

HONGXING JIANG

Edward E. Whitacre, Jr. Endowed Chair and Horn Professor
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Appointments

Edward E. Whitacre, Jr. Endowed Chair and Horn Professor, Electrical and Computer Engineering, Texas Tech University, 2013 – present (Horn Professorships, the highest honor Texas Tech University may bestow on members of its faculty: http://www.swco.ttu.edu/university_archive/uacollections11.html)

Edward E. Whitacre, Jr. Endowed Chair and Professor, Electrical and Computer Engineering, Texas Tech University, 2008 - 2013

Co-Director, Center for Nanophotonics, Texas Tech University (Center formed in Sept. 2010)

University Distinguished Professor, Kansas State University, 2004-2008

Professor of Physics, Kansas State University, 1998-2004

Director, Kansas Advanced Semiconductor Coordinated Laboratory, 1998-2008

Visiting Scientist, Sandia National Lab (Albuquerque, NM), 1/99-6/99

Associate Professor of Physics, Kansas State University, 1993-1998

Assistant Professor of Physics, Kansas State University, 1988-1993

Education

B. S., Fudan University, Shanghai, China, 1977-1981

M. S. in Physics, Syracuse University, Syracuse, New York, 1981-1983

Ph. D. in Physics, Syracuse University, Syracuse, New York, 1983-1986

Awards, honors, and special appointments

Elected Fellow of the American Physical Society, 2010

Elected Fellow of the Optical Society of America, 2014

Elected Fellow of SPIE - the international society for optics and photonics, 2016

Elected Fellow of the American Association for the Advancement of Science, 2017

Horn Professor, Texas Tech University (TTU), 2013 –

Barnie E. Rushing, Jr. Faculty Distinguished Research Award, TTU, 2011

Edward E. Whitacre, Jr. Endowed Chair, TTU, 2008 –

University Distinguished Professor, Kansas State University, 2004-2008

Graduate Student Fellow, Syracuse University (1984-1986)

CUSPEA Fellow, 1981 (<http://en.wikipedia.org/wiki/CUSPEA>)

Royal Society of London Kan Tong Po Visiting Professorship, Hong Kong PolyU, 2011

Guest professorship, Zhejiang University, China, 2000-2004

Guest professorship, Xi'an Jiaotong University, China, 2001-2005

Biographic Reference: *Who's Who in America; Who's Who in the World*

Research Grants:

Over the past two decades, in addition to the support from DOE and NSF for conducting fundamental research in photonic materials and devices, our research group has been an active member of important R & D programs in the United States related to the development of III-nitride material and device technologies, including DARPA's Semiconductor Ultra-Violet Optical Sources (SUVOS), Deep Ultraviolet Avalanche Photodetectors (DUVAP), Visible InGaN Injection Lasers (VIGIL), and Compact Mid Ultraviolet Technology (CMUVT) programs, BMDO's GAMPA program, DHS's ARI program to develop semiconductor neutron detectors, and is currently involved in the High Energy Laser program of the Joint Technology Office (JTO).

- Secured \$11 million in federal research funding to Texas Tech University for conducting research in areas of wide bandgap semiconductors and associated photonic devices (08/2008-present)
- Conducted research in areas of wide bandgap semiconductors and associated photonic devices at Kansas State University (Total ~ \$16 million, 1988-2008)

Students and Postdocs Mentored

Total number of graduate students and postdoctoral scholars mentored: > 50

Total number of undergraduates hosted: 8

Total number of international exchanged students hosted: 6

Visiting professors Hosted: 9

Professional Activities/Services

Co-Founder/Owner: III-N Technology, Inc. (3N) and AC-LED Lighting, L.L.C. 3N develops proprietary next-generation photonic devices for advanced lighting and compact displays. In particular, 3N has invented and built up a comprehensive patent portfolio of micro-LED based single-chip high voltage AC/DC-LEDs. High voltage AC-LEDs can be plugged directly into standard power outlets or lamp sockets without power conversion and address the key compatibility issue between LEDs and AC power grid infrastructure, while the single-chip high voltage DC LEDs have a broad range of commercial applications, including automobile headlights. 3N has facilitated the commercialization of AC-LED technology through its related entity AC-LED Lighting, L.L.C. and the novel device architecture is being adopted by LED manufactures worldwide for energy efficient solid-state lighting applications. 3N has also developed and patented novel self-emissive microdisplays for future ultra-portable products such as next generation pico-projectors, wearable displays, and head-up displays.

