

## Biographical Sketch

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### Xiuling Li

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#### PROFESSIONAL POSITIONS

##### University of Illinois

Assistant Professor in Electrical and Computer Engineering (2007- )  
Faculty Affiliate, Beckman Institute (2007- )  
Faculty Affiliate, Materials Science and Engineering (2007 -)  
Research Faculty, Materials Research Laboratory (2010 -)

##### EpiWorks Inc.

R&D Manager (2003-2007)  
Senior Engineer (2001-2003)

##### University of Illinois

Research Assistant Professor (1998-2001)  
Postdoctoral Research Associate (1994-1998)

##### California Institute of Technology

Postdoctoral Research Fellow (1993-1994)

#### EDUCATION

Ph.D. in Physical Chemistry, University of California, Los Angeles, 1993  
B.S. in Physical Chemistry, Peking University, China, 1986

#### HONORS and AWARDS

ONR Young Investigator Program Award: Massively Parallel Planar III-V Nanowires and Rolled-up Tubes: Novel Platforms for High Linearity Electronics and Integrated Photonic Circuits (2011-2014)

DARPA Young Faculty Award: III-V nanowire FinFET on silicon: a bottom-up CMOS compatible approach (2009-2011)

NSF CAREER Award: Semiconductor nanotubes - new nanotechnology building blocks and functionalities (2008-2013)

Fellow, Center for Advanced Study: An All-Silicon Nanowire Tandem Solar Cell for \$1 per Watt Energy Conversion (2010-2011)

Finalist, ECE Pratt Teaching award (2010)

Featured in the annual report of University of Illinois board of trustees (2009-2010)

IEEE senior member (2008)

Best Student Paper awards at IEEE Photonic Society (formerly LEOS) annual meeting with student authors (2008)

Outstanding Symposium Paper at Materials Research Society with student authors (2008)

## PATENTS AND INVENTION DISCLOSURES

1. Metal-assisted chemical etching porous silicon formation method (US6790785, 09/14/2004)
2. Metal-assisted chemical etching to produce porous group III-V materials (US6762134, 07/13/2004)
3. Method of forming an array of high aspect ratio semiconductor nanostructures (US Appl. Serial No. 61/253,700, pending)
4. Method for forming Nanoscale Three Dimensional Patterns in a Porous Material (US patent No. 13/062130, pending)
5. Method of controlled growth and release of self-aligned planar semiconductor nanowires (US patent No. 61/048,207, pending)
6. Heterogeneous epitaxial InGaAs Nanowire on Si as organic free MacEtch metal patterning mask (provisional patent being filed).
7. Metal-assisted chemical etching (MacEtch) to produce high aspect ratio group III-V micro and nanostructures (disclosure filed)

## PEER REVIEWED JOURNAL ARTICLES

- from researcherID.com (Researcher ID: A-2240-2010): as of May 2011

- Citation H-index: 21
- Total articles in publication list: 58
- Articles with Citation data: 55
- Sum of the Times Cited: 1452
- Average Citations per Article: 26.4

1. "Epitaxial growth of three-dimensionally architecture optoelectronic devices," Erik C. Nelson, Neville L. Dias, Kevin P. Bassett, Simon N. Dunham, Varun Verma, Masao Miyake, Pierre Wiltzius, John A. Rogers, James J. Coleman, Xiuling Li, Paul V. Braun, *Nature Materials*, accepted.
2. "Experimental verification of reduced intersubband scattering in ordered nanopore lattices," N. L. Dias, A. Garg, U. Reddy, J. D. Young, K. P. Bassett, X. Li, and J. J. Coleman, *Applied Physics Letters*, vol. 98. 071109 (2011).
3. "Patterned quantum dot molecule laser fabricated by electron beam lithography and wet chemical etching", V.B. Verma, U. Reddy, N.L. Dias, K.P. Bassett, X. Li, and J.J. Coleman, *IEEE Journal of Quantum Electronics*, v46 n12, 1827-1833 (2010). [[pdf](#)]
4. "Direct Heterointegration of III-V Materials on Group IV Substrates", David Ahmari, Brian McDermott, Shawn Thomas, Bradley Roof, Quesnell Hartmann, and Xiuling Li, *ECS Transactions*, 33 (6), 849 – 857 (2010).
5. "Geometry effect on the strain induced self-rolling of semiconductor membranes", Ik Su Chun, Archana Challa, Brad Derickson, Jimmy Hsia, and X. Li, *Nano Lett.* 10, 3927-3932 (2010). [[pdf](#)]
6. "Tuning the Photoluminescence Characteristics with Curvature for GaAs Quantum Well Microtubes," I. Chun, K. Bassett, A. Challa, and X. Li, *Applied Physics Letters*, 96, 251106 (2010). [[pdf](#)]
7. "Light Emission Characteristics and Mechanics of Foldable Inorganic Light-Emitting Diodes," Sang-Il Park, An-Phong Le, Jian Wu, Yonggang Huang, Xiuling Li, and John A. Rogers, *Advanced Mater.* 22, 2062 (2010).

