Kunal Mukherjee

Assistant Professor, Department of Materials Science and Engineering
Stanford University, 476 Lomita Mall, Stanford CA, 94305, USA
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RESEARCH VISION

Understanding and controlling defects, interfaces, and crystal structure in heteroepitaxial semiconductors for electronic, optical, and quantum devices.

PROFESSIONAL EXPERIENCE

Assistant Professor, Materials Science and Engineering, Stanford University	2020 – present
Assistant Professor, Materials, University of California Santa Barbara	2016 – 2020
Postdoctoral Researcher, IBM Research, TJ Watson Center	2015
Postdoctoral Research Associate, Electroceramics Laboratory, MIT	2014
100G Transceiver Engineer, Finisar Corporation	2009 – 2010

EDUCATION

Ph.D. Materials Science and Engineering, Massachusetts Institute of Technology, 2014
M.S. Materials for Micro and Nano systems, National University of Singapore, 2009
M.Eng. Materials Science and Engineering, Massachusetts Institute of Technology, 2008
B.Eng. Electrical and Electronics, Nanyang Technological University, Singapore, 2007

AWARDS

- Young Investigator Award, North American MBE Conference (2024)
- RSC, Nanoscale Emerging Investigators (2024)
- Young Scientist Award, International Symposium on Compound Semiconductors (2024)
- Stanford Tau Beta Pi Teaching Honor Roll (2023)
- IOP J. Phys. D: Applied Physics Journal, Emerging Leaders (2021)
- Reed and Polly Anderson Faculty Fellow, Stanford University (2020-22)
- NSF CAREER Award (2020)
- Corbett Prize, International Conference on Defects in Semiconductors (2019)
- IBM PhD Fellowship (2013)
- Singapore-MIT Alliance Graduate Fellowship (2007)
- President's Research Scholar, Nanyang Technological University (2004-06)
- Singapore Airlines Undergraduate Scholarship (2003-07)

REFEREED JOURNAL PAPERS

61 peer-reviewed papers; **30** student- and postdoc-led papers from my independent research group, with trainee names underlined. Google Scholar: *2029* citations, h-index *24*

Selected papers on heteroepitaxy and integrated semiconductor devices

1. J. Meyer, B. Rodriguez, L. Nordin, **K. Mukherjee**, Mid-Infrared LEDs Based on Lattice-Mismatched Hybrid IV–VI/III–V Heterojunctions, Advanced Optical Materials 14: e03448 (2026)
2. J. Meyer, L. Nordin, R.A. Carrasco, P.T. Webster, M. Dumont, **K. Mukherjee**, Engineering PbSnSe Heterostructures for Luminescence Out to 8 μm at Room Temperature, Advanced Optical Materials, 2401746 (2024)

3. J. Selvidge, J. Norman, E.T. Hughes, C. Shang, D. Jung, A.A. Taylor, MJ Kennedy, R.W. Herrick, J.E. Bowers, and **K. Mukherjee**, Defect Filtering for Thermal Expansion Induced Dislocations in III-V Lasers on Silicon, Applied Physics Letters 117 (2020) 122101

Selected papers on crystal orientation, phase, and metastability

1. P.D. Reddy, V. Tara, A. Vailionis, A. Majumdar, **K. Mukherjee**, Reversible polymorph switching in IV-VI thin films with epitaxial control and birefringence contrast, Nano Letters 26, 1, 238–245 (2026)
2. K. Xiao, V. Tara, P.D. Reddy, J.E. Meyer, A.M. Skipper, R. Chen, L.J. Nordin, A. Majumdar, **K. Mukherjee**, Heteroepitaxial growth of highly anisotropic Sb_2Se_3 films on GaAs, Mater. Horiz., 2025,12, 5829-5838

Selected papers on dislocation science

1. H. Yan, E. Postelnicu, T. Nguyen, S. Corujeira Gallo, A. Stacey, and **K. Mukherjee**, Multi-microscopy characterization of threading dislocations in CVD-grown diamond films, Applied Physics Letters, 124, 102108 (2024)
2. B. Bonef, R.D. Shah, **K. Mukherjee**, Fast diffusion and segregation along threading dislocations in semiconductor heterostructures, Nano Letters 19 (2019) 1428–1436
3. P.G. Callahan*, B.B. Haidet*, D. Jung, G.G.E. Seward, **K. Mukherjee**, "Direct observation of recombination-enhanced dislocation glide in heteroepitaxial GaAs on silicon". Phys. Rev. Materials. 2 (2018) 081601.