Panelist: *NSF and DOE interdisciplinary research programs*

Individual proposal reviewed for: *DOE, NSF, DOD, NSERC, NRC, Research Corp., NSFC*

Papers reviewed for: *Applied Physics Letters, Journal of Applied Physics, Physical Review Letters, Physical Review B, Nature, Nature Photonics; Nature Materials, ACS Nano, etc*

Patents granted ([link](#))

- 1 "Charge Storage Imaging Devices Using Persistent Photoconductivity Crystals," U.S. Patent #5,072,122; Application date: 10/15/1990.
- 2 "Persistent Photoconductivity Quenching Effect Crystals and Electrical Apparatus Using Same," U.S. Patent #5,101,109; Application date: 10/15/1990.
- 3 "Micro-size LED and detector arrays for mini-displays, hyperbright light emitting diodes, lighting, and UV detector and imaging sensor applications," U.S. Patent #6,410,940; Application date: 06/15/2000.
- 4 "Micro-size LED and detector arrays for mini-displays, hyperbright light emitting diodes, lighting, and UV detector and imaging sensor applications," Korean patent #0802764; Application date: 12/11/2002.

- 5 "Light Emitting Diodes for High AC Voltage Operating and General Lighting," US Patent #6,957,899; Application date: 10/24/2002.
- 6 "Light Emitting Diodes for High AC Voltage Operating and General Lighting," US patent 7,210,819, issued in 2007; Application date: 04/19/2005.
- 7 "Light Emitting Diodes for High AC Voltage Operating and General Lighting," US patent 7,213,942; Application date: 05/03/2005.
- 8 "Nitride Microlens and Arrays for Blue and UV Wavelength Applications," U.S. Patent 7,193,784; Application date: 05/20/2004.
- 9 "Heterogeneous Integrated High Voltage DC/AC Light Emitter," US patent 7,221,044; Application date: 01/21/2005.
- 10 "Method and apparatus for use of III-Nitride wide bandgap semiconductors in optical communications," US patent #7,345,812; Application date: 02/21/2004.
- 11 "Micro-LED Based High Voltage AC/DC Indicator Lamp," US patent 7,535,028; Application date: 04/08/2005.
- 12 "Extreme Ultraviolet (EUV) Detectors Based upon Aluminum Nitride (AlN) Wide Bandgap Semiconductors," US patent 7,498,645; Application date: 10/04/2007.
- 13 "Micro-LED Based High Voltage AC/DC Indicator Lamp, "基于微型发光二极管的高压交直流指示灯," Chinese patent CNZL200510098257.6; Application date: 09/05/2005.
- 14 "AC/DC Light Emitting Diodes with Integrated Protection Mechanism," US patent 7,714,348; Application date: 05/10/2007.
- 15 "Micro-Emitter Array Based Full-Color Microdisplay," US patent 8,058,663; Application date: 09/26/2007.
- 16 "Er doped III-nitride materials and devices synthesized by MOCVD," US patent 8,227,328; Application date: 08/24/2007.
- 17 "Light emitting diode lamp capable of high AC/DC voltage operation," US patent 8,272,757; Application date: 06/03/2005.
- 18 "CMOS IC for micro-emitter based microdisplay," US patent 9,047,818, Application date: 03/12/2011.
- 19 "Structures and devices based on boron nitride and boron nitride-III-nitride heterostructures," US patent 9,093,581; Application date: 05/29/2012.

Patents pending

- 20 "AC/DC light emitting diodes with integrated protection mechanism," European Patent Application No. 07798009.2 (2080236); Regional Phase of PCT Application PCT/US2007/070213.
- 21 "Detecting and tracking hypersonic projectiles technologies for asset protection ranging from personnel to UAV."

Patent disclosures filed

1. "Optical Hearing Device Based on Micro-LED Arrays," filed May 2009.

Press Coverage on Our Research Work

The innovations of our research have been reported in German, Japanese, Russian, French, Italian, Indian, British, Portuguese, and Chinese technical magazines, in addition to press releases by media outlets including *The New York Times*, *CNN.com*, *ABCnews.com* and *USA Today*. For more detailed information link to <http://www2.ece.ttu.edu/nanophotonics/news.html>.

Books Edited

1. *III-Nitride Semiconductors Optical Properties I*, edited by M .O. Manasreh and H. X. Jiang, Taylor & Francis Books, (New York, London 2002).