8. "GaAs photovoltaics and optoelectronics using releasable multilayer epitaxial assemblies," Jongseung Yoon, Sungjin Jo, Inhwa Jung, Ik Su Chun, Hoon-Sik Kim, Matthew Meitl, Etienne Menard, Xiuling Li, James J. Coleman, Ungyu Paik, John A. Rogers, *Nature*, 465, 329-333 (2010). [[pdf](#)]
9. "Nonlithographic Patterning and Metal-Assisted Chemical Etching for Manufacturing of Tunable Light-Emitting Silicon Nanowire Arrays," W. Chern, K. Xu, I. Chun, B. P. de Azeredo, N. Ahmed, K-H. Kim, J. Zuo, N. Fang, P. Ferreira, and X. Li, *Nano Lett.* 10 (5), pp 1582–1588 (2010). [[pdf](#)]
10. "Topography and refractometry of nanostructures using spatial light interference microscopy (SLIM)", Zhuo Wang, Ik Su Chun, Xiuling Li, Zhun-Yong Ong, Eric Pop, Larry Millet, Martha Gillette, and Gabriel Popescu, *Opt. Lett.* 35 (2), 208 (2010). [[pdf](#)]
11. "Metal-catalyzed semiconductor nanowires: a review on the control of growth direction," S.A. Fortuna, and X. Li, *Semiconductor Science and Technology*, 25 (2010) 024005; invited review. [[pdf](#)]
12. "Printed Assemblies of Inorganic Light-Emitting Diodes for Deformable and Semitransparent Displays," S. Park, Y. Xiong, R. Kim, P. Elvikis, M. Meitl, D. Kim, J. Wu, J. Yoon, C. Yu, Z. Liu, Y. Huang, K. Hwang, P. Ferreira, X. Li, K. Choquette, and J. A. Rogers, *Science* 325, 977-981 (2009). [[pdf](#)]
13. "GaAs MESFET With a High-Mobility Self-Assembled Planar Nanowire Channel," S.A. Fortuna, and X. Li, *IEEE Elec. Dev. Lett.* 30 (6), 593-595 (2009). [[pdf](#)]
14. "Planar GaAs Nanowires on GaAs (100) Substrates: Self-Aligned, Nearly Twin-Defect Free, and Transfer-Printable," S.A. Fortuna, J. Wen, I.S. Chun, and X. Li, *Nano Letters* 8 (12), 4421-4427 (2008). [[pdf](#)]
15. "Strain induced semiconductor nanotubes: from formation process to device applications", X. Li, *J. Phys. D: Appl. Phys.* 41, 193001 (2008). [[pdf](#)]
16. "Controlled Assembly and Dispersion of Strain-Induced InGaAs/GaAs Nanotubes," I.S. Chun, and X. Li, *IEEE Trans. Nanotech.* 7, 493-495 (2008). [[pdf](#)]
17. "Nanoscale three dimensional pattern formation in light emitting porous silicon," I.S. Chun, E. Chow, and X. Li, *Appl. Phys. Lett.* 92, 191113 (2008). [[pdf](#)]
18. "InGaAs/GaAs 3D Architecture Formation by Strain Induced Self-Rolling with Lithographically Defined Rectangular Stripe Arrays," I.S. Chun, V.B. Verma, V.C. Elarde, S.W. Kim, J.M. Zuo, J.J. Coleman, and X. Li, *J. Cryst. Growth*, 310, 2353-2358 (2008). [[pdf](#)]
19. "Fabrication and Characterization of InGaP/GaAs Heterojunction Bipolar Transistors on Germanium on Insulator (GOI) Substrates," S. G. Thomas, E. S. Johnson, C. Tracy, P. Maniar, X. Li, B. Roof, Q. Hartmann and D. A. Ahmari, *IEEE Electron Device Lett.*, 26, 438, (2005).
20. "In-plane Bandgap Control in Porous GaN through Electroless Wet Chemical Etching," X. Li, Y.-W. Kim, P. W. Bohn, and I. Adesida, *Appl. Phys. Lett.*, 80 980-982 (2002).
21. "In-plane Control of Morphology and Tunable Photoluminescence in Porous Silicon Produced by Metal-assisted Electroless Chemical Etching," S. Chattopadhyay, X. Li, P.W. Bohn, *J. Appl. Phys.*, 91, 6134 (2002).
22. "Catalytic Amplification of the Soft Lithographic Patterning of Si. Nonelectrochemical Orthogonal Fabrication of Photoluminescent Porous Si Pixel Arrays," Y. Harada, X. Li, P.W. Bohn, and R.G. Nuzzo, *J. Am. Chem. Soc.* 123, 8709-8717 (2001).
23. "Experimental Factors Determining the Efficiency of Analyte Ion Generation in Laser Desorption/Ionization Mass Spectrometry on Porous Silicon," R.A. Kruse, X. Li, P.W. Bohn, and J.V. Sweedler, *Analyt. Chem.* 73, 3639-3645 (2001).
24. "Temperature dependence of photoluminescence spectra from multiple Er<sup>3+</sup> sites in Er-implanted undoped and Mg-doped GaN," S. Kim, S.J. Rhee, J.O. White, A.M.

