Detailed CV of S. J. Xu

I. Identifying Data

Full name and title: Shijie Xu Professor

Academic Degrees:

PhD. Electronic Engineering, Xi'an Jiaotong University, 1993.
MS. Electronic Engineering, Xi'an Jiaotong University, 1989.
BS. Electrical Engineering, Hebei Institute of Technology, 1984.

Employments:

2014.7-present, Professor (tenured), Department of Physics, The University of Hong Kong
2007.8-2014.6, Associate Professor (tenured), Department of Physics, The University of Hong Kong
2001.7-2007.7, Assistant Professor (tenure track), Department of Physics, The University of Hong Kong
1999. 1 – 2001.6, Research Assistant Professor, Departments of Physics, The University of Hong Kong, Hong Kong
1997. 1 – 1998. 12, Research Fellow, Institute of Materials Research and Engineering, Singapore
1995. 6 – 1996. 12, NSTB Postdoctoral Fellow, Department of Electrical and Electronic Engineering, National University of Singapore, Singapore
1993. 1 – 1995. 5, Postdoctoral Research Fellow, State Key Laboratory for Superlattices and Microstructures, Institute of Semiconductors, Chinese Academy of Sciences
1992. 1 – 1992. 12, Research Assistant, State Key Laboratory for Superlattices and Microstructures, Institute of Semiconductors, Chinese Academy of Sciences
1984. 8 – 1986. 8, Processing Technician, Renqiu Semiconductor Device Co., Hebei, China

Area of Specialty:

Optoelectronic Physics and Devices of Semiconductors and Their Nanostructures
Photoluminescence and Other Optical Properties of Semiconductors and Their Nanostructures

Current Research Interests:

1. Optoelectronic physics and devices of wide band gap semiconductors and their nanostructures.
2. Optical spectroscopy and imaging of individual semiconductor quantum dots and impurities in semiconductors.

II. Research and Scholarship:

Highlights of Research Output:

- **139** SCI papers with **71** first author or corresponding author in peer-reviewed international journals. Among them are **43** articles in Applied Physics Letters and **28** cited by outstanding scholars over the world in their excellent review articles, as well as **12** selected in the Virtual Journal of Nanoscience and Technology.
  Sum of the times cited to these publications: **2862 (SCI database).** Average Citations per Article: **20.74 (Researcher ID: D-3149-2009)**
- H-index: **27**
- 35 presentations at conferences (23 invited) and 15 seminars/lectures
- 2 book chapters

Book Chapters:

1. S.J. Xu, "LO Phonon Assisted Excition Luminescence Processes in Heteroepitaxial GaN Films", in *III-Nitride Semiconductors Optical Properties II*, Ed. by M.O. Manasreh and H. X. Jiang, (Taylor & Francis Books, New York, 2002), Chapter 8, pp339-361. (peer-reviewed; the sole author)
2. R.X. Wang, S.J. Xu, and S. Fung, "GaN Schottky Contacts and Their Applications", in "Gallium Nitride: Structure, Thermal Properties and Applications"， Ed. by K. O. Peak, (Nova Science Publishers, New York, 2014), Chapter 5, pp.119-166. (peer-reviewed)

Articles:

(* item: the first author; † item: the corresponding author; ‡ item: the 1st author was postgraduate students or research associates supervised by me)