2. *"III-Nitride Semiconductors Optical Properties II"* edited by M .O. Manasreh and H. X. Jiang, Taylor & Francis Books, (New York, London 2002).
3. *"Ultrafast Phenomena in Semiconductors V," Volume 4280 (2001),* edited by H. X. Jiang, K. T. Tseng, and J. J. Song. Published by The International Society for Optical Engineering.
4. *"Ultrafast Phenomena in Semiconductors VI," Volume 4643 (2002),* edited by K. T. Tseng, H. X. Jiang, and J. J. Song. Published by The International Society for Optical Engineering.
5. *Ultrafast Phenomena in Semiconductors VII," Volume 4992 (2003),* edited by K. T. Tseng, H. X. Jiang, and J. J. Song. Published by The International Society for Optical Engineering.
6. *Ultrafast Phenomena in Semiconductors VIII," Volume 5352 (2004),* edited by K. T. Tseng, J. J. Song, and H. X. Jiang. Published by The International Society for Optical Engineering.
7. *Ultrafast Phenomena in Semiconductors IX," Volume 5725 (2005),* edited by K. T. Tseng, J. J. Song, and H. X. Jiang. Published by The International Society for Optical Engineering.
8. *Ultrafast Phenomena in Semiconductors IX," Volume 6118 (2006),* edited by K. T. Tseng, J. J. Song, and H. X. Jiang. Published by The International Society for Optical Engineering.
9. *"Optical Materials," Vol. 23, Issues 1-2 - Proceedings of the 8th International Conference on Electronic Materials, 2002, Xi'an, China,* edited by R. Zhang, T.F. Kuech, H. Jiang, J. Xu, D. Kip, Q. Sun, and J. Wang, published by Elsevier.
10. *"Advances in III-V Nitride Semiconductor Materials and Devices," MRS Fall 2006 Meeting Proceedings Vol. 955E, Edited by C.R. Abernathy, H. Jiang, J.M. Zavada.*
11. *"Wide Bandgap Light-Emitting Materials and Devices,"* edited by G.F. Neumark, I. Kuskovsky, and H. X. Jiang, published by Wiley –VCH Verlag GmbH, 2007.
12. *"Compound Semiconductors for Generating, Emitting, and Manipulating Energy,"* 2011 MRS Fall meeting Proceedings, Vol 1396, edited by T. Li, M. Mastro, R. Dagar, H. X. Jiang, and J. Kim; ISBN: 978-1-60511-373-9.

Meeting organized

1. 1998 Int'l Topical Meeting on GaN, Co-Chair, Beijing China.
2. 2000 American Physical Society March Meeting, Chair, Division of Materials Physics Focused Session: Wide Bandgap Semiconductor.
3. SPIE Int'l Symposium on Ultrafast Phenomena in Semiconductors; Co-Chair/committee member for 8 years, 2001-2007.
4. ONR Workshop on Narrow Gap Nitrides, Co-Chair, Singapore, October, 2001.
5. The 8th Int'l Conference on Electronic Materials Symposium on Wide Bandgap Materials for Electronic and Optoelectronic Devices, Co-Chair, Xi'an, China, June 2002.
6. Workshop on Physics and Technology of Dilute Nitrides for Optical Communications, Committee Member, Istanbul, Sept. 2002.
7. The 5th Int'l Conference on Nitride Semiconductors," Committee Member, Japan, May 2003.
8. 2006 Fall Meeting, Material Research Society, Organizer/Chair, Symposium I: Advances in III-V Nitride Semiconductor Materials and Devices.
9. National Organizing Committee – 14th Semiconducting and Insulating Materials Conference, Committee Member, University of Arkansas, May 2007.
10. SPIE Symposium on Quantum Sensing and Nanophotonic Devices IV; Committee member, 2007.
11. Summer School 2008 on Wide-bandgap Semiconductor Physics and Devices, Co-Chair, July 28 - August 3, 2008 – Dalian, China.
12. Second Int'l Symposium on Growth of III-Nitrides, Committee Member, Laforet Shuzenji, Izu, Japan, July 6-9, 2008.
13. 8th Int'l Symposium on Semiconductor Light Emitting Devices, Co-Chair, May 16-21, 2010, Beijing, China
14. Int'l Conference of Nitride Semiconductors, Committee Member, ICNS-2011 Glasgow, UK.
15. Asia-Pacific Workshop on Wide Gap Semiconductors, Committee Member, Toba, Japan, May 2011.

16. Materials Research Society, 2011 Fall Meeting, Organizer/Chair, Symposium O: Compound Semiconductors for Generating, Emitting, and Manipulating Energy, Boston, MA, 2011.
17. 10th Int'l Conference on Nitride Semiconductors, Regional Committee Member, DC, August, 2013.
18. Int'l Conference on White LEDs and Solid State Lighting, Committee Member, June 2014, Jeju Island, Korea
19. The 11th International Conference on Nitride Semiconductors (ICNS-11), program committee member, Sept. 2015, Beijing, China.

Invited Presentations (Invited talks/plenary/key notes/short courses - 140 total)

(Delivered in 2015 & 2016)

