Dhanvini Gudi

312-776-9517 — LinkedIn — Google Scholar — Science Writing — Science Communication

Education

Johns Hopkins University **Sep 2026**
PhD in Electrical and Computer Engineering

University of Alberta **Jan 2020**
MSc in Microsystems and Nanodevices

National Institute of Technology, Karnataka **May 2017**
BTech in Electrical and Electronics Engineering

Awards and Honors

- JHU Graduate Student Organization Travel Award (2024)
- Departmental Fellowship at Department of Electrical and Computer Engineering, JHU (2021)
- Spotlight Award, 2 Appreciation Awards at Global Foundries (2020-2021)
- Best Poster at Canadian Semiconductor Science and Technology Conference (CSSTC-2019)
- MNT Fabrication Grant Award by CMC Microsystems (2018,2019)

Technical Research Experience

Johns Hopkins University **2021–2026**
PhD Candidate — Thon Lab, ECE Department

- Dissertation: PbS colloidal quantum dot synthesis, device fabrication, and material and electronic characterization for solar cells and photobattery applications
- Experience with solution-phase synthesis, material, optical, and device characterization techniques, and thin film deposition techniques
- Experience with 1D-SCAPS for solar device simulations
- Conducted cross-institutional collaborative research through the Ralph O'Connor Sustainable Energy Institute (ROSEI) with Morgan State University and JHU-APL
- Presented at IEEE PVSC, ECS, and Gordon Research Conference; contributed to journal publications, conference proceedings, and grant proposals
- Mentored and trained high school students, undergraduate students, and graduate students on synthesis, fabrication, and characterization processes in the research lab
- Developed standardized training modules and SOPs for lab tools; onboarded external users from partner institutions and coordinated tool usage

Global Foundries **2020–2021**
Senior Engineer of Yield and Integration

- Served as a device specialist in the Yield and Integration team
- Conducted root cause analysis of electrical tests, correlating data with process parameters
- Led investigations on maverick and scrapped wafers, ensuring baseline monitoring across products.
- Took on a leadership role within the first year becoming interim device team lead, trained new hires and coordinated team deliverables; received 3 performance awards

University of Alberta **2016–2020**
MSc Student and Research Assistant — Gupta Lab, ECE Department

- Material synthesis, device fabrication, and characterization of 2D TMDCs, perovskites, and ZnO thin films for optoelectronic applications
- Experience with physical vapor deposition processes, thin film deposition, nanofabrication, material and device characterization methods
- Experience with Sentaurus TCAD and NanoTCAD ViDES for device design simulations
- Collaborative projects between Future Energy Systems (FES), University of Alberta, and University of Calgary
- Mentored undergraduate and graduate students in fabrication and characterization techniques

Technical Skills

- **Material and Optical Characterization**: TEM, STEM, SEM, EDX, XRD, XPS, AFM, UV-Vis and steady state PL, PLQY
- **Device Fabrication & Characterization**: Colloidal quantum dot synthesis, thin film deposition, solar cell and photobattery fabrication; electrical characterization
- **Semiconductor Yield**: Root Cause Analysis, Electrical Test Correlation, Yield Integration, Data-Derived Investigation
- **Programming and Data Analysis**: Python, MATLAB, LaTeX, R;
- **Simulation Software**: 1D-SCAPS, Sentaurus TCAD, NanoTCAD ViDES, Lumerical
- **Communication & Documentation**: Technical writing (journals, SOPs, grant proposals), cross-functional stakeholder presentations, science communication for non-technical audiences

Relevant Courses and Teaching Pedagogy Training

Relevant Courses	Photovoltaic Devices, Organic Electronics, Integrated Photonic Circuits, Advanced Semiconductor Devices, Introduction to Optical Instruments, Nanoscale Phenomena, Nanofunctional Materials
JHU Teaching Academy	Teaching Institute Certification, Educational Scholarship Methods (course), JEDI in the Classroom: Fostering Inclusive Learning Environments that Support Mental Health, Belonging, and Equity (workshop)
CIRTL Network	Evidence-Based Undergraduate STEM Teaching; Incorporating Active Learning

Teaching Experience

Johns Hopkins University **2021–present**
Course Assistant — Whiting School of Engineering

