

## **Prof. CAN BAYRAM**

Intel Alumni Endowed Faculty Scholar  
Department of Electrical and Computer Engineering,  
University of Illinois at Urbana-Champaign, IL, USA

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### **PROFESSIONAL APPOINTMENTS**

Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign

Professor,	2025 - present
Intel Alumni Endowed Faculty Scholar,	2023 - present
Associate Professor,	2020 - 2025
Assistant Professor,	2014 - 2020

IBM Thomas J. Watson Research Center, NY, USA

Postdoctoral Research Scientist	2011 - 2014
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### **EDUCATION**

Ph.D. in EE, Northwestern University, IL, USA	2011
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B.S. in EE, Bilkent University, Ankara, Turkiye	2005
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### **SELECT HONORS**

2025 SPIE Fellow

2024 National Inventors Hall of Fame Collegiate Inventors Competition Silver Medalist

2024 Dean's Award for Early Innovation

2024 Dean's Award for Excellence in Research

2024 Gentec Electro-Optics Company Laser Lab Award

2023 Intel Alumni Endowed Faculty Scholar

2022 Andrew T. Yang Research and Entrepreneurship Award

2022 CGS/ProQuest Distinguished Dissertation Award Campus Nominee Advisor

2021 DOE Lighting R&D Workshop Best Student Poster Honorable Mention

2019 SPIE Community Champion

2019 National Inventors Hall of Fame Collegiate Inventors Competition Finalist

2019 NAE CAE Frontiers of Engineering Symposium Invitee

2019 Gulf Coast Undergraduate Research Symposium Outstanding Presentation Trophy

2018 International Union of Pure and Applied Physics Young Scientist Medal in Optics

2018 IEEE Nanotechnology Council Early Career Award in Nanotechnology

2018 Turkish American Scientists & Scholars Association Young Scholar Award

2018 Dean's Award for Excellence in Research

2018 List of Teachers Ranked as Excellent by Their Students

2017 CS MANTECH Best Student Paper Award

2017 NSF CAREER Award

2016 AFOSR Young Investigator Award

2014 IEEE Electron Devices Society Early Career Award

2014 IBM Invention Achievement Award

2013 IBM Invention Achievement Award

2012 IBM Invention Achievement Award  
2012 MIOMD-XI Best Paper Award  
2010 Link Foundation Energy Fellow  
2010 IBM Ph.D. Fellow  
2010 IEEE Electron Devices Society Ph.D. Fellow  
2009 Boeing Engineering Student of the Year Award  
2009 IEEE Photonics Society Graduate Student Fellow  
2009 SPIE Laser Technology, Engineering and Applications Scholar  
2009 International Centre for Diffraction Data Ludo Frevel Crystallography Scholar  
2008 Dow Chemical Company Sustainability Innovation Award  
2005 IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Travel Award

## **RESEARCH IMPACT**

Revealing the "Efficiency Cliff" in submicron scaling of light emitting diodes, i.e. lateral carrier diffusion identified as the dominant cause for surface recombination/leakage in submicron LEDs. Appl. Phys. Lett. 126, 242101 (2025).

Record >545V/ns slew rate in photoconductive semiconductor switches (PCSS), i.e. record-breaking voltage/current handling and slew rates, efficiency, and reliability simultaneously achieved in diamond PCSS. Appl. Phys. Lett. 126, 152105 (2025). Appl. Phys. Lett. 128 (12), 123301 (2026).

Inventing "buried channel" concept in photoconductive semiconductor switches, i.e. solving traditional power handling – speed tradeoff in photoconductive semiconductor switches for electricity grid protection and resilience. IEEE Electron Device Lett. 45 (6) 1044 (2024).

First field-plate technology in diamond electronics, i.e. innovative lateral architecture with highly conductive contact regrowth approach and field-plate edge termination technique. IEEE Electron Device Lett. 44 (10) 1692 (2023).

Discovering Aspect Ratio phase Trapping (ARpT) material synthesis technique, i.e. invention and scaling of U-groove aspect ratio silicon patterning for phase-transition III-nitride material synthesis. Adv. Funct. Mater. 24 (28) 4492 (2014). Appl. Phys. Lett. 109, 042103 (2016). ACS Photonics 5 (3), 955–963 (2018). Appl. Phys. Lett. 121, 032101 (2022). Appl. Phys. Lett. 124, 011101 (2024).

Solving the efficiency droop in III-nitride LEDs, i.e. demystifying the efficiency droop contributors in III-nitride LEDs. J. Appl. Phys. 131, 193102 (2022). IEEE J. of Quantum Electron. 58 (1), 1-9 (2022). IEEE Trans. Electron Devices 69(6), 3240-3245 (2022). J. Opt. Soc. Am. B 40(5), 1017-1023 (2023). Appl. Phys. Lett. 126, 211103 (2025).

Revealing cubic III-nitride semiconductor properties. Sci. Rep. 9:6583 (2019). ACS Omega 5, 3917 (2020). Comp. Mater. Sci. 190, 110283 (2021).

GaN on 200 mm Si, i.e. direct integration of photonic and electronic devices on Si. Sci. Rep. 6: 37588 (2016). IEEE Electron Device Lett. 38 (8) 1094 (2017). AIP Advances 9, 025306 (2019).

Discovering quasi-van der Waals (a.k.a. remote) epitaxy and enablement of 3D/2D heterostructures, i.e. first 3D compound semiconductor direct epitaxy integration on a 2D one (i.e., GaN on graphene). Invented the missing link in epitaxy technology at the intersection of 3D-on-3D conventional and 2D-on-2D van der Waals epitaxy. Nat. Comm. 5: 4836 (2014).

First reliable resonant tunneling in GaN heterostructures, i.e. first reliable and reproducible negative differential resistance via defect reduction, elimination of polarization-fields, and reduction of Al-

content. Appl. Phys. Lett. 96, 042103 (2010). Appl. Phys. Lett. 97, 092104 (2010). Appl. Phys. Lett. 97, 181109 (2010).

First ZnO atop InGaN-based high spectral quality visible LEDs. i.e. first use of ZnO in visible LEDs & first inverted LED. Appl. Phys. Lett. 93, 081111 (2008).

### **MEMBERSHIPS**

Fellow	2025-present	SPIE Society ( <i>member since 2006</i> )
Senior Member	2018-present	Optica ( <i>member since 2005</i> )
Senior Member	2016-present	IEEE Electron Devices Society ( <i>member since 2009</i> )
Senior Member	2016-present	IEEE Photonics Society ( <i>member since 2007</i> )
Senior Member	2016-present	IEEE Society ( <i>member since 2005</i> )

### **SELECT SERVICE**

**Board Member (Editorial):** Journal of Physics: Photonics, 2019 to 2024.

**Editor (Guest):** IEEE Nanotechnology Magazine, April & August Issues, 2019.

**Editor (Associate):** IEEE Nanotechnology Magazine, 2019 - 2024 ; IEEE Transactions on Electron Devices, 2019 – 2022.

**Fellowship Committee:** SPIE Scholarship, 2017 - 2019; Link Foundation, 2013 - 2016.

**Proposal Reviewer:** Major U.S. and European Science and Technology agencies.

**Technical Committee Chair:** IEEE EDS Optoelectronic Devices, 2020 - 2022.

### **TEACHING**

ECE 110 Introduction to Electrical Engineering	(Class of 100+ Students)
ECE 297 Individual Study in ECE Problems	
ECE 340 Semiconductor Electronics	(Class of ~80 Students)
ECE 397 Individual Study in ECE Problems	
ECE 443 LEDs and Solar Cells	(Class of ~35 Students)
ECE 445 Senior Design Laboratory	(Class of ~50 Students)
ECE 496/499 Senior Research and Thesis	