Complete publication list

1. P.D. Reddy, V. Tara, A. Vailionis, A. Majumdar, K. Mukherjee, Reversible polymorph switching in IV-VI thin films with epitaxial control and birefringence contrast, Nano Letters 26, 1, 238–245 (2026)
2. J. Meyer, B. Rodriguez, L. Nordin, K. Mukherjee, Mid-Infrared LEDs Based on Lattice-Mismatched Hybrid IV–VI/III–V Heterojunctions Advanced Optical Materials 14:e03448 (2026)
3. K. Xiao, A. Vailionis, Y. Shen, A. Skipper, A-K. Preidl, A. Lindenberg, and K. Mukherjee, Solid-phase heteroepitaxy of oriented Sb2Se3 on GaAs for birefringent thin films, Journal of Vacuum Science and Technology A 44, 022702 (2026)
4. P.D. Reddy, Z.N. Heussen, K. Mukherjee, Epitaxial growth of anisotropic SnSe on GaAs(001) via step-edge orientation control, Journal of Applied Physics 139, 175301 (2026) **(Featured Article)**
5. K. Xiao, V. Tara, P.D. Reddy, J.E. Meyer, A.M. Skipper, R. Chen, L.J. Nordin, A. Majumdar, K. Mukherjee, Heteroepitaxial growth of highly anisotropic Sb2Se3 films on GaAs, Mater. Horiz., 2025,12, 5829-5838
6. S. Kim, P. London, D. Yang, L.B. Hughes, J. Ahlers, S. Meynell, W. Mitchell, K. Mukherjee, A.C. Bleszynski Jayich, Scalable, nanoscale positioning of highly coherent color centers in prefabricated diamond nanostructures, Nature Communications 16, 9803 (2025).
7. L.B. Hughes, S.A. Meynell, W. Wu, S. Parthasarathy, L. Chen, Z. Zhang, Z. Wang, E.J Davis, K. Mukherjee, N.Y. Yao, A.C. Bleszynski Jayich, A strongly interacting, two-dimensional, dipolar spin ensemble in (111)-oriented diamond, Physical Review X 15, 021035 (2025)
8. K. Xiao, B. Wong, J. Meyer, L. J. Nordin, K. Mukherjee, Epitaxial PbGeSe thin films and their photoluminescence in the mid-wave infrared , Journal of Applied Physics, 137, 145705 (2025)
9. P.D. Reddy, L.J. Nordin, L.B. Hughes, A.-K. Preidl, and K. Mukherjee, Expanded Stability of Layered SnSe-PbSe Alloys and Evidence of Displacive Phase Transformation from Rocksalt in Heteroepitaxial Thin Films, ACS Nano 18, 20, 13437–13449 (2024)