1. †‡X.H. Wang, J.Q. Ning, C.C. Zheng, B.R. Zhu, L. Xie, H.S. Wu, and S.J. Xu, "Photoluminescence and Raman Mapping Characterization of WS_2 Monolayers Prepared in Top-Down and Bottom-Up Methods", *Journal of Materials Chemistry* C **3**, 2589-2592 (2015).
2. †‡J. Wang, C.C. Zheng, J.Q. Ning, L.X. Zhang, W. Li, H.N. Zhen, Y. Chen, J.N. Wang, and S.J. Xu, "Luminescence Signature of Free Exciton Dissociation and Liberated Electron Transfer Across the Junction of Graphene/GaN Hybrid Structure", *Scientific Reports* **5**, 7687 (2015).
3. †‡Z. Deng, J.Q. Ning, Z.C. Su, S.J. Xu, X. Zheng, R.X. Wang, S.L. Lu, J.R. Dong, B.S. Zhang, and H. Yang, "Structural Dependences of Localization and Recombination of Photogenerated Carriers in the Top GaInP Subcells of GaInP/GaAs Double-junction Tandem Solar Cells", *ACS Applied Materials & Interfaces* **7**, 690-695 (2015).
4. †‡Z. Deng, R.X. Wang, J.Q. Ning, C.C. Zheng, S.J. Xu, Z. Xing, S.L. Lu, J.R. Dong, B.S. Zhang, and H. Yang, "Super transverse diffusion of minority carriers in $Ga_xIn_{1-x}P$/GaAs double-junction tandem solar cells", *Solar Energy* **110**, 214 (2014).
5. †‡C.C. Zheng, J.Q. Ning, Z.P. Wu, J.F. Wang, D.G. Zhao, K. Xu, J. Gao, and S.J. Xu, "Effects of Fe doping on the strain and optical properties of GaN epilayers grown on sapphire substrates", *RSC Advances* **4**, 55430-55434 (2014).
6. †‡J.Q. Ning, S.J. Xu, Z. Deng, and Z.C. Su, "Polarized and non-polarized photoluminescence of GaInP2 alloy with partial CuPt-type atomic ordering: ordered domains vs. disordered regions", *Journal of Materials Chemistry C* **2**, 6119 (2014).
7. †‡Y.N. Chen, S.J. Xu, C.C. Zheng, J. Q. Ning, F.C.C. Ling, W. Anwand, G. Brauer, and W. Skorupa, "Nature of red luminescence band in research-grade ZnO single crystals: A "self-activated" configurational transition", *Applied Physics Letters* **105**, 041912 (2014).
8. W.D. Sheng, M.C. Sun, A.P. Zhou, and S.J. Xu, "Substrate effects on quasiparticles and excitons in graphene nanoflakes", *Applied Physics Letters* **103**, 143109 (2013).
9. Y. Hu, X.H. Gao, L. Yu, Y.R. Wang, J.Q. Ning, S.J. Xu, and X.W. Lou, "Carbon-Coated CdS Petalous Nanostructures with Enhanced Photostability and Photocatalytic Activity", Angewandte Chemie-International Edition **52**, 5636 (2013).
10. A.P. Zhou, W.D. Sheng, and S.J. Xu, "Electric field driven magnetic phase transition in graphene nanoflakes", *Applied Physics Letters* **103**, 133103 (2013).
11. H.L. Zeng, G.B. Liu, J.F. Dai, Y.J. Yan, B.R. Zhu, R.C. He, L. Xie, S.J. Xu, X.H. Chen, W. Yao, and X.D. Cui, "Optical signature of symmetry variations and spin-valley coupling in atomically thin tungsten dichalcogenides", *Scientific Reports* **3**, 1608 (2013).
12. R.X. Wang, L.C. Yang, Y.M. Zhang, S.J. Xu, K. Fu, B.S. Zhang, J.F. Wang, K. Xu, and H. Yang, "The effect of Ga-doped nanocrystalline ZnO electrode on deep-ultraviolet enhanced GaN photodetector", *Applied Physics Letters* **102**, 212104 (2013).
13. Rongxin Wang, Lechen Yang, Shijie Xu, Xiaodong Zhang, Xue Dong, Yingchun Zhao, Kai Fu, Baoshun Zhang, and Hui Yang, "Bias-voltage dependent ultraviolet photodetectors prepared by GaOx + ZnO mixture phase nanocrystalline thin films", *Journal of Alloys & Compounds* **566**, 201 (2013).