### **Ph.D. THESES BEING SUPERVISED**

6. **Ingyu Woo, Ph.D. student in EE, degree completion expected in 2030,**  
(Ultra)Wide-Bandgap Semiconductors for Next-Generation Photonics and Electronics
5. **Johnathan Wright, Ph.D. student in EE, degree completion expected in 2029,**  
III-Nitride Semiconductors for Next-Generation Photonics and Electronics
4. **Berre Vize, Ph.D. student in EE, degree completion expected in 2028,**  
(Ultra)Wide-Bandgap Semiconductors for Next-Generation Photonics and Electronics
3. **Abdelghany Abouelnagga, Ph.D. student in EE, degree completion expected in 2028,**  
III-Nitride Semiconductors for Next-Generation Photonics and Electronics
2. **Keith Chang, Ph.D. student in EE, degree completion expected in 2027,**  
(Ultra)Wide-Bandgap Semiconductors for Next-Generation Photonics and Electronics
1. **Hubert Elly, Ph.D. Candidate in EE, degree completion expected in 2027,**  
(Ultra)Wide-Bandgap Semiconductors for Next-Generation Photonics and Electronics

## Ph.D. ALUMNI

7. **Dr. Yu-Chieh Chiu, Ph.D. in EE, 2025**, Scaling to submicron for III-nitride optoelectronics devices: Applications in micro light emitting diodes and resonant tunneling diodes.  
*Panel Process Integration Engineer, Apple, CA, USA*
6. **Dr. Zhuoran Han, Ph.D. in EE, 2025**, Diamond Power Electronics for Next Generation Electric Grid.  
*Display Technology Engineer, Apple, CA, USA*
5. **Dr. Jaekwon Lee, Ph.D. in EE, 2025**, Cubic III-Nitrides for Photonics: Physics, Materials, and Devices.  
*Distinguished Postdoctoral Fellow, Stanford University, CA, USA*
4. **Dr. Yi-Chia Tsai, Ph.D. in EE, 2022**, Theoretical Exploration of Efficiency Droop Mechanisms in III-nitride Visible Light Emitting Diodes.  
*Senior Software Algorithm Engineer, ASML Corporation, CA, USA*
3. **Dr. Richard Liu, Ph.D. in EE, 2020**, Cubic Phase Gallium Nitride Photonics Integrated on Silicon(100) for Next Generation Solid State Lighting.  
*Section Manager – Electronic Materials and Devices, Aerospace Corporation, CA, USA*
2. **Dr. Kihoon Park, Ph.D. in EE, 2020**, Investigation of Generation, Dissipation, and Transport of Heat in GaN Materials for Advanced High-Power Devices.  
*Software Engineer, Intel, Hillsboro, OR, USA*
1. **Dr. Hsuan-Ping Lee, Ph.D. in EE, 2020**, Al<sub>2</sub>O<sub>3</sub>-passivated AlGaIn/GaN High Electron Mobility Transistors on Si(111) Towards Reliable Terahertz Electronics.  
*Staff Data Scientist, Intel, Hillsboro, OR, USA*

## M.S. ALUMNUS

2. **Yu-Chieh Chiu, M.S. in EE, 2022**, Absolute Internal Quantum Efficiency of Indium-Gallium Nitride Based Light Emitting Diodes.  
*Yu-Chieh continued to pursue his Ph.D. degree at U of I.*
1. **Richard Liu, M.S. in EE, 2017**, Structural and optical properties of phase transition cubic phase gallium nitride for photonic devices.  
*Richard continued to pursue his Ph.D. degree at U of I.*

## UNDERGRADUATE SENIOR THESES

7. Efficiency Droop Contributors to AlGaIn UV LEDs, *Jason Li* (May 2025).
6. Hydrogen-terminated Diamond MOSFETs for Power Electronics, *Alkesh Sumant* (May 2022).
5. Application of Controlled Spalling to Thin-film Lithium Niobate Transducers, *Dennis Rich* (Dec. 2018).
4. Thin-film GaN HEMTs For Flexible Electronics, *Joshua Perozek* (May 2017).
3. Simulation of Zinc-blende Gallium Nitride High Electron Mobility Transistors For Normally-off Operation, *Ryan Grady* (May 2017).
2. Optimization of Off-State Breakdown Voltage in GaN High Electron Mobility Transistors, *Begum Kasap* (May 2016).
1. Normally-off GaN Transistors, *Philip Tsai* (May 2016).

## Postdoctoral Research Scientist ALUMNI

1. **Dr. Ali Johar, 2020 - 2022**, Cubic Gallium Nitride on Silicon as a Scalable Platform for Advanced Energy Devices.  
*Principal Epitaxy Engineer, Coherent, PA, USA.*

## **BIBLIOGRAPHY** (students supervised: underlined)

### **Technical Reports**

2. Green Light Emitting Diodes for the Ultimate Solid-state Lighting. DOE-UIUC-AR0001558. <https://doi.org/10.2172/3027503>
1. Investigating Heteroepitaxy Principles and Transport Characteristics of Vertically Integrated GaN-on-Graphene Heterostructures. AFRL-AFOSR-VA-TR-2019-0241. <https://apps.dtic.mil/sti/citations/AD1096597>

### **Publications**

#### **Journal Articles (listed in the International Science Index database):**

[April 2026] [h-index  $\geq$  31; citations  $\geq$  3,630]

67. H. Elly, E. Cheng, A. Mazumder, Z. Han, J. Lee, A. Mironov, and **C. Bayram**, "Ultrafast Vertical Photoconductive Intrinsic Diamond Switch with High Current (17.1 A at 1 kV)," [Appl. Phys. Lett. 128 \(12\), 123301 \(2026\)](#).
66. J. Lee, Y. C. Chiu, and **C. Bayram**, "Efficiency Cliff in Scaling InGaN Light-emitting Diodes Down to Submicron," [Appl. Phys. Lett. 126, 242101 \(2025\)](#).
65. P. Thirasuntrakul\*, J. Li\*, J. Lee, Y. C. Chiu, and **C. Bayram**, "Efficiency Droop Contributors in InGaN Green Light-Emitting Diodes," [Appl. Phys. Lett. 126, 211103 \(2025\)](#).
64. Z. Han, J. Lee, A. Mazumder, H. Elly, S. Messing, A. Mironov, and **C. Bayram**, "Record Performance in Intrinsic, Impurity-Free Lateral Diamond Photoconductive Semiconductor Switches," [Appl. Phys. Lett. 126, 152105 \(2025\)](#).
63. J. Lee, **C. Bayram**, and J.-P. Leburton, "High Field Transport in (Ultra) Wide Bandgap Semiconductors: Diamond vs. Cubic GaN", [IEEE Trans. Electron Devices 71 \(9\), 5638-5644 \(2024\)](#). (TOP Downloaded Article)
62. Z. Han, J. Lee, S. Messing, T. Reboli, A. Mironov, and **C. Bayram**, "Buried Channel Diamond Photoconductive Switch with High Above-Bandgap Responsivity," [IEEE Electron Device Lett. 45 \(6\) 1044 \(2024\)](#). (TOP Downloaded Article)
61. J. Lee and **C. Bayram** "Green-emitting Cubic GaN/In<sub>0.16</sub>Ga<sub>0.84</sub>N/GaN Quantum Well with 32% Internal Quantum Efficiency at Room Temperature," [Appl. Phys. Lett. 124, 011101 \(2024\)](#). (FRONT COVER ARTICLE) (EDITOR'S PICK 2024)
60. Z. Han and **C. Bayram** "Diamond p-type lateral Schottky barrier diodes with high breakdown voltage (4612 V at 0.01 mA/mm)," [IEEE Electron Device Lett. 44 \(10\) 1692 \(2023\)](#). (TOP Downloaded Article)
59. J. Lee, J.P. Leburton, and **C. Bayram** "Design trade-offs between traditional hexagonal and emerging cubic In<sub>x</sub>Ga<sub>(1-x)</sub>N/GaN-based green light-emitting diodes," [J. Opt. Soc. Am. B 40\(5\), 1017-1023 \(2023\)](#). (EDITOR'S PICK 2023) (TOP Downloaded Article)
58. Y. C. Chiu and **C. Bayram** "Low Temperature Absolute Internal Quantum Efficiency of InGaN-based Light-Emitting Diodes," [Appl. Phys. Lett. 122, 091101 \(2023\)](#).
57. J. Lee\*, Y. C. Chiu\*, M. A. Johar\*, and **C. Bayram** "Structural and Optical Properties of Cubic GaN on U-grooved Si (100)," [Appl. Phys. Lett. 121, 032101 \(2022\)](#). (EDITOR'S PICK 2022)