10. J.E. Meyer, L. Nordin, R.A. Carrasco, P.T. Webster, M. Dumont, K. Mukherjee, Engineering PbSnSe Heterostructures for Luminescence Out to 8 μm at Room Temperature, Advanced Optical Materials, 2401746 (2024)
11. S. Parthasarathy, M. Joos, L.B. Hughes, S.A. Meynell, T.A. Morrison, J.D. Risner-Jamtgaard, D.M. Weld, K. Mukherjee, A.C.B. Jayich, Role of Oxygen in Laser Induced Contamination at Diamond-Vacuum Interfaces, Physical Review Applied 22 (2), 024067 (2024)
12. H. Yan, E. Postelnicu, T. Nguyen, S. Corujeira Gallo, A. Stacey, and K. Mukherjee, Multi-microscopy characterization of threading dislocations in CVD-grown diamond films, Applied Physics Letters, 124, 102108 (2024)
13. E.T. Hughes, C. Shang, J. Selvidge, D. Jung, Y. Wan, R.W. Herrick, J.E. Bowers, K. Mukherjee, Gradual degradation in InAs quantum dot lasers on Si and GaAs, Nanoscale, 16, 2966-2973 (2024)
14. T. Nguyen, L. Nordin, K. Mukherjee, Sputtered SnTe thin films on Si and Ge as a plasmonic material, ACS Applied Electronic Materials 6, 2, 950–957 (2024)
15. J.E. Meyer, L. Nordin, T. Nguyen, K. Mukherjee, Mid-wave infrared photoluminescence from low-temperature-grown PbSe epitaxial films on GaAs after rapid thermal annealing, Appl. Phys. Lett. 123, 131109 (2023)
16. E.T. Hughes, G. Kusch, J. Selvidge, B. Bonef, J. Norman, C. Shang, J.E. Bowers, R.A. Oliver, K. Mukherjee, Dislocation-Induced Structural and Luminescence Degradation in InAs Quantum Dot Emitters on Silicon, Phys. Status Solidi A 2300114 (2023)
17. L. Hughes, Z. Zhang, C. Jin, S. Meynell, B. Ye, W. Wu, Z. Wang, E. Davis, T. Mates, N. Yao, K. Mukherjee, A.B. Jayich, Two-dimensional spin systems in PECVD-grown diamond with tunable density and long coherence for enhanced quantum sensing and simulation, APL Materials 11, 021101 (2023)
18. B.B. Haidet, J. Meyer, P. Reddy, E.T. Hughes, K. Mukherjee, Versatile strain relief pathways in epitaxial films of (001)-oriented PbSe on III-V substrates, Physical Review Materials 7, 024602 (2023)
19. M. Nordstrom, T. Garrett, P. Reddy, J. McElearney, J.R. Rushing, K. Vallejo, K. Mukherjee, K. Grossklaus, T.E. Vandervelde, P. Simmonds, Direct integration of GaSb with GaAs(111)A using interfacial misfit arrays, Crystal Growth and Design, 23, 12 (2023)
20. R. France, J. Selvidge, K. Mukherjee, and M. Steiner, Optically-thick GaInAs/GaAsP strain-balanced quantum-well tandem solar cells with 29.2% efficiency under the AM0 space spectrum, Journal of Applied Physics 132, 184502 (2022)
21. E.T. Hughes, M. Dumont, Y. Hu, D. Liang, R. Beausoleil, J.E. Bowers, K. Mukherjee, Dislocation formation and filtering in III-V regrowth on GaAs bonded on Si, Crystal Growth & Design 22 (2022), 5852–5860
22. B.B. Haidet, E.T. Hughes, K. Mukherjee, Epitaxial integration and defect structure of layered-SnSe films on PbSe/III-V templates, Crystal Growth & Design 22 (2022) 3824−3833
23. J. Meyer, A.J. Muhowski, L.J. Nordin, E.T. Hughes, B.B. Haidet, D. Wasserman, K. Mukherjee, Bright mid-infrared photoluminescence from high dislocation density epitaxial PbSe films on GaAs, APL Materials 9 (2021) 111112
24. K. Mukherjee, J. Selvidge, E.T. Hughes, J. Norman, C. Shang, R.W. Herrick, J.E. Bowers, Post-growth formation of kinetically controlled misfit dislocations in III-V lasers on silicon, Journal of Physics D: Applied Physics 54 (2021) 494001
25. C. Shang, Y. Wan, J. Selvidge, E.T. Hughes, R.W. Herrick, K. Mukherjee, J. Duan, F. Grillot, W. Chow, J.E. Bowers, Perspective on advances in quantum dot lasers and integration with Si photonic integrated circuits, ACS Photonics 8 (2021) 2555–2566

