

# P. A. Praveen

Assistant Research Scientist, Beijing Academy of Quantum Information Sciences, China.

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## Positions

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- **Assistant Research Scientist** *Jun. 2025 – Present*  
Beijing Academy of Quantum Information Sciences, Beijing, China.
  - Developing methods for efficient charge injection in organic and 2D systems
  - Chiral lasing from 2D materials
- **Postdoctoral Fellow** *May. 2023 – May. 2025*  
Tohoku University, Sendai, Japan.
  - Developing furan substituted thiophene co-oligomers for organic lasing
  - Using DFT analysis, crystal growth, optical pumping and electrical characterizations
- **Research Associate** *Jan. 2023 – May. 2023*  
Indian Institute of Science Education and Research, Tirupati, India.
  - Theoretical analysis of role of furan substitution in pyrene/thiophene systems
  - Efficacy of different DFT functionals on predicting optoelectronic properties
- **Postdoctoral Fellow** *Jun. 2022 – Jan. 2023*  
University of Tartu, Estonia.
  - Design and develop diffractive optical elements for computational imaging
  - Performed theoretical and experimental analysis on incoherent holographic systems
- **Postdoctoral Fellow** *Jun. 2019 – May. 2022*  
Indian Institute of Science Education and Research, Tirupati, India.
  - Design, synthesis and crystal growth of organic semiconductors
  - Fabrication of OLETs, low power X-ray sensors and broadband photodetectors

## Education

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- **Doctoral Degree** *Jan. 2013 – Jun. 2019*  
Bharathidasan University, Tiruchirappalli  
Quantum chemical and experimental analysis of metal organic nanostructures for NLO applications
- **Project Student** *Jun. 2011 – Jan. 2013*  
Bharathidasan University, Tiruchirappalli  
Improvising organic medium by metal dopants for nonlinear optical applications
- **Post Graduation** *Jul. 2009 – Apr. 2011*  
Bharathidasan University, Tiruchirappalli  
First Class (CGPA 7.5)
- **Under Graduation** *Jun. 2006 – Apr. 2009*  
Periyar University, Salem  
First Class (80%)

## Areas of Expertise

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- **Optoelectronic devices**
  - Crystal growth and thin film deposition of organic & hybrid perovskite semiconductors

- OFET and organic diodes fabrication and electrical characterization
- Optical pumping, photoluminescence and spectral characteristics of organic semiconductors
- **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
  - Excited state dynamics of organic optoelectronic systems

## Instruments and Packages

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- **Instruments**
  - *Crystal growth*: PVT, hydrothermal, low & high temperature solution growth
  - *Thin films*: Thermal evaporation, CVD, spin coating
  - *Structural*: PXRD, Raman, FTIR, SEM/TEM, AFM
  - *Electrical*: Parametric, Dielectric, Hall analyses
  - *Optical*: Optical gain, Indirect imaging, Z-Scan, SHG measurements
  - *Microfabrication*: Laser ablation, photolithography and thermal nano-imprinting
- **Softwares**
  - Gaussian, ORCA, MOPAC, Dalton, AutoDock
- **Programming**
  - Python, MATLAB, R, FORTRAN

## Publications

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### Journal Articles

- (24) P. Haldar, **P. A. Praveen**, K. Arulkannan, V. B. Sreegowri and T. Kanagasekaran, "An ultra narrow high quality factor single mode deep blue organic solid state laser", *Optics & Laser Technology*, 2025, **183**, 112379.
- (23) **P. A. Praveen** and T. Kanagasekaran, "Theoretical studies on photophysical properties of luminescent thienylboranes and their suitability towards organic lasing", *Materials Chemistry and Physics*, 2025, **332**, 130268.
- (22) **P. A. Praveen**, T. Kanagasekaran, C. Ma, M. Terada, T. Jin, Y. Wakabayashi and H. Shimotani, "Structural, Photophysical and Distributed Feedback Lasing Characteristics of Furan Substituted Thiophene/Phenylene Co-Oligomer Single Crystals", *ACS Applied Materials & Interfaces*, 2025, Accepted for publication.
- (21) V. B. Sreegowri, **P. A. Praveen**, S. Vigneshwaran, K. Arulkannan and T. Kanagasekaran, "Influence of substrate temperature and polymer dielectric on broadband photodetection characteristics of pentacene-based phototransistors", *Journal of Materials Science: Materials in Electronics*, 2025, **36**, 462.
- (20) **P. A. Praveen**, T. Kanagasekaran, C. Ma, M. Terada, T. Jin, Y. Wakabayashi and H. Shimotani, "Optoelectronic characteristics of furan substituted thiophene/phenylene co-oligomer single crystals for organic lasing", *Journal of Materials Chemistry C*, 2024, **12**, 15995–16003.
- (19) **P. A. Praveen**, D. Saravanapriya, S. V. Bhat, K. Arulkannan and T. Kanagasekaran, "Comprehensive analysis of DFT-3C methods with B3LYP and experimental data to model optoelectronic properties of tetracene", *Materials Science in Semiconductor Processing*, 2024, **173**, 108159.
- (18) A. Bhattacharya, **P. A. Praveen**, S. V. Bhat, S. Dhanapal, A. Kandhasamy and T. Kanagasekaran, "Theoretical insights on pyrene end-capped thiophenes/furans and their suitability towards optoelectronic applications", *Computational and Theoretical Chemistry*, 2023, **1225**, 114135.