- “GaN microLEDs, high-voltage AC/DC LEDs, and microdisplays,” The ForumLED Europe 2016, Congress Center in Lyon, France on 12/8/2016.
- “Nitride microLEDs - applications and future perspectives,” Nanjing Golden Autumn Economic and Trade Fair (终极显示技术竞争与展望论坛), 9/8/2016.
- “Hexagonal BN Epilayers – Growth, applications, and perspectives,” The International Workshop on UV Materials and Devices (IWUMD), 07/31/2016, Beijing, China.
- “Basic Properties of h-BN Epilayer,” 229th Electrochemical Society (ECS) Meeting, San Diego, 5/30/2016.
- “Er doped GaN – Growth, properties and application,” PRE’16 6th Int’l workshop on Photoluminescence in Rare-Earth, June 8-10, Greenville, SC.
- “Basic Properties of h-BN Epilayers,” 229th ECS Meeting, May 29-June 2, 2016, San Diego, CA.
- “MicroLED Development and Applications,” The 10th Taiwan Solid State Lighting (2016 tSSL) Symposium, 4/13-4/14/2016, Taipei, Taiwan.
- “Hexagonal boron nitride epilayers - growth, properties, and applications,” SPIE Photonics West, OPTO, Gallium Nitride Materials and Devices XI, San Francisco, 02/15/2016.
- “Hexagonal boron nitride - growth, properties, and applications,” China International Scientific & Technological Cooperation Week and International Forum on Development Strategy of the Third Generation Semiconductors, Dongguan Institute of Optoelectronics Peking University, Dongguan, China, 12/1/2015.
- “Hexagonal boron nitride materials – growth, properties, and applications,” University of Nebraska, Lincoln, ECE seminar, 11//11/2015
- “Erbium doped GaN – growth, properties, and applications,” Virginia Tech University, ECE seminar, 10/12/2015.
- “Hexagonal boron nitride materials – growth, properties, and applications,” Washington State University, Physics Colloquium, 10/06/2015
- “III-nitride material growth – hexagonal BN epilayers and Er doped GaN bulk crystals,” UT-Arlington, AFRL-UTA workshop, Sept. 2015.
- "Hexagonal boron nitride (h-BN) epilayers: growth, properties, and applications," The 11th International Conference on Nitride Semiconductors (ICNS-11), Sept. 2015, Beijing, China.
- "Hexagonal BN for deep UV photonics," 2015 IEEE Photonics Society Summer Topics Meeting on UV LEDs and Lasers, July 13 to 15, 2015 in Nassau, Bahamas.
- “Nitride semiconductors for energy generation” 227th The Electrochemical Society (ECS) meeting, May 2015, Chicago.
- “History and development of efficient blue LEDs for lighting,” Kansas State University public lecture, 2/23/2015.

Publications and Citations

Total publications: 403

Total Citations: > 15,000

H-index: 68 (as of 01/2017, according to Google Scholar Citations for [Hongxing Jiang](#))

List of Publications (Journal articles, book chapters, invited review articles and conference proceedings) (*indicating conference proceedings)

(link to <http://www2.ece.ttu.edu/nanophotonics/index.html> to download a copy of an article):

403. V. X. Ho, S. P. Dail, T. V. Dao, H. X. Jiang, J. Y. Lin, J. M. Zavada, and N. Q. Vinh, "Temperature dependence studies of Er optical centers in GaN epilayers grown by MOCVD", *MRS Advances*, pp. 1-6 (2017). doi: 10.1557/adv.2017.27.
402. V. X. Ho, T. V. Dao, H. X. Jiang, J. Y. Lin, J. M. Zavada, S. A. McGill, and N. Q. Vinh, "Photoluminescence quantum efficiency of Er optical centers in GaN epilayers," *Scientific Reports* **7**, 39997 (2017).
401. Q. W. Wang, J. Li, J. Y. Lin, and H. X. Jiang, "Enhancement of 1.5 μm emission under 980nm resonant excitation in Er and Yb co-doped GaN epilayers," *Appl. Phys. Lett.* **109**, 152103 (2016).
400. T. M. Al tahtamouni, J. Li, J. Y. Lin, and H. X. Jiang, "Current injection 1.54 μm light-emitting devices based on Er-doped GaN/AlGaIn multiple quantum wells," *Optical Materials Express* **6**, 3476 (2016).
399. T. C. Doan, J. Li, J. Y. Lin, and H. X. Jiang, "Bandgap and exciton binding energies of hexagonal boron nitride probed by photocurrent excitation spectroscopy," *Appl. Phys. Lett.* **109**, 122101 (2016).
398. A. Maity, T. C. Doan, J. Li, J. Y. Lin, and H. X. Jiang, "Realization of highly efficient hexagonal boron nitride neutron detectors," *Appl. Phys. Lett.* **109**, 072101 (2016).
397. Z. Y. Sun, J. Li, W. P. Zhao, J. Y. Lin, and H. X. Jiang, "Toward the realization of erbium-doped GaN bulk crystals as a gain medium for high energy lasers," *Appl. Phys. Lett.* **109**, 052101 (2016).
396. T. C. Doan, J. Li, J. Y. Lin, and H. X. Jiang, "Growth and device processing of hexagonal boron nitride epilayers for thermal neutron and deep ultraviolet detectors," *AIP Advances* **6**, 075213 (2016).
395. *D. K. George ; M. D. Hawkins ; H. X. Jiang ; J. Y. Lin ; J. M. Zavada; N. Q. Vinh, "Optical excitation of Er centers in GaN epilayers grown by MOCVD," *Proc. SPIE 9744*, Optical Components and Materials XIII, 97440V, 2016; invited.
394. N. Nepal, H. X. Jiang, J. Y. Lin, B. Mitchell, V. Dierolf, J. M. Zavada, "MOCVD growth of Er-doped III-N and optical-magnetic characterization" Chapter 7 in *Rare Earth and Transition Metal Doping of Semiconductor Materials: Synthesis, Magnetic Properties and Room Temperature Spintronics*," edited by V. Dierolf, I. T. Ferguson, and J. M. Zavada, Elsevier, Woodhead Publishing, 2016, pp. 225-255.
393. X. Z. Du, J. Li, J. Y. Lin, and H. X. Jiang, "The origins of near band-edge transitions in hexagonal boron nitride epilayers," *Appl. Phys. Lett.* **108**, 052106 (2016).
392. N. Nepal, J. Y. Lin, H. X. Jiang B. Mitchell, V. Dierolf, and J. Zavada, "MOCVD growth of Er-doped III-N and magnetic-optical characterization," Chapter 6 in "Rare earth and transition metal and doping of semiconductors material for room temperature spintronics," to be published by Woodhead Publishing, Elsevier.
391. * H. X. Jiang and J. Y. Lin, "InGaIn/GaN multiple quantum well solar cells for energy and hydrogen generation," *ECS Transactions* **66**, 129 (2015); invited.
390. D. K. George, M. D. Hawkins, M. McLaren, H. X. Jiang, J. Y. Lin, J. M. Zavada, and N. Q. Vinh, "Excitation mechanisms of Er optical centers in GaN epilayers," *Appl. Phys. Lett.* **107**, 171105 (2015).

