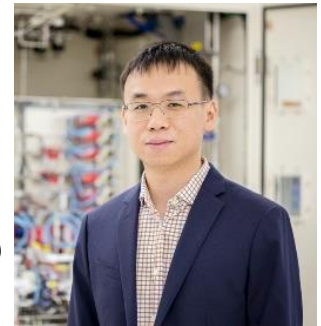


XIAOHANG LI



Basic Info

Xiaohang Li, Ph.D.

Associate Editor of *Photonics Research*, the Optical Society (OSA)

Vice Chair of Western Saudi Arabia Chapter, IEEE Electron Devices Society (EDS)

Founder of Polarization Toolbox

Principal Investigator of Advanced Semiconductor Laboratory

Assistant Professor of Electrical Engineering (Primary), CEMSE Division

Assistant Professor of Applied Physics (Secondary), PSE Division

King Abdullah University of Science and Technology (KAUST)

Thuwal, Saudi Arabia 23955

KAUST Mobile: +966.54.470.0580 | U.S. Mobile: +1.734.985.0624

Email: xiaohang.li@kaust.edu.sa

Research Area: wide bandgap semiconductor materials, physics, devices, hardware, software

Webpages: [Laboratory](#) | [Polarization Toolbox](#) | [Google Scholar](#)

Education

- 1) Ph.D., Georgia Institute of Technology, GA, USA, 2011-2015**
 - Ph.D. in Electrical Engineering with minor in Physics
 - Thesis title: III-nitride ultraviolet laser | Advisor: Prof. Russell D. Dupuis
 - Research: growth, characterization, fabrication, and simulation of III-nitride materials, nanostructures and devices applicable for optoelectronics and power electronics
- 2) Certificates of MBA Courses, Wharton School, University of Pennsylvania, PA, 2013**
 - Graded MBA courses including Accounting, Operation, Marketing, Corporate Finance at the Wharton School
- 3) M.S., Lehigh University, PA, USA, 2008-2011**
 - Research Assistant and M.S. in Electrical Engineering
 - Advisor: Prof. Nelson Tansu
 - Research: growth, characterization, fabrication, and simulation of III-nitride materials, nanostructures and devices applicable for inorganic and organic optoelectronics
- 4) B.S., Huazhong University of Science and Technology, China, 2004-2008**
 - B.S. in Applied Physics with the highest honor

Selected Awards and Honors

- 1. The 40 under 40 Award, Georgia Institute of Technology Alumni Association, 2020**

Selected along 39 other distinguished alumni under 40 years old including founder/CEO of unicorn startup and four-time Olympian
- 2. IEEE North Jersey Section ED/CAS MTT/AP Chapters Award, 2019**
- 3. Harold M. Manasevit Young Investigator Award, American Association of Crystal Growth (AACG), 2018**

“for significant and innovative contributions in the MOVPE growth of state-of-the-art deep UV lasers, B-III-N alloys, III-oxides, and blue and green emitters.”

2018 is the 50th anniversary of the MOCVD invention by Dr. Manasevit

Selected biennially by experts including Nobel laureate and US NAE members
- 4. Official Nominee of KAUST Distinguished Teaching Award, KAUST, 2018**

Six nominees out of 150 faculty at KAUST

5. Member of University Academic Counsel, KAUST, 2017-2019

6. Title of the Weekly Newsletter (1), Compound Semiconductor, 2017

7. Editor's Select, Applied Physics Letter, 2016

8. Representative of Georgia Institute of Technology, Global Young Scientist Summit, 2015

9. Graduate Student Fellowship, IEEE Photonics Society, 2014

The highest award from IPS for graduate students with 10 recipients worldwide annually

10. Steve W. Chaddick Fellowship, Georgia Institute of Technology, 2014

11. Anne Robinson Clough International Student Grant, Georgia Institute of Technology, 2014

12. D. J. Lovell Scholarship, SPIE, 2013

"for research focusing on growing high-quality InAlGaN semiconductor material for ultraviolet devices such as laser diodes, LED, and detectors"

The most prestigious scholarship from SPIE

13. Edison Prize, Georgia Institute of Technology, Edison Innovation Foundation, 2013

14. Member of Insight Engineering & Science Program, McKinsey & Company, 2013

15. Member of Bridge to BCG Program, Boston Consulting Group, 2013

16. Most Commercialize Prize, Georgia Institute of Technology, 2013

17. Best Product Showcase Prize, Georgia Institute of Technology, 2013

18. Innovation Alley, Lehigh Valley, TEDx, 2013

19. Immigrant Innovator and Entrepreneur Awarding Ceremony, the U.S. White House, 2013

20. Georgia Tech representative, ACC Startup Madness, 2013

21. Best Customer Discovery Award, Georgia Tech, 2012

22. First Place of Elevator Pitch Competition, Georgia Institute of Technology, 2012

23. Michael W Levin '87 Advanced Technology Award, Lehigh University, 2012

24. National Scholarship, China, 2008

Selected Awards and Honors of My Advisees

25. SPIE Optics and Photonics Education Scholarship (\$4,000 USD tier), 2020

Awarded to my PhD student Ronghui Lin

26. 1st, 2nd, 3rd Prizes, KAUST-Asia Wide Bandgap Semiconductor Workshop, 2019

Awarded to my advisees Che-Hao Liao, Xiao Tang, Yi Lu, Feras Alqatari, Ronghui Lin, Rongyu Lin

27. News Features, Semiconductor Today, 2019

ACS Photonics Paper of Maocheng Shan, a PhD student I advised remotely. Only one work is shown as the News Features on the top of the homepage one time

28. Scanning Electron Microscopy Image Competition, Oxford Instruments, 2019

Awarded to my PhD student Ronghui Lin

29. Hundred Talent Full Professorship, University of Science and Technology of China, 2018

Awarded to my postdoc Haiding Sun

30. Fullbright Scholarship, Fulbright-Hays Program (won by my student Carlos Torres), 2017

Awarded to my visiting student Carlos Torres

31. Title of the Weekly Newsletter (2), Compound Semiconductor, 2017

My postdoc Haiding Sun's Applied Physics Letter paper

32. Exploration Award, Whale Foundation, 2017

Awarded to my visiting student Kaikai Liu

33. Outstanding Student Award, UESTC (won by my student Jingtao Li), 2017

Awarded to my visiting student Jingtao Li

34. Poster Award, KAUST-NSF Conference on Electronic Materials, Devices and Systems for a Sustainable Future, 2017

Awarded to my postdoc Haiding Sun

Professional Experience

1) 08/2015-Present, Assistant Professor, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

- Note: I started working at full-time capacity remotely from 08/2015. I physically arrived at KAUST in 01/2016 after the US immigration-related travel restriction was lifted
- Assistant Professor of Electrical Engineering Program, Division of Computer, Electrical, Mathematical Science and Engineering (CEMSE)
- Secondary affiliation in the new Applied Physics Program since Sept 2019
 - I am one of the five co-founding faculty of Applied Physics Program
- PI of Advanced Semiconductor Laboratory
- Research field: wide-bandgap semiconductor science and technology

2) 1/2019-Present, Founder, Polarization Toolbox

- Designed and created the first software to systematically study III-nitride polarization and the first machine learning software for III-nitride polarization based on research done at KAUST.
- These two cloud-based software programs are being used by researchers and engineers from over 70 universities, research institutes, and companies around the world:
 - *University of California Santa Barbara, Mie University, TU Wien, IMEC, University of Sheffield, Nanjing University, King Abdullah University of Science and Technology, Jilin University, Anna University, Ningbo Institute of Materials Technology and Engineering (CAS), Institute of Semiconductor (CAS), Hebei University of Technology, Xiamen University, Zhengzhou University, Nanjing University of Posts and Telecommunications, Huazhong University of Science and Technology, SRM Institute of Science and Technology, Indian Institute of Technology Delhi, Peking university, Slovak Academy of Sciences, RIKEN, Tyndall National Institute, Indian Institute of Science, Advanced Micro-Fabrication Equipment, Xiamen Changelight, ASML, CrayoNano, École polytechnique fédérale de Lausanne, University of Queensland, Australian National University, Ulm University, Johannes Gutenberg University of Mainz, National Chiao Tung University, Facebook, Georgia Institute of Technology, Centre national de la recherche scientifique, University of Arkansas, Saitama University, Institut Lafayette, University of California San Diego, Institute of Semiconductors NAS Ukraine, Technical University of Berlin, University of Eastern Finland, German University in Cairo, National Cheng Kung University, Wuhan University, Central South University, Hebei Semiconductor Research Institute, Nanchang University, Cornell University, Sun Yat-sen University, University of Bath, Shenzhen University, King Abdulaziz University, Stony Brook University, New Jersey Institute of Technology, Sivas Cumhuriyet University, Indian Institute of Technology Madras, Indian Institute of Science Education and Research, S. N. Bose National Centre for Basic Sciences, Indian Institute of Technology Kharagpur, Madras Institute of Technology, Central Electronics Engineering Research Institute, KLE Technological University, University of Utah, Indian Institute of Technology Roorkee, University at Buffalo, Arizona State University, Indian Institute of Technology Bombay, University of Pisa, Suzhou Institute of Nano-Tech and Nano-Bionics (CAS), North China Electric Power University, Xinyang Normal University, Beijing Jiaotong University, North Carolina State University.*

3) 11/2018-Present, Associate Editor, Photonics Research, the Optical Society (OSA)

- Associate Editor for the areas of semiconductor lasers, LEDs, and photodetectors
- 4) **11/2018-Present, Vice Chair, Western Saudi Arabia Chapter, IEEE Electron Devices Society (EDS)**
 - Working with Chair to organize different local events and increase the number of members
- 5) **06/2018-08/2019, Lead Guest Editor, Photonics Research, the Optical Society (OSA)**
 - Lead Guest Editor of Special Issue *Semiconductor UV Photonics*
 - PR ranks 10th out of 94 optics and photonics journals in the latest Journal Citation Reports
- 6) **09/2015-12/2015, Visiting Professor, Portland State University, Portland, OR, USA**
 - Visiting Professor at Departments of Physics and Electrical and Computer Engineering
- 7) **07/2011-08/2015, Georgia Institute of Technology, Atlanta, GA, USA**
 - Research Assistant of Center for Compound Semiconductors
- 8) **07/2008-05/2011, Lehigh University, Bethlehem, PA USA**
 - Research Assistant of Center for Optical Technologies

Major Contributions and Achievements

From works led by my group

- 1) III-nitride device incorporating BAlN proposal (arXiv:2005.00929)
- 2) Record-high Al composition in β -(Al_xGa_{1-x})₂O₃ alloy (arXiv:2005.05799)
- 3) First AlN/Ga₂O₃ device proposal (arXiv:1901.05111)
- 4) Epitaxially-grown Ga₂O₃ flexible device (under review)
- 5) N-polar tunnel junction LED (ACS Photonics 2020)
- 6) visible laser based on hyperuniformity (Laser Photonics Review 2020)
- 7) Dual-reactor III-oxide and III-nitride MOCVD system (Oct 2019)
- 8) GaN quantum well deep UV laser (ACS Photonics 2019)
- 9) Three-dimensional device band diagram for III-nitride LED and laser (Optica 2019)
- 10) UV LED without electron blocking layer proposal (IEEE Photonics J 2019)
- 11) Machine learning software for III-nitride semiconductors (Jan 2019)
- 12) Polarization-focused software for III-nitride semiconductors (Dec 2018)
- 13) III-nitride dual-polarity quantum wells (Adv. Funct. Mater. 2018)
- 14) Nanowire UV edge-emitting laser structure (ACS Photonics 2018)
- 15) Demonstration of α -, β - and ϵ -Ga₂O₃ films grown by MOCVD (Cryst. Growth Des. 2018)
- 16) Demonstration of strain-compensated superlattices on AlN (Appl. Phys. Exp. 2018)
- 17) Report of polarization parameters of boron-incorporated III-nitride alloys (Appl. Phys. Lett. 2017(3))
- 18) Report of band structures of boron-incorporated III-nitride alloys (Phys. Status Solidi B 2017(2))
- 19) Report of band offset of boron-incorporated III-nitride alloys (Appl. Phys. Lett. 2017(2))
- 20) Revelation of working principle of TMAI preflow for AlN MOCVD (Appl. Phys. Lett. 2017(1))

Before KAUST

- 21) Record-high boron content in monocrystalline wurtzite BAlN (Phys. Status Solidi B 2017(1))
- 22) Deep UV surface stimulated emission from semiconductors (Appl. Phys. Lett. 2015(2))
- 23) TE-TM optical polarization switch of semiconductor lasers (Appl. Phys. Lett. 2015(1))
- 24) Low-threshold deep UV semiconductor laser on sapphire substrates (Appl. Phys. Lett. 2014)
- 25) Deep UV semiconductor laser below 260 nm on sapphire substrates (Appl. Phys. Lett. 2014)

Publication Summary

- 1) >200 journal and conference publications
- 2) >80 invited/plenary talks, seminars, and tutorials in conferences, research institutions, and companies

- 3) Three book chapters and one editorial in *Compound Semiconductor*
- 4) >20 issued and pending patents
- 5) Reviewers of ~30 leading journals
- 6) Google Scholar citations: >2,100, h-index: 24
 - <https://scholar.google.com/citations?user=y2AAXjwAAAAJ&hl=en>

Works Featured in English Media

1. “First claim of nitrogen-polar III-nitride tunnel-junction light-emitting diodes,” KAUST
 - http://www.semiconductor-today.com/news_items/2020/jul/kaust-300720.shtml
2. “KAUST Ph.D. student receives SPIE 2020 Optics and Photonics Education Scholarship,” KAUST
 - <https://cemse.kaust.edu.sa/news/kaust-phd-student-receives-spie-2020-optics-and-photonics-education-scholarship>
3. “Extremely thin gallium nitride wells enable deep ultraviolet lasing,” Semiconductor Today
 - http://www.semiconductor-today.com/news_items/2019/oct/kaust-301019.shtml
4. “Overlaid optical metalenses have new properties,” Laser Focus World
 - <https://www.laserfocusworld.com/optics/article/14037483/overlaid-optical-metalenses-have-new-properties>
5. “Scientists Develop Effortless Way of Producing Multifunctional Metalenses,” AZO Nano
 - http://www.semiconductor-today.com/news_items/2018/nov/smi_191118.shtml
6. “Flat lenses with a twist,” Phys.org & KAUST Discovery
 - <https://phys.org/news/2019-07-flat-lenses.html>
 - <https://discovery.kaust.edu.sa/en/article/858/flat-lenses-with-a-twist>
7. “SMI supporting NSF INTERN program and science exchange programs,” Semiconductor Today
 - http://www.semiconductor-today.com/news_items/2018/nov/smi_191118.shtml
8. “NSF’s INTERN program prepares students for STEM careers outside of academia,” US National Science Foundation (NSF)
 - <https://www.youtube.com/watch?v=sDJ1C3nhjc4>
9. “KAUST demonstrates nanowire GRIN SCH diode for efficient UV-LED/laser applications,” Semiconductor Today
 - http://www.semiconductor-today.com/news_items/2018/jul/kaust_230718.shtml
10. “NIMTE and KAUST Team Enhance UV Luminescence,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/104559/NIMTE_and_KAUST_team_enhance_UV_luminescence
11. “Strain engineering higher hole density in N-polar aluminum gallium nitride,” Semiconductor Today
 - http://www.semiconductor-today.com/news_items/2018/may/kaust_250518.shtml
12. “KAUST’s Xiaohang Li wins Manasevit Young Investigator Award for research on III-nitrides and III-oxides,” Semiconductor Today
 - http://www.semiconductor-today.com/news_items/2018/apr/kaust_190418.shtml
13. “Controlling the crystal structure of gallium oxide,” Phys.org & KAUST Discovery
 - <https://discovery.kaust.edu.sa/en/article/509/controlling-the-crystal-structure>
 - <https://phys.org/news/2018-05-crystal-gallium-oxide.html>
14. “Diluted potassium hydroxide is all what it takes to boost AlGaN nanowire UV LEDs,” EE News LED Lighting
 - <http://www.eenewsled.com/news/diluted-potassium-hydroxide-all-what-it-takes-boost-algan-nanowire-uv-leds/page/0/1>
15. “KAUST Team Heats Up MOCVD,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/104053/KAUST_Team_Heats_Up_MOCVD

