimberg), we have successfully demonstrated a continuous-wave (CW) metal-cavity surface-emitting microlaser with electrical injection at room temperature.

In this talk, I will discuss our metal-cavity surface-emitting microlaser, which consists of an active (multiple quantum-well) region with a top metal reflector and a bottom distributed-Bragg reflector and the device including the side wall is encapsulated by silver. The device has a physical volume of 12 λ_0^3 and is flip-chip mounted onto a silicon substrate. So far, almost all nanolasers suffer from low power, and they require low-temperature electrical injection or optical pumping. We have demonstrated continuous-wave microwatt output power, sub-angstrom lasing linewidth, and very small thermal lasing wavelength shift with increasing bias current in our microlasers at room temperature. Further size reduction of our substrate-free metal-cavity surface-emitting microlasers is in progress and will be presented. Our device structure and fabrication concepts represent a significant progress toward future size reduction and integration of active photonic devices with silicon electronics.

BIOGRAPHY:
Shun Lien Chuang received the BS degree from National Taiwan University in 1976; and the MS., E.E., and Ph. D. degrees from MIT in 1980, 1981, and 1983, respectively. He joined in 1983 the Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, where he is currently the Robert MacClinchie Distinguished Professor. His research interest is on semiconductor nanophotonic devices. He has published more than 380 papers in leading technical journals and conferences. He is the author of *Physics of Photonic Devices* (2nd edition, 2009) and *Physics of Optoelectronic Devices* (1st edition, 1995), Wiley, New York. He served as an Associate Editor for IEEE *Journal of Quantum Electronics* (1997-2002) and *Journal of Lightwave Technology* (2007-2008).
Professor Chuang is a Fellow of the American Physics Society, IEEE, and Optical Society of America. He received Engineering Excellence Award from OSA in 2004, the IEEE/LEOS Distinguished Lecturer Award for 2004 to 2006, and the William Streifer Scientific Achievement Award from IEEE LEOS (Photonics Society) in 2007. He received the Humboldt Research Award for Senior U.S. Scientists in 2008-2009. He was elected as a member of the Board of Governors for IEEE Photonics Society for 2009-2011.

Silicon Photonics for On-Chip Optical Interconnections



Qianfan Xu
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qianfan@rice.edu

ABSTRACT:

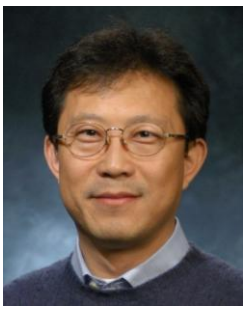
Recent progresses in the field of silicon photonics have enabled large-scale and monolithic optoelectronic integration on chip. One major application of this technology is optical interconnections, which will have profound impact as the performance of computers is increasingly limited by the bandwidth and power consumption of the interconnection systems. In this talk, I will give a brief overview of the research on on-chip optical interconnection systems. The talk will then focus on the electrooptic modulators, as a compact, low-power, high-speed and CMOS-compatible modulator is an essential component of the system. I will show a micron-size electrooptic modulator based on the free-carrier dispersion effect in silicon micro-ring resonator with a modulation speed over 10 Gbit/s. I will present a new modulator design based on coupled-ring resonators.

BIOGRAPHY:

Dr. Qianfan Xu is an assistant professor of the Department of Electrical and Computer Engineering at Rice University. His research interest is in the area of silicon nanophotonics and optoelectronics. Before joining Rice in 2008, he was a research associate at Hewlett-Packard Labs. He received his Ph.D. degree in Electrical and Computer Engineering from Cornell University in 2007 and his B. Eng. and M. Eng. degrees in Electronic Engineering from Tsinghua University in 1999 and 2002. Dr. Xu has published over 30 papers in peer-reviewed journals, which includes *Nature*, *Nature Physics*, *Nature Photonics*, and *Phys. Rev. Lett.* His papers have total citations of over 2000.

A High Speed WDM Optical Link Based on Integrated Silicon Photonics

Haisheng Rong
Photonics Technology Group of Intel Labs



ABSTRACT:

The need for increased IO bandwidth in and around the CPU in many different computer systems has stimulated the research into optical interconnects for many years. Intel has been pursuing Silicon Photonics, a technology which creates optical components from a silicon substrate, as a candidate for these applications and has developed a series of silicon based photonic building blocks. Here we report on a silicon photonics based WDM link demonstrating all the key technologies required to create a viable optical link for system integration. We succeeded in demonstrating a 4-channel CWDM integrated silicon photonics link at a line rate of 12.5Gbps per channel, i.e., 50Gbps aggregate bandwidth.