- Mitofsky, X. Li, G.C. Papen, J.J. Coleman; S.G. Bishop, *Mater. Sci. Eng. B*, 81, 136, (2001).
25. "Effects of material growth technique and Mg doping on Er<sup>3+</sup> photoluminescence in Er-implanted GaN," S. Kim, R.L. Henry, A.E. Wickenden, D.D. Koleske, S.J. Rhee, J.O. White, J.M. Myoung, K. Kim, X. Li, G.C. Papen, J.J. Coleman; S.G. Bishop, *J. Appl. Phys.*, 90, 252 (2001).
  26. "Spectroscopic Studies of the Modification of Crystalline Si (111) Surfaces with Covalently-attached Alkyl Chains using a Chlorination/Alkylation Method," A. Bansal, X. Li, S. Yi, W. H. Weinberg, and N. S. Lewis, *J. Phys. Chem. B*, 105 (42), 10266-10277 (2001).
  27. "Selective enhancement of 1540 nm Er<sup>3+</sup> emission centers in Er- implanted GaN by Mg codoping", S. Kim, S.J. Rhee, X. Li, J.J. Coleman, and S.G. Bishop, *Appl. Phys. Lett.* 76, 2403 (2000).
  28. "Metal-assisted chemical etching in HF/H<sub>2</sub>O<sub>2</sub> produces porous silicon", X. Li and P.W. Bohn, *Appl. Phys. Lett.* 77, 2572 (2000).
  29. "Spatially resolved bandedge emission from partially coalesced GaN pyramids prepared by epitaxial lateral overgrowth", X. Li, P.W. Bohn, J. Kim, J. A. White and J. J. Coleman, *Appl. Phys. Lett.* 76, 3031 (2000).
  30. "Arsenic oxide microcrystals in anodically processed GaAs: electrochemical growth, spectroscopy and morphology", X. Li and P.W. Bohn, *J. Electrochem. Soc.* 147, 1740 (2000).
  31. "Impurity states are the origin of yellow band origin in GaN produced by epitaxial lateral overgrowth", X. Li, P.W. Bohn and J. J. Coleman, *Appl. Phys. Lett.* 75, 4049 (1999).
  32. "Production and evolution of composition, morphology, and luminescence properties of microcrystalline arsenic oxide produced during anodic processing of (100) GaAs", C. M. Finnie, X. Li, and P. W. Bohn, *J. Appl. Phys.* 86, 4997 (1999).
  33. "Annealing studies of photoluminescence spectra from multiple Er<sup>3+</sup> centers in Er-implanted GaN", S. Kim, S.J. Rhee, X. Li, J.J. Coleman, and S.G. Bishop, *J. Electron. Mater.* 28, 266 (1999).
  34. "Photoluminescence and photoluminescence excitation spectroscopy of in situ Er-doped and Er-implanted GaN films grown by hydride vapor phase epitaxy", S. Kim, X. Li, J.J. Coleman, R. Zhang, D. M. Hansen, T.F. Kuech, and S.G. Bishop, *MRS Internet J. Nitride Semicond. Res.* 4S1, U956 (1999).
  35. "GaN lateral overgrowth and optical characterization", X. Li, S. G. Bishop, and J. J. Coleman, *Appl. Phys. Lett.* 73, 1179 (1998).
  36. "The incorporation of arsenic in GaN by metalorganic chemical vapor deposition", X. Li, S. Kim, E.E. Reuter, S.G. Bishop, and J.J. Coleman, *Appl. Phys. Lett.* 72, 1990 (1998).
  37. "Excitation mechanisms of multiple Er<sup>3+</sup> sites in Er-implanted GaN", Kim, S.J. Rhee, X. Li, J.J. Coleman, S.G. Bishop, and P. B. Klein, *J. Electron. Mater.* 27, 246 (1998).
  38. "Photoluminescence and photoluminescence excitation spectroscopy of multiple Nd<sup>3+</sup> sites in Nd-implanted GaN", Kim, S.J. Rhee, X. Li, J.J. Coleman, and S.G. Bishop, *Phys. Rev. B* 57, 14588 (1998).
  39. "Observation of multiple Er<sup>3+</sup> sites in Er-implanted GaN by site-selective photoluminescence excitation spectroscopy", Kim, S. J. Rhee, D. A. Turnbull, E. E. Reuter, X. Li, J. J. Coleman, and S. G. Bishop, *Appl. Phys. Lett.* 71, 231 (1997).
  40. "Characteristics of GaN stripes grown by selective-area metalorganic chemical vapor deposition", X. Li, A. M. Jones, S. D. Roh, D. A. Turnbull, S. G. Bishop and J. J. Coleman, *J. Electron. Mater.* 26, 306 (1997).