- (17) A. Bhattacharya, **P. A. Praveen** and K. Thangavel, "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 and Technology*, 2023, **58**, 2200263.
- (16) A. Bleahu, S. Gopinath, T. Kahro, **P. A. Praveen**, A. S. J. F. Rajeswary, S. Prabhakar, R. Kumar, G. R. Salla, R. P. Singh, K. Kukli et al., "3D incoherent imaging using an ensemble of sparse self-rotating beams", *Optics Express*, 2023, **31**, 26120–26134.
- (15) A. Jayavel, S. Gopinath, **P. A. Praveen**, F. G. Arockiaraj, A. Bleahu, A. P. I. Xavier, D. Smith, M. Han, I. Slobozhan, S. H. Ng et al., "Improved classification of blurred images with deep-learning networks using Lucy-Richardson-Rosen algorithm", *Photonics*, 2023, **10**, 396.
- (14) S. Gopinath, **P. A. Praveen**, T. Kahro, A. Bleahu, F. G. Arockiaraj, D. Smith, S. H. Ng, S. Juodkazis, K. Kukli, A. Tamm et al., "Implementation of a large-area diffractive lens using multiple sub-aperture diffractive lenses and computational reconstruction", *Photonics*, 2022, **10**, 3.
- (13) M. Han, D. Smith, S. H. Ng, T. Katkus, A. S. John Francis Rajeswary, **P. A. Praveen**, K. R. Bamberg, M. J. Tobin, J. Vongsivut, S. Juodkazis et al., "Single shot lensless interferenceless phase imaging of biochemical samples using synchrotron near Infrared Beam", *Biosensors*, 2022, **12**, 1073.
- (12) **P. A. Praveen**, F. G. Arockiaraj, S. Gopinath, D. Smith, T. Kahro, S.-M. Valdma, A. Bleahu, S. H. Ng, A. N. K. Reddy, T. Katkus et al., "Deep deconvolution of object information modulated by a refractive lens using Lucy-Richardson-Rosen algorithm", *Photonics*, 2022, **9**, 625.
- (11) **P. A. Praveen**, A. Bleahu, F. Arockiaraj, S. Gopinath, D. Smith, S. Ng, A. Rajeswary, S. Juodkazis and V. Anand, "Digital refocusing of images recorded with white light using Lucy-Richardson-Rosen algorithm", *Asian Journal of Physics*, 2022, **31**, 1027–1034.
- (10) **P. A. Praveen**, P. Muthuraja, P. Gopinath and T. Kanagasekaran, "Impact of furan substitution on the optoelectronic properties of biphenyl/thiophene derivatives for light-emitting transistors", *The Journal of Physical Chemistry A*, 2022, **126**, 600–607.
- (9) D. Smith, S. Gopinath, F. G. Arockiaraj, A. N. K. Reddy, V. Balasubramani, R. Kumar, N. Dubey, S. H. Ng, T. Katkus, **P. A. Praveen** et al., "Nonlinear reconstruction of images from patterns generated by deterministic or random optical masks—concepts and review of research", *Journal of Imaging*, 2022, **8**, 174.
- (8) V. L. Vineela, **P. A. Praveen**, T. Kanagasekaran, N. Kumar and N. N. Murty, "Direct x-ray detection using thin-film pentacene Schottky diodes", *Journal of Instrumentation*, 2022, **17**, P02024.
- (7) **P. A. Praveen**, A. Bhattacharya and T. Kanagasekaran, "A DFT study on the electronic and photophysical properties of biphenyl/thiophene derivatives for organic light emitting transistors", *Materials Today Communications*, 2020, **25**, 101509.
- (6) **P. A. Praveen** and R. R. Babu, "Evaluation of nonlinear optical properties from molecular descriptors of benzimidazole metal complexes by principal component analysis", *Journal of Molecular Graphics and Modelling*, 2019, **93**, 107447.
- (5) **P. A. Praveen**, R. R. Babu, P. Balaji, A. Murugadas and M. Akbarsha, "Laser assisted anticancer activity of benzimidazole based metal organic nanoparticles", *Journal of Photochemistry and Photobiology B: Biology*, 2018, **180**, 218–224.
- (4) **P. A. Praveen**, R. R. Babu and 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*, 2017, **173**, 800–808.
- (3) **P. A. Praveen**, R. R. Babu and K. Ramamurthi, "Theoretical and experimental investigations on linear and nonlinear optical response of metal complexes doped PMMA films", *Materials Research Express*, 2017, **4**, 025024.
- (2) **P. A. Praveen**, R. R. Babu, K. Jothivenkatachalam and K. Ramamurthi, "Spectral, morphological, linear and nonlinear optical properties of nanostructured benzimidazole metal complex thin films", *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 2015, **150**, 280–289.

