

P. A. Praveen

JSPS Post Doctoral Fellow

Tohoku University, Sendai, Japan

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Positions

Postdoctoral Fellow

TOHOKU UNIVERSITY

Electrically driven organic lasers

May. 2023 - Present

Sendai, Japan

Research Associate

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER) TIRUPATI

Organic optoelectronic materials and devices

Jan. 2023 - May. 2023

Tirupati, India

Postdoctoral Fellow

UNIVERSITY OF TARTU

Computational imaging using diffractive optical elements

Jun. 2022 - Jan. 2023

Tartu, Estonia

Postdoctoral Fellow

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER) TIRUPATI

OLETs for lasing: DFT and Experimental studies

Jun. 2019 - May. 2022

Tirupati, India

Education

Doctoral Degree

BHARATHIDASAN UNIVERSITY

Quantum chemical and experimental analysis of metal organic nanostructures for NLO applications

Jan. 2013 - Jun. 2019

Tiruchirappalli, India

Project Student

BHARATHIDASAN UNIVERSITY

Improvising organic medium by metal dopants for nonlinear optical applications

Jun. 2011 - Jan. 2013

Tiruchirappalli, India

Post Graduation

BHARATHIDASAN UNIVERSITY

First Class with CGPA 7.5

Jul. 2009 - Apr. 2011

Tiruchirappalli, India

Under Graduation

PERIYAR UNIVERSITY

First Class with 80%

Jun. 2006 - Apr. 2009

Salem, India

Areas of Expertise

Optoelectronic devices

- Crystal growth and thin film deposition of organic & hybrid perovskite semiconductors
- OFET and organic diodes fabrication and electrical characterization

Metal-organic NLO systems

- Crystal growth / thin film deposition of metal-organic systems
- Nonlinear optical studies - SHG and Z-Scan studies

Computational materials science

- Materials analysis using DFT and semiempirical calculations
- DFT simulation of optoelectronic properties of organic semiconductors

Hands-On Experience

Experimental Techniques

- **Crystal growth:** PVT, hydrothermal, low & high temperature solution growth
- **Thin films:** Thermal evaporation, photolithography, CVD, spin coating
- **Structural:** PXRD, FTIR, AFM, SEM/EDX
- **Electrical:** Parametric, Dielectric, Hall analyses
- **Optical:** Optical pumping, PL, PYS, PLQY, Z-Scan, SHG measurements

Molecular Packages Gaussian, ORCA, MOPAC, Dalton, AutoDock
Programming Python, FORTRAN, R, MATLAB

Selected Publications

12. **P. A. Praveen**, S. Dhanapal, S. V. Bhat, A. Kandhasamy, T. Kanagasekaran, *Comprehensive analysis of DFT-3C methods with B3LYP and experimental data to model optoelectronic properties of tetracene*. **Materials Science in Semiconductor Processing** 173 (2024) 2200263.
11. A. Bhattacharya, **P. A. Praveen**, Yashwanth R, T. Kanagasekaran, *A Combined Theoretical and Experimental Approach to Deduce the Role of Dielectric Layer on Interface Trap Density in Single Crystal Organic Field-Effect Transistors*. **Crystal Research & Technology** 58 (2023) 2200263.
10. A. Bhattacharya, **P. A. Praveen**, S. V. Bhat, S. Dhanapal, A. Kandhasamy, T. Kanagasekaran, *Theoretical insights on pyrene end-capped thiophenes/furans and their suitability towards optoelectronic applications*. **Computational and Theoretical Chemistry** 1225 (2023) 114135.
9. V. Lakshmi Vennila, **P. A. Praveen**, T. Kanagasekaran, N V L Narasimha Murty, *Direct X-ray detection using thermally evaporated Pentacene Schottky diodes*. **Journal of Instrumentation** 17 (2022) P02024.
8. **P. A. Praveen**, P. Muthuraja, P. Gopinath, T. Kanagasekaran, *Impact of Furan Substitution on the Optoelectronic Properties of Biphenyl/Thiophene for Light Emitting Transistor Applications*. **The Journal of Physical Chemistry A** 126 (4) (2022) 600.

7. **P. A. Praveen**, A. Bhattacharya, T. Kanagasekaran, *A DFT Study on the Electronic and Photophysical Properties of Biphenyl/Thiophene Derivatives for Organic Light Emitting Transistors*. **Materials Today Communications** 25 (2020) 101509.
6. **P. A. Praveen**, R. Ramesh Babu, *Evaluation of nonlinear optical properties from molecular descriptors of benzimidazole metal complexes by principal component analysis*. **Journal of Molecular Graphics and Modeling** 93 (2019) 107447.
5. **P. A. Praveen**, R. Ramesh Babu, P. Balaji, A. Murugadas, M.A. Akbarsha, *Laser assisted anticancer activity of benzimidazole based metal organic nanoparticles*. **Journal of Photochemistry & Photobiology, B: Biology** 180 (2018) 218.
4. **P. A. Praveen**, R. Ramesh Babu, K. Ramamurthi, *Role of annealing on the structural and optical properties of nanostructured diaceto bis-benzimidazole Mn(II) complex thin films*. **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy** 173 (2017) 800.
3. **P. A. Praveen**, R. Ramesh Babu, K. Ramamurthi, *Theoretical and experimental investigations on linear and non-linear optical response of metal complexes doped PMMA films*. **Materials Research Express** 4 (2017) 025024.
2. **P. A. Praveen**, R. Ramesh Babu, K. Jothivenkatachalam, K. Ramamurthi, *Spectral, morphological, linear and non-linear optical properties of nanostructured benzimidazole metal complex thin films*. **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy** 150 (2015) 280.
1. **P. A. Praveen**, S. P. Prabhakaran, R. Ramesh Babu, K. Sethuraman, K. Ramamurthi, *Low power optical limiting studies on nanocrystalline benzimidazole thin films prepared by modified liquid phase growth technique*. **Bulletin of Materials Science** 38 (3) (2015) 645.