- Course and Teaching Assistant across four undergraduate and graduate courses: Introduction to Optical Instruments, Advanced Optical Instruments, Photovoltaic Devices, and Introduction to Renewable Energy Devices
- Conducted weekly office hours to support student understanding of complex materials science, optics, and device physics concepts
- Delivered guest lectures for Photovoltaics Devices and Renewable Energy Devices courses
- Graded assignments and exams; provided timely, constructive feedback to promote student learning
- Led weekly journal club meetings; designed a rubric to enable effective engagement and critical evaluation of presenter and the paper
- Designed a one-credit course on ”Harnessing Solar Energy: From Sun to Grid” using UDL principles to include active learning, collaborative effort, and practical application

Paper Crane Lab **2020–2021**
Curriculum Developer and Educator

- Designed and delivered project-based STEAM curriculum for low resource government school programs across India, creating accessible engineering learning experiences for students with no prior technical background
- Developed STEAM curriculum for beginners learning to code across a wide age range using hands-on activities and open ended project goals to facilitate active learning
- Created STEM + Art tutorials on Instructables garnering ∼70k views and winning a STEM contest prize; developed ability to sequence creative technical content for broad, non-expert audiences

Science Communication and Outreach

Dhanvini Explores **2023–present**
Founder and Science Communicator

- Created a science communication channel translating complex concepts in materials science, renewable energy, and photovoltaics for general audiences, averaging **2.5k views per post**
- Produced written content via science blog complementing short-form video content
- Used Canva and CapCut to develop engaging, accessible science content across platforms

FASEB JHU Science Policy Fellows Program **2024**

- Selected among the **top 15 applicants** at JHU for the competitive science policy certification program
- Authored a science policy memo advocating for increased federal funding for renewable energy initiatives

Social Outreach **2017–present**

- Science writer and reviewer for **Let’s Talk Science (LTS)**; runner-up for the LTS Volunteer Online Award 2019
- Volunteer science communicator for **Project Bridge JHU**

Leadership and Community

BMore Natyam **2022–present**
Founder and Dance Instructor
- Founded a community of 25+ dancers through free and donation-based Indian classical dance sessions in Baltimore
- Instructed and facilitated workshops, classes, and performances; organized 3 community events with 100+ attendees

JHU Student Organizations — Professional Development Chair **2021–present**
- Organized professional development and networking events for ECE-GSA, GRACE, and IGSA with 50–200 attendees per event

Publications

Full publication list: Google Scholar

Journal Articles

Dhanvini Gudi*, Delancy Ma*, Joseph Zoller IV, Jill Cleveland, Susanna M. Thon. *A Novel Synthesis Approach to Quasi-Stable Ultra-small PbS CQDs for Multijunction Solar Cells.* Manuscript in preparation (2026).

Dhanvini Gudi*, Arlene Chiu*, Dana C. Kachman, Serene Kamal, Eric Rong, Yucheng Lan, Susanna M. Thon. *Solution Exfoliated WSe_2 as a Hole Transport Material for PbS Colloidal Quantum Dot Solar Cells.* Manuscript in preparation (2026).

Dhanvini Gudi*, Kevin J. Bennett*, Jill M. Cleveland, Luke R. O'Connor, Gregory Foley, James R. Wilkes, Kyle S. Barcus, Hoon Jeong Lee, Arthur E. Bragg, Jier Huang, Susanna M. Thon, and V. Sara Thoi. *Solar-Matched Colloidal Quantum Dots/Metal-Organic Framework Hybrid Materials for Photo-Induced Charge Transfer.* Manuscript under review (Nov 2025).

Kyle Barcus, Jill Cleveland, **Dhanvini Gudi**, Kevin Bennett, Susanna M. Thon, Van Sara Thoi. *Charge Transfer in Hybrid Quantum Dot / Metal-Organic Framework Systems: Current Understanding and Future Challenges.* Coordination Chemistry Reviews, Vol. 542 (Aug 2025).

Haris Ansari*, **Dhanvini Gudi***, Dipanjan Nandi, Viola Birss, Manisha Gupta. *Pulsed laser deposition grown $La_{0.3}Ca_{0.7}Fe_{0.7}Cr_{0.3}O_{3-\delta}$ thin films on yttria-stabilized zirconia substrates for fundamental electrochemical energy conversion studies.* Thin Solid Films, Vol. 784 (Nov 2023).