16. “Building crystals on a very hot surface,” Phys.org & KAUST Discovery
 - <https://phys.org/news/2018-04-crystals-hot-surface.html>
 - <https://discovery.kaust.edu.sa/en/article/507/building%20acrystals-on-a-very-hot-surface>
17. “Reducing the loss of light at the surface of semiconductor nanostructures,” Phys.org
 - <https://phys.org/news/2018-03-loss-surface-semiconductor-nanostructures.html>
18. “KAUST And SMI Show One-step Tuning Of Gallium Oxide Phases,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/103722/KAUST_shows_one-step_tuning_of_Gallium_Oxide_phases
19. “Cleaning nanowires to get out more light,” KAUST Discovery & Nanotech Now
 - <https://discovery.kaust.edu.sa/en/article/476/cleaning%20ananowires-to-get-out-more-light>
 - http://www.nanotech-now.com/news.cgi?story_id=55012
20. “Fine tuning boron content in nitride alloys,” Semiconductor Today
 - http://www.semiconductor-today.com/news_items/2018/feb/kaust_020218.shtml
21. “UESTC students visit CEMSE Laboratories during a one week Winter Camp at KAUST,” KAUST CEMSE
 - <https://cemse.kaust.edu.sa/Pages/UESTC%20students%20visit%20CEMSE.aspx>
22. “Taking control at the junction,” KAUST Discovery
 - <https://discovery.kaust.edu.sa/en/article/466/taking-control-at-the-junction>
23. “KAUST Team Cleans Nanowires For More Efficient UVLEDs,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/103117/KAUST_Team_Cleans_Nanowires_For_More_Efficient_UVLEDs
24. “KAUST/Georgia Tech team determines band alignment at BAlN/AlGaN heterojunction,” Semiconductor Today
 - http://www.semiconductor-today.com/news_items/2017/dec/kaust-georgiatech_151217.shtml
25. “KAUST Predicts Polarisation-free III-nitride Heterojunctions On C-plane,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/102958/KAUST_Predicts_Polarisation-free_III-nitride
26. “Researchers Determine Electronic Properties of Interface Between Two Wide Bandgap Semiconductors,” AZO Materials
 - https://www.azom.com/news.aspx?newsID=48416&lipi=urn%3Ali%3Apage%3Ad_flagship3_feed%3BT%2BLivMHRQqGdHkHtZ2wPbw%3D%3D
27. “Semiconductors with an aligned interface,” Phys.org & KAUST Discovery & Nanowerk
 - <https://phys.org/news/2017-11-semiconductors-aligned-interface.html>
 - <https://discovery.kaust.edu.sa/en/article/440/semiconductors-with-an-aligned-interface>
 - <https://www.nanowerk.com/nanotechnology-news/newsid=48604.php>
28. “Researchers Discover Unique BAlN Properties,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/102580/Researchers_discover_unique_BAlN_properties
29. “KAUST Team Reports Record-breaking UV LED Comms,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/102534/KAUST_team_reports_record-breaking_UV_LED_comms
30. “Keeping the heat out,” KAUST Discovery
 - <https://discovery.kaust.edu.sa/en/article/378/keeping-the-heat-out>
 - https://www.eurekalert.org/pub_releases/2017-07/kauo-kth070217.php

31. “Researchers Reveal Secrets of Metalorganic Preflow for AlN MOCVD Process,” Compound Semiconductor
 - https://compoundsemiconductor.net/article/101476/Researchers_Reveal_Secrets_Of_Metalorganic_Preflow_For_AlN_MOCVD_Process%7BfeatureExtra%7D
32. “Faculty Focus: Xiaohang Li,” KAUST News
 - <https://www.kaust.edu.sa/en/news/faculty-focus-xiaohang-li>
33. “KAUST Team Reveals Thermodynamic Disorder in GaN Nanowires,” Compound Semiconductor
 - <https://www.compoundsemiconductor.net/article/101402-kaust-team-reveals-thermodynamic-disorder-in-gan-based-nanowires.html>
34. “Thermodynamic disorder in GaN-based nanowires,” Nanowerk
 - <http://www.nanowerk.com/nanotechnology-news/newsid=46578.php>
35. “Researchers Simplify Fabrication Of Nanowire UV-LEDs On Silicon,” Compound Semiconductor, 2017
 - <https://www.compoundsemiconductor.net/article/101173-researchers-simplify-fabrication-of-nanowire-uv-leds-on-silicon.html>
36. “UV LEDs: solving the droop issue,” EE Times Europe
 - <http://www.electronics-eetimes.com/news/uv-leds-solving-droop-issue>
37. “KAUST Team Grows Droop-Free UV LEDs On Metal/Silicon Substrate,” Compound Semiconductor
 - <https://www.compoundsemiconductor.net/article/100915-kaust-team-grows-droop-free-uvleds-on-metalsilicon-substrate.html>
38. “Growing thicker, more boron rich BAlN,” Compound Semiconductor
 - <https://www.compoundsemiconductor.net/article/100877-growing-thicker,-more-boron-rich-baln.html>
39. “Sapphire substrates slash the cost of deep UV lasers,” **Editorial** of Compound Semiconductor
 - <http://www.compoundsemiconductor.net/pdf/magazines/2016/june2016.pdf>
40. “CloudSolar Helps Renewable Energy Fans Who Can’t Install Their Own Solar Panels,” Techcrunch
 - <http://techcrunch.com/2015/03/26/cloudsolar/>
41. “The Entrepreneur Who Wants You to Share Your Roof Real Estate,” Inc.
 - <https://www.inc.com/david-whitford/built-from-passion-yeloha.html>
42. “What the Energy Sector Can Learn From Uber” Wall Street Journal
 - <https://blogs.wsj.com/experts/2015/03/31/what-the-energy-sector-can-learn-from-uber/>
43. “CloudSolar wants to give everyone a piece of the solar power movement” WBUR
 - <https://www.bizjournals.com/boston/blog/startups/2015/03/cloudsolar-wants-to-give-everyone-a-piece-of-the.html>
44. “Startup Gives New Incentive To Use Solar Energy” WBUR
 - <http://www.wbur.org/hereandnow/2015/03/31/cloudsolar-energy-startup>
45. “Solar Energy Startup Launches Campaign to Bring Hassle-Free Solar Energy to Everyone” Business Wire
 - <http://www.businesswire.com/news/home/20150318005058/en/Solar-Energy-Startup-Launches-Campaign-Bring-Hassle-Free>
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 - <https://gigaom.com/2015/03/04/do-you-want-to-own-a-solar-panel-in-a-farm-far-away/>
47. “Startup selling solar panels ‘in the cloud,’ not on your roof,” Boston Globe
 - <https://www.bostonglobe.com/business/2015/03/06/startup-selling-solar-panels-cloud-not-your-roof/ZIISLORzszmpm0nwYRoyFM/story.html>

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 - <http://www.compoundsemiconductor.net/article/95412-georgia-tech-team-demonstrates-deep-uv-lasers-on-sapphire.html>
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 - <http://photonicsociety.org/newsletters/oct14/Careers-Fellowship.pdf>
50. “Guest Blog: UV LED for Revolutionizing Water Purification,” Edison Innovation Foundation
 - <http://www.edisonmuckers.org/uv-led-for-revolutionizing-water-purification/>
51. “Graduate Engineering Student Make Strong Showing at GT Research and Innovation Conference,” School of Engineering of Georgia Tech
 - <http://www.coe.gatech.edu/news/graduate-engineering-students-make-strong-showing-gt-research-and-innovation-conference>
52. “SPIE announces 2013 scholarship recipients,” SPIE News
 - <http://spie.org/about-spie/press-room/press-releases/2013-spie-scholarships-7-19-2013>
53. “Xiaohang Li Tapped for Prestigious SPIE Scholarship,” Georgia Tech
 - <https://www.ece.gatech.edu/news/215541/xiaohang-li-tapped-prestigious-spie-scholarship>
54. “2012 Winning Companies” Lehigh University
 - <http://lehighbakerinstitute.com/2013/05/09/2012-winning-companies/>

Scientific Community Leadership Experience

- | | |
|---|--------------|
| 7) Vice Chair of Western Saudi Arabia Chapter, IEEE Electron Devices Society | 2018-Present |
| 8) President of Lehigh University Student Chapter, IEEE Photonics Society | 2010-2011 |
| ○ Significantly increased the number of members and events | |
| 9) Advisor of Lehigh University Student Chapter, SPIE | 2010-2011 |
| 10) Treasurer of Lehigh University Student Chapter, IEEE Photonics Society | 2009-2010 |

Professional Membership

11) OSA, IEEE, IEEE Photonics, SPIE, MRS

Research Experience

1. Feb 16 – Present, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

Principal Investigator (PI), Advanced Semiconductor Laboratory

- ✓ **Research and development of extremely high temperature MOCVD with low premature reaction rate**
 - “Induction-heating MOCVD reactor with significantly improved heating efficiency and reduced harmful magnetic coupling,” J. Cryst. Growth 488, 16 (2018).
- ✓ **Growth and characterization of Ga₂O₃ with different phases by MOCVD and PLD**
 - H. Sun, K.-H. Li, C. G. T. Castanedo, S. Okur, G. S. Tompa, T. Salagaj, S. Lopatin, A. Genovese, and X. Li*, “HCl flow-induced phase change of α-, β- and ε-Ga₂O₃ films grown by MOCVD,” Cryst. Growth Des. 18, 2370 (2018).
 - H. Sun, C. G. T. Castanedo, K. Liu, K.-H. Li, W. Guo, R. Lin, X. Liu, J. Li, and X. Li*, “Valence and conduction band offsets of β-Ga₂O₃/AlN heterojunction,” Appl. Phys. Lett. 111 (16), 162105 (2017).
- ✓ **Study of TMAI preflow for AlN MOCVD process on sapphire substrate**
 - “Influence of TMAI preflow on AlN epitaxy on sapphire,” Appl. Phys. Lett. 110, 192106 (2017)
 - “Structural properties, crystal quality and growth modes of MOCVD-grown AlN with TMAI pretreatment of sapphire substrate,” J. Phys. D: Appl. Phys. 50, 395101 (2017)

- ✓ **Polarization-free and very-large polarization III-N heterojunction on c-plane**
 - "Wurtzite BAlN and BGaN alloys for heterointerface polarization engineering," *Appl. Phys. Lett.* 111 (22), 222106 (2017)
 - "Structural and Electronic Properties of Wurtzite B_xAl_{1-x}N from First-Principles Calculations", *Phys. Status Solidi B*, 254 (8), 1600749 (2017)
- ✓ **Interface study of emerging semiconductor heterojunction**
 - "Valence and conduction band offsets of β-Ga₂O₃/AlN heterojunction," *Appl. Phys. Lett.* 111 (16), 162105 (2017)
 - "Band alignment of B_{0.14}Al_{0.86}N / Al_{0.7}Ga_{0.3}N heterojunction," *Appl. Phys. Lett.* 111 (12), 122106 (2017)
- ✓ **Thermodynamics study of GaN and AlGaN nanowires**
 - "Thermodynamic photoinduced disorder in AlGaN nanowires," *AIP Adv.* 7, 125113 (2017)
 - "Photoinduced entropy of InGaN/GaN p-i-n double-heterostructure nanowires," *Appl. Phys. Lett.* 110, 161110 (2017)
- ✓ **Growth, fabrication, and optimization of UV LED**
 - "Surface-Passivated AlGaN Nanowires for Enhanced Luminescence of Ultraviolet Light Emitting Diodes," *ACS Photonics*, in press: DOI: 10.1021/acsp Photonics.7b01235
 - "Significant internal quantum efficiency enhancement of GaN/AlGaN multiple quantum wells emitting at ~350 nm via step quantum well structure design," *J. Phys. D: Appl. Phys.* 50, 245101 (2017)
 - "Self-planarized quantum-disks nanowires ultraviolet-B emitter utilizing pendeo-epitaxy", *Nanoscale* 9, 7805 (2017)
 - "Droop-free Al_xGa_{1-x}N/Al_yGa_{1-y}N quantum-disks-in-nanowires ultraviolet LED emitting at 337 nm on metal/silicon substrates", *Opt. Express* 25, 2 (2017)
- ✓ **Characterization of BAlN and layers BAlN/AlGaN superlattice grown by MOCVD**
 - "Microstructure revealing and dislocation behavior in BAlN/AlGaN heterostructures," *Appl. Phys. Express* 11, 011001 (2018)
 - "Crystal structure of BAlN thin films: effect of boron concentration in the gas flow," *J. Cryst. Growth* 475, 334 (2017)
- ✓ **Bionic photonics**
 - "Biomimetic spiral grating for stable and highly efficient absorption in crystalline silicon thin-film solar cells," *Opt. Express* 25(20), A922-A931 (2017)
- ✓ **Investigation of nanostructure for light emitting devices**
 - "Spatially resolved investigation of competing nanocluster emission in quantum-disks-in-nanowires structure characterized by nanoscale cathodoluminescence," *J. Nanophoton.* 11(2), 026015 (2017)
- ✓ **Non-line-of-sight communication based on UV devices**
 - "71-Mbit/s Ultraviolet-B LED Communication Link based on 8-QAM-OFDM Modulation", *Opt. Express* 25 (19), 23267 (2017)
- ✓ **Set up state-of-the-art research equipment**
 - Led the university, vendor, and company teams to install, test and calibrate \$2M state-of-the-art semiconductor research equipment including TNS MOCVD and excimer laser from scratch

2. Jul 11 – Aug 15, Georgia Institute of Technology, Atlanta, GA

Research Assistant under Prof Russell Dupuis, Material and Device Studies of III-Nitride Semiconductors

- ✓ **Low temperature MOCVD growth of high quality AlN templates on sapphire substrates**
 - “Temperature dependence of crystalline quality of AlN layer grown on sapphire substrate by metalorganic chemical vapor deposition,” *J. Cryst. Growth* 414, 76-78 (2015)
 - “Growth of high-quality AlN layer on sapphire substrate at relatively low temperatures by metalorganic chemical vapor deposition,” *Phys. Status Solidi B* 252(5), 1089 (2015).
- ✓ **Growth of BAlN alloys by MOCVD**
 - “100-nm thick single-phase wurtzite BAlN films with boron contents over 10%,” *Phys. Status Solidi B* 254 (8), 1600699 (2017)
- ✓ **III-nitride deep UV edge-emitting laser**
 - “Demonstration of transverse-magnetic dominant deep-ultraviolet stimulated emission from AlGa_N multiple-quantum-well lasers on sapphire substrates,” *Appl. Phys. Lett.* 106, 041115 (2015)
 - “Low-threshold stimulated emission at 249 nm and 256 nm from AlGa_N-based multiple-quantum-well lasers grown on sapphire substrates,” *Appl. Phys. Lett.* 105, 141106 (2014)
 - “AlGa_N-Based Vertical Injection Laser Diodes Using Inverse Tapered p-Waveguide for Efficient Hole Transport,” *IEEE J. of Quantum Electron.* 50, 166 (2014)
 - “Optically pumped AlGa_N quantum-well lasers at sub-250 nm grown by MOCVD on AlN substrates,” *Phys. Status Solidi C* 11, 258 (2014)
 - “Stimulated emission at 257 nm from AlGa_N/AlN heterostructure on AlN substrate,” *Phys. Status Solidi A* 210, 9, 1768 (2013)
 - “Sub-250 nm low-threshold deep-ultraviolet AlGa_N-based heterostructure laser employing HfO₂/SiO₂ dielectric mirrors,” *Appl. Phys. Lett.* 103, 211103 (2013)
 - “Deep-Ultraviolet Lasing at 243 nm from Photo-Pumped AlGa_N/AlN Heterostructure on AlN Substrate,” *Appl. Phys. Lett.* 102, 101110 (2013).
- ✓ **III-nitride deep UV surface-emitting laser**
 - “Onset of surface stimulated emission at 260 nm from AlGa_N multiple quantum wells,” *Appl. Phys. Lett.* 107, 241109 (2015)
- ✓ **Studies of structure and optical properties of AlGa_N alloys**
 - “Structural and optical investigations of AlGa_N MQWs grown on a relaxed AlGa_N buffer on AlN templates for emission at 280 nm,” *J. Cryst. Growth* 432, 37 (2015)
- ✓ **P-type doping studies of Al-rich AlGa_N layers**
 - “Theoretical analysis of strategies for improving p-type conductivity in wurtzite III-nitride devices for high power opto and microelectronic applications,” *Phys. Status Solidi C* 11, 828 (2014)
- ✓ **Set up state-of-the-art research equipment**
 - Led the university, vendor, and company teams to install, test and calibrate \$2M state-of-the-art semiconductor research equipment including AIXTRON MOCVD and Coherent excimer laser from scratch

3. Jul 08 – May 11, Lehigh University, Bethlehem, PA

Research Assistant under Prof Nelson Tansu, Material and Device Studies of III-Nitride Semiconductors

- ✓ **Light extraction efficiency of LED and OLED**
 - “Light Extraction Efficiency Enhancement of III-Nitride Light-Emitting Diodes by using 2-D Close-Packed TiO₂ Microsphere Arrays,” *IEEE J. Display Technol.* 9, 5, 324 (2013)
 - “Light extraction of organic light emitting diodes using defective hexagonal-close-packed array,” *Adv. Funct. Mater.* 22, 3454 (2012)

- “Light Extraction Efficiency and Radiation Patterns of III-Nitride Light-Emitting Diodes with Colloidal Microlens Arrays with Various Aspect Ratios,” *IEEE Photon. J.* 3, 3, 489 (2011)
- ✓ **Investigation of new materials for light emitting devices**
 - “First-Principle Electronic Properties of Dilute-As GaNAs Alloy for Visible Light Emitters,” *IEEE J. Display Technol.* 9, 4, 272 (2013)
 - “Band Structure Calculation of Dilute-As GaNAs by First Principle,” *Proc. of the SPIE Photonics West 7597, 75970H1* (2010)
- ✓ **MOCVD growth of GaN template on nanopatterned sapphire**
 - “Dislocation structure of GaN films grown on planar and nano-patterned sapphire,” *J. Appl. Phys.* 110, 053505 (2011)
 - “Abbreviated MOVPE Nucleation Studies of III-Nitride Light-Emitting Diodes on Nano-Patterned Sapphire,” *J. Crys. Growth* 312, 1311 (2010)
- ✓ **High efficiency quantum well design for InGaN LED**
 - “Breakthrough in Photonics 2009: III-N Photonics,” *IEEE Photon. J.* 2, 236 (2010).
 - “Design and Characteristics of Staggered InGaN Quantum Well Light-Emitting Diodes in Green Spectral Regimes” *IET Optoelectron.* 3, 283 (2009)
 - “Growths of Staggered InGaN Quantum Wells Light-Emitting Diodes Emitting at 520-525 nm Employing Graded Growth-Temperature Profile,” *Appl. Phys. Lett.* 95, 061104, (2009)
- ✓ **AlInN growth by MOCVD**
 - “Metalorganic Vapor Phase Epitaxy and Characterizations of Nearly-Lattice-Matched AlInN Alloys on GaN / Sapphire Templates and Free-Standing GaN Substrates,” *J. Cryst. Growth* 340, 66 (2011)
- ✓ **Novel quantum wells for phosphor-free white light LEDs**
 - U.S. Patent #8569737: Broadband light emitting diodes and method for producing same (Issued)