- (1) **P. A. Praveen**, S. Prabhakaran, R. R. Babu, K. Sethuraman and K. Ramamurthi, “Low power optical limiting studies on nanocrystalline benzimidazole thin films prepared by modified liquid phase growth technique”, *Bulletin of Materials Science*, 2015, **38**, 645–651.

## Conference Proceedings

- (12) K. Arulkannan, V. B. Sreegowri, S. Vigneshwaran, **P. A. Praveen**, B. Arka and K. Thangavel, AIP Conference Proceedings, 2025, vol. 3198, p. 020060.
- (11) H. Pratik, D. Saravanapriya, J. Jesmal, **P. A. Praveen** and K. Thangavel, AIP Conference Proceedings, 2025, vol. 3198, p. 020049.
- (10) D. Saravanapriya, H. Pratik, V. B. Sreegowri, K. Arulkannan, **P. A. Praveen** and K. Thangavel, AIP Conference Proceedings, 2025, vol. 3198, p. 020076.
- (9) A. Bleahu, S. Gopinath, R. Kumar, F. G. Arockiaraj, D. Smith, T. Kahro, **P. A. Praveen**, S. H. Ng, A. Pristy, T. Katkus et al., Practical Holography XXXVII: Displays, Materials, and Applications, 2023, vol. 12445, pp. 190–193.
- (8) A. Bleahu, S. Gopinath, A. P. I. Xavier, T. Kahro, A. N. K. Reddy, F. G. Arockiaraj, D. Smith, S. H. Ng, T. Katkus, **P. A. Praveen** et al., Holography: Advances and Modern Trends VIII, 2023, vol. 12574, pp. 153–157.
- (7) S. Gopinath, **P. A. Praveen**, F. G. Arockiaraj, D. Smith, T. Kahro, S.-M. Valdma, A. Bleahu, S. H. Ng, A. N. K. Reddy, T. Katkus et al., AI and Optical Data Sciences IV, 2023, vol. 12438, pp. 329–333.
- (6) S. Gopinath, A. P. I. Xavier, **P. A. Praveen**, T. Kahro, O. Tamm, A. Bleahu, F. G. Arockiaraj, D. Smith, S. H. Ng, S. Juodkazis et al., Holography: Advances and Modern Trends VIII, 2023, vol. 12574, pp. 162–165.
- (5) M. Han, D. Smith, S. H. Ng, T. A. Katkus, A. S. J. F. Rajeswary, **P. A. Praveen**, M. J. Tobin, J. Vongsivut, S. Juodkazis and V. Anand, Practical Holography XXXVII: Displays, Materials, and Applications, 2023, vol. 12445, pp. 200–204.
- (4) **P. A. Praveen** and R. R. Babu, AIP Conference Proceedings, 2017, vol. 1832.
- (3) **P. A. Praveen** and R. R. Babu, AIP Conference Proceedings, 2016, vol. 1731.
- (2) **P. A. Praveen**, R. R. Babu and K. Ramamurthi, AIP Conference Proceedings, 2015, vol. 1665.
- (1) **P. A. Praveen**, R. R. Babu, S. Prabhakaran and K. Ramamurthi, AIP Conference Proceedings, 2014, vol. 1591, p. 991.