14. L.C. Yang, R.X. Wang, S.J. Xu, Z. Xing, Y.M. Fan, X.S. Shi, K. Fu, and B.S. Zhang, "Effects of annealing temperature on the characteristics of Ga-doped ZnO film metal-semiconductor-metal ultraviolet photodetectors", *Journal of Applied Physics* **113**, 084501 (2013).
15. †‡X.H. Wang and S.J. Xu, "Two-electron-satellite transition of donor bound exciton in ZnO: Radiative Auger effect", *Applied Physics Letters* **102**, 181909 (2013).
16. †‡Z. Deng, R.X. Wang, J.Q. Ning, C.C. Zheng, W. Bao, S.J. Xu, X.D. Zhang, S.L. Lu, J.R. Dong, B.S. Zhang, and H. Yang,"Radiative recombination of carriers in the GaxIn1-xP/GaAs double-junction tandem solar cells", *Solar Energy Materials & Solar Cells* **111**, 102 (2013).
17. †‡C.C. Zheng, S.J. Xu, F. Zhang, J.Q. Ning, D.G. Zhao, H. Yang, and C.M. Che, "Can interference patterns in the reflectance spectra of GaN epilayers give important information of carrier concentration?", *Applied Physics Letters* **101**, 191102 (2012).
18. †‡J.Q. Ning, S.J. Xu, P.W. Wang, Y.P. Song, D.P. Yu, Y.Y. Shan, S.T. Lee, and H. Yang, "Microstructure and micro-Raman studies of nitridation and structure transition of gallium oxide nanowires", *Materials Characterization* **73**, 153 (2012).
19. †‡X.M. Dai, S.J. Xu, C.C. Ling, G. Brauer, W. Anwand, and W. Skorupa, "Emission bands of nitrogen-implantation induced luminescent centers in ZnO crystals: experiment and theory", *Journal of Applied Physics* **112**, 046102 (2012) (Communications).
20. †‡Y. Wen, M. Yang, S.J. Xu, L. Qin, and Z.X. Shen, "Effects of internal strain and external pressure on electronic structures and optical transitions of self-assembled InxGa1-xAs/GaAs quantum dots: An experimental and theoretical study", *Journal of Applied Physics* **112**, 014301 (2012).
21. †‡C.C. Zheng, S.J. Xu, J.Q. Ning, Y.N. Chen, F. Zhang, and C.M. Che, "Temperature dependent distinct coupling and dispersions of heavy- and light-hole excitonic polaritons in ZnO", *Applied Physics Letters* **100**, 221105 (2012).
22. †‡C.C. Zheng, S.J. Xu, J.Q. Ning, W. Bao, J.F. Wang, J. Gao, J.M. Liu, J.H. Zhu, and X.L. Liu, "Residual strains and optical properties of ZnO thin epilayers grown on r-sapphire planes", *Semiconductor Science and Technology* **27**, 035008 (2012).
23. †‡C.C. Zheng, S.J. Xu, J.Q. Ning, Y.N. Chen, B.K. Li, J.N. Wang, and C.M. Che, "Formation Dynamics of Excitons and Temporal Behaviors of Fano Resonance Due To The Exciton-Impurity-Phonon Configuration Interaction in ZnO", *Journal of Physical Chemistry A* ***116***, 381 (2012).
24. †‡X.H. Wang, J.Q. Ning, S.J. Xu, and W.K. Choi, "Raman and photoluminescence characterization of focused ion beam patterned InGaN/GaN multi-quantum-wells nanopillar array", *Journal of Applied Physics* **110**, 093111 (2011).
25. †‡C.C. Zheng, S.J. Xu, J.Q. Ning, Y.N. Chen, X.H. Lu, C.-C. Ling, C.M. Che, G.Y. Gao, J.H. Hao, G. Brauer, and W. Anwand, "Ion-implantation induced nano distortion layer and its influence on nonlinear optical properties of ZnO single crystals", *Journal of Applied Physics* **110**, 083102 (2011).