Research Funding Programs

1. **PI**, KAUST-Asia Wide Bandgap Semiconductor Workshop; Source of Support: KAUST Workshop Support; Award Amount: \$35,000; My Portion: \$35,000; Period: 08/01/2019-12/31/2019
2. **PI**, Collaborative development of B-containing III-nitride semiconductor ternary alloys for solid-state neutron detectors; Source of Support: Competitive Research Grant (CRG); Award Amount: \$840,000; My Portion: \$575,000; Period: 04/01/2019-03/31/2022
3. **Co-PI**, Research and development on the epitaxial structure of deep-UV LED with high internal quantum efficiency; Source of Support: Guangdong Academy of Sciences; Award Amount: ¥ 300,000 (\$42,361); My Portion: ¥ 100,000 (\$14,120); Period: 01/01/2019-12/31/2020.
4. **PI**, Investigation of Controlled Bending Strain for Enhanced Deep UV LED Efficiency; Source of Support: Competitive Research Grant (CRG); Award Amount: \$840,000; My Portion: \$530,000; Period: 04/01/2018-03/31/2021
5. **Co-PI**, Optical field manipulation and efficient electric injection of AlGaIn based deep ultraviolet lasers; Source of Support: National Natural Science Foundation (China); Award Amount: ¥670,000; My Portion: ¥200,000; Period: 01/01/2018-12/31/2021
6. **PI**, Fundamental studies of BAlN and B GaN wide bandgap semiconductors; Source of Support: GCC Research Council; Award Amount: \$240,000; My Portion: \$240,000; Period: 01/01/2017-12/31/2019
7. **Co-PI**, Low cost, high stability and high efficiency monolithic solar hydrogen fuel nano-generator; Source of Support: SABIC; Award Amount: \$445,178; My Portion: \$0; Period: 09/01/2016-08/31/2018

8. **PI**, KAUST Baseline Fund; Source of Support: KAUST; Award Amount: \$2,400,000; My Portion: \$2,400,000; Period: 01/31/2016-01/30/2022
9. **PI**, KAUST Startup Fund; Source of Support: KAUST; Award Amount: \$700,000; My Portion: \$700,000; Period: 01/31/2016-01/31/2018
10. **PI**, KAUST Startup Chemical Fund; Source of Support: KAUST; Award Amount: \$100,000; My Portion: \$100,000; Period: 01/31/2016-01/31/2018
Below are programs in which I was one of the primary researchers before I became a faculty at KAUST:
11. Collaborative Research: Fundamental Studies of the Properties of B-III-N Wide-Bandgap Semiconductor Alloys; PI: Russell D. Dupuis; Source of Support: NSF; Award Amount: \$300,000; Period: 07/01/2014-06/30/2017
12. Advanced Middle-UV Coherent Optical Sources; PI: Russell D. Dupuis; Source of Support: DARPA; Award Amount: \$2,000,000; Period: 2010-2013
13. High Efficiency Organic Lighting Emitting Devices for Lighting; PI: Nelson Tansu; Source of Support: DOE; Total Award Amount: \$950,000; Period: 07/01/2009-06/30/2013
14. Investigation of Microsphere Convective Deposition for Photonic, Biological, and Materials Applications; PI: Nelson Tansu; Source of Support: NSF; Award Amount: \$300,000; Period: 08/15/2008-08/14/2012
15. Nanostructure Engineering of III-Nitride Active Regions for High- Performance Visible Emitters and Lasers; PI: Nelson Tansu; Source of Support: NSF; Award Amount: \$ 270,000; Period: 07/01/2007-06/30/2011
16. FRG: Nano-patterning of Sapphire Substrates for Improved III-Nitride Growth; PI: Nelson Tansu; Source of Support: NSF; Award Amount: \$ 320,000; Period: 08/15/2007-08/14/2010

Consulting/Mentoring Experience

- **Consultant, Community Consulting Team, Atlanta, GA** Jan 2014-Jul 2014
 - Took major initiative and responsibility in a team to consult a major nonprofit for child safety, Safe Kid Georgia under Children's Healthcare of Atlanta, to transform its structure to better fit in the digital age
 - Interviewed staff and attended board meeting to understand existing inefficiency
 - Researched best-in-industry practices which are transformed into actionable plans based on client's budget
 - Result: the solutions were well acknowledged and adopted by the client and its board, which are expected to double the client budget and operation efficiency within three years by extensive automation
- 12) **Participant of Insight Engineering & Science Program, McKinsey & Company** Summer 2013
 - This is an extremely selective program, wherein 40 participants were selected from 1,000+ applicants from top U.S. Ph.D. programs
 - Worked with McK consultants to help a server manufacturer to identify market entry strategy of a new technology to achieve its maximum potential
 - Analyzed competition landscape to seek the best exit
 - Surveyed client executives to understand internal constraints
- 13) **Participant of Bridge to BCG Program, Boston Consulting Group** Summer 2013
 - Worked with top candidates and BCG consultants to help a cosmetic manufacturer to improve bottom line and market share
 - Analyzed SKUs to streamline the product mix to cut undesired cost
 - Proposed new in-store display strategy to increase market share

Entrepreneurship Experience

- **Cofounder, CloudSolar, Boston, MA, USA** 2014-2016
 - Invent new models to greatly lower the barrier of investment for organizations and individuals in solar energy
 - Manage daily activities of 13 people in the utility & regulation, engineering & procurement & construction, back-end & front-end web development, and marketing groups
 - Analyze federal and state regulations and propose ways to liquidate the energy credits for maximized revenue
 - Take charge of connecting and building relations with venture capitals in greater Boston area
 - Result: the company is growing rapidly and has been selected by Harvard i-Lab VIP. Successfully launched crowd-funding campaign with the first month proceeds of ~\$500,000 with customers from all over the world and the US. Covered by major media including Wall Street Journal, Techcrunch, CNBC, NPR, Yahoo Finance, Boston Globe etc. Selected to be incubated at the Innovation Labs, Harvard University
- **Advisor, Flow Medical, Atlanta, GA, USA** 2013-2016
 - Incubated at the Innovation Labs, Harvard University
 - Help founding team lay out strategies of innovation, prototyping, production, fund raising and marketing
 - Introduce key contacts for business development and fund raising
 - Result: the team has bypassed the initial ‘confusing’ stage and is actively building the products for fund raising. Besides, the team has won the most competitive award for social entrepreneurship at Georgia Tech
- **Cofounder, UVNITY, Atlanta, GA, USA** 2012-2014
 - Invent some of the first products and technologies to revolutionize portable water purification
 - Work with strategic partners like Atlanta Department of Watershed Management for technology development
 - Use lean startup strategy to conduct intensive customer discovery
 - Manage a 20-people multi-disciplinary team on marketing, finance, legal, sales, strategy, manufacturing etc
 - Result: the business and go-to-market strategy were established within a short period of time and the business has received many prestigious business awards in Atlanta and other places. Selected to be incubated at Advanced Technology Development Center (ATDC), Georgia Tech

Service & Leadership at KAUST

1. **Member, Search Committee, Electrical Engineering Program, CEMSE Division, KAUST**
May 2020-Present
The faculty search committee is in charge of hiring strategy, and attracting and evaluating applicants. In this period, I have co-organized the first faculty recruiting webinar of the program to perspective candidates from top-ranking universities in North America.
2. **Member, User Committee, Imaging & Characterization Core Lab, KAUST**
February 2020-Present
The user committee of the Imaging & Characterization Core Labs comprises four KAUST faculty. It connects the operation with faculty and advises the Core Lab leadership on important issues including procurement and maintenance.
3. **Advisor and Translator, Coronavirus Task Force, KAUST**
January-March 2020

This is an informal role. I have alerted the university about the seriousness of the novel coronavirus when the outbreak started in Wuhan which help form the beginning of the KAUST response. I have been asked by the Coronavirus Task Force to monitor local situations and social media. I have been asked by the Coronavirus Task Force to translate the quarantine and campus entry documents from English to Chinese. I have been asked to help form evidences about the positive values of mask wearing, which help make mask wearing mandatory in public indoor spaces on campus.

4. Lead, Task Force for Strategy about China, KAUST

November 2019-Present

This is an informal role. As the leading member, I work with other faculty from the three academic divisions to develop strategy about opportunities in China related to student and faculty recruitment, marketing, advertisement, branches, and joint degree. I have presented to and discussed with the academic leadership and the relevant departments ranging from Admission, International Office to Global Branding and Communication.

5. Member, University Academic Council, KAUST

November 2017-November 2019

The Academic Council, on behalf of the Professorial Faculty, provides counsel and recommendations to the President regarding matters pertinent to the academic life of the University. Other members and I have successfully pushed for the formation of the Air Quality Task Force leading to the air quality monitor installation and relevant policy changes depending on the air quality.

6. Member, Electrical Engineering Curriculum Reform Committee, KAUST

November 2018-February 2019

The committee aims to propose meaningful changes to structures of core courses and qualify exam.

7. Founding Task Force, Applied Physics Program, KAUST

2017-2019

As the only member of the founding task force from the Electrical Engineering program, I work with faculty from other programs in the task force to create the Applied Physics Program.

8. KAUST CEMSE and EE websites, KAUST

September 2016

I have advised the contractor about how to improve the CEMSE and EE websites.

Service & Leadership: Conference Committee

1. Co-Chair of Wide Bandgap Electronic Materials Symposium, International Conference on Materials for Advanced Technologies (ICMAT)

Singapore, July 4-9, 2021

As the symposium co-chair, I solicit abstract submissions to the conference, review abstract submission, and invite renowned speakers.

2. Program Committee, China International Forum on Solid State Lighting (SSL-China)

Shenzhen, Guangdong, China, November 21-23, 2020

As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

3. Program Committee, International Forum on Wide Bandgap Semiconductors (IFWS)

Shenzhen, Guangdong, China, November 21-23, 2020

As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

4. Program Committee, China International Forum on Solid State Lighting (SSL-China)

Shenzhen, Guangdong, China, November 23-25, 2019

- As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
- 5. Program Committee, International Forum on Wide Bandgap Semiconductors (IFWS)**
Shenzhen, Guangdong, China, November 23-25, 2019
As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
 - 6. International Advisory Committee, International Symposium on Semiconductor Materials and Devices (ISSMD)**
Jalandhar, India, October 31-November 2, 2020
As a committee member, I advise on the technical program and conference organization, and solicit abstract submissions.
 - 7. International Program Committee, International Workshop on Nitride Semiconductors (IWN)**
Program: Novel Materials and Nano
Berlin, Germany, August 23-28, 2020
As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
 - 8. Program Committee, National MOCVD Conference**
Tunxi, Anhui, China, August 4-7, 2020
As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
 - 9. Technical Committee, Electronic Material Conference (EMC)**
Columbus, OH, USA, June 24-26, 2020
As an invited organizer in the III-nitride area, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
 - 10. Program Committee, International Symposium on the Growth of III-Nitrides (ISGN-8)**
San Diego, CA, USA, May 31-June 4, 2020
As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
 - 11. Program Committee, International Conference on Optics-Photonics Design and Fabrication (ODF'20)**
Taoyuan, Taiwan, China, June 2-4, 2020
As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
 - 12. Chair of Program Committee, KAUST-Asia Workshop on Wide Bandgap Semiconductor (KAWS)**
KAUST, Saudi Arabia, November 28-December 3, 2019
As the main organizer and the program committee chair of the workshop, I have built the framework of the workshop and put together the program including invited/plenary speakers and poster session. It is the first conference in KAUST's history where majority of attendees paid all of the expenses and conference registration fees.
 - 13. Program Committee, China International Forum on Solid State Lighting (SSL-China)**
Shenzhen, Guangdong, China, November 25-27, 2019
As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.
 - 14. Program Committee, International Forum on Wide Bandgap Semiconductors (IFWS)**
Shenzhen, Guangdong, China, November 25-27, 2019

As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

15. Program Committee, US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE)
Granby, Colorado, USA, July 21-August 2, 2019

As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

16. Program Committee, International Summer School on Crystal Growth (ISSCG)

Keystone, Colorado, USA, July 21-August 2, 2019

As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

17. Technical Committee, Electronic Material Conference (EMC)

Ann Arbor, MI, USA, June 26-28, 2019

As an invited organizer in the III-nitride area, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

18. Organizing Committee, International Workshop on UV Materials and Devices (IWUMD)

Kunming, China, December 9-12, 2018

**19. International Program Committee, International Workshop on Nitride Semiconductors (IWN)
Program: Crystal Growth**

Kanazawa, Japan, November 13-17, 2018

As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

20. Technical Committee, Electronic Material Conference (EMC) 2018

Santa Barbara, CA, USA, June 27-29, 2018

As an invited organizer in the III-nitride area, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

21. International Program Committee, International Conference of Metalorganic Vapor Phase Epitaxy (ICMOVPE)

Nara, Japan, June 3-8, 2018

As a committee member, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

22. Technical Committee, Electronic Material Conference (EMC) 2017

South Bend, IN, USA, June 28-30, 2017

As an invited organizer in the III-nitride area, I solicit abstract submissions to the conference, review abstract submission and participate in the establishing the technical schedule.

23. Technical co-Chair, KAUST-US NSF Research Conference on Interactive Electronics 2017

KAUST, Saudi Arabia, January 30-February 1, 2017

As the technical co-chair, I co-organized the conference including solicited speakers and organized the poster competition.

Conference Session Chairing

1. International Conference on Nitride Semiconductors (ICNS)

Seattle, WA, USA, July 2019

Session Title: BN Epitaxy

2. International Conference on Emerging Electronics (ICEE)

Bangalore, India, December 2018

Session Title: WBG: Growth & Characterization

3. International Conference on Metalorganic Vapor Phase Epitaxy

Nara, Japan, June 2018

Session Title: 2D Materials

4. International Workshop UV Materials and Devices (IWUMD)

Fukuoka, Japan, November 2017

Session Title: Material Growth

5. SPIE Optics and Photonics

San Diego, CA, USA, August 2017

Session Title: UV and Higher Energy Materials and Light Sources

6. Electronic Material Conference (EMC)

South Bend, IN, USA, June 2017

Session Title: Nitride Wide Bandgap Epitaxy

7. International Workshop on Nitride Semiconductors (IWN)

Orlando, FL, USA, October 2016

Session Title: Epitaxial Growth of (Al,Ga)N

Service & Leadership: Professional Society Committee

1. Siegman School Selection Committee, the Optical Society (OSA) Foundation, 2019

Service & Leadership: Project Review

1. Future Research Frontiers, Huazhong University of Science and Technology (HUST), 2018

Service & Leadership: Academic Thesis Committee

Doctoral thesis

1. Committee member, Ida Marie Eriksdatter Høiaas, Faculty of Information Technology and Electrical Engineering, Norwegian University of Science and Technology (NUST), August 2020
Thesis title: Semiconductor-graphene hybrid structures and optoelectronic devices
Advisor: Prof. Helge Weman
2. Committee member, Shaobo Tu, Materials Science and Technology, KAUST, May 2020
Thesis title: Design and synthesis of mxene derived materials for advanced electronics and energy harvesting applications
Advisor: Prof. Xixiang Zhang
3. Committee member, Yan Wen, Materials Science and Technology, KAUST, May 2020
Thesis title: Spin Current Detection and Current Induced Switching in Magnetic Multilayers
Advisor: Prof. Xixiang Zhang
4. Committee member, Sherjeel Khan, Electrical Engineering, KAUST, May 2019
Proposal title: Integration Strategy for Standalone Compliant Interactive Systems for Add-on Electronics
Advisor: Prof. Muhammad Hussain
5. Committee member, Yi Tian, Electrical Engineering, KAUST, April 2019
Proposal title: Multi-scale and Complex Metallic Structure Networks for Novel Solar Energy Harvesting-Conversion Applications
Advisor: Prof. Andrea Fratalocchi
6. Committee member, Valerio Mazzone, Electrical Engineering, KAUST, April 2019
Proposal title: Complex photonic materials for cryptography, holograms and memories
Advisor: Prof. Andrea Fratalocchi
7. Committee member, Ehson Fawad Nasir, Electrical Engineering, KAUST, October 2018
Thesis title: Mid-IR Laser Absorption Diagnostics for Shock Tube and Rapid Compression Machine Experiments
Advisor: Prof. Aamir Farooq

