Xiao-Hang (Shawn) Li

PhD Candidate and Research Assistant

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Information updated up to: ***Nov 18th 2009***

Contact Information

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Birth Date and Place & Citizenship

June 24th, 1985, Liuzhou, China & Chinese

Education

July. 2008 – present, ***Lehigh University (Pennsylvania, USA)***

Ph.D. Candidate in Electrical Engineering, Department of Electrical and Computer Engineering

- Cumulative GPA: 3.71/4.0 (as Sept of 2009)
- Research Assistant, PhD Advisor: Prof. Nelson Tansu (ECE, Lehigh)
- Research Areas: physics of III-Nitride semiconductor optoelectronics materials and devices, physics of III-Nitride semiconductor nanostructures, and III-Nitride semiconductors light emitting diodes and lasers.

Sep. 2004 – Jul. 2008, ***Huazhong University of Science and Technology (Wuhan, China)***

Bachelor of Science (B.S.) in Physics

- Cumulative GPA: 89.4/100
- Graduate with 1st Class Honors, Rank: 1st out of 29 students
- Thesis: Electronic Structure Study in GaN Including Defect&Dopant by Density Functional Theory; Advisor: Prof. Zhiping (James) Zhou (State Key Laboratory on Advanced Optical Communication Systems and Networks, Peking University) & Yonghong Xiong (Physics, Huazhong University of Science and Technology)
- Awarded the "Best Bachelor Graduation Thesis, Hubei Province, 2008" (0.74%)

Professional Experiences

July 2008 – present, ***Lehigh University (Bethlehem, PA, USA)***

Ph.D. Candidate and Research Assistant

Department of Electrical and Computer Engineering (ECE)
P. C. Rossin College of Engineering and Applied Science
& Center for Optical Technologies (COT)
Ph.D. Advisor: Prof. Nelson Tansu

- **III-Nitride Semiconductor Nanostructures for High Performance Light Emitting Diodes and Lasers**
  - Conduct first-principle simulation and device physics of the III-Nitride semiconductor nanostructure
  - MOCVD epitaxy and device fabrication of III-Nitride semiconductor optoelectronics devices
  - Develop novel gain media with enhanced radiative recombination rate and optical gain for III-Nitride light emitting diodes and lasers.

Research Interests

My research areas cover the fundamental device physics, technology, epitaxy (MOCVD), and fabrication of semiconductor optoelectronics devices based on semiconductor nanostructures. My research works include fundamental studies and novel approaches to improve radiative recombination rate and optical gain of visible gain media based on III-Nitride semiconductors for high efficiency light emitting diodes (LEDs) and lasers for applications in solid state lighting and biomedical lasers.

Awards & Honors Received

- ***Lehigh University Research Assistantship*****,** July. 2008- present, Lehigh University
- ***2nd Order Best Graduation Thesis***(2008), 2/113, Huazhong University of Science & Technology(HUST)
- ***National Scholarship*** (2008), 1/280, China
- ***Technology Innovation Pacemaker*** (2008), 3/600, HUST
- ***Best Student Awards*** (2005-2008), 5/100, HUST
- ***Best Student in Summer Camp*** *(2007), Institute of Biophysics, Chinese Academy of Sciences*
- ***Leadership Award*** (2005-2007), HUST
- ***Best Student Journalist on Campus*** (2005), HUST
- ***Runner-up of Men's 1500m Running*** *(2004),* HUST

Professional Affiliations

2009 – present, Student Member, Institute of Electrical and Electronics Engineers (IEEE)

2009 – present, Student Member, IEEE Laser and Electro-Optics Society

2009 – present, Student Member, International Society for Optical Engineering (SPIE)

2009 – present, Student Member, Optical Society of America (OSA)

Refereed Journal and Conference Publications

1. **(Invited Conference Paper)** N. Tansu, H. Zhao, R. A. Arif, Y. K. Ee, G. Liu, **X. H. Li**, and G. S. Huang, "Polarization Engineering of InGaN-Based Nanostructures for Low-Threshold Diode Lasers and High-Efficiency Light Emitting Diodes," in Proc. of the IEEE Photonics Global 2008, Nanophotonics Symposium, Singapore, Republic of Singapore, December 2008.
2. H. Zhao, G. Liu, **X. H. Li**, G. S. Huang, S. Tafon Penn, V. Dierolf, and N. Tansu, "Staggered InGaN Quantum Wells Light-Emitting Diodes at 520-nm Employing Graded Temperature Growths," in Proc. of the IEEE/OSA Conference on Lasers and Electro-Optics (CLEO) 2009, Baltimore, MD, May 2009
3. H. Zhao, G. S. Huang, G. Liu, **X. H. Li**, J. D. Poplawsky, S. Tafon Penn, V. Dierolf, and N. Tansu, "Characteristics of Staggered InGaN Quantum Wells Light-Emitting Diodes Emitting at 480-525 nm," in Proc. of the 67th IEEE Device Research Conference (DRC) 2009, University Park, PA, June 2009.
4. H. Zhao, G. S. Huang, G. Liu, **X. H. Li**, J. D. Poplawsky, S. Tafon Penn, V. Dierolf, and N. Tansu, "Growths of Staggered InGaN Quantum Wells Light-Emitting Diodes Emitting at 520-525 nm Employing Graded Growth-Temperature Profile," Appl. Phys. Lett., vol. 95(6), August 2009. (accepted)
5. Y. K. Ee, **X. H. Li**, J. E. Biser, W. Cao, H. M. Chan, R. P. Vinci, and N. Tansu, "Reduced Dislocation Engineering and Improved Efficiency of III-Nitride Light Emitting Diodes Grown on Nano-Patterned Sapphire using Abbreviated GaN Metalorganic Vapor Phase Epitaxy Growth Mode," in Proc. of the 14th Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE) 2009, Lake Geneva, WI, August 2009.
6. Y. K. Ee, **X. H. Li**, J. E. Biser, W. Cao, H. M. Chan, R. P. Vinci, and N. Tansu, "Abbreviated MOVPE Nucleation Studies of III-Nitride Light-Emitting Diodes on Nano-Patterned Sapphire," J. Crys. Growth (accepted)
7. **(Invited Journal Paper)** H. Zhao, G. Liu, **X. H. Li**, R. A. Arif, G. S. Huang, J. D. Poplawsky, S. Tafon Penn, V. Dierolf, and N. Tansu, "Design and Characteristics of Staggered InGaN Quantum Well Light-Emitting Diodes in Green Spectral Regimes," IET Optoelectronics (accepted).