56. [Y.-C. Tsai, C. Bayram, and J.P. Leburton "Interplay between Auger recombination, Carrier Leakage, and Polarization in InGaAlN Multiple-Quantum-Well Light-Emitting Diodes," \*J. Appl. Phys.\* 131, 193102 \(2022\).](#)
55. [Y.-C. Tsai, J.P. Leburton, and C. Bayram, "Quenching of the Efficiency Droop in Cubic Phase InGaAlN Light-Emitting Diodes," \*IEEE Trans. Electron Devices\* 69\(6\), 3240-3245 \(2022\).](#)
54. [Y.-C. Tsai, C. Bayram, and J.P. Leburton "Effect of Auger Electron–Hole Asymmetry on the Efficiency Droop in InGaN Quantum Well Light-Emitting Diodes," \*IEEE J. Quantum Electron.\* 58 \(1\), 1-9 \(2022\).](#)
53. [Y.-C. Tsai and C. Bayram, "Mitigate Self-Compensation with High Crystal Symmetry: A First–Principles Study of Formation and Activation of Impurities in GaN," \*Comp. Mater. Sci.\* 190, 110283 \(2021\).](#)
52. [J. Meyer, R. Liu, R.D. Schaller, H-P Lee, and C. Bayram, "Systematic Study of Shockley-Read-Hall and Radiative Recombination in GaN on Al<sub>2</sub>O<sub>3</sub>, Freestanding GaN, and GaN on Si," \*J. Phys. Photonics\* 2, 035003 \(2020\).](#)
51. [R. Liu, E. Z. Tucker, S. M. Lee, K. Kasarla, C. McCormick, and C. Bayram, "Cp<sub>2</sub>Mg-Induced Transition Metal Ion Contamination and Performance Loss in MOCVD-Grown Blue Emitting InGaN/GaN Multiple Quantum Wells," \*Appl. Phys. Lett.\* 116, 192106 \(2020\).](#)
50. [A. Mohamed, K. Park, C. Bayram, M. Dutta, and M. Stroschio, "Phonon-assisted reduction of hot spot temperature in AlInN ternaries," \*J. Phys. D-Appl. Phys.\* 53, 365102 \(2020\).](#)
49. [H-P. Lee and C. Bayram, "Improving Current on/off Ratio and Subthreshold Swing of Schottky-gate AlGaIn/GaN HEMTs By Post-metallization Annealing," \*IEEE Trans. Electron Devices\* 67 \(7\), 2760 \(2020\).](#)
48. [Y.-C. Tsai and C. Bayram, "Band Alignments of Ternary Wurtzite and Zincblende III-Nitrides Investigated by Hybrid Density–Functional Theory," \*ACS Omega\* 5, 3917 – 3923 \(2020\). \(FRONT COVER ARTICLE\)](#)
47. [K. Park and C. Bayram, "Impact of dislocations on the thermal conductivity of gallium nitride studied by time-domain thermoreflectance," \*J. Appl. Phys.\* 126, 185103 \(2019\).](#)
46. [H-P. Lee and C. Bayram, "Investigation of annealed, thin\(~ 2.6 nm\)-Al<sub>2</sub>O<sub>3</sub>/AlGaIn/GaN metal-insulator-semiconductor heterostructures on Si\(111\) via capacitance-voltage and current-voltage studies," \*Mater. Res. Express\* 6, 105904 \(2019\).](#)
45. [Y.-C. Tsai and C. Bayram, "Structural and Electronic Properties of Hexagonal and Cubic Phase AlGaInN Alloys Investigated Using First Principles Calculations," \*Sci. Rep.\* 9, 6583 \(2019\).](#)
44. [A. Mohamed, K. Park, C. Bayram, M. Dutta, and M. Stroschio, "Confined and Interface Optical Phonon Emission in GaN/InGaIn Double Barrier Quantum Well Heterostructures," \*PLoS ONE\* 14\(4\): e0214971 \(2019\).](#)
43. [R. Liu, C. McCormick, and C. Bayram, "Comparison of Structural and Optical Properties of Blue Emitting In<sub>0.15</sub>Ga<sub>0.85</sub>N/GaN Multi-Quantum-Well Layers Grown on Sapphire and Silicon Substrates," \*AIP Advances\* 9, 025306 \(2019\).](#)
42. [K. Park, A. Mohamed, M. Dutta, M. Stroschio, and C. Bayram, "Electron Scattering via Interface Optical Phonons with High Group Velocity in Wurtzite GaN-based Quantum Well Heterostructure," \*Sci. Rep.\* 8:15947 \(2018\).](#)