8. Committee member, Idris A. Ajia, Material Science and Engineering, KAUST, April 2018
Thesis title: Optical and temporal carrier dynamics investigations of III-nitrides for semiconductor lighting
Advisor: Prof. Iman Roqan
9. Committee member, Bilal Janjua, Electrical Engineering, KAUST, April 2017
Thesis title: Nitride-based quantum-confined structures for ultraviolet-visible optical devices on silicon substrates
Advisor: Prof. Boon Ooi
10. Committee member, Aftab Hussain, Electrical Engineering, KAUST, November 2016
Thesis title: Extending Moore's Law for silicon CMOS using more-Moore and more-than-Moore technologies
Advisor: Prof. Muhammad Hussain
11. Committee member, Hang Li, Materials Science and Engineering, KAUST, June 2016
Thesis title: Spin orbit torque in ferromagnetic semiconductors
Advisor: Prof. Aurelien Manchon

Doctoral proposal

12. Committee member, Saravanan Yuvaraja, Electrical Engineering, KAUST, June 2020
Thesis title: Organic Electronics: An innovative 2 in 1 solution to tackle environmental pollution
Advisor: Prof. Khaled Salama
13. Committee chair, Ronghui Lin, Electrical Engineering, KAUST, April 2019
Thesis title: Nanophotonics for visible and UV applications
Advisor: Prof. Xiaohang Li
14. Committee member, Shaobo Tu, Materials Science and Technology, KAUST, March 2019
Thesis title: Design and synthesis of mxene derived materials for advanced electronics and energy harvesting applications
Advisor: Prof. Xixiang Zhang
15. Committee member, Yan Wen, Materials Science and Technology, KAUST, November 2018
Thesis title: Spin Current Detection in Metallic Non-magnetic/Antiferromagnetic Bilayer
Advisor: Prof. Xixiang Zhang
16. Committee member, Yi Tian, Electrical Engineering, KAUST, July 2018
Proposal title: 3D Multi-Scale Complex Metal-Dielectric Junction Matrix for Carbon-Free Energy Harvesting-Conversion Applications
Advisor: Prof. Andrea Fratalocchi
17. Committee member, Sherjeel Khan, Electrical Engineering, KAUST, May 2018
Proposal title: Integration Strategy for Standalone Compliant Interactive Systems for Add-on Electronics
Advisor: Prof. Muhammad Hussain
18. Committee member, Valerio Mazzone, Electrical Engineering, KAUST, April 2018
Proposal title: Complex photonic materials for cryptography
Advisor: Prof. Andrea Fratalocchi
19. Committee member, Areej Aljarb, Materials Science and Engineering, KAUST, December 2017
Proposal title: Controlling the Orientation of 2D Transition Metal Dichalcogenides on Different Substrate
Advisor: Prof. Lain-Jong (Lance) Li
20. Committee member, Bidoor Alsaif, Electrical Engineering, KAUST, June 2017

Proposal title: High-Resolution and High-Sensitivity Spectroscopy in the Mid-Infrared Region for Gas sensing

Advisor: Prof. Aamir Farooq

Master thesis

21. Committee chair, Ahmad Al Sulami, Electrical Engineering, KAUST, April 2020
Thesis title: A First Principle Investigation of Band Alignment in Emerging III-Nitride Semiconductors
Advisor: Prof. Xiaohang Li
22. Committee member, Marim Hakami, Materials Science and Technology, KAUST, June 2019
Thesis title: Graphene Growth by Chemical Vapor Deposition
Advisor: Prof. Pedro Costa
23. Committee chair, Feras Alqatari, Materials Science and Technology, KAUST, April 2019
Thesis title: Theoretical and Experimental Studies of Optical Properties of BAlN and BAlN Alloys
Advisor: Prof. Xiaohang Li
24. Committee member, Chen Gong, Materials Science and Technology, KAUST, June 2018
Thesis title: The effect of geometric confinement on the formation and stability of skyrmionic bubbles
Advisor: Prof. Xixiang Zhang
25. Committee member, Yahya Zakaria, Materials Science and Technology, Qatar University, May 2017
Thesis title: Er-doped III-nitride Semiconductors
Advisor: Prof. Talal Al Tahtamouni

Service & Leadership: Student Engagement and Recruiting

1. **KAUST Gifted Student Programs Engagement Event** Phoenix, AZ, Jan 2018
I joined some other KAUST faculty to engage and mentor the 500+ students KAUST has sponsored who study for bachelor degree in the US.
2. **KAUST Gifted Student Programs Engagement Event** Atlanta, GA, Jan 2017
I joined some other KAUST faculty to engage and mentor the 500+ students KAUST has sponsored who study for bachelor degree in the US.
3. **Organizer of Undergraduate Student Winter Camp at KAUST** Oct 2017-Feb 2018
I initiated and organized the winter camp for 22 undergraduate students and 2 staffers from University of Electronic Science and Technology of China (UESTC) to visit KAUST for a week in Feb 2018. It is the first visiting program where the students cover the costs to come to KAUST since KAUST was founded.
4. **Advisor of Chinese Social Networks for KAUST** Oct 2017-Present
I advise and make plan for the KAUST Admission Office to execute the social network strategy.
5. **Created and operate admin platform of Wechat for Electrophysics Track** May 2016-Oct 2017
Wechat is the largest social media platform in China. I created the first “Admin Platform” for electrophysics track to post announcement to recruit students.
6. **Manage KAUST’s largest online community in China** Oct 2015-Present
KAUST Tieba is the largest online forum of perspective KAUST Chinese students for full-time and intern positions. The students post all kinds of questions from living, studying to researching at KAUST. I have answered numerous questions, which has encouraged numerous students, postdocs, and staff to apply to KAUST.
Link: <http://tieba.baidu.com/f?kw=kaust&ie=utf-8>
7. **KAUST Microelectronics Winter Camp** Sept 2018-Present

I have been part of the camp established by Prof Muhammad Hussain to establish the school to attract the students all over the world to join the microelectronics research at KAUST, including recruiting students, teaching, organizing events, etc.

8. KAUST Photonics Summer School Mar 2016-Present

I have worked with Prof Andrea Fratalocchi to establish the camp to attract the students all over the world to join the photonics research at KAUST, including recruiting students, teaching, organizing events, etc.

9. KAUST blog website Jul 2016-Oct 2016

I have worked with KAUST Process & Technology Department (IT) to improve and streamline the designs and structures of blog websites.

10. Building UESTC student pipeline Dec 2015-Present

UESTC has top-ranked Electrical Engineering related majors in China. I have built the student pipeline that has landed more than 15 MS/PhD and PhD students at KAUST and dozens of visiting students.

Journal Reviewing

1. ACS Applied Electronic Materials, American Chemical Society (ACS)
2. ACS Applied Materials & Interfaces, American Chemical Society (ACS)
3. ACS Materials Letters, American Chemical Society (ACS)
4. ACS Nano, American Chemical Society (ACS)
5. Applied Physics Letter, American Institute of Physics (AIP)
6. Applied Physics Express, Japan Society of Applied Physics
7. Applied Nanoscience, Springer
8. Applied Surface Science, Elsevier
9. IEEE Electron Device Letters, IEEE
10. IEEE Journal of Quantum Electronics, IEEE
11. IEEE Journal of Selected Topics in Quantum Electronics, IEEE
12. IEEE Photonics Journal, IEEE
13. IEEE Photonics Technology Letters, IEEE
14. IEEE Transactions on Electron Devices, IEEE
15. Journal of Applied Physics, American Institute of Physics (AIP)
16. Journal of Crystal Growth, Elsevier
17. Journal of Materials Chemistry C, Royal Society of Chemistry
18. Journal of Nanophotonics, SPIE
19. Materials Science in Semiconductor Processing, Elsevier
20. Nature Photonics, Nature Publication Group (NPG)
21. Nanoscale, Royal Society of Chemistry
22. Nanotechnology, Institute of Physics
23. Nano-Micro Letters, Springer
24. Optics Express, OSA Publishing
25. Optical Materials, Elsevier
26. Optical and Quantum Electronics, Springer
27. Photonics Research, OSA Publishing
28. Physica Status Solidi B, Wiley
29. Physica Status Solidi C, Wiley
30. Scientific Reports, Nature Publication Group (NPG)
31. Superlattices and Microstructures, Elsevier
32. Thin Solid Films, Elsevier

33. Waste and Biomass Valorization, Springer

Teaching Experience

I have a wide range of teaching and mentoring experiences both inside and outside the classroom.

Teaching

1. **Instructor**, Electrical Engineering, King Abdullah University of Science and Technology
EE 390B Special Topics in Solid State Devices
2. **Instructor**, Electrical Engineering, King Abdullah University of Science and Technology
EE 208 Semiconductor Optoelectronic Devices (EE Core Course)
3. **Instructor**, Electrical Engineering, King Abdullah University of Science and Technology
EE 206 Device Physics (created by me in Fall 16 and becomes EE Core Course in Fall 19)
4. **Speaker**, Electrical Engineering, King Abdullah University of Science and Technology
EE 298/398 Graduate Seminar

Student feedbacks:

“Your presentation yesterday was great! Actually it was the only presentation that I could concentrate from the beginning to the end so far.”

“I am writing this email to thank you for your seminar today. I was so inspired by your story and the tips you gave. It is so far the best lecture I ever attended in KAUST. I believe that your story must be shared with the larger community of KAUST and I know that many of my friends would love to attend. So please let me know if you will ever give this lecture again.”

5. **Instructor**, Electrical Engineering, King Abdullah University of Science and Technology
EE 206 Device Physics (created by me and became a Core Course since Academic Year 2020/2021)

Student feedbacks:

“This is the only class I never get sleepy. The classroom atmosphere is terrific. You gave up the convenience of teaching with PPT, instead, adopt blackboard writing in class so that we can understand more easily, which saved us a lot of time.”

“Very good instructor, teaching style is student oriented. The whole course is well organized almost step-by-step learning.”

“The instructor does very well job at preparing for the lecture and making the expectations clear from both the students and himself.”

“The quizzes although hectic, give you the opportunity to learn material that is hard to cover on the midterm. I also believe the professors lecture notes were great.”

“I like to way he makes the class active and always let student participate.”

“The concepts of quantum mechanics is covered in this course. It helped me to lay the foundation for the future work.”

6. **Guest blogger** for Edison Innovation Foundation, Newark, NJ Summer 2013-Present
Educate the foundation’s readers, mainly K-12 students and parents, about the latest research and technologies. The foundation has 99,310 followers in Facebook.
7. **Instructor** for Ph.D. preliminary exam, Georgia Tech, Atlanta, GA Fall 2011
Taught 15 graduate students who were not familiar with microsystem and electromagnetics about the basic principles, knowledge, and practices
Made quiz to prepare them for the Ph.D. preliminary exam
All the students I taught passed the exam
8. **Instructor** of K-12 outreach programs, Georgia Tech & Lehigh University 2009-2015

Please refer to the “Outreach Lectures and Seminars” as below

- 9. Instructor** of Shuren High School, Wuhan, China Spring 2006
Most of the students’ parents were from poor families coming to cities for a job. Thus the parents had very low income and poor education background
Taught 40 students high school physics
Help the students navigate difficulties and pressure in the real life
- 10. Teaching assistant** of undergraduate course C++, HUST, Wuhan, China Spring 2006
Assisted the lecturer to help 30 students on their homework and knowledge
Organized exam workshops to prepare the students for the mid-term and final exam

Advising and Mentoring

Mentoring experience is described through the students or organizations I have advised, which does not include the junior students (10+) I mentored in my previous labs at Lehigh and Georgia Tech for research skills and career development.

- 1) Kishor Upadhyaya (Visiting student)**
March-August 2020
Kishor is a PhD student at KAUST advised by me. He is pursuing his PhD degree at Visvesvaraya Technological University and Jawaharlal Nehru Centre for Advanced Scientific Research, India.
- 2) Daniel De Jesus Pliego Sosa (Visiting student)**
January 2020
Daniel is an undergraduate student at KAUST advised by me. He is pursuing his BS degree at National Autonomous University of Mexico, Mexico.
- 3) Sergei Filnov (Visiting student)**
January 2020
Sergei is a graduate student at KAUST advised by me. He is pursuing his BS degree at Saint Petersburg State University, Russia.
- 4) Vladyslav Hnapovskiy (Visiting student)**
January 2020
Vlad is an undergraduate student at KAUST advised by me. He is pursuing his MS degree at Taras Shevchenko National University of Kiev, Ukraine.
- 5) Yubin Huang (Lab assistant)**
August 2019-Present
Yubin is a lab assistant in my lab. She helps event organization, lab management, and procurement.
- 6) Zhiyuan Liu (Visiting student)**
August 2019-January 2020
Zhiyuan is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Design of Integrated Circuit and Integration System from University of Electronic Science and Technology of China (UESTC), China.
- 7) Yue Wang (Visiting student)**
June 2019-December 2019
Yue is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Electronic Science and Technology from University of Electronic Science and Technology of China (UESTC), China.
- 8) Yujie Qin (Visiting student)**
September 2019-December 2019

Yujie is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Design of Integrated Circuit and Integration System from University of Electronic Science and Technology of China (UESTC), China.

9) Gaia Da Prato (Visiting student)

July 2019-September 2019

Gaia is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Physics from University of Pisa, Italy.

10) Emanuele Troiani (Visiting student)

July 2019-September 2019

Emanuele is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Physics from University of Pisa, Italy.

11) Andrei Luferau (Visiting student)

July 2019-November 2019

Andrei is an graduate student at KAUST advised by me. He is pursuing his Master of Electronics and Nanoelectronics Electrotechnical University “LETI”, Russia.

12) Yara Banda (Visiting student)

July 2019-August 2019

Yara is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Electrical & Computer Engineering from King Abdulaziz University, Saudi Arabia.

13) Shibin Krishna (Postdoctoral fellow)

June 2019-Present

Shibin is a postdoctoral fellow at KAUST advised by me. He received his PhD in Physics at CSIR-National Physical Laboratory, under the supervision of Prof Govind Gupta.

14) Hessa I. Alabdan (Visiting student)

June 2019-July 2019

Hessa is a graduate student at KAUST advised by me. She is pursuing her MS degree in Material Physics from Abdulrahman Bin Faisal University, Saudi Arabia.

15) Yue Wang (Visiting student)

June 2019-December 2019

Yue is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Electronic Science and Technology from University of Electronic Science and Technology of China (UESTC), China.

16) Wen Gu (Visiting student)

February 2019-July 2019

Wen is an undergraduate student at KAUST advised by me. He is pursuing his MS degree from Institute of Semiconductor, Chinese Academy of Science, China.

17) Victor Paiva de Oliveira (Visiting student)

March 2019-May 2019

Victor is a student at KAUST advised by me. He obtained his BS degree in Electrical Engineering from Federal University of Rio Grande do Norte, Brazil.

18) Xiao Tang (Lab assistant)

February 2019-Present

Xiao is a lab assistant in my lab. He is involved in Ga₂O₃ device research.

19) Thomas Winkler (Visiting student)

February 2019

Thomas is a student at KAUST advised by me. He obtained his BS degree in Physics from Johannes Gutenberg University of Mainz, Germany.

20) Stef Koenis (Visiting student)

February 2019

Stef is a student at KAUST advised by me. He obtained his BS degree in Physics from University of Twente, Netherlands.

21) Artem Shushanian (PhD student)

February 2019-May 2019

Artem is a PhD student at KAUST advised by me. He obtained his MS degree in Chemical Science from Novosibirsk State University, Russia.

22) Tinh Tran (Postdoctoral fellow)

October 2018-June 2020

Tinh is a postdoctoral fellow at KAUST advised by me. He received his PhD in Materials Science and Engineering at National Chiao Tung University, under the supervision of Prof Edward Yi Chang.

23) Pavel Kirilenko (PhD student)

August 2018- May 2019

Pavel is a PhD student at KAUST advised by me. He obtained his MS degree in Physics from Novosibirsk State University, Russia.

24) Rongyu Lin (PhD student)

August 2018-Present

Rongyu is a PhD student at KAUST advised by me. He obtained his MS degree in Physics from Southern University of Science and Technology (SUSTech), China.

25) Roman Zamchii (PhD student)

August 2018-January 2019

Roman is a PhD student at KAUST advised by me. He obtained his MS degree in Physics from Saint Petersburg State University, Russia.

26) Ahmad Al Sulami (MS student)

August 2018-Present

Ahmad is an MS student at KAUST advised by me. He received his BS degree in Physics from University of Texas Austin.

27) Zahra Alnakhli (MS student)

August 2018-Present

Zahra is an MS student at KAUST advised by me. She received Bachelor in Physics from Taibah University and Master of Nanotechnology from Flinders University.

28) Chenxin Xiong (Visiting student)

August 2018-February 2019

Chenxin is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Software Engineering from Central South University, China.

29) Xuechun Zhang (Visiting student)

August 2018-February 2019

Xuechun is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Applied Chemistry from University of Electronic Science and Technology of China (UESTC), China.

30) Yi Lu (Visiting student)

April 2018-October 2018

Yi is an undergraduate student at KAUST advised by me. He is pursuing his MS degree from Institute of Semiconductor, Chinese Academy of Science, China.

31) Wei Guo (Visiting researcher)

August 2018-August 2019

Wei Guo is a researcher at Ningbo Institute of Materials Technology & Engineering (NIMTE). His formal advisor is Prof Jichun Ye at NIMTE. However, I am the main advisor on his lateral polarity junction study. He was promoted to Associate Professor in this period. He later came to KAUST to conduct experiments in December 2019.

32) Erick López-Méndez (Visiting student)

August 2018-February 2019

Erick is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Engineering Physics from Tecnológico de Monterrey, Mexico.

33) Dmitry Arkhipov (Visiting student)

July 2018-November 2018

Dmitry is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Physics from Saint Petersburg State University, Russia.