Dhanvini Gudi, Payel Sen, Andres Pico-Forero, Dipanjan Nandi, Manisha Gupta. *Optimization of growth parameters to obtain epitaxial large area growth of molybdenum disulfide using pulsed laser deposition.* AIP Advances, Vol. 12 (Aug 2022).

Salva Salmani Rezaie, **Dhanvini Gudi**, Jiaxin Fan, Carlo Montemagno, Manisha Gupta. *Geometrical Optimization of Organic Electrochemical Transistor for High Transconductance.* ECS Journal of Solid State Science and Technology, Vol. 9 (Sep 2020).

Jiaxin Fan, Salva S. Rezaie, Michael Facchini-Rakovich, **Dhanvini Gudi**, Carlo Montemagno, Manisha Gupta. *Tuning PEDOT:PSS Conductivity to obtain Complementary Organic Electrochemical Transistor.* Organic Electronics, Vol. 166 (Mar 2019).

Conference Papers and Presentations

Dhanvini Gudi, Kevin J. Bennett, Kyle Barcus, Jill Cleveland, Susanna M. Thon, V. Sara Thoi. *Synthesis and Characterization of Hybrid Quantum Dot–Metal Organic Framework Composites for Photobatteries.* The Electrochemical Society ECS Meeting Abstracts, Vol. MA2025-02, D03. Chicago, USA (Oct 2025).

Dhanvini Gudi, Arlene Chiu, Dana C. Kachman, Eric Rong, Kevin M. Bennett, Van Sara Thoi, Susanna M. Thon. *Hybrid Multi-functional PbS Colloidal Quantum Dot Materials for Solar Cells and Photobatteries.* IEEE Photovoltaic Society Conference (Gordon Research Conference). Les Diablerets, Switzerland (Jul 2024).

Dhanvini Gudi, Arlene Chiu, Dana C. Kachman, Eric Rong, Susanna M. Thon. *Improving PbS Colloidal Quantum Dot Solar Cell Performance via Solution-Phase Engineering.* IEEE Photovoltaic Society Conference. San Juan, USA (Jun 2023).

Dana C. Kachman, Arlene Chiu, **Dhanvini Gudi**, Chengchangfeng Lu, Eric Rong, Sreyas Chintapalli, Yida Lin, Daniel Khurgin, Susanna M. Thon. *Improving the Performance and Yield of Colloidal Quantum Dot Solar Cells Through Electron Transport Layer Optimization.* IEEE Photovoltaic Society Conference. San Juan, USA (Jun 2023).

Dhanvini Gudi, Kevin Bennett, Arlene Chiu, Susanna M. Thon, Van Sara Thoi. *PbS Colloidal Quantum Dots for Solar Cells and Photo-batteries.* Ralph O'Connor Sustainability and Energy Institute Summit. Baltimore, USA (Jan 2023).

Dhanvini Gudi, Dipanjan Nandi, Haris Ansari, Hui Yuan, Gianluigi Botton, Viola Birss, Manisha Gupta. *Pulsed Laser Deposition of Novel Perovskite Thin Films for Advanced Electrochemical Systems.* 15th International Conference on Laser Ablation (COLA 2019). Maui, Hawaii, USA (Sep 2019).

Dhanvini Gudi, Dipanjan Nandi, Payel Sen, Xinsong Lin, Andrea Sedgewick, Manisha Gupta. *Pulsed Laser Deposition-based Synthesis of MoS_2 Thin Films for Optoelectronic and Electronic Device Applications.* Canadian Semiconductor Science and Technology Conference (CSSTC 2019). Saskatoon, Canada (Jul 2019).

Dhanvini Gudi, Dipanjan Nandi, Xinsong Lin, Andrea Sedgewick, Manisha Gupta. *Controllable Plasma Based Synthesis of MoS_2 for Optoelectronic Applications.* Materials Research Society (MRS) Fall Meeting and Exhibition. Boston, USA (Nov 2018).

Dhanvini Gudi, Vinutha T.P., Preeti Rao. *Discrimination of Sitar and Tabla Strokes in Instrumental Concerts using Spectral Features.* Frontiers of Research in Speech and Music (FRSM). Rourkela, India (Dec 2017).