389. H. X. Jiang and J. Y. Lin, "InGaN/GaN multiple quantum well solar cells for energy and hydrogen generation," *ECS Transactions*, **66**, 129 (2015).
388. M. R. Uddin, J. Li, J. Y. Lin, and H. X. Jiang, "Carbon-rich hexagonal (BN)C alloys," *J. Appl. Phys.* **117**, 215703 (2015).
387. A. T. Connie, S. Zhao, S. Md. Sadaf, I. Shih, Z. Mi, X. Z. Du, J. Y. Lin, and H. X. Jiang, "Optical and electrical properties of Mg-doped AlN nanowires grown by molecular beam epitaxy," *Appl. Phys. Lett.* **106**, 213105 (2015).
386. J. H. Seo, J. Li, J. Lee, S. Gong, J. Y. Lin, H. X. Jiang, and Z. Ma, "A Simplified Method of Making Flexible Blue LEDs on a Plastic Substrate," *IEEE Photonics Journal*, **7**, 8200207 (2015).
385. T. M. Al tahtamouni, M. Stachowicz, J. Li, J. Y. Lin and H. X. Jiang, "Dramatic enhancement of 1.54 μm emission in Er doped GaN quantum well structures," *Appl. Phys. Lett.* **106**, 121106 (2015).
384. T. C. Doan, S. Majety, S. Grendadier, J. Li, J. Y. Lin, and H. X. Jiang, "Hexagonal boron nitride thin film thermal neutron detectors with high energy resolution of the reaction products," *Nuclear Inst. and Methods in Physics Research Section A* **783**, 121 (2015).
383. T. M. Al tahtamouni, X. Z. Du, J. Y. Lin, and H. X. Jiang, "Erbium-doped AlN epilayers synthesized by metal-organic chemical vapor deposition," *Optical Materials Express* **5**, 648 (2015).
382. D. W. Jeon, Z. Y. Sun, J. Li, J. Y. Lin, and H. X. Jiang, "Erbium doped GaN synthesized by hydride vapor-phase epitaxy," *Optical Materials Express*, **5**, 596 (2015).
381. X. Z. Du, J. Li, J. Y. Lin, and H. X. Jiang, "The origin of deep-level impurity transitions in hexagonal boron nitride," *Appl. Phys. Lett.* **106**, 021110 (2015); doi: 10.1063/1.4905908.
380. T. M. Al tahtamouni, X. Z. Du, J. Li, J. Y. Lin and H. X. Jiang, "Erbium-doped a-plane GaN epilayers synthesized by metal-organic chemical vapor deposition," *Optical Materials Express* **5**, 274 (2015).
379. T. N. Oder, J. Y. Lin, and H. X. Jiang, "III-nitride photonics crystals for lighting applications," Chapter 6 in "Handbook of Microcavities" (edited by A. H. W. Choi, Pan Stanford Publishing, 2015), ISBN 978-981-4463-24-9 (Hardcover), 978-981-4463-25-6 (ebook).
378. T. C. Doan, J. Li, J. Y. Lin, and H. X. Jiang, "Charge carrier transport properties in layer structured hexagonal boron nitride," *AIP Advances* **4**, 107126 (2014) doi: [10.1063/1.4898630](https://doi.org/10.1063/1.4898630) I PDF
377. M. R. Uddin, T. C. Doan, J. Li, K. S. Ziemer, J. Y. Lin, and H. X. Jiang, "Electrical transport properties of (BN)-rich (BN)C semiconductor alloys," *AIP Advances*, **4**, 087414 (2014). doi: [10.1063/1.4893992](https://doi.org/10.1063/1.4893992) I PDF
376. S. Alajlouni, Z. Y. Sun, J. Li, J. M. Zavada, J. Y. Lin, and H. X. Jiang, "Refractive index of erbium doped GaN thin films," *Appl. Phys. Lett.* **105**, 081104 (2014) doi: [10.1063/1.4893992](https://doi.org/10.1063/1.4893992) I PDF
375. R. Hui, R. Xie, I. W. Feng, Z. Y. Sun, J. Y. Lin, and H. X. Jiang, "Excitation cross section of erbium-doped GaN waveguides under 980nm optical pumping," *Appl. Phys. Lett.* **105**, 051106 (2014) doi: [10.1063/1.4892427](https://doi.org/10.1063/1.4892427) I PDF
374. M. Stachowicz, A. Kozanecki, C. -G. Ma, M. G. Brik, J. Y. Lin, H. X. Jiang, and J. M. Zavada, "Crystal field analysis of rare-earth ions energy levels in GaN," *Optical Materials* (2014) doi: [10.1016/j.optmat.2014.05.018](https://doi.org/10.1016/j.optmat.2014.05.018) I PDF
373. J. H. Edgar, T. B. Hoffman, B. Clubine, M. Currie, X. Z. Du, J. Y. Lin, and H. X. Jiang, "Characterization of bulk hexagonal boron nitride single crystals grown by the metal flux technique," *J. Crystal Growth* (2014) doi: [10.1016/j.jcrysgro.2014.06.006](https://doi.org/10.1016/j.jcrysgro.2014.06.006) I PDF
372. H. X. Jiang, and J. Y. Lin, "Hexagonal boron nitride for deep ultraviolet photonic devices," *Semicon. Sci. Technol.* **29**, 084003 (2014), *Invited review*. doi: [10.1088/0268-1242/29/8/084003](https://doi.org/10.1088/0268-1242/29/8/084003) I PDF
371. L. B. Tang, R. B. Ji, X. M. Li, G. X. Bai, C. P. Liu, J. H. Hao, J. Y. Lin, H. X. Jiang, K. S. Teng, Z. B. Yang, and S. P. Lau, "Deep Ultraviolet to Near-Infrared Emission and Photoresponse in Layered N-Doped Graphene Quantum Dots," *ACS NANO* **36**, 1730 (2014) doi: [10.1021/nn501796r](https://doi.org/10.1021/nn501796r) I PDF
370. Q. Wang, S. Zhao, A. T. Connie, I. Shih, Z. Mi, T. Gonzalez, M. P. Andrews, X. Z. Du, J. Y. Lin, and H. X. Jiang, "Optical properties of strain-free AlN nanowires grown by molecular beam epitaxy on Si substrates," *Appl. Phys. Lett.* **104**, 223107 (2014) doi: [10.1063/1.4881558](https://doi.org/10.1063/1.4881558) I PDF