41. "Depth-resolved and excitation power dependent cathodoluminescence study of GaN films grown by metalorganic chemical vapor deposition", X. Li, J. J. Coleman, *Appl. Phys. Lett.* 70, 438 (1997).
42. "Trap-mediated excitation of Er<sup>3+</sup> photoluminescence in Er-implanted GaN", Kim, S. J. Rhee, D. A. Turnbull, X. Li, J. J. Coleman, and S. G. Bishop, P. B. Klein, *Appl. Phys. Lett.* 71, 2662 (1997).
43. "Surface photoabsorption monitoring of the growth of GaAs and InGaAs at 650 degrees C by MOCVD", Y. D. Kim, F. Nakamura, E. Yoon, D. V. Forbes, X. Li, and J. J. Coleman, *J. Electron. Mater.* 26, 1164 (1997).
44. "Effect of e-beam irradiation on a p-n junction GaN light emitting diode", X. Li, S. Q. Gu, E. E. Reuter, J. T. Verdeyen, S. G. Bishop and J. J. Coleman, *J. Appl. Phys.* 80, 2687 (1996).
45. "Time dependent study of low energy electron beam irradiation of Mg-doped GaN grown by metalorganic chemical vapor deposition", X. Li and J. J. Coleman, *Appl. Phys. Lett.* 69, 1605 (1996).
46. "Luminescence studies of GaN grown on GaN and GaN/AlN buffer layers by metalorganic chemical vapor deposition", D. A. Turnbull, X. Li, S.Q. Gu, E.E. Reuter, J.J. Coleman and S.G. Bishop, *J. Appl. Phys.* 80, 5609 (1996).
47. "A new buffer layer for the growth of GaN by MOCVD", X. Li, D. V. Forbes, S. Q. Gu, D. A. Turnbull, S. G. Bishop and J. J. Coleman, *J. Electron. Mater.* 24, 1711 (1995).
48. "Alkylation of Si surfaces using a 2-step halogenation Grignard Route", A. Bansal, X. Li, I. Lauermann, N. S. Lewis, S. Yi and W. H. Weinberg, *J. Am. Chem. Soc.* 118, 7225 (1996).
49. "Photon-induced ejection of halogen atoms in alkali-halide nanocrystals", X. Li, R. D. Beck and R. L. Whetten, *Phys. Rev. Lett.* 68, 3420 (1992).
50. "Stability islands for doubly charged clusters below the kinetic critical size", X. Li and R. L. Whetten, *Chem. Phys. Lett.*, 196, 535 (1992).
51. "Ultraviolet absorption bands of ionic compound clusters: onset of crystalline structures in [C<sub>n</sub>+1In]<sup>+</sup>, n = 1 - 13", X. Li and R. L. Whetten, *J. Chem. Phys.* 98, 6170 (1993).
52. "Ultraviolet absorption bands of [C<sub>n</sub>+1In]<sup>+</sup> clusters ( n < 14 )", X. Li, R. L. Whetten, *Z. Phys. D* 26, 198-200 (1993).
53. "Nonbulk convergence of solvent spectral shift in doped molecular clusters", X. Li, M. Y. Hahn, S. El-Shell and R. L. Whetten, *J. Phys. Chem.* 95, 8524 (1991).
54. "Reactions of alkali-halide clusters", R. L. Whetten, M. L. Homer, X. Li, F. E. Livingston, P. St. John and R. D. Beck, *Ber. Bunsenges. Physik. Chem.* 96, 1120 (1992).
55. "Complete statistical thermodynamics of the cluster phase transition", H. P. Cheng, X. Li and R. L. Whetten, *Phys. Rev. A* 46, 791 (1992).
56. "Spectroscopic signatures of structural aufbau in (benzene)<sub>n</sub>; n=7-19", D. C. Easter, X. Li and R. L. Whetten, *J. Chem. Phys.* 95, 6362 (1991).

#### **JOURNAL PUBLICATIONS SUBMITTED:**

1. "In<sub>x</sub>Ga<sub>1-x</sub>As Nanowires on Silicon: 1D Heterogeneous Epitaxy, Bandgap Engineering, and Tandem Solar Cells," Jae Cheol Shin, Kyou Hyun Kim, Ki Jun Yu, Hefei Hu, John A. Rogers, Jian-Min Zuo, and Xiuling Li, *submitted*.
2. "Scalable Monolithically Grown AlGaAs-GaAs Planar Nanowire High Electron Mobility Transistor," Xin Miao and Xiuling Li, *submitted*.