26. E.T. Hughes, B.B. Haidet, B. Bonef, K. Mukherjee, Pipe-diffusion-enriched dislocations and interfaces in PbSe-SnSe heterostructures, Physical Review Materials 5, 073402 (2021)
27. B.B. Haidet, L.J. Nordin, A.J. Muhowski, K.D. Vallejo, E.T. Hughes, J. Meyer, P.J. Simmonds, D. Wasserman, K. Mukherjee, Interface structure and luminescence properties of epitaxial PbSe films on InAs (111)A, Journal of Vacuum Science and Technology A 39 (2021) 023404
28. C. Shang, E.T. Hughes, Y. Wan, M. Dumont, R. Koscica, J. Selvidge, R.W. Herrick, A.C. Gossard, K. Mukherjee, J.E. Bowers High-temperature reliable quantum-dot lasers on Si with misfit and threading dislocation filters, Optica 8, (2021) 749-754
29. J. Selvidge, E.T. Hughes, J. Norman, C. Shang, MJ Kennedy, M. Dumont, A. Netherton, Z. Zhang, R.W. Herrick, J.E. Bowers, K. Mukherjee, Reduced dislocation growth leads to long lifetime InAs quantum dot lasers on silicon at high temperatures, Applied Physics Letters 118 (2021) 192101
30. R.M. Kennard, C.J. Dahlman, R.A. DeCrescent, J.A. Schuller, K. Mukherjee, R. Seshadri, M.L. Chabinyc, Ferroelastic Hysteresis in Thin Films of Methylammonium Lead Iodide, Chemistry of Materials 33 (2021) 298–309
31. A. Goswami, S. Šuran Brunelli, B. Markman, A. Taylor, H-Y. Tseng, K. Mukherjee, M. Rodwell, J. Klamkin, Jonathan, C. Palmstrøm, Controlling Facets and Defects of InP Nanostructures in Confined Epitaxial Lateral Overgrowth, Physical Review Materials 4 (2020) 123403
32. S.A. Meynell, C.A. McClellan, L.B. Hughes, T.E. Mates, K. Mukherjee, and A.C. Bleszynski Jayich, Engineering quantum-coherent defects: the role of substrate miscut in chemical vapor deposition diamond growth, Applied Physics Letters 117 (2020) 194001
33. C. Shang, J. Selvidge, E.T. Hughes, J. Norman, A.A. Taylor, A.C. Gossard, K. Mukherjee, and J.E. Bowers, A pathway to thin GaAs virtual substrate on on-axis Si (001) with ultralow threading dislocation density, Physica Status Solidi (A) (2020) 2000402
34. J. Selvidge, J. Norman, E.T. Hughes, C. Shang, D. Jung, A.A. Taylor, MJ Kennedy, R.W. Herrick, J.E. Bowers, and K. Mukherjee, Defect Filtering for Thermal Expansion Induced Dislocations in III-V Lasers on Silicon, Applied Physics Letters 117 (2020) 122101
35. K. Mukherjee, J. Selvidge, D. Jung, J. Norman, A.A. Taylor, M. Salmon, A.Y. Liu, J.E. Bowers, and R.W. Herrick, Recombination-enhanced dislocation climb in InAs quantum dot lasers on silicon, Journal of Applied Physics. 128 (2020) 025703
36. B.B. Haidet, E.T. Hughes, K. Mukherjee, Nucleation control and interface structure of rocksalt PbSe on (001) zincblende III-V surfaces, Physical Review Materials 4 (2020) 033402
37. R.M. France, P. Espinet-Gonzalez, B.B. Haidet, K. Mukherjee, H.L. Guthrey, H.A. Atwater, D. Walker, Development of Lattice-Mismatched GaInAsP for Radiation Hardness, IEEE Journal of Photovoltaics. 10 (2020) 103–108
38. O. Vail, P. Taylor, P. Folkes, B. Nichols, B.B. Haidet, K. Mukherjee, G. de Coster, Growth and Magnetotransport in Thin Film α-Sn on CdTe, Physica Status Solidi (B) 257 (2020) 1800513
39. A. Rice, K. Park, E.T. Hughes, K. Mukherjee, K. Alberi, Defects in Cd3As2 Epilayers Via Molecular Beam Epitaxy and Strategies for Reducing Them, Physical Review Materials 3 (2019) 121201(R)
40. J. Selvidge, J. Norman, M.E. Salmon, E.T. Hughes, J.E. Bowers, R.W. Herrick, K. Mukherjee, Non-radiative recombination at dislocations in InAs quantum dots grown on silicon, Applied Physics Letters 115, 131102 (2019)
41. Y. Hu, D. Liang, K. Mukherjee, Y. Li, C. Zhang, G. Kurczveil, X. Huang, and R. Beausoleil, III/V-on-Si MQW lasers by using a novel photonic integration method of regrowth on bonding template, Light Science and Applications 8 (2019) 1–9
42. R.M. Kennard, C.J. Dahlman, H. Nakayama, R.A. DeCrescent, J.A. Schuller, R. Seshadri, K. Mukherjee, M.L. Chabinyc, Phase Stability and Diffusion in Lateral Heterostructures of Methyl Ammonium Lead Halide Perovskites, ACS Applied Materials and Interfaces. (2019)