369. T. M. Al tahtamouni, J. Y. Lin, and H. X. Jiang, "Effects of Mg-doped AlN/AlGa_N superlattices on properties of p-GaN contact layer and performance of deep ultraviolet light emitting diodes," AIP Advances **4**, 047122 (2014) [doi: 10.1063/1.4871996](https://doi.org/10.1063/1.4871996) [I PDF](#)
368. R. Dahal, B. N. Pantha, J. Li, J. Y. Lin, and H. X. Jiang, "Realizing InGa_N monolithic solar-photoelectrochemical cells for artificial photosynthesis," Appl. Phys. Lett. **104**, 143901 (2014). [doi: 10.1063/1.4871105](https://doi.org/10.1063/1.4871105) [I PDF](#)
367. M. Stachowicz, A. Kozanecki, J.Y. Lin, H.X. Jiang, and J. Zavada, "Probing of local alloy disorder in InGa_N using Er³⁺ ions," Optical Materials, 2014; <http://dx.doi.org/10.1016/j.optmat.2014.02.013>
366. M. R. Uddin, S. Majety, J. Li, J. Y. Lin, and H. X. Jiang, "Layer-structured hexagonal (BN)C semiconductor alloys with tunable optical and electrical properties," J. Appl. Phys. **115**, 093509 (2014) [doi: 10.1063/1.4867641](https://doi.org/10.1063/1.4867641) [I PDF](#)
365. T. C. Doan, S. Majety, S. Grendadier, J. Li, J. Y. Lin, and H. X. Jiang, "Fabrication and characterization of solid-state thermal neutron detectors based on hexagonal boron nitride epilayers," Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, **748**, 84 (2014) [doi I PDF](https://doi.org/10.1016/j.nucphysa.2014.02.013)
364. X. Z. Du, C. D. Frye, J. H. Edgar, J. Y. Lin, and H. X. Jiang, "Temperature dependence of the energy bandgap of two-dimensional hexagonal boron nitride probed by excitonic photoluminescence," J. Appl. Phys. **115**, 053503 (2014) [doi:10.1063/1.4863823](https://doi.org/10.1063/1.4863823) [I PDF](#)
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8. H. X. Jiang and J. Y. Lin, "Band Structure of Non-Ideal Semiconductor Superlattices," *Superlattices and Microstructures* **3**, 689 (1987).
7. H. X. Jiang and J. Y. Lin, "Band Structure of Superlattices with Graded Interfaces," *J. Appl. Phys.* **61**, 624 (1987).
6. H. X. Jiang, "Strong-Perturbation Theory for Impurities in Semiconductors," *Phys. Rev. B* **35**, 9287 (1987).
5. H. X. Jiang and J. Y. Lin, "Band-structure of a periodic potential with 2 wells and 2 barriers per period," *Am. J. Phys.* **55**, 462 (1987).
4. H. X. Jiang and J. Y. Lin, "Superlattice with Multiple Layers per Period," *Phys. Rev. B* **33**, 5851 (1986).