41. [R. Liu](#), R. Schaller, C.-Q. Chen, and **C. Bayram**, "High internal quantum efficiency ultraviolet emission from phase-transition cubic GaN integrated on nanopatterned Si(100)," [ACS Photonics 5 \(3\), 955–963 \(2018\)](#).
40. K.-T. Lee, **C. Bayram**, D. Piedra, E. Sprogis, H. Deligianni, B. Krishnan, G. Papanoulotis, A. Paranjpe, E. Aklimi, K. Shepard, W. J. Gallagher, T. Palacios, and D. K. Sadana, "Heterogeneous Integration of GaN Devices on a 200 mm Si(100) Wafer via Scalable CMOS Technology," [IEEE Electron Device Lett. 38 \(8\), 1094 - 1096 \(2017\)](#).
39. [K. Park](#), M. A. Stroschio, and **C. Bayram**, "Investigation of electron mobility and saturation velocity limits in gallium nitride using uniaxial dielectric continuum model," [J. Appl. Phys. 121, 245109 \(2017\)](#).
38. [R. Grady](#) and **C. Bayram**, "Simulation of zincblende AlGaIn/GaN high electron mobility transistors for normally-off operation," [J. Phys. D-Appl. Phys. 50, 265104 \(2017\)](#).
37. [J. Perozek](#), [H.-P. Lee](#), B. Krishnan, G. Papanoulotis, A. Paranjpe, K. B. Reuter, D. K. Sadana, and **C. Bayram**, "Investigation of Structural, Optical, and Electrical Characteristics of an AlGaIn/GaN High Electron Mobility Transistor Structure across a 200 mm Si (111) Substrate," [J. Phys. D-Appl. Phys. 50, 055103 \(2017\)](#).
36. [H-P. Lee](#), [J. Perozek](#), [L. N. D. Rosario](#), and **C. Bayram**, "Investigation of AlGaIn/GaN high electron mobility transistor structures on 200-mm silicon (111) substrates employing different buffer layer configurations," [Sci. Rep. 6:37588 \(2016\)](#).
35. [K. Park](#) and **C. Bayram**, "Thermal Resistance Optimization of GaN / Substrate Stacks Considering Thermal Boundary Resistance and Temperature-dependent Thermal Conductivity," [Appl. Phys. Lett. 109, 151904 \(2016\)](#).
34. [R. Liu](#) and **C. Bayram**, "Maximizing Cubic Phase Gallium Nitride Surface Coverage on Nano-patterned Silicon (100)," [Appl. Phys. Lett. 109, 042103 \(2016\)](#).
33. [R. Liu](#) and **C. Bayram**, "Cathodoluminescence study of luminescence centers in hexagonal and cubic phase GaN hetero-integrated on Si(100)," [J. Appl. Phys. 120, 025106 \(2016\)](#).
32. [J. Kim](#)† & **C. Bayram**† († equal contribution), [H. Park](#), [C.-W. Cheng](#), [C. Dimitrakopoulos](#), [J. A. Ott](#), [K. B. Reuter](#), [S. W. Bedell](#), and [D.K. Sadana](#), "Principle of direct van der Waals epitaxy of single-crystalline films on epitaxial graphene," [Nat. Commun. 5:4836 \(2014\)](#).
31. **C. Bayram**, [J. Ott](#), [K.-T. Shiu](#), [C.-W. Cheng](#), [Y. Zhu](#), [J. Kim](#), [M. Razeghi](#), and [D.K. Sadana](#), "Cubic phase GaN on nano-grooved Si (100) via maskless selective area epitaxy," [Adv. Funct. Mater. 24 \(28\), 4492 \(2014\)](#). (FRONTISPECE COVER ARTICLE)
30. [S. W. Bedell](#), **C. Bayram**, [K. Fogel](#), [P. Lauro](#), [J. Kiser](#), [J. Ott](#), [Y. Zhu](#), and [D. Sadana](#), "Vertical light-emitting diode fabrication by controlled spalling," [Appl. Phys. Express 6 \(11\), 112301 \(2013\)](#).
29. [D. Shahrjerdi](#), [S. W. Bedell](#), **C. Bayram**, [C. C. Lubguban](#), [K. Fogel](#), [P. Lauro](#), [J. A. Ott](#), [M. Hopstaken](#), [M. Gayeness](#), and [D. Sadana](#), "Ultra-light high-efficiency flexible InGaP/(In)GaAs tandem solar cells on plastic," [Adv. Energy Mater. 3 \(5\), 566–571 \(2013\)](#). (INSIDE COVER ARTICLE)
28. [Y. Zhang](#), [S. Gautier](#), [C.-Y. Cho](#), [E. Cicek](#), [Z. Vashaei](#), [R. McClintock](#), **C. Bayram**, [Y. Bai](#), and [M. Razeghi](#), "Near milliwatt power AlGaIn-based ultraviolet light emitting diodes based on lateral epitaxial overgrowth of AlN on Si(111)," [Appl. Phys. Lett. 102, 011106 \(2013\)](#).

27. D. Shahrjerdi, S. W. Bedell, C. Ebert, **C. Bayram**, B. Hekmatshoar, K. Fogel, P. Lauro, M. Gaynes, T. Gokmen, J. Ott, and D. K. Sadana, "High-efficiency thin-film InGaP/InGaAs/Ge tandem solar cells enabled by controlled spalling technology," [Appl. Phys. Lett. 100, 053901 \(2012\)](#). (TOP 20 Most Downloaded Articles) (EDITOR'S PICK 2012)
26. **C. Bayram**, "High quality AlGaIn/GaN superlattices for near- and mid-infrared intersubband transitions," [J. Appl. Phys. 111, 013514 \(2012\)](#).
25. **C. Bayram**, Z. Vashaei, and M. Razeghi, "Reliability in room-temperature negative differential resistance characteristics of low-aluminium-content AlGaIn/GaN double-barrier resonant tunneling diodes," [Appl. Phys. Lett. 97, 181109 \(2010\)](#).
24. Z. Vashaei, **C. Bayram**, P. Lavenus, and M. Razeghi. "Photoluminescence characteristics of polar and nonpolar AlGaIn/GaN superlattices," [Appl. Phys. Lett. 97, 121918 \(2010\)](#).
23. **C. Bayram**, Z. Vashaei, and M. Razeghi, "Room temperature negative differential resistance characteristics of polar III-nitride resonant tunneling diodes," [Appl. Phys. Lett. 97, 092104 \(2010\)](#).
22. E. Cicek, Z. Vashaei, R. McClintock, **C. Bayram**, and M. Razeghi, "Geiger-mode operation of ultraviolet avalanche photodiodes grown on sapphire and free-standing GaN substrates," [Appl. Phys. Lett. 96, 261107 \(2010\)](#).
21. Z. Vashaei, E. Cicek, **C. Bayram**, R. McClintock, and M. Razeghi, "GaN avalanche photodiodes grown on m-plane freestanding GaN substrate," [Appl. Phys. Lett. 96, 201908 \(2010\)](#).
20. Z. Vashaei, **C. Bayram**, and M. Razeghi, "Demonstration of negative differential resistance in GaN/AlN resonant tunneling diodes at room temperature," [J. Appl. Phys. 107, 083505 \(2010\)](#).
19. **C. Bayram**, Z. Vashaei, and M. Razeghi, "AlN/GaN double-barrier resonant tunneling diodes grown by metal-organic chemical vapor deposition," [Appl. Phys. Lett. 96, 042103 \(2010\)](#).
18. **C. Bayram**, N. Péré-Laperne, and M. Razeghi, "Effects of well width and growth temperature on optical and structural characteristics of AlN/GaN superlattices grown by metal-organic chemical vapor deposition," [Appl. Phys. Lett. 95, 201906 \(2009\)](#).
17. N. Péré-Laperne, **C. Bayram**, L. Nguyen-Thê, R. McClintock, and M. Razeghi, "Tunability of Intersubband absorption from 4.5 to 5.3  $\mu\text{m}$  in a GaN/Al<sub>0.2</sub>Ga<sub>0.8</sub>N superlattices grown by metalorganic chemical vapor deposition," [Appl. Phys. Lett. 95, 131109 \(2009\)](#).
16. **C. Bayram** and M. Razeghi, "ULTRAVIOLET DETECTORS: Nitrides push performance of UV photodiodes," [Laser Focus World 45\(9\), p. 47-51 \(2009\)](#).
15. **C. Bayram**, D. Rogers, F. H. Teherani, and M. Razeghi, "Fabrication and characterization of novel hybrid green LEDs based on substituting n-type ZnO for n-type GaN in an inverted p-n junction," [J. Vac. Sci. Technol. B 27, 1784 \(2009\)](#).
14. V. E. Sandana, D. J. Rogers, F. H. Teherani, R. McClintock, **C. Bayram**, M. Razeghi, H.-J. Drouhin, M.C. Clochard, V. Sallet, G. Garry, and F. Falyouni, "Comparison of ZnO nanostructures grown using pulsed layer deposition, metalorganic chemical vapor deposition, and physical vapor transport", [J. Vac. Sci. Technol. B 27, 1678 \(2009\)](#).