Awards

- 2024 **IOP Outstanding Reviewer 2023**, Physica Scripta
- 2023 **IOP Trusted Reviewer**, For exceptionally high level peer review competency
- 2023 **JSPS Postdoctoral Fellowship**, Post Doctoral Research, Tohoku University, Japan
- 2022 **ERA Chair Postdoctoral Fellowship**, Post Doctoral Research, University of Tartu, Estonia
- 2019 **Research Fellowship Award**, Post Doctoral Research, IISER Tirupati, India
- 2017 **Best Paper Award**, 21st National Seminar on Crystal Growth and Applications, National College, Tiruchirapalli
- 2016 **Research Fellowship for Meritorious Students in Science**, SRF, UGC, India
- 2016 **Best Paper Award**, National Conference on Computational and Experimental Physics of Functional Materials, K.S.R College, Tiruchengode
- 2014 **Third Prize**, DST SERB School on DFT and Beyond, M. S. University, Vadodara
- 2014 **Research Fellowship for Meritorious Students in Science**, JRF, UGC, India

Supervision of Graduate Students

- 2021 **BSMS Vth year Project**, Fabrication of organic photodetectors for broadband detection
- 2019 **BSMS Vth year Project**, Effect of different dielectric layers on the mobility of OSCs
- 2018 **M. Sc., Project**, NLO properties of transition metal substituted ZIF structures
- 2017 **M. Phil., Project**, Copper based metal organic frameworks for nonlinear optical applications

- 2017 **M. Sc., Project**, Theoretical & experimental analysis of optical properties of cadmium based ZIF structures
- 2016 **M. Sc., Project**, ZIF-8 thin films for nonlinear optical applications
- 2015 **M. Sc., Project**, Pd doped ZnO nanoparticles for nonlinear optical applications
- 2014 **M. Sc., Project**, Synthesis of new quinoline derivative for nonlinear optical applications

Teaching

- 2021 **Tutor**, BSMS - Physics UG Lab: Mechanics & Optics
- 2020 **Tutor**, BSMS - Physics UG Lab: Mechanics & Optics
- 2019 **Tutor**, BSMS - Advanced Physics Lab: Optics
- 2019 **Tutor**, BSMS - Physics UG Lab: Mechanics & Optics
- 2018 **Tutor**, M. Sc., (II Year) - Materials Science
- 2017 **Tutor**, M. Sc., (II Year) - Materials Science

Invited Talks

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| APR, 2024 | <i>Hands-on workshop: L^AT_EX,
Chennai Institute of
Technology, Chennai</i> |
| Beyond the basics: Version control and more | |
| JUL, 2022 | <i>Photonics Summer School,
University of Tartu, Estonia</i> |
| Organic lasers: concepts, challenges and the story so far | |
| JUN, 2021 | <i>Sri Krishna College of
Technology, Coimbatore</i> |
| Roadmap for Research Writing | |
| JUL, 2020 | <i>Jamal Mohamed College
(Autonomous), Tiruchirappalli</i> |
| Skill Development using Learning Assistance Tools | |
| JUN, 2020 | <i>Jamal Mohamed College
(Autonomous), Tiruchirappalli</i> |
| Summer School for Online Training on L ^A T _E X | |
| JUN, 2020 | <i>Hindustan College of
Engineering & Technology,
Coimbatore</i> |
| Unveiling Molecules: A Computational Materials Science Perspective | |
| MAY, 2020 | <i>Karpagam College of
Engineering, Coimbatore</i> |
| Methods and Tools for Qualitative Research Writing | |
| FEB, 2018 | <i>Dr. SNSR College of Arts &
Science, Coimbatore</i> |
| One Day Workshop on L ^A T _E X | |

Academic Activities

Reviewer

JOURNAL OF MATERIALS SCIENCE: MATERIALS IN ELECTRONICS

Springer Nature

Sep. 2023 - Present

Reviewer

PHYSICA SCRIPTA

IOP Publications

Oct. 2021 - Present

Reviewer

SPECTROCHIMICA ACTA PART A

Elsevier Publications

Nov. 2018 - Present

Organizing Team Member

CIPHR HACKATHON

University of Tartu

Nov. 2022

Joint Secretary & Joint Treasurer

UNIVERSITY PHYSICS FORUM

Bharathidasan University

Jun. 2018 - Apr. 2019

Personal Details

Gender : Male

Marital status : Married

Nationality : Indian

Reference

Prof. R. Ramesh Babu

Ph.D. Supervisor

rampap2k@yahoo.co.in

Associate Professor

School of Physics

Bharathidasan University

Tiruchirappalli, India

Prof. T. Kanagasekaran

PostDoc PI

kanagasekaran@iisertirupati.ac.in

Associate Professor

Department of Physics

Indian Institute of Science Education & Research

Tirupati, India

Prof. Hidekazu Shimotani

PostDoc PI

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Associate Professor

Department of Physics

Tohoku University

Sendai, Japan