**CONFERENCE PROCEEDINGS:**

1. W. Chern, K. J. Yu, D. Chanda, J. C. Shin, J. A. Rogers, and X. Li, "Ordered silicon nanowire array based solar cells produced by metal assisted chemical etching," 2010 23rd Annual Meeting of the IEEE Photonics Society, Denver, CO, United states, 2010, pp. 718-719.
2. W. Chern, K. Hsu, I. Chun, B. Azeredo, N. Fang, P. Ferreira, and X. Li, "Non-lithographic Patterning and Metal-Assisted Chemical Etching for Manufacturing of Tunable Light-Emitting Silicon Nanowire Arrays," 2010 Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, 2010.
3. N. L. Dias, A. Garg, J. D. Young, U. Reddy, V. B. Verma, K. Bassett, X. Li, and J. J. Coleman, "Reduced scattering rate in nanopore structures," 2010 23rd Annual Meeting of the IEEE Photonics Society, PHOTONICS 2010, Denver, CO, United states, 2010, pp. 84-85.
4. S. A. Fortuna, R. Dowdy, and X. Li, "Epitaxial III-V planar nanowires: Self-aligned, high-mobility and transfer-printable," Conference Proceedings - International Conference on Indium Phosphide and Related Materials, Kagawa, Japan, 2010, pp. 88-91.
5. V. B. Verma, N. L. Dias, U. Reddy, K. P. Bassett, X. Li, and J. J. Coleman, "Bandstructure engineering with a two-dimensional patterned quantum dot lattice," Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference: 2010 Laser Science to Photonic Applications, CLEO/QELS 2010, San Jose, CA, United states, 2010.
6. V. B. Verma, U. Reddy, N. L. Dias, K. P. Bassett, X. Li, and J. J. Coleman, "Patterned quantum dot molecule laser fabricated by electron beam lithography and wet chemical etching," 2010 IEEE Photonics Society Winter Topicals Meeting Series, WTM 2010, Majorca, Spain, 2010, pp. 143-144.
7. "Direct Heterointegration of III-V Materials on Group IV Substrates", David Ahmari, Brian McDermott, Shawn Thomas, Bradley Roof, Quesnell Hartmann, and Xiuling Li, ECS Transactions, 33 (6), 849 – 857 (2010); invited paper.
8. "Strain-induced Self-rolling III-V Tubular nanostructures: Formation Process and Photonic Applications," Ik Su Chun, Kevin Bassett, Archana Challa, Xin Miao, Mika Saarinen, and Xiuling Li, Proc. of SPIE, 7608, 760810, (2010); invited paper.
9. S. A. Fortuna, I. S. Chun, J. Wen, R. Dowdy, and X. Li, "GaAs 110 nanowires: Planar, self-aligned, twin-free, high-mobility and transfer-printable," Hong Kong, China, 2009, pp. IEEE - Hong Kong Section; IEEE Photonics Society Hong Kong Chapter.
10. S. A. Fortuna and X. Li, "GaAs FET with a high mobility self-assembled planar nanowire channel on a (100) substrate," University Park, PA, United states, 2009, pp. 19-20.
11. I. S. Chun, K. Bassett, A. Challa, and X. Li, "Ultra-thin-walled III-arsenide microtubes with embedded QW light emitters: room temperature PL characteristics," Piscataway, NJ, USA, 2009, p. 2 pp.
12. I. S. Chun, E. K. Chow, and X. Li, "3D Nanoscale pattern formation in porous silicon," San Jose, CA, United states, 2008.
13. S. A. Fortuna, J. Wen, and X. Li, "MOCVD grown III-V nanowires: In-plane, self-aligned and transfer-printable," Newport Beach, CA, United states, 2008, pp. 429-430.
14. S. A. Fortuna, X. Zeng, and X. Li, "Self-aligned planar GaAs nanowires grown by MOCVD on GaAs (100) substrates," San Jose, CA, United states, 2008.
15. I. S. Chun, E. K. Chow, and X. Li, "3D nanoscale pattern formation in porous silicon," Piscataway, NJ, USA, 2008, p. 2 pp.