13. **C. Bayram**, N. Péré-laperne, R. McClintock, B. Fain and M. Razeghi, "Pulsed metalorganic chemical vapor deposition of high quality AlN/GaN superlattices for near-infrared intersubband transitions," [Appl. Phys. Lett. 94, 121902 \(2009\)](#).
12. **C. Bayram** and M. Razeghi, "Stranski-Krastanov growth of InGaN quantum dots emitting in green spectra," [Appl. Phys. A – Mater. 96, 403 \(2009\)](#).
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96. **(INVITED) C. Bayram**, “(Ultra)Wide Bandgap Semiconductor Revolution” ECE Distinguished Seminar, Center for Integrated Nanotechnologies (CINT) Colloquium Series, NM, USA, Nov. 5, 2024.
95. **(INVITED) C. Bayram**, “(Ultra)Wide Bandgap Semiconductor Revolution” Grainger First-Year Experience Research Scholars Seminar, Mar. 28, IL, USA.
94. **(INVITED) C. Bayram**, “Diamond Photoconductive Semiconductor Switches” ARPA-E ULTRAFast Kick-off Meeting, Mar. 12 & 13, Chicago, IL, USA.
93. **(INVITED) C. Bayram**, Technology Student Association Guest Speaker, Normal Community High School, IL, USA, Feb. 28, 2024.
92. **(INVITED) C. Bayram**, “(Ultra)Wide Bandgap Semiconductor Revolution” ECE Distinguished Seminar, Northwestern University, IL, USA, Nov. 21, 2023.
91. **(INVITED) C. Bayram**, “Cubic-phase III-nitrides for Advanced Electronics” Allegro MicroSystems, NH, USA, Aug. 22, 2023.
90. Y.C. Chiu and C. Bayram, “Fabrication of Sub-Micron InGaN Based Light Emitting Diodes for Next Generation Displays,” Lester Eastman Conference on High Performance Devices, University of Chicago, Chicago, IL, USA, August 7 – 9 (2023).
89. J. Lee and C. Bayram, “Cubic InGaN/GaN Platform for Droop-free Green Light-emitting Diodes,” Lester Eastman Conference on High Performance Devices, University of Chicago, Chicago, IL, USA, August 7 – 9 (2023).
88. Z. Han and C. Bayram, “Diamond p-type lateral Schottky barrier diodes with high breakdown voltage (>4.6kV),” Lester Eastman Conference on High Performance Devices, University of Chicago, Chicago, IL, USA, August 7 – 9 (2023).
87. Z. Han, J. Lee, S. Messing, T. Reboli, A. Mironov, and C. Bayram, “Buried Channel Diamond Photoconductive Semiconductor Switches,” Lester Eastman Conference on High Performance Devices, University of Chicago, Chicago, IL, USA, August 7 – 9 (2023).
86. Z. Han and C. Bayram, “Diamond P-type Lateral Schottky Barrier Diodes with High Breakdown Voltage (>4.6kV),” 16th International Conference on New Diamond and Nano Carbons (NDNC), Michigan State University, East Lansing, MI, USA, June 18 – 22 (2023).
85. **(INVITED) C. Bayram**, “Green Light Emitting Diodes for the Ultimate Solid-State Lighting” ARPA-E Semiconductor Device Cohort Annual Review meeting & PNDIODES Close-out, Dec. 8th & 9th, San Francisco, CA, USA.
84. **(PLENARY AWARD) C. Bayram**, “Cubic-phase III-nitrides for Next Generation Quantum Devices” World General Congress for Optics and Photonics of the International Commission for Optics, Dresden, Germany, Sept. 7, 2022.

83. **(INVITED) C. Bayram**, "*From Wide (Al)GaN towards Ultra-wide Bandgap Diamond Electronics*" National Institute of Standards and Technology, MD, USA, Aug. 4, 2022.
82. **(KEYNOTE) C. Bayram**, "*From Wide (Al)GaN towards Ultra-wide Bandgap Diamond Electronics*" 13th International Conference on Nanotechnology: Fundamentals and Applications (ICNFA'22), Prague, Czech Republic, Aug. 3 - 5, 2022.
81. **(INVITED) C. Bayram** "*From Wide (Al)GaN towards Ultra-wide Bandgap Diamond Electronics*," AFOSR GHz-THz Electronics Review, Arlington, VA, USA, July 11- 15, (2022).
80. **(INVITED) C. Bayram**, "*From Wide (Al)GaN towards Ultra-wide Bandgap Diamond Electronics*" Ultra-wide Bandgap Materials for Microelectronics Workshop, APS/CNM Users Meeting, Argonne National Laboratory, IL, USA, May 11, 2022.
79. **(INVITED) C. Bayram**, "*Through Physics and Smart Materials, Breaking the Efficiency (Droop) Barrier in Light Emitting Diodes for the Ultimate Solid-State Lighting*" IEEE NTC Mumbai and SPIE IIT Bombay Student Chapter, Indian Institute of Technology, Bombay, India, March 8, 2022.
78. **(INVITED) C. Bayram**, "[Monolithic Integration of III-V emitters on Si for Ultra-low-power Photonics](#)" Virtual Technical Interchange Meeting Series, Center for Aggressive Scaling by Advanced Processes for Electronics and Photonics, University of Illinois at Urbana-Champaign, IL, USA, March 2, 2022.
77. **(INVITED) C. Bayram**, "[Vertical thinking in light emitting diodes](#)" IEEE EDS Webinar, November 24, 2021.
76. **(INVITED) C. Bayram**, "*Vertical thinking in light emitting diodes*" Colloquium Talk, Physics Department, Illinois State University, November 2, 2021.
75. **(INVITED) C. Bayram**, "*Vertical thinking in light emitting diodes*" Scientific Seminar, Osram Company, Germany, July 8, 2021.
74. **(INVITED) C. Bayram**, "*Vertical thinking in light emitting diodes*" Nanotechnology Lecture, Clarkson University, NY, USA, April 14, 2021.
73. **(INVITED) Y. Tsai and C. Bayram**, "*First-Principles Calculations of N- and P-type Doping in Wurtzite and Zincblende GaN*," SPIE Photonics West, San Francisco, CA, USA, March 6 - 11 (2021).
72. **(INVITED) Y. Tsai and C. Bayram**, "*Next-Generation Green Light-Emitting Diodes by Novel Cubic III-Nitrides*," DOE Lighting R&D Workshop, Virtual Meeting, Feb. 1 - 4 (2021).
71. **(INVITED) A. Mohamed, K. Park, C. Bayram, R. Singh, M. Dutta, and M. A. Stroscio**, "*Reduction of Hot Spot Temperature in Nitride-based Devices using Interface Phonons*," Workshop on Compound Semiconductor Materials and Devices (WOCSEMADD), Palm Springs, CA, USA Feb. 19 (2020).
70. **K. Park and C. Bayram**, "*GaN thermal conductivity and its dependence on threading dislocations for advanced electronic and photonic device designs*," 13th International Conference on Nitride Semiconductors, WA, USA, July 7-12, (2019).
69. **C. Bayram**, "*Vertical Thinking with GaN Devices: Ultraviolet, Visible, and Terahertz Photonics*," National Academy of Engineering China-America Frontiers of Engineering Symposium, San Diego, CA, USA, June 20 - 22 (2019).