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2. H. X. Jiang and J. Y. Lin, "Precession of Kepler's Orbit," *Am. J. Phys.* **53**, 694 (1985).
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Invited reviews in scientific journals

1. H. X. Jiang and J. Y. Lin, Book Review for "Properties of Advanced Semiconductor Materials: GaN, AlN, InN, BN, SiGe, by Michael E. Levinshtein, Serge L. Rumyantsev, and Michael S. Shur, Eds (John Wiley & Sons, New York, 2001), *MRS Bulletin*, Vol. **26**, 728 (2001), invited.
2. H. X. Jiang and J. Y. Lin, "AlGaIn and InAlGaIn Alloys – Epitaxial Growth, Optical and Electrical Properties, and Applications," in a special issue of *Opto-Electronics Review*, **10**, 271 (2002), invited.
3. H. X. Jiang and J. Y. Lin, "Advances in III-Nitride Microstructures and Micro-Size Emitters," *J. of the Korean Physical Society*, **42**, S757 (2003), invited.
4. J. Y. Lin and H. X. Jiang, "Recent Advances in III-Nitride Ultraviolet Photonic Materials and Devices," *J. of the Korean Physical Society*, **42**, S535 (2003), invited.
5. J. Y. Lin, H. X. Jiang, and J. Zavada, "Nitride Photonic Crystals," Eighth International Symposium on Contemporary Photonics Technology, Tokyo, Japan (January 2005), *invited*.
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7. H. X. Jiang & J. Y. Lin, "III-Nitride Quantum Devices – Microphotonics," *CRC Critical Reviews in Solid State and Materials Sciences*, (P. Holloway, Editor), **28**, 131 (2003), invited.
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11. B. N. Pantha, J. Y. Lin, and H. X. Jiang, "III-nitride nanostructures for energy generation," *Proc. SPIE* **7608**, 76081I (2010); invited.
12. S. Majety, X. K. Cao, R. Dahal, B. N. Pantha, J. Li, J. Y. Lin and H. X. Jiang, "Semiconducting hexagonal boron nitride for deep ultraviolet photonics," *Proc. SPIE* **8268**, 82682R (2012); invited.
13. J. Day, J. Li, D. Y. C. Lie, C. Bradford, J. Y. Lin and H. X. Jiang, "Full-Scale Self-Emissive Blue and Green Microdisplays Based on GaN Micro-LED Arrays," *Proc. SPIE* **8268**, 82681X (2012) ; invited.
14. X. K. Cao, S. Majety, J. Li, J. Y. Lin and H. X. Jiang, "Optoelectronic properties of hexagonal boron nitride epilayers," *Proc. SPIE* **8631**, 863128 (2013); invited.
15. H. X. Jiang and J. Y. Lin, "Nitride micro-LEDs and beyond - a decade progress review," *Optics Express*, *Optics Express* **21**, A475 (2013); invited.
16. H. X. Jiang, and J. Y. Lin, "Hexagonal boron nitride for deep ultraviolet photonic devices," (in special section "Deep UV LEDs", Guest editors: Jung Han, Hiroshi Amano and Leo Scholwalter), *Semicon. Sci. Technol.* **29**, 084003 (2014), *invited*.
17. H. X. Jiang and J. Y. Lin, "Review—Hexagonal Boron Nitride Epilayers: Growth, Optical Properties and Device Applications," *ECS J. Solid State Sci. Technol.* **6**, Q3012 (2017), invited.

Invited feature articles written for popular magazines

1. H. X. Jiang and J. Y. Lin, "Microdisplays Based on III-Nitride Wide Band Gap Semiconductors," *oe* magazine (The Monthly Publication of SPIE-The internal Society for Optical Engineering), July 2001 issue, page 28, *invited*.
2. H. X. Jiang and J. Y. Lin, "Advances in III-Nitride Micro-Size Light Emitters," *III-Vs Review*, **14**, 35 (2001) [June/July 2001 issue], *invited*.
3. H. X. Jiang, J. Y. Lin, R. Hui, and J. Zavada, "III-nitrides show promise for telecom wavelengths," *Laser Focus World*, Nov. issue, S8 (2003), *invited*.