34) Anja Dobravec (Visiting student)

July 2018

Anja is a graduate student at KAUST advised by me. She is pursuing his MS degree in Physics from University of Ljubljana, Slovenia.

35) Mark Berčan (Visiting student)

July 2018

Mark is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Physics from University of Ljubljana, Slovenia.

36) Francesco Blanda (Visiting student)

July 2018-September 2018

Francesco is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Physics from University of Pisa, Italy.

37) Rahaf H. Shalabi (Visiting student)

May 2018-December 2018

Rahaf is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Electrical Engineering from Effat University, Saudi Arabia.

38) Maocheng Shan (PhD student)

March 2018-Present

Maocheng is a PhD student at Huazhong University of Science and Technology (HUST). His formal advisor is Prof Jiangnan Dai at HUST. However, his main advisor is me for his PhD study.

39) Guozheng Zhang (Visiting student)

January 2018-June 2018

Guozheng is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Electrical Engineering and Automation from Hebei University of Technology, China.

40) Zhongjie Ren (Visiting student)

December 2017-May 2018

Zhongjie is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Opto-Electronic Engineering from Huazhong University of Science and Technology, China.

41) Joseph Hsin-Hung Yao (Postdoctoral fellow)

January 2018-December 2018

Joseph is a postdoctoral fellow at KAUST advised by me. He received his PhD in Photonics and Optoelectronics at National Chiao Tung University, under the supervision of Prof Shing-Chung Wang.

42) Che-Hao Liao (Postdoctoral fellow)

October 2017-Present

Che-Hao is a postdoctoral fellow at KAUST advised by me. He received his PhD in Photonics and Optoelectronics at National Taiwan University, under the supervision of Prof Chih-Chung Yang.

43) Feras Al Qatari (MS student)

August 2017-Present

Feras is an MS student at KAUST advised by me. He received his BS degree in Materials Science and Engineering from University of Maryland.

44) Wenzhe Guo (PhD student)

June 2017-Jan 2018

Wenzhe is a PhD student at KAUST advised by me. He received his BS degree in Integrated Circuit Design and Integrated System from University of Electronic Science and Technology of China (UESTC), China.

45) Jingtao Li (Visiting student)

August 2017-January 2018

Jingtao is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Microelectronic Science and Engineering from University of Electronic Science and Technology of China (UESTC), China.

46) Kaikai Liu (Visiting student)

July 2017-March 2018

Kaikai is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Applied Physics from Huazhong University of Science and Technology, China.

47) Xinwei Liu (Visiting student)

July 2017-March 2018

Muwei is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Electronic Science and Technology from Huazhong University of Science and Technology, China.

48) Sergio Valdes (Visiting student)

July 2017-March 2018

Sergio is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Mechanical and Electrical Engineering from Instituto Tecnológico de Monterrey, Mexico.

49) Carlos Torres (Visiting student)

July 2017-August 2018

Carlos is a graduate student at KAUST advised by me. He received his MS degree at Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV), Mexico.

50) Fatimah Alowa (Visiting student)

May 2017-September 2017

Fatimah is an undergraduate student at KAUST advised by me. She is pursuing her BS degree in Mechanical Engineering and Physics from Boston University, USA.

51) Abdulmohsen Alowayed (Visiting student)

May 2017-September 2017

Fatimah is an undergraduate student at KAUST advised by me. He is pursuing her BS degree in Mechanical Engineering from Massachusetts Institute of Technology (MIT), USA.

52) Yangrui Hu (Visiting student)

January 2017-July 2017

Yangrui is an undergraduate student at KAUST advised by me. She is pursuing his BS degree in Applied Physics from University of Science and Technology of China (USTC), China.

53) Wenzhe Guo (Visiting student)

November 2016-July 2017

Wenzhe is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Integrated Circuit Design and Integrated System from University of Electronic Science and Technology of China (UESTC), China.

54) Raheef A. Aljefri (Visiting student)

October 2016-May 2017

Renad is an undergraduate student at KAUST advised by me. She is pursuing his BS degree in Electrical Engineering from Effat University, KSA.

55) Esraa Alghamdi (Visiting student)

October 2016-May 2017

Esraa is an undergraduate student at KAUST advised by me. She is pursuing his BS degree in Electrical Engineering from Effat University, KSA.

56) Sarah Alsaggaf (MS student)

September 2016-February 2017

Sarah is a PhD student at KAUST advised by me. She obtained his BS degree in Physics from King Abdulaziz University, KSA.

57) Altyнай Kaidarova (MS student)

September 2016-January 2017

Altyнай is a PhD student at KAUST advised by me. She obtained his BS degree in Electronics and Communication from University of Liverpool, UK.

58) Ronghui Lin (PhD student)

August 2016-Present

Ronghui is a PhD student at KAUST advised by me. He obtained his MS degree in Mechanical Engineering from University of Science and Technology of China (USTC), China.

59) Muwei Zhang (Visiting student)

August 2016-August 2017

Muwei is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Electronic Science and Technology from Huazhong University of Science and Technology, China.

60) Haiding Sun (Postdoctoral fellow)

June 2016-October 2018

Haiding is a postdoctoral fellow at KAUST advised by me. He received his PhD in Electrical Engineering at Boston University, USA, under the supervision of Prof Ted Moustakas.

61) Renad A. Aljefri (Visiting student)

June 2016-May 2017

Renad is an undergraduate student at KAUST advised by me. She is pursuing his BS degree in Electrical Engineering from Effat University, KSA.

62) Hamad Alotaibi (Visiting student)

May 2016-January 2017

Hamad is an undergraduate student at KAUST advised by me. He is pursuing his BS degree in Electrical Engineering from King Fahd University of Petroleum and Minerals (KFUPM), KSA.

63) Kuang-Hui Li (PhD student)

May 2016-December 2018

Kuang-Hui is a PhD student at KAUST advised by me. He obtained his dual BS degrees in Physics and Mathematics from National Chiao Tung University, Taiwan.

64) Feng Wu (Visiting student)

March 2016-March 2017

Feng is an exchange PhD student at KAUST advised by me from Huazhong University of Science and Technology (HUST) and Wuhan National Laboratory for Optoelectronics (WNLO). He obtained his BS degree in Optoelectronics at HUST. He is currently working on novel quantum structures for high efficiency UV LEDs.

65) Nasir Alfaraj (PhD student)

February 2016-July 2017

Nasir is a Saudi PhD student at KAUST advised by me. He obtained his BS degree at West Michigan University and MS degree at KAUST, both in Electrical Engineering. He is currently working on electron transport in the quasi-1D III-nitride structures and devices.

66) Ibrahim Aldabbagh

Mar 2016-July 2016

Ibrahim is studying in Electrical Engineering at University of California, San Diego (UCSD) under the KAUST Gifted Students Program (KGSP) Scholarship.

67) Christine Hang and Chauvik Choudhary

Mar 2014-Dec 2016

Christine and Chauvik are Vietnamese American and Indian students, respectively at Georgia Institute of Technology. I have advised them to start and run companies on their inventions regarding stroke risk reduction and reduction of configuration complexity across different Android platforms. With my help, they have grown the business and won the first place of ACC School Startup Madness and highest award of Georgia Tech Ideas 2 Serve Competition

68) Laura Mejia-Suarez

Jan 2013-Jul 2016

Laura is a Hispanic American student at Lehigh University. I have mentored her since her junior year academically and found her a paid internship in Atlanta, GA. Recently, my recommendation letter has helped her get into the graduate program at Lehigh University.

69) Khin Latt

Jan 2013-Dec 2016

Kihn is from a small Southeast Asian country, Myanmar. He was a student at Lehigh University. I have mentored him academically since his junior year. Recently, I helped him to get a well-paid software engineering position in Atlanta.

70) Entrepreneurial Finance and Private Equity Program, Georgia Tech, Atlanta

Aug 2013-Oct 2013

- Worked with four graduate students majored in Quantitative & Computational Finance
- Provided business and technical guidance and help them navigate the course challenge

71) Engineers for a Sustainable World Organization, Georgia Tech, Atlanta, GA

Feb 2013-Dec 2013

- Worked with this organization to develop non-profit water purification solutions for the 3rd world
- Provided business and technical guidance and help them in fund raising
- Protected and commercialized intellectual properties created in this process

72) Integrated Product Development Program, Lehigh University, Bethlehem, PA

Jan 2013-Dec 2013

- Guided 12 undergraduate students to develop portable water purification products
- Established development strategy, goal and oversee their activities
- Help students protected and commercialized intellectual properties created in this process

K-12 Outreach Lectures and Seminars*Geared towards prospective middle and high school students*

1. Lab Tour and Presentation for Optics Students, Georgia Institute of Technology, Atlanta, GA, March 2013.
2. Lab Tour and Presentation for Optics Students, Georgia Institute of Technology, Atlanta, GA, July 2012.
3. “Semiconductor Nanotechnology for High Energy Efficient Applications,” Outreach Program, OptoCamp 2008 – Center for Optical Technologies, Lehigh University, Bethlehem, PA, August 2009.

Research and Teaching Interests

My research is positioned at the cross-roads of interdisciplinary electrical engineering, applied physics, material science and engineering, and biomedical engineering. Specifically, I am interested in the investigation of the physics, growth, fabrication, and characterization of semiconductor especially III-V optoelectronic and electronic devices. The device applications include visible LED and solar cells for energy saving and energy generation applications, UV LED and lasers for biomedical and communication applications, and FET, HFET, and HBT for power electronic applications. In addition, I am also interested in HFET based biochemical sensing and III-V-on-Si devices for post-Si computing chips. Fundamental knowledge from quantum mechanics, quantum electronics / optics, solid state physics, semiconductor physics, and electromagnetics will be used to solve problems related to semiconductor, optoelectronics and energy. In addition, I am interested in the development of extremely high temperature MOCVD reactors.

As my academic pursuit started in applied physics which further extended into electrical engineering in the graduate school, my teaching interests encompass courses in the areas of basic physics, electromagnetics and electronic device fabrication (sophomore / junior), photonic and optoelectronic devices (graduate), applied quantum mechanics (graduate), physics of semiconductor devices (senior / graduate). My mentorship crosses graduate students, undergraduate students, K-12 students and K-12 educators.

Other Professional Experience

- | | |
|--|-----------|
| 14) Invited Judge of Poster Competition of IWPSD, India | 2019 |
| 15) Invited Judge of Undergraduate Poster Competition, KAUST | 2018 |
| 16) Invited Judge of Undergraduate Research Symposium, Georgia Tech | 2013-2014 |
| 17) Invited Judge of Capstone Design Expo, Georgia Tech | 2013-2014 |
| 18) Tour guide of Scientific Facilities for Board of Trustee, Lehigh University | 2010-2011 |

Patents*The patent application numbers are not shown per the request of the IP attorneys*

1. U.S. Patent #8569737: Broadband light emitting diodes and method for producing same (Issued)

2. U.S. Patent #9024292: Monolithic semiconductor light emitting devices and method of making the same (Issued)
3. Chinese Patent # CN200976041Y: A novel magnetic field detector (Issued)
4. U.S. Patent Pending: Susceptor device, chemical vapor deposition apparatus, and deposition methods
5. U.S. Patent Pending: Susceptor for induction heating with thermal uniformity
6. U.S. Patent Pending: Significant performance improvement of blue and UV light-emitting diode by applying AlN electron block layer
7. U.S. Patent Pending: The formation of boron-contained nitrides and beta-phase gallium-oxide heterostructure for optical and power devices.
8. U.S. Patent Pending: Boron III nitride heterojunctions with zero to large heterointerface polarizations
9. U.S. Patent Pending: Boron-contained-nitride-based interlayer in AlGaIn/GaN heterostructure for power electronics
10. U.S. Patent Pending: Boron containing III-nitride metal contact layers
11. U.S. Patent Pending: III-nitride semiconductor heterostructures with zero to large heterointerface polarization
12. U.S. Patent Pending: Polarization effect of InGaIn/AlInN heterojunctions strained on GaN
13. U.S. Patent Pending: Polarization effect of GaAlIn/AlInN heterojunctions strained on AlN
14. U.S. Patent Pending: Polarization effect of AlGaIn/InGaIn heterojunctions strained on GaN
15. U.S. Patent Pending: Polarization effect of AlGaIn/BGaIn heterojunctions strained on GaN
16. U.S. Patent Pending: Polarization effect of AlGaIn/AlInN heterojunctions strained on AlN
17. U.S. Patent Pending: Method of evaluating and predicting the III-nitride polarization doping effect
18. U.S. Patent Pending: Methods of changing sensitivity of strain for polarization of III-nitride materials and heterojunctions
19. U.S. Patent Pending: A multiple-layer stacking structure consisting of (Al, Ga, In) III-oxide with different phases
20. U.S. Patent Pending: Removal of electron blocking layer by grading quantum barrier in multiple quantum wells for light emitting devices
21. U.S. Patent Pending: Method to transform Binary oxide material into ternary and quaternary oxide materials with group-III material by high temperature annealing
22. U.S. Patent Pending: Dielectric multilayer metalenses for multifocal and achromatic applications
23. U.S. Patent Pending: Use of polarization-induced two-dimensional electron gas and two-dimensional hole gas of III-nitride semiconductors for making a sheet PN junction
24. U.S. Patent Pending: Epitaxial Growth of high crystal quality β -Ga₂O₃ Thin Films on CeO₂- Buffered Flexible Substrate
25. U.S. Patent Pending: Polarization-matched InAlN last quantum barrier for UV LED
26. U.S. Patent Pending: Predict quantum well structures of III-nitride deep-UV LEDs and lasers using Machine Learning
27. U.S. Patent Pending: Low resistance III-nitride tunnel junction design based on machine learning
28. U.S. Patent Pending: Ultrafast integrated artificial intelligent chip based on complex lasers

Book Chapters and Editorials

1. Chapter 4: *III-N Wide Bandgap Deep-Ultraviolet Lasers and Photodetectors*, Volume 96, *Semiconductors and Semimetals series*, ISBN: 9780128095843, Elsevier, 2017. [<link>](#)

2. Chapter 16: *Future Developments in MOVPE, Metalorganic Vapor Phase Epitaxy (MOVPE): Growth, Materials Properties and Applications*, ISBN: 9781119313021, Wiley, 2019. <link>
3. Chapter 7: *Ultraviolet Lasers, Nanoscale Semiconductor Lasers*, ISBN: 9780128141625, Elsevier, 2019. <link>
4. *Sapphire Substrates Slash the Cost of Deep UV Lasers, Compound Semiconductor Magazine Editorial*, June 2016. <pdf>
5. *The Beginning of Semiconductor UV Optoelectronics (Chinese: 紫外光电半导体芯片化大幕的展开)*, *Chinese Laser Press*, Jan 2020. <link>

Journal Publications since KAUST

Papers with my advisees as the first/corresponding author (underlined)

1. T. B. Tran, C.-H. Liao, F. Alqatari, and X. Li*, "Demonstration of single-phase wurtzite BAlN with over 20% boron content by metalorganic chemical vapor deposition," **Appl. Phys. Lett.** in press (2020).
2. X. Tang and X. Li*, "Ripening of gold clusters into single domain on semiconductor quantum rods during Langmuir-Blodgett deposition," **Cryst. Growth Des.** in press (2020).
3. R. Lin, X. Liu, K. Liu, Y. Lu, X. Liu, X. Li*, " BAlN alloy for enhanced two-dimensional electron gas characteristics of GaN/AlGaIn heterostructures," **J. Phys. D: Appl. Phys.** in press (2020).
4. R. Lin, Z. Alnakhli, F. AlQatari, and X. Li*, "Design of dielectric reflective metalens: analysis of tapered nanopillars," **IEEE Photonics J.** **12**, 4600907 (2020).
5. Y. Zhang, G. Deng, Y. Yu, Y. Wang, D. Zhao, Z. Shi, B. Zhang, X. Li*, "Demonstration of N-polar III-nitride tunnel junction LED," **ACS Photonics** **7**, 1723 (2020).
6. C. G. Torres-Castanedo, K. H. Li, L. Braic, and X. Li*, "Determination of band offsets of Ga₂O₃:Si/FTO heterojunction for current spreading for high temperature and UV applications," **J. Phys. D: Appl. Phys.** **53**, 314003 (2020).
7. R. Lin, Y. Zhai, C. Xiong, and X. Li*, "Inverse design of plasmonic metasurfaces by convolutional neural network," **Opt. Lett.** **45**, 1362 (2020).
8. N. Alfaraj, W. Alghamdi, M. Alaweini, I. Ajia, D. Priante, B. Janjua, H. Sun, T. Ng, B. Ooi, I. Roqan, X. Li*, "Time–Energy Quantum Uncertainty—Quantifying the Effectiveness of Surface Defect Passivation Protocols for Low-Dimensional Semiconductors," **ACS Appl. Electron. Mater.** **2020**, 409 (2020).
9. R. Lin, V. Mazzone, N. Alfaraj, J. Liu, X. Li*, and A. Fratalocchi*, "On-Chip Hyperuniform Lasers for Controllable Transitions in Disordered Systems," **Laser & Photonics Rev.** **2020**, 1800296 (2020).
10. X. Li*, R. D. Dupuis, T. Wernicke, "Semiconductor UV photonics: feature introduction," **Photonics Res.** **7**, SUVP1 (2019).
11. M. Shan, Y. Zhang, T. B. Tran, J. Jiang, H. Long, Z. Zheng, A. Wang, W. Guo, J. Ye, C. Chen*, J. Dai*, and X. Li*, "Deep UV laser at 249 nm based on GaN quantum wells," **ACS Photonics** **6**, 2387 (2019).
12. W. Guo, S. Mitra, J. Jiang, H. Xu, M. Sheikhi, H. Sun, K. Tian, Z.-H. Zhang, H. Jiang, I. Roqan, X. Li*, and J. Ye*, "Three-dimensional band diagram in lateral polarity junction III-nitride heterostructures," **Optica** **6**, 1058 (2019).
13. R. Lin and X. Li, "Multifocal metalens based on multilayer Pancharatnam-Berry phase elements architecture," **Opt. Lett.** **44**, 2819 (2019).
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Papers with my advisees as non-leading authors (underlined)