68. **C. Bayram**, "Ultraviolet Light Emitting Diodes for Disinfection," Nature-Society Interactions in Developing Communities Workshop, University of Illinois at Urbana-Champaign, IL, USA, April 5 (2019).
67. **R. Liu**, **C. McCormick**, and **C. Bayram**, "Suppression of indium clustering and quantum confined stark effect of InGaN LED on Silicon (111)," SPIE Photonics West, San Francisco, CA, USA, Feb. 2 - Feb. 7 (2019).
66. **(INVITED) C. Bayram**, "Atomic Engineering of Gallium Nitride Semiconductors for Ultraviolet-to-Terahertz Photonics," IEEE Nanotechnology Materials and Devices Conference, Portland, OR, USA, October 14-17, 2018.
65. **(INVITED) C. Bayram**, "LIGHTing and NETworking (LIGHTNET) through Advanced Solid State Lighting," Turkish American Scientists & Scholars Association (TASSA) Conference, Boston University, MA, USA, June 2-3, 2018.
64. **R. Liu**, **R. Schaller**, **C.-Q. Chen**, and **C. Bayram**, "Phase-transition Cubic GaN with ~29 % Internal Quantum Efficiency," Compound Semiconductor Week, Massachusetts Institute of Technology, MA, USA, May 29 - June 1, 2018.
63. **(INVITED) C. Bayram**, "Al<sub>x</sub>Ga<sub>(1-x)</sub>N-based intersubband devices" Room Temperature High-Power Terahertz Frequency Sources Symposium, Drexel University, PA, USA, April 18, 2018.
62. **(INVITED) C. Bayram**, "Vertical thinking in light emitting diodes" Nanotechnology Lecture, University of California at Los Angeles, CA, USA, April 9, 2018.
61. **(INVITED) C. Bayram**, **R. Grady**, and **K. Park** "Novel cubic phase III-nitride complementary metal-oxide-semiconductor transistor technology," SPIE Photonics West, San Francisco, CA, USA, Jan. 27 - Feb. 1 (2018).
60. **(INVITED) C. Bayram**, "Next Generation Gallium Nitride Microelectronics & Photonics," Air Force Research Laboratory - Wright-Patterson Air Force Base, Dayton, OH, USA, Jan. 10 (2018).
59. **(INVITED) C. Bayram**, "Vertical thinking in light emitting diodes" Nanotechnology Lecture, University of Illinois at Chicago, IL, USA, Nov. 30, 2017.
58. **C. Bayram** "InGaN-based flexible light emitting diodes," The 11th International Symposium on Semiconductor Light Emitting Devices, Banff, Alberta, Canada, Oct. 8-12, 2017.
57. **C. Bayram**, **J. Kim**, **H. Park**, **C.W. Cheng**, **C. Dimitrakopoulos**, **J. Ott**, **K.B. Reuter**, **S.W. Bedell**, and **D.K. Sadana**, "A Novel Thin-film Blue Light Emitting Diode via GaN-on-Graphene Technology," IEEE Photonics Conference, FL, USA, Oct. 1-5, 2017.
56. **C. Bayram** and **R. Liu** "Cubic Phase Light Emitters Hetero-integrated on Silicon," IEEE Photonics Conference, FL, USA, Oct. 1-5, 2017.
55. **(INVITED) C. Bayram**, "Next Generation Gallium Nitride Microelectronics & Photonics," NANOTAM Seminar, Bilkent University, Ankara, Turkey, Aug. 4 (2017).
54. **(INVITED) C. Bayram** "Investigating Thermal Properties of Vertically-Integrated GaN Heterostructures," AFOSR GHz-THz Electronics Review, Arlington, VA, USA, July. 10-13, (2017).
53. **K. Park**, **M. A. Stroschio**, and **C. Bayram**, "Electron momentum relaxation rates via Frohlich interaction with polar-optical-phonons in bulk wurtzite gallium nitride," International Workshop on Computational Nanotechnology, Windermere, UK, June 5-9, 2017.

52. H.-P. Lee, J. Perozek, and **C. Bayram**, “Scaling AlGaIn/GaN High Electron Mobility Transistor Structures onto 200-mm Silicon (111) Substrates through Novel Buffer Layer Configurations,” International Conference on Compound Semiconductor Manufacturing Technology, Indian Wells, CA, USA, May 22 - 25, 2017.
51. R. Liu and **C. Bayram**, “Cubic Phase GaN Integrated on CMOS-Compatible Silicon (100),” International Conference on Compound Semiconductor Manufacturing Technology, Indian Wells, CA, USA, May 22 - 25, 2017.
50. **(INVITED) C. Bayram** “InGaIn-based flexible light emitting diodes,” SPIE Photonics West, San Francisco, CA, USA, Jan. 28 - Feb.2 (2017).
49. **(INVITED) C. Bayram** and R. Liu, “Polarization-free integrated gallium-nitride photonics,” SPIE Photonics West, San Francisco, CA, USA, Jan. 28 - Feb.2 (2017).
48. **C. Bayram**, J. Kim, C. Dimitrakopoulos, and D. K. Sadana, “A Novel Thin-Film Blue Light Emitting Diode via GaN-on-Graphene Technology,” MRS Fall Meeting, Boston, MA, USA, Nov. 27-Dec. 2, (2016).
47. **C. Bayram** and R. Liu, “Polarization-Free Integrated Gallium Nitride Photonics,” International Workshop on Nitride Semiconductors, Orlando, FL, USA, Oct. 2-7, (2016).
46. **(INVITED) C. Bayram**, “GaN Devices Gearing up for the 21st Century,” NANOTAM Seminar, Bilkent University, Ankara, Turkey, July 27 (2016).
45. **(INVITED) C. Bayram**, “Vertical thinking in light emitting diodes,” Nano@Illinois RET Research Seminar, University of Illinois at Urbana-Champaign, Urbana, IL, USA, June 28 (2016).
44. **(INVITED) C. Bayram**, “GaN devices gearing up for the 21st century,” Company Seminar, Veeco Company, Somerset, NJ, USA, January 11 (2016).
43. K.-T. Lee, **C. Bayram**, W. Gallagher, D. Sadana, D. Piedra, T. Palacios, B. Krishnan, G. Papanoulis, A. Paranjpe, E. Aklimi, and K. L. Shepard, “A Scalable CMOS Technology Platform for Co-integrating GaN on Si,” Compound Semiconductors Week 2, 45 (2015).
42. **(INVITED) C. Bayram**, “Vertical thinking in light emitting diodes,” Nano@Illinois RET Research Seminar, University of Illinois at Urbana-Champaign, Urbana, IL, USA, July 21 (2015).
41. **(INVITED) C. Bayram**, “Vertical thinking in light emitting diodes,” CNST 13th Annual Nanotechnology Workshop, University of Illinois at Urbana-Champaign, Urbana, IL, USA, May 7-8 (2015).
40. **(INVITED) C. Bayram**, “Light emitting diode gearing up for the 21st century,” ECE Explorations, University of Illinois at Urbana-Champaign, Urbana, IL, USA, Feb. 25 (2015).
39. **(INVITED) C. Bayram**, J. Kim, H. Park, C.-W. Cheng, C. Dimitrakopoulos, J. A. Ott, K. B. Reuter, S. W. Bedell, and D.K. Sadana, “Vertical thinking in blue light emitting diodes: GaN-on-graphene technology,” SPIE Photonics West, San Francisco, CA, USA, February 7-12 (2015).
38. **(INVITED) C. Bayram**, J. Ott, K. T. Shiu, C. W. Cheng, Y. Zhu, J. Kim, D. K. Sadana, and M. Razeghi, “Polarization-free GaN emitters in the ultraviolet and visible spectra via heterointegration on CMOS-compatible Si (100),” SPIE Photonics West, San Francisco, CA, USA, February 7-12 (2015).
37. **(INVITED) C. Bayram**, “Vertical thinking in light emitting diodes” ECE Colloquium, University of Illinois at Urbana-Champaign, Urbana, IL, USA, Nov. 13, 2014.