26. †‡J.H. Zhu, J.Q. Ning, C.C. Zheng, S.J. Xu, S.M. Zhang, and H. Yang, "Localized Surface Optical Phonon Mode in the InGaN/GaN MQW Nanopillars: Raman Spectrum and Imaging", *Applied Physics Letters* **99**, 113115 (2011).
27. †‡J.Q. Ning, S.J. Xu, X.Z. Ruan, Y. Ji, H.Z. Zheng, W.D. Sheng, and H.C. Liu, "Electronic band structures and electron spins of InAs/GaAs quantum dots induced by wetting-layer fluctuation", *J. Appl. Phys.* **110**, 054320 (2011).
28. †‡H. Yang, S. J. Xu, C.-H. Tao, V.W.-W. Yam, and J. Zhang, "A branched luminescent multinuclear platinum(II) complex", *J. Appl. Phys.* **110**, 043105 (2011).
29. †‡S.L. Shi, S.J. Xu, Z.X. Xu, V.A.L. Roy, and C.M. Che, "Broadband second harmonic generation from ZnO nano-tetrapods", *Chem. Phys. Lett.* **506**, 226 (2011).
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34. †‡J.Q. Ning, S.J. Xu, Z.F. Wei, X.Z. Ruan, Y. Ji, H.Z. Zheng, and H.C. Liu, "Ultrafast Kerr rotations and zero-field dephasing time of electron spins in InAs/GaAs quantum disks", *Phys. Lett. A* **374**, 4793 (2010).
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36. †‡J.Q. Ning, S.J. Xu, R.X. Wang, F. Zhang, H.Q. Le, and S.J. Chua, "Correlated Band-Edge Emissions of ZnO Nanorods and GaN Underlying Substrate", *Jpn. J. Appl. Phys.* **48**, 021102 (2009). Selected in the Virtual J. Nano. Sci. & Tech. Vol. 19, 2009.
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38. L. Ding, B.K. Li, H.T. He, W.K. Ge, J.N. Wang, J.Q. Ning, X.M. Dai, C.C. Ling, and S.J. Xu, "Classification of bound exciton complexes in bulk ZnO by magnetophotoluminescence spectroscopy", *J. Appl. Phys.* **105**, 013511 (2009).
39. †C.H. Tao, H. Yang, N.Y. Zhu, V.W.W. Yam, and S.J. Xu, "Branched luminescent multinuclear platinum(II) alkynyl complexes: Candidates for efficient two-photon induced luminescence", *Organometal.*, **27**, 5453 (2008).
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43. W.D. Sheng and S.J. Xu, "Optical characterization of structure for semiconductor quantum dots", *Phys. Rev. B* **77**, 113305 (2008).
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49. †‡J.Q. Ning, S.J. Xu, S.L. Shi, and M.H. Xie, "Slow oscillations in the low-temperature reflectance spectra of ZnO: Surface space charge effect", *Appl. Phys. Lett.* **90**, 061109 (2007).
50. †R.X. Wang, S.J. Xu, C.D. Beling, and C.K. Cheung, "Response to "comments on influence of indium tin oxide thin-film quality on reverse leakage current of indium tin oxide/n-GaN Schottky contacts"", *Appl. Phys. Lett.* **90**, 046102 (2007).
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57. †‡Q. Li and S.J. Xu, "On luminescence of localized-state ensemble", *Physics* (Wu Li, in Chinese, invited article), **35**, 659 (2006).
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Editorial Broad Membership and Invited Article Reviewer of International Journals:

