

Arya Keni

West Lafayette | keni1@purdue.edu | linkedin.com/in/aryakeni

Synopsis

Arya Keni is a 3rd year PhD Student at Purdue University in West Lafayette, in the Department of Electrical and Computer Engineering. His research focuses primarily on Quantum Optics and Nanoscale Photonics.

Research Interests

- Quantum Optics
- Nanophotonics
- Solid State Emitters
- Optoelectronics

Education

Purdue University, PhD, MS in Electrical and Computer Engineering July 2023 - July 2028

- GPA: 3.55/4.0

• **Coursework:** Nonlinear Optics, Quantum Mechanics, Quantum Devices

Pennsylvania State University, BS in Computer Engineering August 2019 - May 2023

- GPA: 3.35/4.0

• **Coursework:** Computer Architecture, RF Circuits, Electromagnetics

Experience

Graduate Researcher, Purdue ECE – West Lafayette, IN July 2023 - July 2028

- Optimized chemical synthesis protocols for high-purity anthracene crystals doped with dibenzoterrylene (DBT) for quantum optical applications
- Designed and fabricated nanophotonic architectures to enhance emission properties of DBT-based single-photon emitters
- Implemented active electrical feedback and tuning mechanisms for photostable organic molecular systems to control optical response and stability

Research Assistant, Penn State EECS – State College, PA August 2019 - July 2023

- Developed and analyzed SAT-solving neural networks with custom architectures, focusing on TNNs and bottom-clause guided literal selection.
- Modeled and simulated WOLED deposition processes, optimizing particle flux and film formation using advanced PVD techniques.
- Extended thin-film deposition simulations to non-conformal and anisotropic geometries, integrating dimensional modeling for predictive material growth.

Publications

Vapor Phase Assembly of Molecular Emitter Crystals for Photonic Integrated Circuits

Feb 2026

Arya D Keni, Christian M Lange, Adhyyan S Mansukhani, Emma Daggett, Ankit Kundu, Ishita Agarwal, Patrick Bak, Benjamin Cerjan, Jonathan D Hood

arXiv quant-ph

A Hybrid Molecular–Nanophotonic Platform for On-Chip Cavity Quantum Electrodynamics and Collective Interactions

Mar 2026

Christian M Lange, *Arya D Keni*, Ishita Agarwal, Emma Daggett, Adhyyan S Mansukhani, Ankit Kundu, Benjamin Cerjan, Libai Huang, Jonathan D Hood

ACS Nano, 20-12

Single-photon generation: materials, techniques, and the Rydberg exciton frontier (<i>Editor's Pick</i>)	Mar 2025
<i>Arya D Keni</i> , Kinjol Barua, Khabat Heshami, Alisa Javadi, Hadiseh Alaeian	
Optical Materials Express 15-4	
Bottom-up fabrication of 2D Rydberg exciton arrays in cuprous oxide	Jan 2025
Kinjol Barua, Samuel Peana, <i>Arya D Keni</i> , Vahagn Mkhitarian, Vladimir M Shalaev, Yong P Chen, Alexandra Boltasseva, Hadiseh Alaeian	
Communication Materials, 6-21	
A brief analogy of NNs and literal selection procedures within SAT solvers	Mar 2023
Mahfuza Farooque, <i>Arya D Keni</i>	
PSU Archive	
US Patents	Apr 2020
USPTO <i>Arya D Keni</i>	

Projects

Circular Bragg Grating Cavity	2025
<ul style="list-style-type: none"> Designed and simulated photonic crystal cavities to enhance emission from embedded quantum emitters using radial Bragg reflectors 	
Microlens Two Photon Polymerization Design	2025
<ul style="list-style-type: none"> Engineered and optimized freeform microlens arrays for femtosecond laser-based two-photon polymerization fabrication 	
Multi-Emitter Temporal Dynamics Solver	2024
<ul style="list-style-type: none"> Developed a simulation tool to model and analyze time-resolved emission dynamics of interacting quantum emitters 	

Technologies

Languages: Python, C, C++, LabView, Matlab, Julia, Markdown, LaTeX, R

Software Technologies: Tidy3D, MEEP, Legume, Lumerical, COMSOL, QuTIP, GDSII, FPGA, CAD

Optical Tools: Pico/Femtosecond Pulsed Lasers, CW Lasers, Tunable Lasers, EOM, AOM, Microscopy, Spectroscopy, EM/CCD, Single Photon Detectors, Photodiodes, Polarimetry, FTIR, Raman, Ellipsometry

Fabrication Tools: Photolithography, E-Beam Lithography, Spin-Coating, Sputter/Evaporative Metal Deposition, HDPCVD, PECVD, ALD, Inkjet and EHD deposition, ICP RI Etching, Profilometry, 3D Printing, Laser Etching, Wafer Dicing, Nanopolymer Lithography

Imaging Tools: SEM, AFM, EDX, XRD, Profilometry, Reflectometry, TEPL, NSOM, TERS