8. **(Invited Conference Paper)** N. Tansu, H. Zhao, R. A. Arif, Y. K. Ee, G. Liu, **X. H. Li**, H. Tong, and G. S. Huang,"Novel Approaches for Efficiency Enhancement in InGaN-Based Light-Emitting Diodes," in Proc. of the 2nd International Conference on White LEDs and Solid State Lighting 2009, Taipei, Taiwan, December 2009.
9. **(Invited Conference Paper)** N. Tansu, H. Zhao, Y. K. Ee, G. Liu, **X. H. Li**, and G. S. Huang, "Novel Device Concept for High-Efficiency InGaN Quantum Wells Light-Emitting Diodes," in Proc. of the SPIE Photonics West 2010, Gallium Nitride Materials and Devices V, San Francisco, CA, Jan 2010.
10. **(Invited Conference Paper)** N. Tansu, H. Zhao, Y. K. Ee, G. Liu, **X. H. Li**, J. Zhang, S. F. Zhang, and G. S. Huang, "Novel Growth and Device Concepts for High-Efficiency InGaN Quantum Wells Light-Emitting Diodes," in Proc. of the IEEE/OSA Conference on Lasers and Electro-Optics (CLEO) 2010, San Jose, CA, May 2010.
11. **X. H. Li**, H. Tong, H. Zhao, and N. Tansu, "Band Structure Calculation of Dilute-As GaNAs by First Principle," in Proc. of the SPIE Photonics West 2010, Physics and Simulation of Optoelectronics Devices XVIII, San Francisco, CA, Jan 2010.
12. Y. K. Ee, **X. H. Li**, J. Biser, W. Cao, H. M. Chan, R. P. Vinci, and N. Tansu, "Abbreviated GaN Metalorganic Vapor Phase Epitaxy Growth Mode on Nano-Patterned Sapphire for Enhanced Efficiency of InGaN-Based Light-Emitting Diodes," in Proc. of the SPIE Photonics West 2010, LEDs: Materials, Devices, and Applications for Solid State Lighting XIV, San Francisco, CA, Jan 2010.

Submitted Journal and Conference Publications

1. **(Invited Review Article)** Y. K. Ee, **X. H. Li**, J. E. Biser, W. Cao, H. M. Chan, R. P. Vinci, and N. Tansu,"Metalorganic Vapor Phase Epitaxy of III-Nitride Light-Emitting Diodes on Patterned AGOG Sapphire," Materials (submitted).

Patents or Invention Disclosures

1. **Xiaohang Li**, Yonghong Xiong, Dian Peng, *A Novel Magnetic Field Direction Device based on Magnetic Fluid Gratings*. (China Patent CN200976041).
2. N. Tansu, **X.H. Li**, G. Liu, H. Zhao, A Novel Approach to Achieve Monolithic White Light-Emitting Diodes. (US Patent, in disclosure)

Internal Scientific Lectures & Seminars (Non-Refereed)

1. N. Tansu, R. A. Arif, H. Zhao, Y. K. Ee, G. S. Huang, G. Liu, and **X. H. Li**, "High Efficiency III-Nitride Light-Emitting Diodes for Solid State Lighting," Oral Presentation in Lehigh Center for Optical Technologies (COT) Open House 2008, COT Workshop on Solid State Materials for Energy Applications, Lehigh University, Bethlehem, Pennsylvania, USA, October 2008.
2. H. Zhao, G. Liu, **X. H. Li**, R. A. Arif, G. S. Huang, S. Tafon Penn, V. Dierolf, and N. Tansu, "Enhancement of Radiative Efficiency via Staggered InGaN Quantum Well Light Emitting Diodes," Invited Poster Presentation in Transformation in Lighting 2009, DOE R&D Workshop on Solid State Lighting 2009, San Francisco, CA, USA, February 2009.

Outreach Lectures and Seminars

1. Nelson Tansu, Ronald A. Arif, Hongping Zhao, Hua Tong, Yik Khoon Ee, **Xiaohang Li**, and Guangyu Liu, "Semiconductor Nanotechnology for High Energy Efficient Applications," Outreach Program, OptoCamp 2007 – Center for Optical Technologies, Lehigh University, Bethlehem, Pennsylvania, USA, August 2008.

Professional and Synergistic Services

1. ***Conference Volunteer*** at the 2007 Asia-Pacific Optical Communications, Nov, Wuhan, China.
2. ***Treasurer*** of the IEEE Photonics Society (formerly LEOS) Student Chapter at Lehigh, Fall 2009 – Present.

References

1. **Prof. Nelson Tansu** (PhD Advisor)
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3. **Prof. Alastair McAulay**
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4. **Prof. Helen M. Chan**
   Chair, Department of Material Science and Engineering
   Lehigh University, Bethlehem, PA 18015, USA
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5. **Prof. Zhiping (James) Zhou**
   Vice Director, State Key Laboratory on Advanced Optical Communication Systems and Networks
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