43. E.T. Hughes, R.D. Shah, K. Mukherjee, Glide of threading dislocations in (In)AlGaAs on Si induced by carrier recombination: Characteristics, mitigation, and filtering, Journal of Applied Physics. 125 (2019) 165702
44. B. Bonef, R.D. Shah, K. Mukherjee, Fast diffusion and segregation along threading dislocations in semiconductor heterostructures, Nano Letters 19 (2019) 1428–1436
45. K. Mukherjee, M. Vaisman, P.G. Callahan, M.L. Lee, Anomalous tilting in InGaAs graded buffers from dislocation sources at wafer edges, Journal of Crystal Growth. 512 (2019) 169–175
46. J.S. Lee, B. Shojaei, M. Pendharkar, M. Feldman, K. Mukherjee, C.J. Palmstrøm, Contribution of top barrier materials to high mobility in near-surface InAs quantum wells grown on GaSb(001), Physical Review Materials 3, 014603 (2019)
47. D. Jung, J. Norman, Y. Wan, S. Liu, R. Herrick, J. Selvidge, K. Mukherjee, A.C. Gossard, J.E. Bowers, Recent Advances in InAs Quantum Dot Lasers Grown on On-Axis (001) Silicon by Molecular Beam Epitaxy, Physica Status Solidi (A). (2019) 1800602
48. P.G. Callahan*, B.B. Haidet*, D. Jung, G.G.E. Seward, K. Mukherjee, "Direct observation of recombination-enhanced dislocation glide in heteroepitaxial GaAs on silicon". Phys. Rev. Materials. 2 (2018) 081601. (*Equal contribution)
49. K. Mukherjee, C.H. Reilly, P.G. Callahan, G.G.E. Seward, “Recombination activity of threading dislocations in GaInP influenced by growth temperature”, Journal of Applied Physics. 123 (16) 165701 (2018).
50. D. Jung, P.G. Callahan, B. Shin, K. Mukherjee, A.C. Gossard, J.E. Bowers, "Low threading dislocation density GaAs growth on on-axis GaP/Si (001), J. Appl. Phys. 122 (22), 225703 (2017)
51. K. Mukherjee, B.A. Wacaser, S.W. Bedell, D.K. Sadana, "Rapid imaging of misfit dislocations in SiGe/Si in cross-section and through oxide layers using electron channeling contrast", Appl. Phys. Lett. 110, 232101 (2017)
52. K. Mukherjee, Y. Hayamizu, C. Kim, L. Kolchina, G. Mazo, S.Y. Istomin, S.R. Bishop, H.L. Tuller, "Praseodymium cuprate thin film cathodes for intermediate temperature solid oxide fuel cells: Roles of doping, orientation, and crystal structure", ACS Appl. Mater. Interfaces, 2016, 8 (50), pp 34295–34302
53. M. Vaisman*, K. Mukherjee*, T. Masuda, K.N. Yaung, E.A. Fitzgerald and M. L. Lee, “Direct-gap 2.1-2.2 eV AlInP Solar Cells on GaInAs/GaAs Metamorphic Buffers”, IEEE J. Photovolt. 6, 571 (2016) (*Equal contribution)
54. K. Mukherjee, A.G. Norman, A.J. Akey, T. Buonassisi, and E.A. Fitzgerald, “Spontaneous lateral phase separation of AlInP during thin film growth and its effect on luminescence” J. Appl. Phys. 118 (11), 115306 (2015)
55. K. Mukherjee, P.B. Deotare and E.A. Fitzgerald, “Improved photoluminescence characteristics of order-disorder AlGaInP quantum wells at room and elevated temperatures”, Appl. Phys. Lett. 106 (14), 142109 (2015)
56. K. Mukherjee, D. A. Beaton, A. Mascarenhas, M. T. Bulsara, E.A. Fitzgerald, “Effects of dislocation strain on the epitaxy of lattice-mismatched AlGaInP layers”, J. Cryst. Growth. 392 (2014), P74-P80
57. K. Mukherjee, D.A. Beaton, T. Christian, E.J. Jones, K. Alberi, A. Mascarenhas, M.T. Bulsara, E.A. Fitzgerald, “Growth, microstructure, and luminescent properties of direct-bandgap InAlP on relaxed InGaAs on GaAs substrates”, J. Appl. Phys. 113, 183518 (2013)
58. N.Y. Pacella, K. Mukherjee, M.T. Bulsara, and E.A. Fitzgerald. "Silicon CMOS Ohmic Contact Technology for Contacting III-V Compound Materials." ECS J. Solid State Sci. Technol. 2(2013) P324–P331.