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Professional Membership and Awards:

1. Life-time member of OSA
2. NSFC Academic Collaboration Award for Overseas Chinese, HK and Macau Scholars (Formerly well known as NSFC Outstanding Young Researcher Award for Overseas Chinese, HK and Macau Scholars), 2010.

Invited Talks and Conference Papers:

1. S.J. Xu, "Evolution of Surface Morphology, Stress and Defect States with Thickness of GaN Films Directly Grown on Flat 6H-SiC", **invited talk** in **Second Vacuum and Surface Sciences Conference of Asia and Australia**, Hong Kong, Aug. 26-30, 2002.
2. S.J. Xu, "Ultrafast Coherent Dynamics of Carriers in GaN", **invited talk** in **2nd International Symposium on Ultrafast Phenomena and Terahertz Waves** (ISUPTW2004), Shanghai, May 11-13, 2004.
3. S.J. Xu, Q. Li, H. Wang, M.H. Xie, S.Y. Tong, and J.-R. Dong, "Recombination mechanism of anti-Stokes photoluminescence in partially ordered GaInP-GaAs heterostructure", 25th Int. Conf. Phys. Semicond., Osaka, Japan, Aug. 2000.
4. Q. Li, Z.L. Fang, S.J. Xu, G.H. Li, M.H. Xie, S.Y. Tong, X.H. Zhang, W. Liu, and S.J. Chua, "Large excitation-power dependence of pressure coefficient of InGaN/InGaN quantum wells", 10th International Conference on High pressure Semiconductor Physics, Guildford, UK, Aug. 2002.
5. S.J. Xu, H.J. Wang, S.H. Cheung, Q. Li, X.Q. Dai, M.H. Xie, and S.Y. Tong, "Emissions from defects in thin GaN epilayers grown on vicinal 4H-SiC substrates", COMMAD-2002, Sydney, 2002.
6. Q. Li, S.J. Xu, W.C. Cheng, M.H. Xie, S.Y. Tong, and H. Yang, "Thermodynamics of carrier distribution within localized electronic states with a broad Gaussian energy distribution and its effect on luminescence behaviour of localized states", COMMAD-2002, Sydney, Australia, Dec. 2002.
7. Y. Huang and S.J. Xu, "Fano-type resonance in optical transitions between the above-barrier states in AlGaAs/GaAs composite quantum well structures", IVC16/ICSS12/NANO8, Venice, Italy, 2004.
8. S.J. Xu, "Exciton-LO Phonon Interaction and Fano-type Quantum Interference in Luminescent Spectra of GaN", **invited talk** in **International Conference on Optoelectronics and Spectroscopy of Nano-Structured Thin Films and Materials** (ICOSFM2004), Beijing, Aug. 2-5, 2004.
9. G.H. Li, F.H. Su, B.S. Ma, K. Ding, S.J. Xu, and W. Chen, "Photoluminescence of doped ZnS nanoparticles under hydrostatic pressure", **invited talk** in **11th International Conference on High Pressure Semiconductor Physics**, Berkeley, USA, Aug. 2004.
10. R.X. Wang, S.J. Xu, S. Li, S. Fung, C.D. Beling, K. Wang, Z.F. Wei, T.J. Zhou, J.D. Zhang, M. Gong, and G.K.H. Pang, "Carrier removal in neutron irradiated GaN epilayers", COMMAD-2004, Brisbane, Australia, Dec. 2004.
11. Q. Li, S.J. Xu, D.C. Dai, and C.M. Che, "Two-photon excited photoluminescence in InGaN multi-quantum-wells structures", COMMAD-2004, Brisbane, Australia, Dec. 2004.
12. S.L. Shi, S.J. Xu, X.J. Wang, and G.H. Chen, "Theoretical absorption spectra of SiC nanocrystals", Euro-MRS 2005, Spring Meeting, Strasburg, France, May 2005.