16. "Engineered large area fabrication of ordered InGaAs-GaAs nanotube arrays," I.S. Chun, V.B. Verma, and X. Li, *Mater. Res. Soc. Symp. Proc.* **1057**, II05-40, 2008.
17. S. Kim, X. Li, J. J. Coleman, R. Zhang, D. M. Hansen, T. F. Kuech, and S. G. Bishop, "Photoluminescence and photoluminescence excitation spectroscopy of in situ Er-doped and Er-implanted GaN films grown by hydride vapor phase epitaxy," *MRS Internet Journal of Nitride Semiconductor Research*, vol. 4S1, 1999.
18. S. Kim, X. Li, J. J. Coleman, R. Zhang, D. M. Hansen, T. F. Kuech, and S. G. Bishop, "Photoluminescence and photoluminescence excitation spectroscopy of in situ Er-doped and Er-implanted GaN films grown by hydride vapor phase epitaxy," Warrendale, PA, USA, 1999, pp. 11-4.
19. X. Li, S. G. Bishop, and J. J. Coleman, "GaN: from selective area to epitaxial lateral overgrowth," Boston, MA, USA, 1999, pp. G4.8-G4.8.
20. X. Li, S. G. Bishop, and J. J. Coleman, "GaN: from selective area to epitaxial lateral overgrowth," *MRS Internet Journal of Nitride Semiconductor Research*, vol. 4S1, 1999.
21. J. J. Coleman and T. S. Yeoh, "Metalorganic vapor phase epitaxy of quantum dots," Piscataway, NJ, USA, 2001, pp. 560-1.
22. S. Kim, S. J. Rhee, X. Li, J. J. Coleman, and S. G. Bishop, "Site-selective photoluminescence spectroscopy of Er-implanted wurtzite GaN under various annealing conditions," Warrendale, PA, USA, 1998, pp. 381-6.
23. S. Kim, S. J. Rhee, X. Li, J. J. Coleman, S. G. Bishop, and P. B. Klein, "Trap-mediated, site-selective excitation of photoluminescence from multiple Er<sup>3+</sup> sites in Er-implanted GaN," New York, NY, USA, 1998, pp. 203-6.
24. S. J. Rhee, S. Kim, X. Li, J. J. Coleman, and S. G. Bishop, "Photoluminescence quenching spectroscopy of trap-mediated Er<sup>3+</sup> excitation mechanisms in Er-implanted GaN," Warrendale, PA, USA, 1998, pp. 667-72.
25. "Trap-mediated, site-selective excitation of photoluminescence from multiple Er<sup>3+</sup> sites in Er-implanted GaN", Kim, S.J. Rhee, X. Li, J.J. Coleman, and S.G. Bishop, *Inst. Phys. Conf. Ser.* 156, 203 (1998).
26. S. Kim, S. J. Rhee, D. A. Turnbull, X. Li, J. J. Coleman, and S. G. Bishop, "Site-selective photoluminescence excitation and photoluminescence spectroscopy of Er-implanted wurtzite GaN," San Francisco, CA, USA, 1997, pp. 131-136.
27. S. Kim, S. J. Rhee, D. A. Turnbull, E. E. Reuter, X. Li, J. J. Coleman, and S. G. Bishop, "Characterization of As-grown and ion-implanted GaN by photoluminescence and photoluminescence excitation spectroscopy," Montreal, Can, 1997, pp. 52-53.
28. X. Li, S. Kim, S. G. Bishop, and J. J. Coleman, "On the incorporation of arsenic (As) in GaN films by conventional MOCVD," Montreal, Can, 1997, p. 8.
29. S. J. Rhee, S. Kim, X. Li, J. J. Coleman, and S. G. Bishop, "Photoluminescence quenching spectroscopy of trap-mediated Er<sup>3+</sup> excitation mechanisms in Er-implanted GaN," Boston, MA, USA, 1997, pp. 667-672.
30. "Site-selective photoluminescence excitation and photoluminescence spectroscopy of Er-implanted wurtzite GaN", S. Kim, S. J. Rhee, D. A. Turnbull, X. Li, J. J. Coleman, and S. G. Bishop, *Mat. Res. Soc. Symp. Proc.* 468, 131 (1997).
31. "Correlation of surface morphology and optical properties of GaN by conventional and selective-area MOCVD", X. Li, A.M. Jones, S.D. Roh, D.A. Turnbull, E.E. Reuter, S.Q. Gu, S.G. Bishop and J.J. Coleman, *Mat. Res. Soc. Symp. Proc.* 395, 943 (1996).
32. X. Li, A. M. Jones, S. D. Roh, D. A. Turnbull, E. E. Reuter, S. Q. Gu, S. G. Bishop, and J. J. Coleman, "Correlation of surface morphology and optical properties of GaN by conventional and selective-area MOCVD," Boston, MA, USA, 1996, pp. 943-948.

**BOOK CHAPTERS**

1. "Strain-induced Self Rolled-up Semiconductor Microtube Resonators: A New Architecture for Photonic Device Applications", Xin Miao, Ik Su Chun, and Xiuling Li, Springer, in press (galley proof done).
2. "Spatially resolved optical characterization of GaN structures produced by selective area epitaxial lateral overgrowth," X. Li, P.W. Bohn, Y. W. Kim, and J. J. Coleman, in "III-Nitride semiconductors: Growth" Optoelectronic Properties of Semiconductors and Superlattices; v. 19, edited by M.O. Manasreh and I.T. Ferguson. New York: Taylor & Francis, 2003.

**PRESENTATIONS****Invited seminars and talks:**

1. "III-V Nanoelectronic and Nanophotonic Devices: Towards Controllability and Manufacturability," Nano Photonics and Electronics Industry Affiliates Program, Illinois, May 2011, invited talk.
2. "III-V and Silicon Based Nanoelectronic and Nanophotonic Devices: Towards Controllability and Manufacturability," Center for Quantum Devices Seminar, Northwestern University, March 21, 2011, invited speaker.
3. "III-V Nanoelectronic and Nanophotonic Devices: towards controllability and manufacturability" Applied Physics and Electrical Engineering Joint Colloquium, Harvard University, Feb, 2011, invited speaker.
4. "Planar GaAs Nanowires on GaAs (100) substrates: self-aligned, twin-defect free and transfer-printable," NSF-MEXT (Japan) Young Researchers Exchange Program, Dec. 2010, Kyoto, Japan, invited talk.
5. "Towards High Performance III-V Semiconductor Nanowire-FETs and Nano-lasers," University of Southern California, Nov. 2010, invited seminar speaker.
6. "Ordered Silicon Nanowire Array Based Solar Cells Produced by Metal Assisted Chemical Etching," Photonic Society annual meeting, Denver, Nov. 2010.
7. "Towards High Performance III-V Semiconductor Nanowire-FETs and Nano-lasers," Rensselaer Polytechnic Institute, Oct. 2010, invited seminar speaker.
8. "Towards High Performance III-V Semiconductor Nanowire-FETs and Nano-lasers," Ohio State University, Oct 2010, invited seminar speaker.
9. "Microtube resonators: strain-induced and large area assembled," NSF-MEXT (Japan) Young Researchers Exchange Program, Oct. 2010, UIUC, invited talk.
10. "III-V Planar Nanowire FETs and Rolled-up Tube Based Nanophotonics," Nano-EP seminar series, Sept. 2010, UIUC, invited talk.
11. "Towards High Performance III-V Semiconductor Nanowire-FETs and Nano-lasers," Beijing Institute of Technology, July 2010, invited talk.
12. "Towards High Performance III-V Semiconductor Nanowire-FETs and Nano-lasers," Tsing Hua University, China, July 2010, invited talk.
13. "Towards High Performance III-V Semiconductor Nanowire-FETs and Nano-lasers," Stanford University, May 2010, invited talk.
14. "Towards High Performance III-V Semiconductor Nanowire-FETs and Nano-lasers," Solid State Seminar (S3) Series, April 2010, Norte Dame, invited speaker.