BIOGRAPHY:

Dr. Haisheng Rong is a senior scientist in the Photonics Technology Group of Intel Labs. He has worked in many areas of optical and laser technologies during his career including optical information processing, high-resolution laser spectroscopy, large-scale laser interferometer, and optical communications and interconnects. He has published numerous scientific papers including two in Nature and given over 20 invited and keynote presentations at major international conferences and meetings including SPIE conferences, CLEO, OFC, and IEEE LEOS meetings. He has won various Intel awards including the highest Intel Achievement Award. In November 2005, he was recognized by Scientific American as one of the top 50 research leaders in science and technology for his work on development of silicon Raman lasers. He received his Ph.D. degree from the University of Heidelberg, Germany, M.S. and B.S. degrees from Nankai University, China. Prior to joining Intel Corporation, he also held research positions at MIT and Caltech. He is a Senior Member of IEEE.

Opportunities and Challenges for Silicon Photonics in Telecommunications

Long Chen, Christopher Doerr, Larry Buhl, Young-kai Chen
Alcatel-Lucent Bell Laboratories
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Long_L.Chen@Alcatel-Lucent.com

ABSTRACT:

There are many reasons to expect that silicon photonics could become a platform-of-choice for optical modules used in many telecommunication systems: small footprint, low electric power consumption, electronics integration, CMOS foundry capabilities, etc. However, silicon photonics also face hard obstacles preventing it from most practical applications: e.g., strong polarization birefringence, large temperature sensitivity, and extreme intolerance to fabrication variations. In this talk, several application examples ranging from access, to DWDM and coherent long haul will be briefly described to highlight the opportunities and challenges.

BIOGRAPHY:

Long Chen received his B.E. degree in optical engineering from Zhejiang University, China in 2003, and Ph.D. degree in electrical engineering from Cornell University in 2009. He is currently affiliated with Alcatel-Lucent Bell Labs as a Member of Technical Staff. His primary research effort has been on integrated photonics for interconnects and telecommunications, including integration strategy, device design, and module characterizations. He has published more than 30 journal papers, filed 7 US patents, and served as invited speaker and committee member for various technical conferences.

Announcement for 2012 PSC officers

Dr. Steve Yao, President of PSC

Dr. X. Steve Yao is the founder and CEO of General Photonics Corporation, a leading company for polarization and timing control and measurement for telecommunications, sensor, and medical imaging industries.

Dr. Yao has authored more than 50 referred journal publications. He has given invited speeches in numerous major photonics-related conferences and authored a book chapter in RF Photonic Technology in Optical Fiber Links detailing his break-through research in opto-electronic oscillator for generating 10GHz and higher frequency signals. Dr. Yao holds more than 40 issued U.S. patents, 15 pending applications, and 29 NASA's innovation awards. Three products based on his inventions have won different top innovation awards in the industry. He also served as a member of the Technical Committee in the Optical Fiber Communications conferences (OFC) in 1998, 2000, and 2001. He was the organization committee member for the Microwave Photonics Conference in 2000 (MWP'2000).

Dr. Yao worked at NASA's Jet Propulsion Laboratory from 1990 to 2000, concentrated on the research and development of microwave photonic devices and systems, where he invented the opto-electronic oscillator for generating the world cleanest 10 to 80 GHz signals. He was responsible for the design and demonstration of the X-band fiber optic antenna remoting system for NASA's Deep Space Network. Prior to JPL, he was an optical engineer at ADC Fiber Optics (a division of ADC Telecommunications) from 1985 to 1987, responsible for developing the first generation of fiber optic WDM devices. Dr. Yao received M.S. and Ph.D degrees in Electrical Engineering/Electrophysics from the University of Southern California in 1989 and in 1992 respectively.