59. D.A. Beaton, T. Christian, K. Alberi, A. Mascarenhas, K. Mukherjee, and E.A. Fitzgerald. "Determination of the direct to indirect bandgap transition composition in AlInP." J. Appl. Phys. 114, 203504 (2013)
60. T. Christian, D.A. Beaton, K. Mukherjee, K. Alberi, E.A. Fitzgerald, A. Mascarenhas, "Amber-green light emitting diodes using order-disorder $Al_xIn_{1-x}P$ heterostructures", J. Appl. Phys. 114, 074505 (2013)
61. K. Mukherjee, T. Teng, R. Jose, and S. Ramakrishna, Electron transport in electrospun TiO_2 nanofiber dye-sensitized solar cells, Appl. Phys. Lett. 95 (1), 012101 (2009)

BOOK CHAPTERS

1. K. Mukherjee, Materials science of defects in GaAs-based lasers, Reliability of Semiconductor Lasers and Optoelectronic Devices
2. J. Norman, D. Jung, A. Liu, J Selvidge, K. Mukherjee, J.E. Bowers, R.W. Herrick, Reliability of lasers on silicon substrates for silicon photonics, Reliability of Semiconductor Lasers and Optoelectronic Devices

PATENTS

1. J. P. de Souza, Y. S. Lee, K. Mukherjee, and D. K. Sadana, "United States Patent: 10,581,109- Fabrication method of all solid-state thin film battery", 3-Mar-2020.
2. S. W. Bedell, C.-W. Cheng, K. Mukherjee, J. A. Ott, D. K. Sadana, and B. A. Wacaser, "United States Patent: 10,460,937 - Post-growth heteroepitaxial layer separation for defect reduction in heteroeptaxial films", 29-Oct-2019.
3. S. W. Bedell, K. Mukherjee, J. A. Ott, D. K. Sadana, and B. A. Wacaser, "United States Patent: 10127649 - Electron channeling pattern acquisition from small crystalline areas", 13-Nov-2018.
4. N. Li, Q. Li, K. Mukherjee, D. K. Sadana, and G. G. Shahidi, "United States Patent: 10043941 – Light emitting diode having improved quantum efficiency at low injection current", 07-Aug-2018.
5. J. P. de Souza, Y. S. Lee, K. Mukherjee, and D. K. Sadana, "United States Patent: 9984949 – Surface passivation having reduced interface defect density", 29-May-2018.
6. S. W. Bedell, K. Mukherjee, J. A. Ott, D. K. Sadana, and B. A. Wacaser, "United States Patent: 9859091- Automatic alignment for high throughput electron channeling contrast imaging", 02-Jan-2018.
7. S. W. Bedell, K. Mukherjee, J. A. Ott, D. K. Sadana, and B. A. Wacaser, "United States Patent: 9741532 - Multi-beam electron microscope for electron channeling contrast imaging of semiconductor material", 22-Aug-2017.
8. S. W. Bedell, R. T. Mo, K. Mukherjee, J. A. Ott, D. K. Sadana, and B. A. Wacaser, "United States Patent: 9739728 - Automatic defect detection and classification for high throughput electron channeling contrast imaging", 22-Aug-2017.