36. **C. Bayram**, J. Kim, H. Park, C.-W. Cheng, C. Dimitrakopoulos, J. Ott, K.B. Reuter, S.W. Bedell, and D. K. Sadana, "Thin-film blue light emitting diodes via revolutionary GaN-on-graphene technology," International Symposium on Graphene Devices (ISGD-4), Bellevue, WA, USA, Sep. 21-25, 2014.
35. **(INVITED) C. Bayram**, "Gallium nitride compound semiconductors for ultraviolet, visible, and terahertz photonics" 2nd International Conference and Exhibition on Lasers, Optics, and Photonics, Philadelphia, PA, USA, Sep. 08-10, 2014.
34. **(INVITED) C. Bayram**, "LED lighting" International Summer School on Advanced TV Technologies, Antalya, TURKEY, Aug. 25-29, 2014.
33. **C. Bayram**, J. Kim, H. Park, C.-W. Cheng, C. Dimitrakopoulos, J. Ott, K.B. Reuter, S.W. Bedell, and D. K. Sadana, "Revolutionary GaN-on-graphene technology," 5th International Symposium on Growth of III-Nitrides, Atlanta, GA, USA, May 18-22, 2014.
32. **C. Bayram**, J. Ott, K.-T. Shiu, C.-W. Cheng, Y. Zhu, J. Kim, M. Razeghi, and D.K. Sadana, "Cubic phase GaN on nano-grooved Si (100) via maskless selective area epitaxy," 5th International Symposium on Growth of III-Nitrides, Atlanta, GA, USA, May 18-22, 2014.
31. **(INVITED) D. K. Sadana**, N. Li, **C. Bayram**, K.-T. Shiu, and C.-W. Cheng, "Technologies for high speed III-V optical links on silicon optoelectronics," International Conference and Exhibition on Lasers, Optics & Photonics, Hilton San Antonio Airport, TX, USA, Oct. 07-09 (2013).
30. **(INVITED) C. Bayram**, "Renewable energy and energy-efficiency in Turkey: Research and development trends," 2nd TUBITAK Workshop for Turkish Scientist Residing Abroad (hosted by Scientific and Technological Research Council of Turkey), Grand Cevahir Otel, Istanbul, TURKEY, July 4-5 (2013).
29. **D. Shahrjerdi**, S. W. Bedell, **C. Bayram**, and D. K. Sadana, "Flexible InGaP/(In)GaAs tandem solar cells with very high specific power," 39th IEEE Photovoltaic Specialists Conference, Tampa, Florida, USA, June 16-21 (2013).
28. **(INVITED) C. Bayram**, "Gallium nitride compound semiconductors for ultraviolet, visible, and terahertz photonics," Special Materials Science & Engineering Seminar, Columbia University, Morningside Campus, NY, USA, June 12 (2013).
27. **(INVITED) C. Bayram**, K.T. Shiu, Y. Zhu, C.W. Cheng, D.K. Sadana, F.H. Teherani, D.J. Rogers, V. E. Sandana, P. Bove, Y. Zhang, S. Gautier, C.-Y. Cho, E. Cicek, Z. Vashaei, R. McClintock, and M. Razeghi, "Engineering light- emitting diodes with inexpensive materials: Integrating ZnO and Si into solid state lighting," SPIE Photonics West, San Francisco, CA, USA, February 2-7 (2013).
26. **(INVITED) C. Bayram**, K.T. Shiu, Y. Zhu, C.W. Cheng, D.K. Sadana, Z. Vashaei, E. Cicek, R. McClintock, and M. Razeghi, "Gallium nitride on silicon for cheap, scalable, and sustainable photonics," SPIE Photonics West, San Francisco, CA, USA, February 2-7 (2013).
25. **(INVITED) D. K. Sadana**, S.W. Bedell, D. Shahrjerdi, B. Hekmatshoar, N. Li, **C. Bayram**, and J. Kim, "Advanced PV technologies: Challenges & Opportunities," SPIE Photonics West, San Francisco, CA, USA, February 2-7 (2013).
24. **(INVITED) D. Shahrjerdi**, S. W. Bedell, B. Hekmatshoar, **C. Bayram**, and D. Sadana, "New paradigms for cost- effective III-V photovoltaic technology," Pacific Rim Meeting on Electrochemical and Solid-State Science, Honolulu, Hawaii, USA, October 7-12 (2012).

23. **C. Bayram**, Z. Vashaei, R. McClintock, D.K. Sadana, and M. Razeghi, "*Al<sub>x</sub>Ga<sub>1-x</sub>N-based engineered intersubband devices*," Infrared Optoelectronics: Materials & Devices (MIOMD-XI) Conference, Chicago, IL, USA, September 4-8 (2012).
22. **D. Shahrijerdi**, S. W. Bedell, C. Ebert, **C. Bayram**, B. Hekmatshoar, K. Fogel, P. Lauro, M. Gaynes, T. Gokmen, J. A. Ott, and D. K. Sadana, "*High-efficiency thin-film InGaP/InGaAs/Ge tandem solar cells enabled by controlled spalling technology*", 38th IEEE Photovoltaic Specialists Conference, Austin, Texas, USA, June 3-8 (2012).
21. **(INVITED) C. Bayram**, "*Applied photonics for a sustainable earth: High efficiency light emitting diodes and solar cells*," TASSA Annual Conference, University of Maryland, College Park, MD, USA, March 3-4 (2012).
20. **(INVITED) C. Bayram**, D. K. Sadana, Z. Vashaei, and M. Razeghi, "*Reliable GaN-based resonant tunneling diodes with reproducible room-temperature negative differential resistance*," SPIE Photonics West, San Francisco, CA, USA, January 22-27 (2012).
19. **(INVITED) C. Bayram** and M. Razeghi, "*AlGaInN gap engineering from ultraviolet and visible wavelengths towards terahertz regime*," ICDD Spring Meetings, Pennsylvania, USA, March 17 (2011).
18. **(INVITED) C. Bayram** and M. Razeghi, "*III-Nitride optoelectronic devices*," ICDD Spring Meetings, Pennsylvania, USA, March 15 (2011).
17. **Z. Vashaei**, **C. Bayram**, R. McClintock, and M. Razeghi, "*Effects of substrate quality and orientation on the characteristics of III-nitride resonant tunneling diodes*", SPIE Photonics West, San Francisco, CA, USA, January 22-27 (2011).
16. **E. Cicek**, Z. Vashaei, **C. Bayram**, R. McClintock, and M. Razeghi, "*Comparison of ultraviolet APDs grown on free-standing GaN and sapphire substrates*", SPIE Optics + Photonics, San Diego, California, USA, August 1-5 (2010).
15. **(INVITED) R. McClintock**, E. Cicek, Z. Vashaei, **C. Bayram**, M. Razeghi, and Melville P. Ulmer, "*III-nitride based avalanche photodetectors*," SPIE Optics + Photonics, San Diego, USA, August 1-5 (2010).
14. **M. Razeghi**, **C. Bayram**, and Z. Vashaei, "*III-Nitride intersubband absorption devices and resonant tunneling diodes*," 3rd International Symposium on Growth of III-Nitrides (ISGN-3) Corum - Montpellier, France, July 4-8 (2010).
13. **M. Razeghi**, Z. Vashaei, and **C. Bayram**, "*High quality metal-organic chemical vapor deposition of (Al)GaN-based resonant tunneling diodes*," 3rd International Symposium on Growth of III-Nitrides (ISGN-3) Corum - Montpellier, France, July 4-8 (2010).
12. **(INVITED) M. Razeghi**, **C. Bayram**, R. McClintock, F.H. Teherani, D.J. Rogers, and V.E. Sandana, "*Novel green light emitting diodes: Exploring droop-free lighting solutions for a sustainable Earth*", LED 2010: The 4<sup>th</sup> International Conference on LED and Solid State Lighting, COEX (Seoul), Korea, Feb. 3-5 (2010).
11. **(INVITED) C. Bayram**, F. H. Teherani, D. Rogers, and M. Razeghi, "*Novel green light emitting diodes*", Dow Chemical Company Sustainability Innovation Student Challenge Recognition Event, University of Michigan Ann Arbor, Oct. 19 (2009).
10. **(INVITED) F. H. Teherani**, **C. Bayram**, D. J. Rogers, M. Razeghi, and R. McClintock, "*Hybrid Green LEDs with n-type ZnO Substituted for n-type GaN in an Inverted p-n Junction*", 2009 Annual Meeting of IEEE Photonics Society, Antalya - Belek, Turkey, Oct. 4-8 (2009).