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Conference Publications since KAUST

1. **(Invited Talk) X. Li**, “UV LED, laser, and photodetector research and applications,” International Conference on Emerging Electronics (ICEE), Bangalore, India, November 2020.
2. **(Invited Talk) X. Li**, “BAIN and B GaN: emerging III-nitride semiconductors,” 12th International Symposium on Semiconductor Light Emitting Devices (ISSLED), Magdeburg, Germany, postponed to Summer 2021.
3. Z. Liu, Y. Lu, Y. Wang, R. Lin, C. Xiong, **X. Li**, “Engineering of heterointerface polarization for high-efficiency AlGa_N-based UV LED,” IEEE Photonics Conference (Online), Sept 2020.
4. Y. Lu, C. Wang, V. P. de Oliveira, Z. Liu, **X. Li**, “Ultraviolet Light-emitting Diodes with Buried Tunneling Junction,” IEEE Photonics Conference (Online), Sept 2020.
5. R. Lin, Z. Alnakhli, F. AlQatari, **X. Li**, “Inverse design of plasmonic metasurfaces by convolutional neural network,” IEEE Photonics Conference (Online), Sept 2020.
6. **(Invited Talk) X. Li**, “The 3rd generation semiconductor: from epitaxy, materials, devices, to artificial intelligence,” Zolix Optoelectronics Workshop, Beijing, China, Jun 2020.
7. R. Lin and **X. Li**, “High accuracy inverse design in nanophotonics by convolutional neural network,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
8. W. Gu, Y. Lu, R. Lin, W. Guo, J. Yan, J. Wang, J. Li, and **X. Li**, “High-performance UV LED with an undoped BAIN EBL,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
9. R. Lin, P. Han, Y. Wang, C. Xiong, and **X. Li**, “Low resistance UV-LED tunnel junction design based on machine learning,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
10. T. B. Tran, F. AlQatari, and **X. Li**, “Characterizations of BAIN films with various boron contents,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
11. R. Lin, X. Liu, K. Liu, Y. Lu, X. Liu, and **X. Li**, “AlGa_N/Ga_N heterostructure field-effect transistor with BAIN interlayer,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
12. Y. Lu, H.-H. Yao, and **X. Li**, “AlN/ β -Ga₂O₃-based HEMT for high-power devices,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
13. C.-H. Liao, Y. Banda, Gaia Da Prato, K.-H. Li, and **X. Li**, “ β -(AlGa)₂O₃ solar-blind photodetector fabricated by high temperature driven interdiffusion method,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
14. C. Xiong, Y. Lu, D. Qu, X. Zhang, R. Lin, and **X. Li**, “Quantum-well design of deep-UV LEDs and lasers using machine learning for optical sensing and metrology,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
15. Y. Lu, Z. Ren, H.-H. Yao, C.-H. Liao, and **X. Li**, “Electron-blocking-layer-free deep ultraviolet light-emitting diode,” SPIE Photonics West, San Francisco, CA, United States, Feb 2020.
16. **(Invited Tutorial) X. Li**, “Polarization Theory and Applications of III-nitride semiconductor,” International Workshop on the Physics of Semiconductor Devices (IWPSD), Kolkata, India, December 2019.
17. **(Invited Talk) X. Li**, “What happens when III-polar and N-polar III-nitride structures are side by side,” International Workshop on the Physics of Semiconductor Devices (IWPSD), Kolkata, India, December 2019.
18. F. AlQatari, M. Sajjad, R. Lin, K.-H. Li, U. Schwingenschlög, **X. Li**, “BAIN and B GaN for Lattice-Matched UV Optical Structures,” International Workshop on Ultraviolet Materials and Devices (IWUMD), St. Petersburg, Russia, September 2019.
19. T. B. Tran, H.-L. Che, F. AlQatari, **X. Li**, “Exceed 20% Boron of Single-Phase Wurtzite in BAIN Film Grown Using MOCVD,” International Workshop on Ultraviolet Materials and Devices (IWUMD), St. Petersburg, Russia, September 2019.

20. **(Invited Talk) X. Li**, “Semiconductor deep UV laser, LED, and design software,” Workshop on the Third-generation Semiconductor Technologies and Applications, Ezhou, Hubei, China, June 2019.
21. **(Plenary Talk) X. Li**, “Semiconductor deep UV laser, LED, and design software,” China (Changzhi) International UV LED Conference (CULCON), Changzhi, Shan’xi, China, May 2019.
22. **(Invited Talk) C. G. Torres-Castanedo, K.-H. Li, L. Braic, M. N. Hedhili, H. Sun, and X. Li**, “Determination of band offsets of β -Ga₂O₃/FTO heterojunction,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
23. N. Alfaraj, K.-H. Li, C. H. Kang, D. Priante, L. Braic, Z. Guo, T. K. Ng, **X. Li**, and B. Ooi. "Electrical Characterization of Solar-Blind Deep-Ultraviolet (Al_{0.28}Ga_{0.72})₂O₃ Schottky Photodetectors Grown on Silicon by Pulsed Laser Deposition," in Proc. of the IEEE/OSA Conference on Lasers and Electro-Optics (CLEO) 2019, San Jose, CA, United States, May 2019.
24. **(Invited Talk) C. G. Torres-Castanedo, K.-H. Li, L. Braic, M. N. Hedhili, H. Sun, and X. Li**, “Determination of band offsets of β -Ga₂O₃/FTO heterojunction,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
25. C.-H. Liao, K.-H. Li, C. G. Torres-Castanedo, G. Zhang, and **X. Li**, “Ultra-high temperature annealing of β -Ga₂O₃ thin film,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
26. C.-H. Liao, F. AlQatari, and **X. Li**, “Energy bandgap versus lattice constant and direct-to-indirect bandgap transitions in born III-nitride alloys,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
27. H. Sun, D. Priante, J.-W. Min, R. Lin, K.-H. Li, T. K. Ng, B. S. Ooi, and **X. Li**, “Graded-index separate confinement heterostructure AlGa_N nanowires: towards ultraviolet laser-diode implementation,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
28. H. Sun, B. Janjua, R. Lin, K.-H. Li, M. K. Shakfa, T. K. Ng, B. S. Ooi, and **X. Li**, “Surface-passivated AlGa_N nanowires for enhanced luminescence of ultraviolet light-emitting diodes on metals,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
29. H. Sun, C. H. Liao, R. Lin, K. H. Li, Y. J. Park, T. Detchprohm, R. D. Dupuis, and **X. Li**, “Emerging BAlN/Al_xGa_{1-x}N heterostructures for ultraviolet emitters and power electronic devices,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
30. Y. Lu, H.-H. Yao, Z. Ren, H. Sun, C.-H. Liao, and **X. Li**, “Electron-blocking-layer-free DUV-LED with linearly graded AlGa_N quantum barriers,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
31. H.-H. Yao, Y. Lu, K.-H. Li, F. AlQatari, C.-H. Liao, and **X. Li**, “Polarization matched c-plane III-nitride quantum wells structure,” SPIE Photonics West, San Francisco, CA, United States, Feb 2019.
32. **(Invited Talk) X. Li**, “Emerging ultrawide bandgap materials and devices for optoelectronics and power electronics,” International Conference on Emerging Electronics (ICEE), Bangalore, India, December 2018.
33. **(Invited Talk) X. Li**, “Research of emerging ultrawide bandgap semiconductor materials and UV devices,” International Workshop on Ultraviolet Materials and Devices (IWUMD), Kunming, China, December 2018.
34. **(Late News) K. Liu and X. Li**, “III-nitride polarization toolbox,” International Workshop on Nitride Semiconductors (IWN), Kanazawa, Japan, November 2018.
35. N. Susilo, M. Schilling, M. Narodovitch, **X. Li**, B. Witzigmann, J. Enslin, M. Guttman, M. Rychetsky, I. Koslow, T. Wernicke, T. Niermann., M. Lehmann, and M. Kneissl, "Polarization fields in c-plane GaN/Al_xGa_{1-x}N/GaN quantum wells determined by capacitance-voltage-measurements," International Workshop on Nitride Semiconductors (IWN), Kanazawa, Japan, November 2018.

36. H. Sun, B. Ooi, and **X. Li**, "Efficient AlGa_N nanowires UVLEDs on metal grown by molecular beam epitaxy," International Conference on Molecular Beam Epitaxy, Shanghai, September 2018.
37. **(Invited Talk) X. Li**, "Research of emerging wide-bandgap semiconductor materials and devices," National MOCVD Conference of China, Jinggangshan, China, August 2018.
38. H. Sun, Y. J. Park, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Tuning the growth of AlN epilayers on Al₂O₃ via TMAI preflow by MOCVD," International Symposium on Growth of III-nitrides (ISGN-7), Warsaw, Poland, August 2018.
39. H. Sun, Y. J. Park, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Novel BAlN/Al_xGa_{1-x}N heterostructures for optical and power devices," International Symposium on Growth of III-nitrides (ISGN-7), Warsaw, Poland, August 2018.
40. **(Invited Talk) X. Li**, "Significantly enhanced performance for AlGa_N UV LED by employing a thin BAlN electron blocking layer," International Symposium on Growth of III-nitrides (ISGN-7), Warsaw, Poland, August 2018.
41. F. S. Alqatari, K.-H. Li, K. Liu, and **X. Li**, "Refractive Indices of BAlN and BGa_N Alloys from First-Principle Calculations," 60th Electronic Material Conference (EMC), Santa Barbara, CA, United States, June 2018.
42. H. Sun, K. Liu, M. Zhang, F. S. Alqatari, and **X. Li**, "Wurtzite B_xAl_{1-x}N and B_xGa_{1-x}N Heterointerface for Optical and Power Electronics," 60th Electronic Material Conference (EMC), Santa Barbara, CA, United States, June 2018.
43. H. Sun, B. Janjua, M. M. Muhammed, M. K. Shakfa, K.-H. Li, R. Lin, T. K. Ng, I. Roqan, B. S. Ooi, and **X. Li**, "Droop-Free AlGa_N Nanowires Ultraviolet Light Emitting Diodes on Metal," 60th Electronic Material Conference (EMC), Santa Barbara, CA, United States, June 2018.
44. R. Lin and **X. Li**, "Structure Optimization and Light Extraction Efficiency Enhancement of Deep Ultraviolet Nanowire Light Emitting Diode," 60th Electronic Material Conference (EMC), Santa Barbara, CA, United States, June 2018.
45. R. Lin, H. Sun, Y. Hu, and **X. Li**, "Structure Optimization and Light Extraction Efficiency Enhancement of Deep Ultraviolet Nanowire Light Emitting Diode," 60th Electronic Material Conference (EMC), Santa Barbara, CA, United States, June 2018.
46. H. Sun, K.-H. Li, C. G. Torres Castanedo, S. Okur, G. Tompa, T. Salagaj, and **X. Li**, " Tuning the Phases of MOCVD-Grown Ga₂O₃ Films," 60th Electronic Material Conference (EMC), Santa Barbara, CA, United States, June 2018.
47. H. Sun, K.-H. Li, Y. J. Park, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Tuning the growth mode and polarity of AlN films via TMAI preflow of Al₂O₃," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Nara, Japan, June 2018.
48. H. Sun, K.-H. Li, Y. J. Park, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Revealing Microstructure and Band Offsets of BAlN/AlGa_N Heterostructures," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Nara, Japan, June 2018.
49. K.-H. Li, H. Sun, C. T. Castanedo, C.-H. Liao, S. Okur, T. Salagaj, A. Feldman, G. Provost, G. Tompa, and **X. Li**, "Temperature-dependent Ga₂O₃ Growth on Sapphire by MOCVD," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Nara, Japan, June 2018.
50. K.-H. Li, H. Sun, C.-H. Liao, H.-H. Yao, W. Holder, A. Feldman, T. Salagaj, G. Provost, G. Tompa, and **X. Li**, "Extreme-high-temperature MOVPE Design and Practice for Nitrides," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Nara, Japan, June 2018.
51. **(Plenary Talk) X. Li**, "Material, physics, device, and equipment research for emerging semiconductor technologies," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Nara, Japan, June 2018.

52. H. Sun, K.-H. Li, Y. J. Park, T. Detchprohm, R. D. Dupuis, and **X. Li**, "MOCVD-grown BAlN-contained Heterojunctions," Compound Semiconductor Week (CSW), Boston, United States, June 2018.
53. H. Sun, K.-H. Li, C. T. Castanedo, S. Okur, T. Salagaj, G. Tompa, and **X. Li**, "Phase Change of Ga₂O₃ Films Grown by HCl-Enhanced MOCVD," Compound Semiconductor Week (CSW), Boston, United States, June 2018.
54. K.-H. Li, H. Sun, C. T. Castanedo, C.-H. Liao, S. Okur, T. Salagaj, A. Feldman, G. Provost, G. Tompa, and **X. Li**, "Temperature-dependent Ga₂O₃ Growth on Sapphire by MOCVD," Compound Semiconductor Week (CSW), Boston, United States, June 2018.
55. K.-H. Li, H. Sun, C.-H. Liao, H.-H. Yao, W. Holder, A. Feldman, T. Salagaj, G. Provost, G. Tompa, and **X. Li**, "Extreme-high-temperature MOVPE Design and Practice for Nitrides," Compound Semiconductor Week (CSW), Boston, United States, June 2018.
56. **(Invited Talk) X. Li**, "Beyond conventional III-nitride semiconductor," the 233rd Electrochemical Society (ECS) Meeting, Seattle, United States, May 2018.
57. **(Invited Talk) X. Li**, "AlN growth and AlGa_N deep UV lasers on sapphire," XIX International Workshop on the Physics of Semiconductor Devices (IWPSD), Delhi, India, December 2017.
58. R. Lin, H. Sun, and **X. Li**, "Stealthy Hyperuniform Disordered Structure for III-N Random Laser Applications," MRS Fall Meeting, Boston, United States, December 2017.
59. R. Lin, H. Sun, S. V. Galan, Y. Hu, and **X. Li**, "Structure Optimization for Enhanced Light Extraction Efficiency of Deep Ultraviolet Nanowire Light Emitting Diode," MRS Fall Meeting, Boston, United States, December 2017.
60. H. Sun, Y. J. Park, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Band Alignment of BAlN/AlGa_N Heterojunction for Ultraviolet Emitter Applications," MRS Fall Meeting, Boston, United States, December 2017.
61. H. Sun, M. Zhang, and **X. Li**, "Structural and Electronic Properties of Wurtzite B_xAl_{1-x}N from First-Principles Calculations," MRS Fall Meeting, Boston, United States, December 2017.
62. **(Invited Talk) X. Li**, "Latest progress on B-III-N alloy & impact of TMA preflow on AlN MOVPE," International Workshop on UV Materials and Devices (IWUMD-2017), Fukuoka, Japan, November 2017.
63. **(Invited Talk) X. Li**, "AlGa_N deep UV lasers on sapphire and novel III-N materials," International Forum on Wide Bandgap Semiconductors (IFWS), Beijing, China, November 2017.
64. **(Invited Talk) X. Li**, "AlGa_N and B-III-N materials for deep UV lasers," the 8th Asia-Pacific Workshop on Widegap Semiconductors (APWS), Qingdao, China, September 2017.
65. **(Invited Talk) X. Li**, "AlGa_N deep UV lasers and BAlN alloys," National Wide Bandgap Material Conference, Xining, China, August 2017.
66. **(Invited Talk) X. Li**, "Research on AlGa_N deep UV lasers and B-III-N alloys," SPIE Optics + Photonics, San Diego, CA, United States, August 2017.
67. K.-H. Li, H. Alotaibi, and **X. Li**, "High temperature OMVPE reactor with reduced premature reaction and improved heating efficiency," 21st American Conference on Crystal Growth and Epitaxy (ACCGE-21) and 18th US Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-18), Santa Fe, New Mexico, USA, July 2017.
68. K.-H. Li, H. Alotaibi, and **X. Li**, "Temperature uniformity of induction-heated OMVPE susceptors at high temperature," 21st American Conference on Crystal Growth and Epitaxy (ACCGE-21) and 18th US Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-18), Santa Fe, New Mexico, USA, July 2017.