4. J. Y. Lin, J. Day, J. Li, D. Lie, C. Bradford, and H. X. Jiang, "High-resolution group III nitride microdisplays," SPIE Newsroom, Dec. issue (2011).
5. H. X. Jiang and J. Y. Lin, "Semiconductor lasers: Expanding into blue and green," *Nature Photonics* **5**, 521 (2011), *invited*.

Invited book chapters

1. H. X. Jiang and J. Y. Lin, "Time-Resolved Photoluminescence Studies of GaN," A3.5 in *Gallium Nitride and Related Compounds, EMIS Datareview Series, Edited by J. Edgar, S. Strite, I. Akasaki, H. Amano, and C. Wetzel*, (The Institute of Electrical Engineers, London, 1999).
2. H. X. Jiang and J. Y. Lin, "Persistent Photoconductivity in GaN," A3.6 in *Gallium Nitride and Related Compounds, EMIS Datareview Series, Edited by J. Edgar, S. Strite, I. Akasaki, H. Amano, and C. Wetzel*, (The Institute of Electrical Engineers, London, 1999).
3. H. X. Jiang and J. Y. Lin, "Persistent photoconductivity in III-nitrides," *Chapter 5 in "III-Nitride Semiconductors: Electrical, Structural and Defects Properties" edited by M. O. Manasreh*, (Elsevier Science, 2000).
4. H. X. Jiang, J. Y. Lin, and W. W. Chow "Time-Resolved Photoluminescence Studies of III-Nitrides," Chapter 1 in *"Optical Properties of III-Nitrides I" edited by M. O. Manasreh and H. X. Jiang*, (Taylor & Francis Books, New York & London 2002).
5. H. X. Jiang and J. Y. Lin, "III-Nitride Micro-Cavity Light-Emitters," – in *"Wide Bandgap Light-Emitting Materials and Devices,"* edited by G.F. Neumark, I. Kuskovsky, and H. X. Jiang, published by Wiley –VCH Verlag GmbH, 2007.
6. H. X. Jiang and J. Y. Lin, "Carrier Dynamics Probed by Time-Resolved Photoluminescence,"– in *"Ultrafast Dynamics Processes in Semiconductors,"* Book Volume 92 – Topics in Applied Physics, edited by K. T. Tsen, published by Springer-Verlag Berlin, (Berlin Heidelberg, 2004).
7. H. X. Jiang & J. Y. Lin, "AlN Epitaxial Layers for UV Photonics" – Chapter 7 in *Optoelectronic Devices: III-Nitride*, edited by M. Razeghi and M. Heini, published by Elsevier Ltd. (Amsterdam, 2004).
8. R. Dahal, J. Y. Lin, H. X. Jiang, and J. Zavada "Er doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ for optical communications," Chapter 5 in *Rare-earth doped III-Nitrides for Optoelectronic and Spintronic Applications*, edited by K O'Donnell & V Dierolf, Canopus Academic Publishing Ltd and Springer SBM (2010).
9. J. Li, J. Y. Lin, H. X. Jiang, and N. Sawaki, "III-nitrides on Si substrate," Chapter 3 in *III-V Compound Semiconductors: Integration with Silicon Based Microelectronics*, edited by T. Li, et al, published by CRC Press (Boca Raton 2010).
10. A. Sedhain, J. Y. Lin, and H. X. Jiang "AlN: Properties and Applications," Chapter 2 in *"Handbook of Luminescent Semiconductor Materials,"* edited by L. Bergman and L. McHale, published in September, 2011 by CRC Press, Taylor & Francis Group (ISBN: 1439834679).
11. B. N. Pantha, J. Y. Lin, and H. X. Jiang, "High quality Al-rich AlGa_N alloys," Chapter 2 in *"Ga_N and ZnO-based Materials and Devices,"* edited by S.J. Pearton, published in February 2012 by Springer, Springer Series in Materials Science (ISBN: 978-3-642-23520-7).
12. T. N. Oder, J. Y. Lin, and H. X. Jiang, "III-nitride photonics crystals for lighting applications," Chapter 6 in *"Handbook of Microcavities" (edited by A. H. W. Choi, Pan Stanford Publishing, 2015),* ISBN 978-981-4463-24-9 (Hardcover), 978-981-4463-25-6 (ebook).
13. N. Napal, H. X. Jiang, J. Y. Lin, B. Mitchell, V. Dierolf, and J. M. Zavada, "MOCVD growth of Er-doped III-N and optical-magnetic characterization," *Chapter 7 in "Rare Earth and Transition Metal Doping of Semiconductor Materials: Synthesis, Magnetic Properties and Room Temperature Spintronics,"* edited by V. Dierolf, I. T. Ferguson, and J. M. Zavada, Woodhead Publishing, Elsevier, 2016, pp. 225-255.

Conference Presentations

Over 100 additional contributed presentations and abstracts delivered by our graduate students and postdoctoral research associates in national and international conferences.