Pronoy Das

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Education

Purdue University — Aug 2021 – Present

***Ph.D. in Electrical & Computer Engineering (ECE)**, GPA: 3.89/4.0, Selected achievements: West Lafayette, IN, USA*

- **Bilsland Fellowship (2026)**: Purdue University - Recognition for exceptional performance in doctoral research.
- **APS Distinguished Student Award (2025)**: American Physical Society, Forum on International Physics
- **Purdue ECE Award for Excellence in Teaching (2024)**: Dept. of ECE, Purdue University

Indian Institute of Science Education and Research (IISER) Kolkata — Aug 2016 – Jun 2021

***Bachelor and Master in Physics**, GPA: 8.82/10* — *West Bengal, India*

Work Experience

Graduate Research Assistant, Purdue University — Aug 2021 – Present

Prof. Zubin Jacob's Research Group — *West Lafayette, IN, USA*

Sub-nanoscale quantum light-matter interactions (theory + computational)

- Resolved a decades-old challenge of high dispersion optical activity by quantifying hidden optical modes in semiconductors using quantum field theory + applied sparse matrix eigen-solvers for high- dimensional hamiltonians/matrices.
- Developed a software module in C++ for the open-source software: Purdue-PicoMax, for calculating nonlocal optical responses in semiconductors, with errors $< 10\%$. Similar parameters with competitive software packages has error $\sim 50\%$.
- Discovered new fundamental quantum fluctuations in the orbital angular momentum of spatiotemporal optical vortices using low-photon Poissonian statistics + quantum optics.
- Current project: resolve nonlocal photonic dispersion in 2D kagome lattice for topologically-protected waveguides.

Spin qubit manipulation of NV centers in diamonds (experimental)

- Devised an ultrafast (GHz) modulation laser setup for twisted light using temperature-controlled Sagnac interferometry.
- Collaborated to build single NV ODMR spectroscopy setup for NV spin control and readout at cryogenic temperatures.
- Generated shallow NV defects (30nm from surface) in diamond using ion implantation and vacuum anneal.

Undergraduate Researcher, IISER Kolkata — Aug 2019 – Jul 2021

Prof. Chiranjib Mitra's Research Group — *West Bengal, India*

Spin qubit detection and readout (experimental)

- Developed benchtop confocal + ODMR setup for spin control and readout of bulk NV centers using lock-in amplifiers.
- Devised on-chip microwave antenna designs and performed EM simulation in 2-4 GHz in CST Studio Suite, and fabricated these antennas using UV photolithography for use in home-built cryogenic ESR setup.

Outreach and Leadership

Scientific Reviewer for Numerous High-Impact Journals — **Aug 2024 – Present**

- Reviewer for *Physical Review A*. (APS Publishing), *New Journal of Physics* (IOP Publishing), *Proceedings of the Royal Society A*, and *SciPost Physics*

Research Implementation and Dissemination (multiple locations) — **Aug 2021 – Present**

- Published multiple first-authored articles in high-impact journals, accumulating over 10,000 downloads.
- Participated in writing multiple research grants, produced detailed technical reports for sponsors, and presentations for academic and non-academic audiences.

Course Instructor, EE Fundamentals Lab I, Purdue University — **Aug 2023 – May 2024**

- Led 60+ members with a team of 6 TAs, to simulate, prototype and analyze circuits for digital and analog logic projects.
- Recognized by the Purdue ECE Excellence in Teaching Award.

Team Lead, Multimedia and Web Technology, INQUIVESTA, IISER Kolkata — **Aug 2017 – Mar 2018**

- Led a team of 8 members towards front-end web development, sponsor meetings, graphic design and media coverage.

Skills

- **Programming** & **tools**: Python, C++ & Matlab, HTML & TeX, COMSOL and CST Studio.
- **Quantum Techniques** & **Optics**: ODMR & ESR spectroscopy, confocal microscopy, ultrafast (GHz) laser modulation, lumped circuit antenna design for qubit control, creating spin-defects in crystals.
- **Communication**: Strong verbal skills, collaborative teamwork, technical reporting and writing grants.

Hobbies: Film camera restoration, photography and development, IR photography, mechanical watch designing and assembly