69. H. Sun, F. Wu, T. M. Al tahtamouni, N. Alfaraj, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Study of TMAI-induced carbon impurity on AlN film polarity and growth mode on sapphire," 12th International Conference on Nitride Semiconductors (ICNS-12), Strasbourg, France, July 2017.
70. S. Wang, **X. Li**, A. M. Fischer, T. Detchprohm, R. D. Dupuis, and F. A. Ponce, "Crystal structure of BAlN thin films: effect of boron concentration in the gas flow," 12th International Conference on Nitride Semiconductors (ICNS-12), Strasbourg, France, July 2017.
71. N. Alfaraj, S. Mitra, F. Wu, I. A. Ajia, B. Janjua, A. Prabaswara, R. A. Aljefri, H. Sun, T. K. Ng, B. S. Ooi, I. S. Roqan, and **X. Li**, "Modeling and investigation of photoinduced entropy of InGaN/GaN p-i-n double-heterostructure nanowires," 12th International Conference on Nitride Semiconductors (ICNS-12), Strasbourg, France, July 2017.
72. H. Sun, F. Wu, T. M. Al tahtamouni, N. Alfaraj, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Structural Properties and Growth Modes of MOCVD-Grown AlN with TMAI Pretreatment of Sapphire Substrate," 59th Electronic Material Conference (EMC), South Bend, IN, United States, June 2017.
73. H. Sun, F. Wu, T. M. Al tahtamouni, D. H. Anjum, N. Alfaraj, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Investigation of Microstructure, Strain and Defect of BAlN/Al(Ga)N Heterostructures," 59th Electronic Material Conference (EMC), South Bend, IN, United States, June 2017.
74. N. Alfaraj, S. Mitra, F. Wu, I. A. Ajia, B. Janjua, A. Prabaswara, R. A. Aljefri, H. Sun, T. K. Ng, B. S. Ooi, I. S. Roqan, and **X. Li**, "Photoinduced thermodynamic behavior in InGaN/GaN double-heterostructure nanowires," 59th Electronic Material Conference (EMC), South Bend, IN, United States, June 2017.
75. **(Invited Talk) X. Li**, "AlGaIn Deep UV Lasers and B-III-N Alloys," 9th International Conference on Materials for Advanced Technologies (ICMAT 2017), Singapore, June 2017.
76. H. Sun, F. Wu, Y. J. Park, T. M. Al tahtamouni, N. Alfaraj, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Control of polarity, crystal quality and growth mode of AlN films by MOCVD," 17th European Workshop on Metal-Organic Vapour Phase Epitaxy (EW-MOVPE 17), Grenoble, France, June 2017.
77. H. Sun, F. Wu, T. M. Al tahtamouni, N. Alfaraj, T. Detchprohm, R. D. Dupuis, and **X. Li**, "Structural characterizations of high B-content BAlN/Al(Ga)N heterostructures grown by MOCVD," 17th European Workshop on Metal-Organic Vapour Phase Epitaxy (EW-MOVPE 17), Grenoble, France, June 2017.
78. K.-H. Li, H. S. Alotaibi, and **X. Li**, "A study of thermal uniformity on induction-heated susceptor for MOCVD," 17th European Workshop on Metal-Organic Vapour Phase Epitaxy (EW-MOVPE 17), Grenoble, France, June 2017.
79. K.-H. Li, H. S. Alotaibi, and **X. Li**, "High-temperature MOCVD reactor design," 17th European Workshop on Metal-Organic Vapour Phase Epitaxy (EW-MOVPE 17), Grenoble, France, June 2017.
80. **(Invited Talk) X. Li**, "III-nitride deep UV materials and devices," KAUST-NSF Conference on Electronic Materials, Devices and Systems, Thuwal, KAUST, Saudi Arabia, January 2017.
81. **(Invited Talk) X. Li**, "Collaboration opportunities in III-nitride materials and devices," KACST-CNRS Workshop, Riyadh, Saudi Arabia, November 2016.
82. F. Wu, J. Dai, Z. C. Feng, C. Chen, and **X. Li**, "Significant internal quantum efficiency enhancement of GaN/AlGaIn multiple quantum wells emitting at ~350 nm," International Workshop on Nitride Semiconductors (IWN 2016), Orlando, FL, United States, October 2016.
83. **X. Li**, S. Wang, H. Liu, F. A. Ponce, T. Detchprohm, and R. D. Dupuis, "100-nm Thick Single-Phase Wurtzite BAlN with B Contents up to 14.4% Grown by MOCVD," International Workshop on Nitride Semiconductors (IWN 2016), Orlando, FL, United States, October 2016.
84. N. Alfaraj, R. Aljefri, M. Baier, D. Priante, B. Janjua, A. Prabaswara, T. K. Ng, B. S. Ooi, F. Laquai, and **X. Li**, "Effective surface passivation of InGaIn/GaN nanowires studied by photoluminescence and

- photothermal deflection spectroscopy,” International Workshop on Nitride Semiconductors (IWN 2016), Orlando, FL, United States, October 2016.
85. **(Invited Talk) X. Li**, “AlGa_N Deep UV Lasers on Sapphire Substrates Grown by MOCVD,” International Workshop on UV Materials and Devices (IWUMD), Beijing, China, July 2016.
 86. **(Late News) K. H. Li***, N. Alfaraj*, M. S. Alias*, T. K. Ng, B. S. Ooi, T. Detchprohm, R. D. Dupuis, and **X. Li**, “Refractive index measurement of single-crystalline wurtzite BAlN with Boron contents up to 11.6%”, 2016 International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), San Diego, CA, United States, July 2016.
 87. **X. Li**, S. Wang, H. Liu, F. A. Ponce, T. Detchprohm, and R. D. Dupuis, “100-nm Single-Phase Wurtzite BAlN with B Contents up to 7.2% Grown by MOVPE,” International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), San Diego, USA, July 2016.
 88. **(Late News) F. Wu**, J. Dai, Z. C. Feng, C. Chen, and **X. Li**, “Strong enhancement in internal quantum efficiency of GaN/AlGa_N multiple quantum wells emitting at ~350 nm,” Electronic Material Conference (EMC), Newark, DE, United States, June 2016.
 89. **X. Li**, S. Wang, H. Liu, F. A. Ponce, T. Detchprohm, and R. D. Dupuis, “Single-Phase Wurtzite BAlN with 7.2%-B Contents Grown by MOCVD,” Electronic Material Conference (EMC), Newark, DE, United States, June 2016.
 90. **X. Li**, S. Wang, H. Liu, F. A. Ponce, T. Detchprohm, and R. D. Dupuis, “Growth of single-phase wurtzite BAlN with relatively large thicknesses and high B contents by metalorganic chemical vapor deposition,” in Proc. of the SPIE Photonics West 2016, Gallium Nitride Materials and Devices XI, San Francisco, CA, United States, Feb 2016.
 91. **(Invited Talk) X. Li**, “III-nitride deep UV laser,” KAUST-NSF Conference on Electronic Materials, Devices and Systems for a Sustainable Future, Thuwal, KAUST, Saudi Arabia, Mar 2016.

Conference Publications before KAUST

92. **(Invited Talk) X. Li**, T. Detchprohm, T. T. Kao, M. Satter, S. C. Shen, P. D. Yoder, R. D. Dupuis, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, T. Wernicke, C. Reich, M. Martens, and M. Kneissl, “III-nitride deep UV laser on sapphire substrate,” IEEE Photonics Conference, Reston, VA, United States, Oct 2015.
93. **(Invited Talk) X. Li**, T. Detchprohm, Y. S. Liu, R. D. Dupuis, T. T. Kao, Saniul Haq, S. C. Shen, K. Mehta, P. D. Yoder, S. Wang, Y. O. Wei, H. Xie, A. M. Fischer, F. A. Ponce, T. Wernicke, C. Reich, M. Martens, M. Kneissl, “Optically pumped low-threshold UV lasers,” IEEE Summer Topicals Meeting Series (SUM), Nassau, Bahamas, July 2015.
94. **(Late News) X. Li**, S. Wang, H. Liu, F. A. Ponce, T. Detchprohm, and R. D. Dupuis, “High quality wurtzite BAlN with high B content by metalorganic chemical vapor deposition,” Electronic Material Conference (EMC), Columbus, OH, United States, June 2015.
95. **(Invited Talk) X. Li**, T. Detchprohm, Y. S. Liu, T. T. Kao, S. C. Shen, M. Satter, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, T. Wernicke, C. Reich, M. Martens, M. Kneissl, and R. D. Dupuis, “Optically-pumped low-threshold Deep UV Lasers Grown on Sapphire Substrates,” SPIE Photonics West, San Francisco, CA, United States, Feb 2015.
96. **X. Li**, T. Detchprohm, Y. S. Liu, T. T. Kao, M. Satter, S. C. Shen, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, and R. D. Dupuis, “Low-threshold stimulated emission from AlGa_N-based lasers grown on sapphire substrates,” Materials Research Society (MRS) Fall Meeting, Boston, MA, United States, Nov-Dec 2014.
97. **(Invited Talk) X. Li**, Y. S. Liu, T. Detchprohm, T. T. Kao, S. C. Shen, M. Satter, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, T. Wernicke, C. Reich, M. Martens, M. Kneissl, and R. D.

- Dupuis, "Low-threshold Deep UV Lasers Grown on Sapphire Substrates," International Workshop on Nitride Semiconductors (IWN), Warsaw, Poland, August 2014.
98. J. D. Justice, **X. Li**, T. Detchprohm, R. D. Dupuis, H. Kim, J. M. Zuo, Z. Lin, and Y. H. Zhang, "Properties of InAs/InAsSb Type-II superlattices Grown on GaSb by MOCVD," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Lausanne, Switzerland, July 2014.
 99. **(Late News) X. Li**, T. Detchprohm, Y. S. Liu, R. D. Dupuis, T. T. Kao, S. C. Shen, M. Satter, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, T. Wernicke, C. Reich, M. Martens, and M. Kneissl, "Low-threshold Deep UV Lasers Grown on Sapphire Substrates," International Workshop on Nitride Semiconductors (IWN), Wroclaw, Poland, Aug 2014.
 100. **X. Li**, T. Detchprohm, Y. S. Liu, T. T. Kao, M. Satter, S. C. Shen, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, and F. A. Ponce, and R. D. Dupuis, "High Quality AlN/Sapphire Template Grown by Relatively Low-Temperature Metalorganic-Chemical-Vapor Deposition," International Workshop on Nitride Semiconductors (IWN), Wroclaw, Poland, Aug 2014.
 101. **(Late News) X. Li**, T. Detchprohm, Y. S. Liu, T. T. Kao, M. Satter, S. C. Shen, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, and R. D. Dupuis, "Room-temperature low-threshold deep-ultraviolet stimulated emission from AlGa_N heterostructures grown on sapphire substrates," OptoElectronics and Communications Conference and Australian Conference on Optical Fibre Technology (OECC/ACOFT), Melbourne, Australia, July 2014.
 102. **(Late News) X. Li**, T. Detchprohm, Y. S. Liu, T. T. Kao, M. Satter, S. C. Shen, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, and R. D. Dupuis, "Low-threshold stimulated emission at 239nm-270nm from AlGa_N-based multiple-quantum-well lasers grown on sapphire substrates at room temperature," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Lausanne, Switzerland, July 2014.
 103. **X. Li**, T. Detchprohm, Y. S. Liu, T. T. Kao, M. Satter, S. C. Shen, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, and R. D. Dupuis, "Growth of High Quality AlN/Sapphire Template Low-Temperature Metalorganic-Chemical-Vapor Deposition," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Lausanne, Switzerland, July 2014.
 104. **X. Li**, T. Detchprohm, Y. S. Liu, and R. D. Dupuis, "High Quality AlN/Sapphire Template Grown by Low-Temperature Metalorganic-Chemical-Vapor Deposition," The 5th International Symposium on Growth of III-Nitrides (ISGN-5), Atlanta, GA, United States, May 2014.
 105. Y. S. Liu, T. T. Kao, M. Satter, **X. Li**, S.-C. Shen, P. D. Yoder, T. Detchprohm, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, and R. D. Dupuis, "Optically Pumped AlGa_N-Based Ultraviolet Laser Grown by Metalorganic Chemical Vapor Deposition with Distributed Bragg Reflector Facet Coating," International Conference on Metalorganic Vapor Phase Deposition (ICMOVPE), Lausanne, Switzerland, July 2014.
 106. Y. S. Liu, T. T. Kao, Z. Lochner, **X. Li**, M. Satter, S.-C. Shen, P. D. Yoder, T. Detchprohm and R. D. Dupuis, "Optically pumped deep-ultraviolet AlGa_N multi-quantum-well lasers grown by metalorganic chemical vapor deposition," presented in SPIE Photonics West, San Francisco, CA, United States, February 2014.
 107. Y. S. Liu, T. T. Kao, Z. Lochner, **X. Li**, M. Satter, J.-H. Ryou, S.-C. Shen, P.D. Yoder, T. Detchprohm, R. D. Dupuis, Y. Wei, H. Xie, A. Fischer, and F. Ponce, "Low-threshold optically pumped AlGa_N based Deep-ultraviolet multi-quantum-well laser grown by MOCVD on AlN substrates," presented in the 10th International Conference on Nitride Semiconductors, Washington, D.C., August 2013.
 108. Z. Lochner, T. T. Kao, Y. S. Liu, **X. Li**, M. M. Satter, S. C. Shen, P. D. Yoder, J. H. Ryou, R. D. Dupuis, Y. Wei, H. Xie, A. Fische, and F A. Ponce, "Optically pumped AlGa_N quantum-well lasers at

~243.5 nm grown by MOCVD on AlN substrates,” E-MRS 2013 Spring Meeting, Strasbourg, France, May 2013.

109. **X. Li**, Z. Lochner, Y. S. Liu, T. T. Kao, M. Satter, J. H. Ryou, S. C. Shen, D. Yoder, R. D Dupuis, Y. Wei, H. Xie, A. Fischer, and F. Ponce, “Stimulated Emission at 256.1 nm with a Low Threshold Optical Pumping Power density from AlGa_N Multiple Quantum Well grown at High Temperature on Sapphire,” 10th International Conference on Nitride Semiconductors (ICNS), Washington, D.C., United States, August 2013.
110. Z. Lochner, **X. Li**, Y.-S. Liu, T.-T. Kao, M. Satter, J.-H. Ryou, S.-C. Shen, P.D. Yoder, T. Detchprohm, R. D. Dupuis, Y. Wei, H. Xie, A. Fischer, and F. Ponce, "Stimulated emission at 256.1 nm with a low threshold optical pumping power density from AlGa_N multiple quantum well grown at high-temperature on sapphire," 10th International Conference on Nitride Semiconductors (ICNS), Washington, D.C., United States, August 2013.
111. **X. Li**, Z. Lochner, Y. S. Liu, T. T. Kao, M. Satter, J. H. Ryou, S. C. Shen, D. Yoder, R. D Dupuis, Y. Wei, H. Xie, A. Fischer, and F. Ponce, “Growth and Characterization of Al_xGa_{1-x}N ($x \geq 0.6$) on Sapphire Substrates using High Growth Temperature by Metalorganic Chemical Vapor Deposition,” The 16th U.S. Biennial Workshop on Organometallic Vapor Phase Epitaxy, Keystone, CO, United States, July 2013.
112. **X. Li**, Z. Lochner, Y. S. Liu, T. T. Kao, M. Satter, J. H. Ryou, S. C. Shen, D. Yoder, R. D Dupuis, Y. Wei, H. Xie, A. Fischer, and F. Ponce, “Growth of High Al-Content AlGa_N on AlN/ Sapphire Templates by High-Temperature Metalorganic-Chemical-Vapor Deposition,” Electronic Material Conference, South Bend, IN, United States, June 2013.
113. R. D. Dupuis, Z. Lochner, **X. Li**, J.-H. Ryou, T. Kao, S.-C. Shen, P. D. Yoder, M. Satter, A. Fisher and F. Ponce, "Room-temperature optically pumped AlGa_N/AlN multiple quantum well lasers operating at < 260 nm grown by metalorganic chemical vapor deposition," presented in the 2013 SPIE Photonics West Conference, San Francisco, CA, United States, February 2013.
114. Z. Lochner, **X. Li**, T. T. Kao, Y. S. Liu, M. M. Satter, S. C. Shen, P. D. Yoder, J. H. Ryou, R. D. Dupuis, Y. Wei, H. Xie, A. Fischer, and F A. Ponce, “Room-temperature optically pumped AlGa_N-AlN multiple-quantum-well lasers operating at <260nm grown by metalorganic chemical vapor deposition,” in Proc. of the SPIE Photonics West 2010, Gallium Nitride Materials and Devices V, San Francisco, CA, United States, February 2013.
115. C. K. Tan, J. Zhang, **X. Li**, G. Y. Liu, and N. Tansu, “Dilute-As GaNAs Semiconductor for Visible Emitters,” Proc. of the IEEE Photonics Conference 2012, Burlingame, CA, United States, September 2012.
116. Z. Lochner, **X. Li**, H. J. Kim, Y. Zhang, S. Choi, S. C. Shen, J. H. Ryou, and Russell D. Dupuis, “High Power and RF Characterizations of III-Nitride Heterojunction Bipolar Transistors on Free-Standing GaN Substrates,” Electronic Material Conference, State College, PA, United States, June 2012.
117. W. Koo, W. Youn, **X. Li**, R. B. Song, N. Tansu, and F. So, “Light extraction from organic light emitting diodes by silica microsphere array pattern,” Proc. of the SPIE Optics + Photonics 2011, The 11th International Conference on Solid State Lighting, vol. 8115, paper 8115-57, San Diego, CA, United States, August 2011.
118. W. Youn, W. Koo, **X. Li**, N. Tansu, and F. So, “Organic light emitting diodes with Silica/polystyrene diffraction grating for improved out-coupling efficiency,” Florida Energy Systems Consortium 2011, Gainesville, FL, United States, Sep 2011.
119. **X. Li**, Y. K. Ee, R. Song, and N. Tansu, “Fabrication of Self-Assembled Silica / Polystyrene Microlens Arrays for Light Extraction Enhancement in Nitride Light-Emitting Diodes” in Proc. of the IEEE/OSA Conference on Lasers and Electro-Optics (CLEO), Baltimore, MD, United States, May 2011.