Dr. Nelson M. Shen (沈木清), Vice President of PSC

Nelson M. Shen, Ph.D., is a 30-year fiber optics industry veteran in Cable TV/Telecom/Data communication systems/components. He is currently work in development of fiber optics communications equipment for Hybrid Fiber Coax system (HFC) in Harmonic, Inc. Before Harmonic, Nelson developed fiber optics system/equipment/component at Cisco System, Inc. San Jose, California, at Raychem/Raynet in Menlo Park, California, at GTE in Mountain View, California and other start up companies. He served as Engineer, VP, or CTO positions in one or more of the companies

Over the course of his career, Nelson has been associated with a number of areas of technical development resulting in the creation of intellectual property such as optical fiber splicers, optical fiber couplers, optical switches, optical isolator, optical fiber sensors, optical transmitters and receivers, coaxial connectors, and electronic packaging systems. He has worked on more than 16 successfully granted fiber optics and technology patents.

Nelson earned a B.S. in Physics from Chung Yuan Christian University, and a Ph.D. in Laser Spectroscopy from the University of Texas at Dallas.

Dr. Xiang Liu, Vice President of PSC

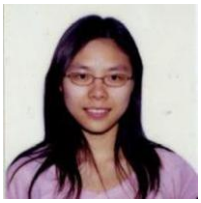
Xiang Liu is a Distinguished Member of Technical Staff at Bell Labs, Alcatel-Lucent. He received his Ph.D. degree in applied physics from Cornell University. Since joining Bell Labs in 2000, Xiang has been primarily working on high-speed optical communication technologies including advanced modulation formats and coherent detection schemes.

Dr. Liu has authored/coauthored more than 200 journal and conference papers, and holds over 35 US patents. He is a Fellow of the OSA, a Senior Member of the IEEE, and an Associated Editor of Optics Express. He is also serving in the technical committees of various conferences such as OFC, ACP, and WOCC.

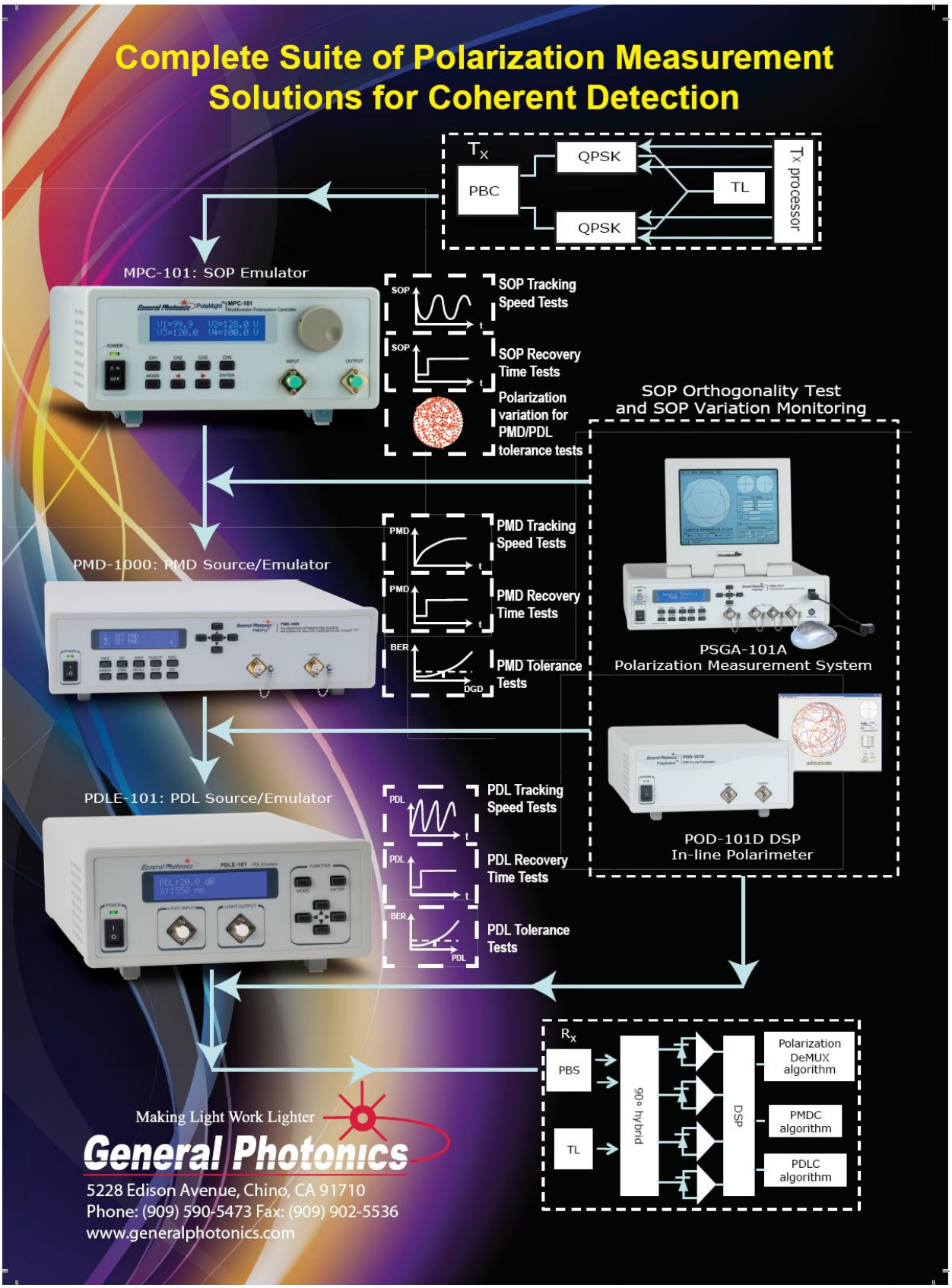
17th Bor-Uer Chen Memorial Scholarship Award Winners