13. S.J. Xu**,** "Fano Resonance in Phonon-Assisted Photoluminescence Spectra of Widegap Polar Semiconductors", **invited talk** in the **20th Congress of the International Commission for Optics** (ICO20), Changchun, Aug. 21-26, 2005.
14. Y.J. Wang, Q. Li, and S.J. Xu, "Anisotropic ambipolar diffusion of carriers in InGaN/GaN quantum wells", 6th International Conference on Nitride Semiconductors, Bremen, Germany, Aug. 2005.
15. Q. Li and S.J. Xu, "Nonlinear luminescence process in InGaN multi-quantum-wells structures due to two-photon absorption", 6th International Conference on Nitride Semiconductors, Bremen, Germany, Aug. 2005.
16. S.J. Xu**,** "On the luminescence of localized-state ensemble", **invited talk** in the **Annual Meeting of Chinese Physics Society**, Wuhan, Sept. 2005.
17. Z.F. Wei, Q. Li, S.J. Xu, W.J. Fan, and S.F. Yoon, "Anomalous temperature dependence of photoluminescence of self-assembled InGaAsN quantum dots", Euro-MRS, Fall Meeting, Warsaw, Poland, Sept. 2005.
18. S.J. Xu, "Two-Photon Absorption Induced Luminescence and Carrier Dynamics in InGaN/GaN Quantum Well Structures", **invited talk** in the **HKU-ICCAS Workshop on Molecular Functional Materials,** Hong Kong, Dec. 2005.
19. S.J. Xu, "Fs-multi-photon-excited fluorescence and carrier dynamics in ZnO", **invited talk** in the **4th Asia Conference on Ultrafast Phenomena**, Hong Kong, Jan. 8-11, 2006.
20. S.J. Xu, "New Type of Fano Resonance in Electron Tunneling through a Doped Superlattice", **invited talk** in the **Annual Meeting of Chinese Physics Society**, Beijing, Sept. 2006.
21. Y.J. Wang and S.J. Xu, "Influence of excitonic polariton damping induced by impurity scattering on the low-temperature reflectance spectra of GaN epilayers", the Annual Meeting of Chinese Physics Society, Beijing, Sept. 2006.
22. S.J. Xu, "Luminescence imaging and blinking behavior of individual InGaN nanoclusters formed in GaN matrix", **invited talk** in the **6th Asia-Pacific Conference on Near-Field Optics (APNFO6)**, Yellow Mountain, June 13-17, 2007.
23. S.J. Xu, "Two-photon photoluminescence of InGaN/GaN multiple quantum wells", **invited talk** in the **International Conference on Materials for Advanced Technologies 2007 (ICMAT2007)**, Singapore, July 1-6, 2007.
24. S.J. Xu, "Exciton-biexciton dynamics in InGaAs quantum wells studied by time-resolved Kerr rotation spectroscopy", **invited talk** in the **23rd Progress in Electromagnetics Research Symposium**, Hangzhou, Mar. 24-28, 2008.
25. S.J. Xu, "Controlled Optical Injections and Initial Coherent Dynamics of Electron Spins in Semiconductor Quantum Disks", **invited talk** in the **6th Asian Conference on Ultrafast Phenomena**, Taipei, Jan. 11-13, 2010.
26. S.J. Xu, "Luminescence imaging and blinking behavior of individual InGaN nanoclusters formed in GaN matrix", **invited talk** in the **28th Progress in Electromagnetics Research Symposium**, Boston, MA, USA, July 5-8, 2010.
27. S.J. Xu, "New surface optical phonon mode and Raman imaging in InGaN/GaN MQW nanopillars", **invited talk** in the **8th Cross-Strait Workshop on Nano Science & Technology**, Hong Kong, Dec. 20-22, 2010.
28. S.J. Xu, *et al.*, "Enhanced Femtosecond Second Harmonic Generation in Thin ZnO Crystal Hollow Rods", **invited talk** in the **OSA-IEEE-COS Topical Meeting on Advances In Optoelectronics & Micro/Nano-Optics**, Guangzhou, Dec. 3-6, 2010.
29. S.J. Xu, "Exciton-Phonon-Impurity Interactions and Optical Properties in ZnO", **invited talk** in the 1**8th Semiconductor Physics Conference**, Huhehot, Aug. 20-26, 2011.
30. S.J. Xu, "Raman enhancement effect in self-assembled Si nanoclusters grown on SiC", **invited talk** in **2nd International Conference on Frontiers of Plasmonics (FOP2)**, Chengdu, Apr. 8-12, 2012.
31. S.J. Xu, "Influence of Internal Strain and External Pressure on Electronic States and Optical Transitions in Self-assembled $In_xGa_{1-x}As$ /GaAs Quantum Dots", **invited talk** in the **9th Cross Strait Workshop on Nano Science and Technology**, Tainan, Taiwan, Apr. 22-25, 2012.
32. S.J. Xu, "Exciton formation dynamics and temporal behavior of many-body Fano resonance in ZnO", **invited talk** in **West Photonics 2013**, Xi'an, Oct. 18-19, 2013.
33. S.J. Xu, "Polarized Photoluminescence and Carrier Localization of $GaInP_2$ Alloy with Partial CuPt-type Atomic Ordering", **invited talk** in **THE 17TH ANNUAL CONFERENCE OF THE PHYSICAL SOCIETY OF HONG KONG**, Hong Kong, June 7, 2014.

34. S.J. Xu, "Carrier Localization and Polarized Photoluminescence of $GaInP_2$ Alloy with Spontaneous Atomic Ordering", **invited talk** in **the 4th Advances in Optoelectronics and Micro/nano-optics**, Xi'an, Sept. 17-20, 2014.
35. S.J. Xu, "Carrier Diffusion and Mid-Way Recombination in $GaInP_2$/GaAs Multijunction Photovoltaic Devices", **invited talk** in **the Asia Communications and Photonics Conference**, Shanghai, Nov. 11-14, 2014.