

PRUTHVIRAJ B

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Mangaluru, Karnataka, India

OBJECTIVE

Highly motivated Master's candidate committed to the Hydrogen Economy and Sustainable Energy Storage. My technical background integrates rigorous experimental materials science (Thin film synthesis techniques, PEC water splitting, EIS, Mott-Schottky, advanced synthesis) with advanced computational modelling. I possess dual expertise in developing Python codes and executing Density Functional Theory (DFT) simulations (Quantum Espresso). I seek to apply this combined skillset in empirical data validation and computational prediction to complex research challenges in sustainable energy systems.

SKILLS

- **Programming Skills:** Python, C++, C, MySQL, JavaScript, Arduino
- **Scientific Tools:** Gaussian, Origin, LaTeX
- **Research Skills:** UV-Vis, Bruker Alpha-II FTIR, Two Probe, Olympus IX73, Thermal Evaporation, Thin film deposition, X-ray diffractometer, FESEM.

EXPERIENCE

- **Summer Research Fellow**  May 2025 - July 2025
Indian Academy of Sciences | IASc-INSNA-NASI Summer Research Fellowship 2025 Bengaluru, India
 - Developed a comprehensive Python pipeline for high-precision single-molecule localization analysis, including 2D Gaussian fitting and drift correction
 - Authored a standard operating procedure for a prism-type Total Internal Reflection Fluorescence (pTIRF) microscope, detailing the optical alignment and sample preparation.
 - Gained proficiency in operating and analysing data from UV-Vis, photoluminescence, and XRD spectrometers to characterize material properties.
- **Research and Development Specialist**  August 2024 - January 2026
IR INFOTECH Remote
 - Led the integration of a new tech stack, which enabled the team to deliver a wider range of innovative projects.
 - Managed the end-to-end project lifecycle from client requirement gathering to deployment.
 - Ensured project progress and timely delivery by implementing Agile methodologies and leading daily Scrum calls.
- **Summer Research Intern**  May 2024 - July 2024
NOEL-EFNMR laboratory | Alva's Institute of Technology Moodbidri, India
 - Developed skills on operating Bruker Alpha-II compact FTIR Spectrometer, Double Beam Spectrometer (UV3200), Keithley's 2450 Source Meter and High temperature Two probe Setup, Conducting Polymer Synthesis, Distillation of Chemicals, Performing Gaussian Calculations and Studying molecular structure using Gaussian09 and IMMM computational Facility.
- **Graduate Engineering Trainee -Product Training**  October 2023 - February 2024
UnifyCx Mangaluru, India
 - Handling Customer issues related to domain, hosting and websites, troubleshooting the website errors and providing the support for hosting.

RESEARCH PROJECTS

- **Influence of Stacking Sequence and Interfacial Chemistry on the Photoelectrochemical Properties of CdS-Ag Thin Films** July 2025 - May 2026
Guide: Dr. Raviprakash Y | Professor, Department of Physics, MIT Manipal
 - **Fabricated** pure CdS, CdS/Ag, and Ag/CdS thin films using **thermal evaporation** and studied their physical and optical properties using tools like HR-XRD, Raman spectroscopy, FE-SEM, and UV-Vis.
 - Tested the films for **hydrogen generation** and discovered the reality that pure CdS actually performed better than the silver-layered structures, because the silver trapped electrons and caused charge recombination.
 - Validation of experimental results and prediction of charge carrier transport mechanisms by executing **Density Functional Theory (DFT)** simulations using the **Quantum Espresso** software package.
- **Super Resolution Imaging using Fluorescence Spectroscopy** July 2025
Guide: Dr. Debashis Panda | Associate Professor, Department of Chemistry, RGIPT Uttar Pradesh, India

- Utilized Python to develop a comprehensive software pipeline for high-precision single-molecule localization microscopy (SMLM) data, incorporating 2D Gaussian fitting, background subtraction, and multi-stage drift correction to produce super-resolved datasets.
 - Authored a comprehensive standard operating procedure for a prism-type Total Internal Reflection Fluorescence (pTIRF) microscope
 - Skills Acquired: Python, Olympus IX73 Microscope, Data Analysis using origin.
- **Synthesis and Characterization of Pani-g-Chitosan/PVA Composites** July 2025
Tools: Gaussian09, Origin
- Synthesized and characterized Pani-g-Chitosan/PVA conducting polymer films (50:50 Chitosan:PVA ratio) during an internship at NOEL-EFNMR Laboratory.
 - Applied computational physics techniques through DFT calculations on the chitin molecular structure.
 - Utilized FTIR, UV-Vis, and IV characterization techniques.
 - Demonstrated proficiency in materials synthesis, characterization, polymer science, and computational physics.

TECHNICAL PROJECTS

- **Agrobot-An Agricultural Robot** 2023
International Cultural Jamboree 2022-23
- Developed an IoT-based agricultural robot, "Agrobot," designed to monitor plant health, detect diseases using machine learning and image processing, send notifications to farmers, and automate irrigation. Additionally, "Agrobot" measured humidity, temperature, and pH levels of the soil.
 - This innovative solution contributed to improved crop yields, reduced disease spread, and optimized resource management.
 - Secured 3rd place in the Science Model Exhibition Competition during the International Cultural Jamboree 2022.
 - Positioned 2nd in the Product Launch competition organized by St. Joseph Engineering College, Puttur.

EDUCATION

- **Manipal Institute of Technology** July 2024 - May 2026
Master's in Physics
 GPA: 7.61/10.00 Manipal, India
- **SDM College(Autonomous)** July 2020 - August 2023
B.Sc in Physics, Mathematics, and Computer Applications
 CGPA: 8.9/10.00 Ujire, India

LEADERSHIP EXPERIENCE

- **Vice President** September 2024 - July 2025
Nano to Infinity Club
 Department of Physics[🌐]
- Responsibility involved Organising Event, Operational Management, Member and Community Engagement.
 - Successfully organized events such as *Make It Happen* and *Kinetica 2025*.
- **Student Faculty** 2022 - 2023
SDM College(Autonomous) Ujire
 Department of Physics[🌐]
- Preparing tentative timetable for first year B.Sc. Physics classes.
 - Taking and Handling classes for 1st year BSc students and completing the prescribed syllabus on time. Units taught: Theory of Special Relativity, Electrodynamics.

CERTIFICATIONS

- **NPTEL: Physics of Functional Materials & Devices** 2025
- **NPTEL: Neutron Scattering for Condensed Matter Studies** 2025
- **Coursera: Introduction to Molecular Spectroscopy by University of Manchester** 2024
- **Coursera: Introduction to Calculus by University of Sidney** 2023

ADDITIONAL INFORMATION

Languages: English (C1), Kannada (Native), Tulu (Mother Tongue), Hindi (Intermediate)
Interests: Agriculture, Green Energy Research, Badminton, IoT.

REFERENCES

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 Manipal Institute of Technology, Manipal
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 <i>Relationship: Project Supervisor</i> | <ul style="list-style-type: none"> • Dr. Shashi Kumar K
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