INVITED TALKS AND SEMINARS

1. Compound Semiconductor Week, Kumamoto, Japan, May 2026
2. The Ohio State University, MSE department seminar, September 2025
3. The Materials Science & Technology (MS&T) technical meeting, September 2025
4. II-VI and Infrared Materials Workshop, September 2025
5. MIT Department of Materials Science and Engineering Seminar, September 2025
6. Berkeley EECS, Solid State Technologies and Devices Seminar April 2025
7. Carnegie Mellon University, Materials Science and Engineering February 2025
8. SPIE Photonics West, January 2025
9. University of Arkansas μATOMS EFRC seminar, October 2024

10. North American Molecular Beam Epitaxy Conference, Boston, MA, July 2024
11. Princeton-GIA Diamond Symposium, May 2024
12. Physics and Chemistry of Surfaces and Interfaces (PCSI), January 2024
13. UST-KIST Seminar, July 2023
14. Compound Semiconductor Week, May 2023
15. Materials Research Society, Fall Symposium, December 2022
16. International Conference on Molecular Beam Epitaxy, September 2022
17. APS March meeting, March 2022
18. UC Berkeley, Materials Science and Engineering, February 2022
19. International Workshop on Physics of Semiconductor Devices, December 2021
20. Microscopy and Microanalysis, Defects in Materials July 2021
21. University of Illinois, Materials Science and Engineering, April 2021
22. University of Michigan, Materials Science and Engineering, November 2020
23. Institute of Energy Efficiency, UC Santa Barbara
24. Stanford University, Department of Materials Science and Engineering, October 2018
25. Global Foundries, Malta, NY, August 2018
26. Materials Research Lab Outreach Symposium, UC Santa Barbara, February 2017
27. Materials Department, UC Santa Barbara, February 2016
28. Rutgers University, Materials Science and Engineering, February 2015
29. University of Cambridge, April 2015
30. Yale University, Department of Electrical Engineering, November 2014

TEACHING

1. Defects and Disorder in Materials (MATSCI 213) – Stanford, Spring 2022-2025
2. Defects in Semiconductors (MATSCI 317) – Stanford, Fall 2021,22,25
3. Microstructure in Materials (MATSCI 213x) – Stanford, Spring 2021
4. Electronic Materials Engineering (MATSCI 152) – Stanford, Winter 2021-2025
5. Materials Structure and Properties (MATRL 100A), UCSB – Fall 2018, 2019
6. Characterization in scanning electron microscopy (MATRL 288C), UCSB – Spring 2018
7. Extended defects in semiconductors (MATRL 288I), UCSB – Fall 2017
8. Metal-organic chemical vapor deposition (MATRL 227), UCSB – Spring 2017, 2019
9. Fundamentals of Electronic Solids I (MATRL 206A/ECE 215A), UCSB – Winter 2017-20
10. Solid state chemistry (3.091), MIT (Teaching assistant) – Fall 2014

PROFESSIONAL ACTIVITIES

- IEEE Electron Devices Society, Optoelectronics Devices Committee (2025 – present)
- Electronic Materials Conference, officer and invited organizer (2018-present)
- Program committee North American Conference on Molecular Beam Epitaxy (2019-present)
- Program committee International Conference on Molecular Beam Epitaxy (2022-present)
- Focus topic organizer, American Physical Society March meeting (2020)
- Program committee, International Conference on Crystal Growth and Epitaxy (2019, 2024)
- Program committee, IEEE Photonics Conference (2018,2025)