9. **(INVITED) C. Bayram** and M. Razeghi, "*III-nitride optoelectronic devices*", 2009 Annual Meeting of IEEE Photonics Society, Antalya - Belek, Turkey, Oct. 4-8 (2009).
8. **(INVITED) C. Bayram**, F. H. Teherani, D. Rogers, R. McClintock, and M. Razeghi, "*Novel green light emitting diodes: Innovating droop-free lighting solutions for sustainable Earth*", 2009 symposium of the Chicago AIChE (American Institute of Chemical Engineers), Chicago, IL, Oct. 4-5 (2009).
7. **(INVITED) M. Razeghi**, **C. Bayram**, R. McClintock and N. Péré-Laperne, "*III- nitride optoelectronic devices: High performance GaN avalanche photodiodes, novel green light emitting diodes and III-nitride intersubband devices*", AFOSR Joint Electronics Program Review, Arlington, VA, May 27 (2009).
6. **C. Bayram**, D. J. Rogers, F. Hosseini Teherani, and M. Razeghi, "*Novel hybrid green LEDs based on substituting n-type ZnO for n-type GaN in an inverted p-n junction*", Proc. of the 5th International Workshop on ZnO and Related Materials, Sept. 22-24, Michigan (2008).
5. V. E. Sandana, D. J. Rogers, F. H. Teherani, R. McClintock, **C. Bayram** M. Razeghi, H.-J. Drouhin, V. Sallet, G. Garry, F. Falyouni,, "*Comparison of ZnO nanostructures grown using PLD, MOCVD & PVT*," Proc. of the 5th Int. Workshop on ZnO and Related Materials, Sept. 22-24, Michigan (2008).
4. **(INVITED) M. Razeghi**, J. L. Pau, **C. Bayram**, B. Fain, P. Giedraitis, and R. McClintock, "*UV single photon detection based on III-nitride Geiger mode avalanche photodiodes*," 2nd International Symposium on Growth of III-Nitrides (ISGN-2). Laforet Shuzenji Izu, Japan, July 6 (2008).
3. **(INVITED) M. Razeghi**, J. L. Pau, **C. Bayram**, R. McClintock, K. Kim, P. Giedraitis, and B. Fain, "*GaN Avalanche Photodiodes and Green Emitters*," AFRL-AFOSR Nanotechnology Initiative Review, Dayton, OH, USA, May 6 (2008).
2. **(INVITED) R. McClintock**, J. L. P. Vizcaino, K. Minder, **C. Bayram** and M. Razeghi, "*III-nitride photon counting avalanche photodiodes*," SPIE Photonics West, San Francisco, CA, USA, January 20-25 (2008).
1. **(INVITED) K. Minder**, F. H. Teherani, D. Rogers, **C. Bayram**, R. McClintock, P. Kung, and M. Razeghi, "*Etching of ZnO towards the development of ZnO homostructure LEDs*," SPIE Photonics West, San Francisco, CA, USA, January 20-25 (2008).

#### **Other Presentations & Posters (presenter: underlined)**

18. Jason Li, "*Efficiency Droop Analysis of AlGaIn Ultraviolet Light-emitting Diodes*," The Grainger College of Engineering Illinois Scholars Undergraduate Research Expo, University of Illinois at Urbana-Champaign, IL, USA, April 30, 2026. [Presentation]
17. Jason Li, "*Efficiency Droop Contributors in Indium Gallium Nitride Green Light-Emitting Diodes*," The Grainger College of Engineering Illinois Scholars Undergraduate Research Expo, University of Illinois at Urbana-Champaign, IL, USA, April 26, 2025. [Presentation]  
\* **Honorable Mention**
16. **(INVITED) Jason Li**, "*Efficiency Droop Contributors in Indium Gallium Nitride Green Light-Emitting Diodes*," Gulf Coast Undergraduate Research Symposium, Rice University, TX, USA, Oct. 18, 2025. [Presentation]

15. **(INVITED)** Sarah Wilson, “*Fabrication and Characterization of Metal-Oxide-Semiconductor (MOS) Capacitors*,” The Grainger College of Engineering Illinois Scholars Undergraduate Research Expo, University of Illinois at Urbana-Champaign, IL, USA, April 23, 2024. [Presentation]\* **SRC Research Scholar**
14. **(INVITED)** C. Shan and C. Bayram, “*Efficiency Droop Study of a Blue Light Emitting Diode via Power-Current-Voltage Measurements*,” Gulf Coast Undergraduate Research Symposium, Rice University, TX, USA, Oct. 21, 2023. [Presentation]
13. Z. Han, A. Sumant, and C. Bayram, “*2DHG on H-terminated Diamond for FET Applications*,” 16th International Conference on New Diamond and Nano Carbons (NDNC), Michigan State University, East Lansing, MI, USA, June 18 – 22 (2023). [Poster]
12. **(INVITED)** A. Herrera, “*Diamond Use in Next Generation Power Electronics*,” The Grainger College of Engineering Illinois Scholars Undergraduate Research Expo, University of Illinois at Urbana-Champaign, IL, USA, April 25, 2023. [Presentation]\* **SRC Research Scholar**
11. Jaekwon Lee, Yi-Chia Tsai, Jean-Pierre Leburton, and Can Bayram, “*Green Light Emitting Diodes for the Ultimate Solid-State Lighting*,” Compound Semiconductor Week, Ann Arbor, MI, USA, June 1 – 3 (2022). [Poster]
10. Z. Han, S. Weiss, V. Garcia, and C. Bayram, “*Diamond Semiconductor Devices for Advanced Power Electronics*,” Compound Semiconductor Week, Ann Arbor, MI, USA, June 1 – 3 (2022). [Poster]
9. Y. Tsai and C. Bayram, “*Electronic Surface and Heterostructure: Band Offsets in Ternary Wurtzite and Zincblende III-Nitrides*,” SPIE Photonics West, San Francisco, CA, USA, March 6 - 11 (2021). [Poster]
8. **(INVITED)** N. Kolagotla, “*The Effect of Temperature on the Electrical Properties of LEDs*,” The Grainger College of Engineering Illinois Scholars Undergraduate Research Expo, University of Illinois at Urbana-Champaign, IL, USA, April 19, 2020. [Presentation]\* **DaRin Butz Foundation Research Scholar**
7. **(INVITED)** J. Meyer, R. Liu, R.D Schaller, H-P Lee, and C. Bayram, “*Impact of Defects on Shockley-Read-Hall and Radiative Recombination in Bulk GaN under Weak Excitation*,” Gulf Coast Undergraduate Research Symposium, Rice University, TX, USA, Nov. 2, 2019. [Presentation]\* **Outstanding Presentation Trophy Winner**
6. **(INVITED)** C. Bayram, “*Vertical Thinking with GaN Devices: Ultraviolet, Visible, and Terahertz Photonics*,” National Academy of Engineering China-America Frontiers of Engineering Symposium, San Diego, CA, USA, June 20 - 22 (2019). [Poster]
5. **(INVITED)** R. Liu and C. Bayram, “*Cubic Phase Gallium Nitride Emitters*,” Siegmán School on Lasers, Technical University Denmark, Island of Hven, AB, Sweden, July 28 – August 04, 2018. [Poster]
4. **(INVITED)** R. Liu and C. Bayram, “*Cubic Phase Gallium Nitride Emitters*,” Turkish American Scientists & Scholars Association (TASSA) Conference, Boston University, MA, USA, June 2-3, 2018. [Poster]
3. **(INVITED)** Y. Yao, “*Investigation of Stress and Structural Evolution in Electrodeposited Thick Nickel*,” Gulf Coast Undergraduate Research Symposium, Rice University, TX, USA, Oct. 4, 2017. [Presentation]

2. Y. Yao, "*Investigation of Stress and Structural Evolution in Electrodeposited Thick Nickel*," MRL Fall Conference, University of Illinois at Urbana-Champaign, IL, USA, Nov. 8-9, 2017. [Presentation]
1. **(INVITED)** J. Perozek, "*GaN Transistors for Next Generation Electronics*," Gulf Coast Undergraduate Research Symposium, Rice University, TX, USA, Oct. 22, 2016. [Presentation]