15. "Bottom-up and Manufacturable: New Paradigms in III-V Semiconductor Nanostructures and Device Prospects," NSF Nano-CEMMS Annual Industry Meeting, March 2010, invited talk.
16. "Strain-induced Self-rolling III-V Tubular nanostructure: Formation process and Photonic Application", SPIE Photonic West, San Francisco, Jan 2010, invited talk.
17. "Compound semiconductor 1D nanostructures and Device Prospects," Purdue University, Birk Nanotechnology Center, November 2009, invited talk.
18. "Compound Semiconductor Nanotubes and Nanowires for photonic and electronic Applications," Argonne National Laboratory, Aug. 2009, invited talk.
19. "Compound Semiconductor Nanotubes and Nanowires for photonic and electronic Applications", Department of Microelectronics, Peking University, China, July 2009, invited talk.
20. "Compound Semiconductor Nanotubes and Nanowires for Nanophotonic and Nanoelectronic Applications," Institute for Advanced Materials, Devices, and Nanotechnology (IAMDN), Rutgers University, April 2009, invited talk.
21. "Compound Semiconductor Nanotubes and Nanowires for photonic and electronic Applications," 1<sup>st</sup> NSF-sponsored US-Argentina Workshop on Nanomaterials, Bariloche, Argentina, March 2009, invited talk.
22. "3D IC and Semiconductor Nanotechnology," IBM, February 2009, invited talk.
23. "Compound semiconductor nanotubes and nanowires," University of California, Los Angeles, February 2009, invited talk.
24. "Compound semiconductor nanotubes and nanowires," Texas Tech University, February 2009, invited talk.
25. "Nanotechnology: compound semiconductor nanotubes and nanowires," ECE 200 seminar, University of Illinois, February 2009.
26. "Nanotechnology: compound semiconductor nanotubes and nanowires," Beckman Institute Nanohour Series, University of Illinois, November 2008.
27. "III-V semiconductor nanotubes and nanowires," University of California, Los Angeles, February 2009, invited talk.
28. "III-V semiconductor nanotubes and planar nanowires," University of Wisconsin, Madison, 2008, invited seminar.
29. "What is your impact factor," NSF Nano-CEMMS graduate student meeting, UIUC, 2010, invited talk.

**Contributed talks and posters:**

30. "Ternary In<sub>x</sub>Ga<sub>1-x</sub>As Nanowires on Silicon Substrates: 1D Heterogeneous Epitaxy, Bandgap Engineering, and Photovoltaics," J. C. Shin and X. Li, EMC, June 2011, oral presentation.
31. "Towards Planar GaAs Nanowire Array High Electron Mobility Transistor," X. Miao and X. Li, DRC, June 2011, poster.
32. "Monolithically Grown In<sub>x</sub>Ga<sub>1-x</sub>As Nanowire on Silicon Tandem Solar Cells with High Efficiency," J. C. Shin, K. J. Ho, J.A. Rogers, and X. Li, DRC, June 2011, poster.
33. "Strain-Induced Self-rolling of Semiconductor Membranes: Effect of Geometry, Energetics, and Kinetics," I. Chun, A. Challa, B. Derickson, K. J. Hsia, and X. Li, CLEO, May 2011, oral presentation.
34. "AlGaAs/GaAs nanowire HEMT: planar GaAs nanowire and AlGaAs shell interface study," X. Miao and X. Li, MRS, April 2011, oral presentation.
35. "Silicon Microwire Array Based Solar Cells Produced by Metal-Assisted Chemical Etching," UGIM, June 2010, Purdue University, oral presentation.