Reviewer for US NSF, DOE, Canadian NSERC, Nature, Applied Physics Letters, Optics Express, Light: Science and Applications, Journal of Applied Physics, Journal of Crystal Growth, Journal of the American Ceramics Society, IEEE Journal of Photovoltaics, Nanoscale, Solar Energy Materials and Solar cells, Journal of Vacuum Sciences and Technology B, Journal of Materials Science: Materials in Electronics

GRADUATE STUDENTS SUPERVISED/CO-SUPERVISED

1. Maria Aguiar Duarte, Ph.D., Materials Science and Engineering, 2029 (Expected)
2. Seong Jin Park, Ph.D., Materials Science and Engineering, 2028 (Expected)
3. Kira Martin, Ph.D., Materials Science and Engineering, 2028 (Expected)
4. Laura Stern, M.S., Materials Science and Engineering, 2028 (Expected)
5. Zahra Heussen, Ph.D., Electrical Engineering, 2027 (Expected), co-advised w. Debbie Senesky
6. Kelly Xiao, Ph.D., Materials Science and Engineering, 2027 (Expected)
7. Tri Nguyen, Ph.D., Materials Science and Engineering, 2026 (Expected)

Graduated

8. Lillian Hughes, Ph.D., Materials, UCSB, 2025, co-advised with Ania Jayich
9. Pooja Reddy, Ph.D., Materials Science and Engineering, 2025
10. Jarod Meyer, Ph.D., Materials Science and Engineering, 2025
11. Eamonn Hughes, Ph.D., Materials, UCSB, 2023, co-advised with John Bowers
12. Jennifer Selvidge, Ph.D., Materials, UCSB, 2021 co-advised with John Bowers
13. Brian Haidet, Ph. D., Materials UCSB, 2021
14. Jared Hoch, M.S., Materials UCSB, 2019
15. Connor Reilly, M.S., Materials UCSB, 2019

RESEARCH AWARDS BY SUPERVISED TRAINEES

Kelly Xiao, Best Student Presentation, North American MBE Conference 2025,
Pooja Reddy, Best Student Presentation, International Conference on MBE 2024
Pooja Reddy, Best Student Presentation, Electronic Materials Conference 2024
Lillian Hughes, Early Career Oral Award, European MRS 2023
Pooja Reddy, Best student Presentation, North American MBE Conference 2022
Eamonn Hughes, Best student Presentation, MRS Electronic Materials Conference 2020
Jennifer Selvidge, Best Student Presentation, MRS Electronic Materials Conference 2020
Brian Haidet, Best Student Presentation, MRS Electronic Materials Conference 2018

POSTDOCTORAL RESEARCHERS SUPERVISED/CO-SUPERVISED

1. Ashlee Garcia, Ph.D. UT Austin, 2025-present

Previous

2. Eveline Postelnicu, Ph.D. MIT, 2023-2025
3. Fatih Ince, Ph.D. U. New Mexico, 2024-2025
4. Leland J. Nordin, Ph.D. UT Austin, 2021-2023
5. Haoxue Yan, Ph.D. MIT, 2022-2023

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1. Diego Rivera, Ph.D. Materials Science and Engineering, Stanford, 2026
2. Luis Delfin Manriquez, Ph.D. Materials Science and Engineering, Stanford, 2026
3. Nidhi Kapate, Ph.D. Materials Science and Engineering, Stanford, 2026
4. Melody Wang, Ph.D. Materials Science and Engineering, Stanford, 2024
5. Emily Lindgren Ph.D. Materials Science and Engineering, Stanford, 2023
6. Yifan Wang Ph.D. Materials Science and Engineering, Stanford, 2022
7. Yunzhi Liu Ph.D. Materials Science and Engineering, Stanford, 2021
8. Rhys Kennard, Ph.D. Materials, UC Santa Barbara, 2021
9. Manik Goyal, Ph.D. Materials, UC Santa Barbara, 2021

10. Amanda Matheson, M.S. Materials, UC Santa Barbara, 2020
11. Michelle Labrecque, M.S. ECE, UC Santa Barbara, 2017