120. **X. Li**, Y. K. Ee, R. Song, and N. Tansu, "Enhancement of light extraction efficiency of InGaN quantum wells light-emitting diodes using TiO₂ microsphere arrays" in Proc. of the SPIE Photonics West 2011, Light-Emitting Diodes: Materials, Devices, and Applications for Solid State Lighting XV, San Francisco, CA, United States, January 2011.
121. **X. Li**, S. Dutta, T. Krentz, T. B. Kim, R. P. Vinci, N. Tansu and H. M. Chan, "MOCVD GaN Growth on Vermicular, Sol-Gel Derived Sapphire Coatings," Molmat 2010, Montpellier, France, July 2010.
122. **X. Li**, Y. K. Ee, G. Y. Liu, P. Kumnorkaew, J. F. Gilchrist, and N. Tansu, "MOCVD Epitaxy of GaN by Employing SiO₂ Colloidal Microsphere Templates," in Proc. of the American Physical Society (APS) Annual March Meeting 2010, Portland, Oregon, United States, March 2010.
123. Y. K. Ee, **X. Li**, J. Biser, W. Cao, H. M. Chan, R. P. Vinci, and N. Tansu, "Growth Evolution and Time-Resolved Measurements of III-Nitride Light-Emitting Diodes Grown by Abbreviated Growth Mode on Patterned AGOG Substrate," in Proc. of the IEEE/OSA Conference on Lasers and Electro-Optics (CLEO) 2010, San Jose, CA, United States, May 2010.
124. **(Invited Talk)** H. P. Zhao, G. Y. Liu, **X. Li**, Y. K. Ee, H. Tong, J. Zhang, G. S. Huang, and N. Tansu, "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, United States, May 2010.
125. S. Dutta, T. Krentz, **X. Li**, T. B. Kim, R. P. Vinci, H. M. Chan, and N. Tansu, "Microstructural evolution of alumina sol-gel coatings on sapphire," ACerS Sosman Award Symposium: Sol-Gel Fundamentals and Applications, Materials Science & Technology 2010, Houston, TX, United States, October 2010.
126. **(Invited Talk)** N. Tansu, H. P. Zhao, G. Y. Liu, **X. Li**, J. Zhang, H. Tong, G. S. Huang, and Y. K. Ee, "Novel Device Concepts and Growths for High-Efficiency III-Nitride Light-Emitting Diodes," in Proc. of the International Union of Materials Research Societies - International Conference on Electronic Materials (IUMRS-ICEM) 2010, Seoul, Korea, August 2010.
127. **(Invited Talk)** H. P. Zhao, J. Zhang, G. Y. Liu, **X. Li**, Y. K. Ee, H. Tong, T. Toma, G. S. Huang, and N. Tansu, "Approaches for High-Efficiency InGaN Quantum Wells Light-Emitting Diodes" in Proc. of the American Vacuum Society Meeting, Ann-Arbor, MI, United States, May 2010.
128. **(Invited Talk)** N. Tansu, H. Zhao, Y. K. Ee, G. Liu, **X. 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, United States, January 2010.
129. **(Invited Talk)** N. Tansu, H. Zhao, Y. K. Ee, G. Liu, **X. 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, United States, May 2010.
130. Y. K. Ee, **X. 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, United States, August 2009.
131. H. Zhao, G. Liu, **X. 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, United States, May 2009.

132. H. Zhao, G. S. Huang, G. Liu, **X. 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, United States, June 2009.
133. (**Invited Talk**) N. Tansu, H. P. Zhao, R. A. Arif, Y. K. Ee, G. Y. Liu, **X. Li**, and G. S. Huang, "Polarization Engineering of InGaN-Based Nanostructures for Low-Threshold Diode Lasers and High-Efficiency Light Emitting Diodes," Proc. of the IEEE Photonics Global 2008, Nanophotonics Symposium, Singapore, Republic of Singapore, December 2008.

Invited Seminars

1. **X. Li**, University of Houston, Houston, TX, USA, September 2020.
2. **X. Li**, Central South University (CSU), Changsha, China, December 2019.
3. **X. Li**, University of Pennsylvania, Philadelphia, PA, USA, October 2019.
4. **X. Li**, New Jersey Institute of Technology, Newark, NJ, USA, September 2019.
5. **X. Li**, State University of New York at Buffalo, Buffalo, NY, USA, September 2019.
6. **X. Li**, Yale University, New Haven, CT, USA, September 2019.
7. **X. Li**, Rochester Institute of Technology, Rochester, NY, USA, September 2019.
8. **X. Li**, Rensselaer Polytechnic Institute, Troy, NY, USA, September 2019.
9. **X. Li**, Georgia Institute of Technology, Atlanta, GA, USA, September 2019.
10. **X. Li**, Nanchang University, Nanchang, China, June 2019.
11. **X. Li**, Wuhan University, Wuhan, China, June 2019.
12. **X. Li**, Huazhong University of Science and Technology, Wuhan, China, June 2019.
13. **X. Li**, Guangdong Institute of Semiconductor Industrial Technology, Guangzhou, China, Feb 2019.
14. **X. Li**, Bolb Inc, Livermore, CA, USA, Feb 2018.
15. **X. Li**, University of College Cork, Tyndall Institute, Cork, Ireland, January 2019.
16. **X. Li**, University of Cambridge, Cambridge, United Kingdom, January 2019.
17. **X. Li**, Westlake University, Hangzhou, China, November 2018.
18. **X. Li**, Zhejiang University, Hangzhou, China, November 2018.
19. **X. Li**, DUV TEK, Ezhou, China, Jun 2018.
20. **X. Li**, Guangxi University, Nanning, China, May 2018.
21. **X. Li**, Ningbo Material Technology and Engineering Institute, Chinese Academy of Science, Ningbo, China, May 2018.
22. **X. Li**, CAS SINANO, Suzhou, China, May 2018.
23. **X. Li**, Soochow University, Suzhou, China, May 2018.
24. **X. Li**, Nanjing University, Nanjing, China, May 2018.
25. **X. Li**, Nanjing University of Posts and Telecommunications, Nanjing, China, May 2018.
26. **X. Li**, Technical University of Berlin, Berlin, Germany, April 2018.
27. **X. Li**, Central South University (CSU), Changsha, China, March 2018.
28. **X. Li**, Texas Tech University, Lubbock, TX, USA, January 2018.
29. **X. Li**, Tecnológico de Monterrey, Monterrey, Mexico, January 2018.
30. **X. Li**, Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV), Queretaro, Mexico, January 2018.
31. **X. Li**, Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV), Mexico City, Mexico, Jan 2018.
32. **X. Li**, Arizona State University, Tempe, AZ, USA, January 2018.
33. **X. Li**, University of Houston, Houston, TX, USA, January 2018.
34. **X. Li**, Guangdong Institute of Semiconductor Industrial Technology, Guangzhou, China, January 2018.

35. X. Li, Sun Yat-sen University, Guangzhou, China, January 2018.
36. X. Li, Southern University of Science and Technology, Shenzhen, China, January 2018.
37. X. Li, Saga University, Saga, Japan, November 2017.
38. X. Li, Institute of Semiconductors, Chinese Academy of Sciences (CAS), Changchun, China, November 2017.
39. X. Li, Hebei University of Technology, Tianjin, China, November 2017.
40. X. Li, Peking University, Beijing, China, November 2017.
41. X. Li, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences (CAS), Changchun, China, November 2017.
42. X. Li, Jilin University, Changchun, China, November 2017.
43. X. Li, University of Electronic Science and Technology of China (UESTC), Chengdu, China, January 2016.
44. X. Li, Central South University (CSU), Changsha, China, January 2016.
45. X. Li, Shanghai Institute of Technical Physics of the Chinese Academy of Sciences (CAS), Shanghai, China, January 2016.
46. X. Li, Longcheng Middle School, Liuzhou, Guangxi, China, January 2016.
47. X. Li, Huazhong University of Science and Technology (HUST), Wuhan, China, December 2015.
48. X. Li, Wuhan National Laboratory for Optoelectronics (WNLO), Wuhan, China, December 2015.
49. X. Li, Wuhan University, Wuhan, China, December 2015.
50. X. Li, Oregon State University, Corvallis, OR, USA, October 2015.
51. X. Li, Portland State University, Portland, OR, USA, October 2015.
52. X. Li, King Abdullah University of Science and Technology (KAUST) Thuwal, Saudi Arabia, April 2015.
53. X. Li, University of South Alabama, Mobile, AL, USA, April 2015.
54. X. Li, University of St. Thomas, St Paul, MN, USA, April 2015.
55. X. Li, Intel Corporation, Hillsboro, OR, USA, April 2015.
56. X. Li, Keysight Technologies, Santa Rosa, CA, USA, March 2015.
57. X. Li, Portland State University, Portland, OR, USA, March 2015.
58. X. Li, University of Alabama in Huntsville, USA, March 2015.

Internal Scientific Lectures & Seminars and Other Non-Refereed Presentations

1. X. Li, "Introduction to the Applied Physics Program," KAUST Undergraduate Poster Competition, January 2020.
2. X. Li, "New knowledge and commercial opportunities of the third-generation semiconductor," KAUST Microelectronics Winter School, January 2020.
3. X. Li, "New knowledge and commercial opportunities of the third-generation semiconductor," KAUST Photonics Summer School, July 2019.
4. X. Li, "Enormous opportunities of the third-generation semiconductor research and commercialization," CEMSE Saudi Summer Internship - Group Seminar, May 2019.
5. X. Li, "UV LED and laser based on wide bandgap semiconductor materials," KAUST Materials Science and Engineering Seminar, April 2019.
6. X. Li, "Bright future of the third-generation semiconductor," KAUST Seminar for UESTC Visitors, March 2019.
7. X. Li, "Enormous opportunities of the third-generation semiconductor research and commercialization," KAUST Microelectronics Winter Camp, February 2019.
8. X. Li, "Enormous opportunities of the third-generation semiconductor research and commercialization," KAUST Electrical Engineering Graduate Seminar, September 2018.

9. **X. Li**, “New knowledge and commercial opportunities of the third-generation semiconductor,” KAUST Photonics Summer School, July 2019.
10. **X. Li**, “Enormous opportunities of the third-generation semiconductor research and commercialization,” CEMSE Mini Sci-Café for KAUST Gifted Students Program (KGSP) Pre-Departure Orientation, July 2018.
11. H.-H. Yao, **X. Li**, “Semiconductor Manufacturing,” KAUST Electrical Engineering Graduate Seminar, February 2018.
12. **X. Li**, “Enormous opportunities of the third-generation semiconductor research and commercialization,” KAUST Electrical Engineering Graduate Seminar, February 2018.
13. **X. Li**, “Opportunities of the third-generation semiconductor, KAUST, and choice of going abroad,” KAUST Seminar for UESTC Visitors, February 2018.
14. H. Sun, N. Alfaraj, K. H. Li, R. Lin, **X. Li**, “Large bandgap material research at Advanced Semiconductor Lab,” KAUST Electrical Engineering Graduate Seminar, April 2017.
15. **X. Li**, “Cutting-edge Research on III-nitride Semiconductor Devices and Tips for Surviving and Thriving in Graduate Study,” KAUST Electrical Engineering Graduate Seminar, September 2016.
16. **X. Li**, “What is management consulting and let’s solve a case,” KAUST Electrical Engineering Special Seminar, September 2016.
17. R. D. Dupuis, **X. Li**, Y. S. Liu, T. Detchprohm, T. T. Kao, S. C. Shen, M. Satter, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, and F. A. Ponce, “III-Nitride Wide-Bandgap Light Emitters: The Ultimate Lamp for the Visible and Ultraviolet,” Alexander von Humboldt-Lecture, Technische Universität Berlin, Berlin, Germany, April 2014.
18. R. D. Dupuis, **X. Li**, Y. S. Liu, T. Detchprohm, T. T. Kao, S. C. Shen, M. Satter, P. D. Yoder, S. Wang, Y. Wei, H. Xie, A. Fischer, F. A. Ponce, “Low-threshold Deep UV Lasers,” Institute of Solid State Physics, Technische Universität Berlin, Berlin, Germany, April 2014.
19. **X. Li**, Z. Lochner, Y. S. Liu, T. T. Kao, M. Satter, J. H. Ryou, S. C. Shen, D. Yoder, R. D Dupuis, Y. Wei, H. Xie, A. Fischer, and F. Ponce, “High Quality AlGaN Material Growth for Deep Ultraviolet Emitter by High-Temperature Metalorganic-Chemical-Vapor Deposition,” User Day, Institute for Electronics and Nanotechnology, Georgia Institute of Technology, Atlanta, GA, USA, May 2013.
20. **X. Li**, Y. K. Ee, J. Biser, W. Cao, R. P. Vinci, H. M. Chan, and N. Tansu, “Abbreviated MOVPE nucleation of III-nitride light-emitting diodes on nano-patterned sapphire,” Nano-Energy Workshop, Lehigh University, Bethlehem, Pennsylvania, USA, September 2010.
21. **X. Li**, R. B. Song, Y. K. Ee, P. Kumnorkaew, J. F. Gilchrist, and N. Tansu, “Light Extraction Efficiency and Radiation Patterns of III-Nitride Light-Emitting Diodes with Colloidal Microlens Arrays,” Nano-Energy Workshop, Lehigh University, Bethlehem, Pennsylvania, USA, September 2010.
22. **X. Li**, and N. Tansu, “Density-Functional-Theory First-Principle Studies on Polarization Fields of III-Nitride Semiconductors,” Poster Presentation in Lehigh Center for Optical Technologies (COT) Open House 2009, COT Workshop on NanoPhotonics, Lehigh University, Bethlehem, Pennsylvania, USA, October 2009.
23. Y. K. Ee, **X. Li**, J. Biser, W. Cao, R. P. Vinci, H. M. Chan, and N. Tansu, “III-Nitride Light-Emitting Diodes on Nano-Patterned Sapphire,” Poster Presentation in Lehigh Center for Optical Technologies (COT) Open House 2011, Lehigh University, Bethlehem, Pennsylvania, USA, November 2011
24. Y. K. Ee, **X. Li**, J. Biser, W. Cao, R. P. Vinci, H. M. Chan, and N. Tansu, “Abbreviated MOVPE Growth Mode of III-Nitride Light-Emitting Diodes on Nano-Patterned AGOG Substrate,” Poster Presentation in Lehigh Center for Optical Technologies (COT) Open House 2010, Lehigh University, Bethlehem, Pennsylvania, USA, October 2010.

25. Y. K. Ee, **X. Li**, J. Biser, W. Cao, R. P. Vinci, H. M. Chan, and N. Tansu, “Abbreviated MOVPE Growth Mode of III Nitride Light-Emitting Diodes on Nano-Patterned AGOG Substrate,” Poster Presentation in Lehigh Nano-Energy Workshop 2010, Lehigh University, Bethlehem, Pennsylvania, USA, September 2010.
26. Y. K. Ee, **X. Li**, J. Biser, W. Cao, R. P. Vinci, H. M. Chan, and N. Tansu, “Enhancement of III-Nitride LEDs Grown on Nano-Patterned AGOG Sapphire Substrate by Metalorganic Vapor Phase Epitaxy,” Poster Presentation in Lehigh Center for Optical Technologies (COT) Open House 2009, COT Workshop on NanoPhotonics, Lehigh University, Bethlehem, Pennsylvania, USA, October 2009.
27. H. P. Zhao, G. Y. Liu, **X. Li**, J. Zhang, G. S. Huang, J. D. Poplawsky, V. Dierolf, and N. Tansu, “Enhancement of Radiative Efficiency via Staggered InGaN Quantum Well Light Emitting Diodes,” Invited Poster Presentation in Transformation in Lighting 2010, DOE R&D Workshop on Solid State Lighting 2010, Raleigh, NC, USA, February 2010.
28. H. P. Zhao, G. Y. Liu, **X. 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.
29. Y. K. Ee, P. Kumnorkaew, **X. Li**, R. A. Arif, H. Tong, H. P. Zhao, J. F. Gilchrist, and N. Tansu, “Light Extraction Efficiency Enhancement of III-Nitride LEDs with Colloidal-Microstructures,” Oral Presentation in Lehigh Center for Optical Technologies (COT) Open House 2009, COT Workshop on NanoPhotonics, Lehigh University, Bethlehem, Pennsylvania, USA, October 2009.
30. H. P. Zhao, G. Y. Liu, **X. Li**, G. S. Huang, J. Poplawsky, V. Dierolf, and N. Tansu, “Staggered InGaN Quantum-Well Light-Emitting Diodes,” Oral Presentation in Lehigh Center for Optical Technologies (COT) Open House 2009, COT Workshop on NanoPhotonics, Lehigh University, Bethlehem, Pennsylvania, USA, October 2009.
31. H. P. Zhao, G. Y. Liu, **X. Li**, G. S. Huang, J. 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,” Poster Presentation in Lehigh Center for Optical Technologies (COT) Open House 2009, COT Workshop on NanoPhotonics, Lehigh University, Bethlehem, Pennsylvania, USA, October 2009.

References

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KEPCO Tech - A new university being built by KEPCO
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