36. "Planar <110> GaAs Nanowires: Effects of Impurity Doping and Substrate Orientation," UGIM, June 2010, Purdue University, poster.
37. "Twinning Superlattice in VLS Grown <110> Planar GaAs Nanowires Induced by Impurity Doping," EMC, June 2010, Norte Dame, oral presentation.
38. "Non-lithographic Patterning and Metal-Assisted Chemical Etching for Manufacturing of Tunable Light-Emitting Silicon Nanowire Arrays," CLEO/QELS, May 2010, San Jose, oral presentation.
39. "Geometry Dependence of the Strain-driven Self-rolling of Semiconductor Nanotubes," Ik Su Chun, Huan Li, Archana Challa, K Jimmy Hsia, Xiuling Li, TMS annual meeting, 2010, oral presentation.
40. "Planar III-V nanowires," International Conference on 1-dimensional Nanomaterials (ICON), Xiuling Li, oral presentation, Dec. 2009.
41. "Strain Driven Self-rolling III-V Tubes," International Conference on 1-dimensional Nanomaterials (ICON), Xiuling Li et. al., poster presentation, Dec. 2009.
42. "Metal-assisted chemical etching for manufacturing of Si nanowire arrays," International Conference on 1-dimensional Nanomaterials (ICON), Xiuling Li et al., poster presentation, Dec. 2009.
43. "High-Mobility Planar GaAs Nanowires on (100) Substrates for Nanoelectronic Applications," Organometallic Capor Phase Epitaxy (OMVPE) Workshop, Wisconsin, August 2009, oral presentation.
44. "Ultra-thin-walled III-Arsenide Microtubes with Embedded QW Light Emitters," ACCGE-17, Wisconsin, August, 2009, oral presentation.
45. "GaAs <110> Nanowires: Planar, Self-aligned, Twin-free, High-mobility and Transfer-Printable," 14th OptoElectronics and Communications Conference, Hong Kong, July 2009, oral presentation.
46. "GaAs FET with a High Mobility Self-Assembled Planar Nanowire Channel on a (100) Substrate", IEEE Device Research Conference, Penn State, June 2009, oral presentation.
47. "Ultra-Thin-Walled III-Arsenide Microtubes with Embedded QW Light Emitters: Room Temperature PL Characteristics", CLEO, Baltimore, May 2009, postdeadline oral presentation.
48. "III-V micro and nanotubes: from formation process to photonic applications," Semiconductor Laser Workshop, Baltimore, May 2009, oral presentation and session organizer.
49. "Self-aligned <110> planar GaAs nanowires for low twin density and high integratability", MRS 2008 symposium LL, poster presentation.
50. "Metal-semiconductor hybrid micro- and nanotubes: large area assembly, dispersion, functionalization and characterization," MRS 2008 Symposium JJ, oral presentation (recognized as Outstanding Symposium Paper).
51. "Three Dimensional Nanoscale Pattern Formation in Light-emitting Porous Silicon," MRS 2008 Symposium MM, oral presentation.
52. "MOCVD Grown III-V Nanowires: In-plane, Self-aligned and Transfer-printable", IEEE LEOS 2008 annual meeting, oral presentation (best student paper award finalist).
53. "Self-Aligned Planar GaAs Nanowires Grown by MOCVD on GaAs (100) Substrates," CLEO/QELS 2008, oral presentation.
54. "3-D Nanoscale Pattern Formation in Porous Silicon," CLEO/QELS 2008, oral presentation.
55. "Engineered large area fabrication of ordered InGaAs-GaAs nanotube arrays," MRS 2007, oral presentation.

**TEACHING**

ECE 444 IC Device Theory and Fabrication

ECE 598 Semiconductor Nanotechnology

**SYNERGISTIC ACTIVITIES**

CLEO Science and Innovation subcommittee (2012 - )

Symposium organizer for 220<sup>th</sup> Electrochemical Society Meeting (2011)

IEEE EDS Student Chapter Faculty Advisor (2010 - present)

Member of NSF US/Japan Young Scientists Exchange Team on Nanomanufacturing (2010)

Instructor for Girls Adventures in Math, Engineering, and Science summer camp (2010)

Device Research Conference (DRC) session chair (2010)

Electronic Materials Conference (EMC) session chair (2010)

IEEE Photonic Society representative to IEEE Nanotechnology Council (2010- present)

IEEE University Government Industry Micro/Nano Symposium Technical Committee (2010)

IEEE Photonic Society *Semiconductor Laser workshop session organizer* (09)

IEEE Photonic Society *Semiconductor Laser Technical Committee* (08, 09, 10)

Associate editor, Journal of Nano Systems and Technology

Active participants of Women in Engineering activities at University of Illinois

Plenary speaker at Evening with Industry for ECE Eta Kappa Nu Honor Society, 2007

Speaker for NSF Nano-CEMMS graduate student meeting on industry research, 2010

NSF REU student host, 2009

Reviewer for NSF proposal review panels and various IEEE, AIP, APS, IOP journals

CNST Nanotechnology workshop organizing committee, 2008, 2009, 2010 (UIUC)

Panel member for career day at Barkstall Elementary school, Champaign, IL

**GRADUATE AND POSTDOCTORAL ADVISORS:**

Graduate Advisor: R. L. Whetten (UCLA, currently at Georgia Tech)

Postdoctoral Advisor: N. S. Lewis (Caltech) and J. J. Coleman (Illinois)