## Book Chapters

- (1) **P. A. Praveen** and T. Kanagasekaran, in *Handbook of Semiconductors: Fundamentals to Emerging Applications*, CRC Press, 2024, p. 81.

## Funding

- Grant-in-Aid for JSPS Fellows (No. 23KF0101) – Multiyear funding of ¥2,000,000.
- Seal of Excellence for MSCA 2024 application.

## Awards

- 2024 – **IOP Outstanding Reviewer 2023**, for the journal *Physica Scripta*
- 2024 – **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** – 21<sup>st</sup> 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

## Co-Supervision of Graduate Students

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- **2021** – BSMS V<sup>th</sup> year Project – Fabrication of organic photodetectors for broadband detection
- **2019** – BSMS V<sup>th</sup> 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

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- 2022 – **Associate Lecturer** – Graduate Physics Course: Diffractive Optical Elements
- 2021 – **Tutor** – BSMS - UG Physics: Mechanics & Optics
- 2020 – **Tutor** – BSMS - UG Physics: Mechanics & Optics
- 2019 – **Tutor** – BSMS - Advanced Physics: Optics
- 2019 – **Tutor** – BSMS - UG Physics: 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 – **Hands-on workshop: L<sup>A</sup>T<sub>E</sub>X**, Chennai Institute of Technology, Chennai  
Beyond the basics: Version control and more
- Jul, 2022 – **Photonics Summer School, University of Tartu, Estonia**  
Organic lasers: concepts, challenges and the story so far
- Jun, 2021 – **Sri Krishna College of Technology, Coimbatore**  
Roadmap for Research Writing
- Jul, 2020 – **Jamal Mohamed College (Autonomous), Tiruchirappalli**  
Skill Development using Learning Assistance Tools
- Jun, 2020 – **Jamal Mohamed College (Autonomous), Tiruchirappalli**  
Summer School for Online Training on L<sup>A</sup>T<sub>E</sub>X
- Jun, 2020 – **Hindustan College of Engineering & Technology, Coimbatore**  
Unveiling Molecules: A Computational Materials Science Perspective
- May, 2020 – **Karpagam College of Engineering, Coimbatore**  
Methods and Tools for Qualitative Research Writing
- Feb, 2018 – **Dr. SNSR College of Arts & Science, Coimbatore**  
One Day Workshop on L<sup>A</sup>T<sub>E</sub>X

## Selected Academic Activities

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- **Reviewer:** Ceramics International, Journal of Physics: Materials, Materials Research Express, Nanotechnology, Physica Scripta, Journal of Materials Science: Materials in Electronics, Spectrochimica Acta Part A, Modelling

and Simulation in Materials Science and Engineering.

- **Organizing Team** – Nov. 2022 – CIPHR Hackathon, University of Tartu
- **Organizing Secretary** – Feb. 2018 and Feb. 2019 - PACE (2018 & 2019), Department of Physics, Bharathidasan University
- **Joint Secretary & Joint Treasurer** – Jun. 2018 - Apr. 2019 – Bharathidasan University Physics Forum
- **Organizing Committee** – Jun. 2018 - International Conference On Sustainable Energy Technologies, Bharathidasan University
- **Organizing Committee** – Feb. 2014 – Seminar on Recent Advances in Materials Science, Bharathidasan University
- **Secretary** – Jul. 2007 - Jun. 2008 – Physics Club, Department of Physics, K. K. College (Periyar University), Namakkal

## Personal Details

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- Gender: Male
- DOB: June 11, 1989
- Marital Status: Married, One son
- Nationality: India
- Permanent Address: 42/59 Kolandanur, Karur - 639004, TN, India

## References

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- **Prof. R. Ramesh Babu** - Ph.D. Supervisor  
**Email:** rampap2k@yahoo.co.in  
Professor and Head  
Department of Physics  
Bharathidasan University  
Tiruchirappalli, India
- **Prof. Thangavel Kanagasekaran** - Postdoc PI  
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