Chien-Yao Lu received the B.S. and M.S. degree in electrical engineering from the National Taiwan University, Taipei, Taiwan, in 2003 and 2005, respectively. He is currently working toward the Ph.D. degree at the Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. He is conducting research on the design, fabrication, and characterization of nanophotonic and metal-cavity devices. During the PhD study, he has designed and fabricated several metal-cavity lasers. Mr. Lu won the best poster award (1st place) in international Nano-Optoelectronics Workshop (i-NOW) 2010 for the work on substrate-free metal-cavity microlasers. He received Nick and Katherine Holonyak outstanding research award from the University of Illinois in 2011.

Ludan Huang received her B.S. in Material Science and Engineering (2004) from Nanjing University, China. She



then pursued her graduate study in the United States, and received her M.S. in Physics (2006) and Electrical Engineering (2010) and Ph.D. in Physics (2011) from the University of Washington, Seattle. She joined the Photonics Group in 2006 where she worked on developing nanoscale photonic and optoelectronic devices based on colloidal quantum dots and plasmonic components. She is the author of 6 journal publications, 8 conference papers/presentations, and 4 patent application/invention disclosures. Besides research, she is also an active advocator of student organizations and outreach activities. During the time she served as the vice president of UW SPIE student chapter, she initiated the SPIE student seminar and participated in a range of science events in local schools and communities.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PMD Recovery Time Tests
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General Photonics
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www.generalphotonics.com

Accelink Technologies Co., Ltd is a leading optical component provider in China.

In 2001, Accelink was reestablished from Solid Device Institute (SDI), which was found in 1974 and be a subsidiary company of Wuhan Research Institute of Posts & Telecommunications (WRI). The company specializes in the research, development and manufacturing of passive optical components, optical instruments and integrated photo-electronic devices. As the host of Wuhan Branch of National Photo-electronic Technology Centre, It makes a significant contribution on the development of the optical communication industry in China.

Accelink has supplied hundreds of thousand high quality fiber optic components for domestic and overseas applications. It is an ISO-9001 certified company and implements strict quality control management system, which covers every process from the product design, manufacturing, and marketing to the customer service. Combining technological innovations with manufacturing process improvement, Accelink is committed to providing customers high quality and cost-effective fiber optic component solutions.

2009 on August 21,Accelink Technologies (SZSE 002281) was successfully listed on China A-Share Market, which makes Accelink become the first public company in China in this industry.

ACCELINK USA，Corporation was recently established in Silicon Valley,California, with the registered capital of 100 thousand U.S. dollars.Accelink USA will initially focus on the sales, customer service and technology supporting in South and North America, supplying optical components, modules and subsystem products for telecom operators and equipment manufacturers. Meanwhile, Accelink USA is also the important overseas raw material trading platform.

Note

Note

The Photonics Society of Chinese Americans

中華光電學會

Objectives

The objectives of the Photonics Society of Chinese Americans (PSC) are to promote friendships and collaborations among Chinese-American engineers and scientists in the field of Photonics so that they can enhance their professional and business contributions for better quality of life in this fast changing world.