



Dr. Pramod K. [M.Sc., M.Phil., Ph.D., & Postdoc (IIT Madras)]

Assistant Professor

School of Pure & Applied Physics

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Biography

Dr. Pramod K. is an Assistant Professor at the School of Pure & Applied Physics, Mahatma Gandhi University. Prior to this, he served as a faculty member at the School of Nanoscience and Nanotechnology, MG University.

He earned his Ph.D. in Physics from Pondicherry University, where his research focused on the electronic transport properties of PVDF thin films and nanodots for advanced memory applications. Following his doctorate, he undertook an Institute Postdoctoral Fellowship in the Department of Electrical Engineering at IIT Madras, and later continued his work at the Industrial Consultancy and Sponsored Research (ICSR), IIT Madras. His postdoctoral research involved the development of polymer piezoelectric surface acoustic wave (SAW) sensors, organic ferroelectric phototransistors, and the nanoscale characterization of ferro-piezo polymer composites using

advanced scanning probe microscopy techniques (AFM, PFM, KPFM). He has also shared his expertise internationally as a Visiting Faculty member at Sarsen Amanzholov University, Kazakhstan.

Areas of Research Interest

- **Organic Electronics & Memory Devices:** Ferroelectric polymer-based resistive and ferroelectric memory, low-voltage ferroelectric switching, polymer ferroelectric phototransistor memory.
- **Sensors & MEMS:** Design and development of surface acoustic wave (SAW) sensors, MEMS devices.
- **Advanced Materials Characterization:** Nanoscale investigation of functional materials using Atomic Force Microscopy (AFM), Piezoelectric Force Microscopy (PFM), and Kelvin Probe Force Microscopy (KPFM).
- **Energy Harvesting & Storage:** Nanogenerators (piezoelectric/triboelectric/pyroelectric), Perovskite solar cells, and supercapacitors.

Professional Experience

- **Assistant Professor**, School of Pure & Applied Physics, Mahatma Gandhi University (Sep 2025 - Present)
- **Assistant Professor**, School of Nanoscience and Nanotechnology, Mahatma Gandhi University (Jul 2022 - Sep 2025)
- **Visiting Researcher**, IISER Thiruvananthapuram (Apr - Jun 2025)
- **Visiting Faculty**, Sarsen Amanzholov University, Kazakhstan (Apr 2024)
- **Postdoctoral Researcher**, Industrial Consultancy and Sponsored Research (ICSR), IIT Madras (Jun - Sep 2021)
- **Institute Postdoctoral Fellow**, Dept. of Electrical Engineering, IIT Madras (May 2018 - May 2021)

Recent Invited Lectures

- International Seminar, BCM College, Kottayam (February 2024)
- International Workshop on Advanced Materials for Emerging Applications (IWAMEA), School of Pure & Applied Physics, MG University, Kottayam (January 2024)
- Recent Advances in Chemical Sciences (RACS), School of Chemical Sciences, MG University, Kottayam (December 2023)
- International Hybrid Conference on Advances in Materials Science (ICAMS), MG University, Kottayam (July 2023)

Teaching Courses

- Quantum Mechanics
- Mathematical Physics
- Atomic and Molecular Physics
- Design and Fabrication of Nanodevices
- Advanced Characterization Techniques of Nanomaterials
- Introduction to Nanomaterials.
- Design and Fabrication of Nanodevices.
- Basics of Nanoscience.

Research Projects & Funding

- **Co-Principal Investigator:** "High performance hybrid piezoelectric/pyroelectric nanogenerator based on hybrid fillers" | **Funding:** Apollo Tyres Ltd. (₹30 Lakhs) | 2023 – Present
- **Principal Investigator:** "Enhancing Perovskite Solar Cell Performance Through the Introduction of Ferroelectric Polymer Layer" | **INUP-IIT Madras** | 2024

Awards & Recognitions

- **Coursera Master Mentor**, Digital Teaching and Learning Innovator (2025)
- **Quantum Computing Certification**, C-DAC Hyderabad & IIT Roorkee (2025)
- **Best Poster Award**, International Conference on Materials for Advanced Technologies, Singapore (2017)
- **SERB International Travel Support** (2017)
- **Rajiv Gandhi National Fellowship**, UGC, Govt. of India (2011-2016)

Key Responsibilities & Leadership

- **Conference Convener:** NanoFest-2024, NanoFest-2025 (International Conference on World Nano Day).
- **Mentor:** Talent Accelerator Programme, Kerala Knowledge Economy Mission (KKEM), Govt. of Kerala (2025).

Selected Publications

- V. Abhijith, B. Akhila, K. Pramod, Tapas Ranjan Mohanty, C. Sivakumar, S. Ramakrishnan, Sabu Thomas, and M.S. Sreekala. "Recent advances in metal oxide reinforced polymer composites for efficient piezoelectric energy harvesting applications." *Applied Energy*, 397 (2025), 126335.

- Ravisankar, M. S., K. Pramod, and R. B. Gangineni. "Effect of the top electrode on local piezoelectric and the ferroelectric response of PVDF thin films in PVDF/Au/Si and Ag/PVDF/Au/Si multilayers." *Applied Physics A*, 129 (2023), 146.
 - M.S.Ravi Sankar, K. Pramod, R. B. Gangineni, (2019)," Local ferroelectric studies on interconnected PVDF nano-dot thin films using piezo force microscopy," *Journal of Materials Science: Materials in Electronics*, 30 (2019), 20716-20724.
 - K. Pramod, R. B. Gangineni, "High-voltage transition studies from rectification to resistive switching in Ag/PVDF/Au capacitor-like structures," *Polymer Bulletin*, 75 (2018), 2769-2778.
 - K. Pramod, R. B. Gangineni," Rectifying electronic transport & the role of Fowler-Nordheim tunneling in Ag/PVDF/Au capacitor structures," *Current Applied Physics*, 17 (2017), 1469-1475.
 - K. Pramod, R. B. Gangineni, "Low voltage bipolar resistive switching in self-assembled PVDF nanodot network in capacitor-like structures on Au/Cr/Si with Hg as a top electrode," *Organic Electronics*, 42 (2017), 47-51.
 - K.Pramod, R.B. Gangineni, "Influence of solvent evaporation rate on crystallization of Poly(vinylidene fluoride) thin films," *Bulletin of Materials Science*, 38 (2015), 1093-1098.
 - K.Pramod, Binaya Kumar Sahu, R. B. Gangineni, "Resistance switching in Polyvinylidene fluoride (PVDF) thin films," *AIP Conference Proceedings*, 1665 (2015), 110051.
 - M.S. Ravi Sankar, K. Pramod, R. B. Gangineni, "Nano-patterning throughput of Poly(vinylidene fluoride) thin films & its dependence upon of solvent, annealing temperature & weight percentage," *Advanced Science, Engineering & Medicine*, 7 (2015), 171-175.
 - K. Pramod, R. B. Gangineni, "Structural phase study in un-patterned & patterned PVDF semi-crystalline films," *AIP Conference Proceedings*, 1591 (2014), 1039-1041.
 - K.Pramod, R. B. Gangineni," Optimization of ferroelectric polymer to realize a multiferroic tunnel junction," *Physics Procedia*, 54 (2014), 101 106.
 - K.Pramod, R. B. Gangineni, "Electronic transport in Au/SrTiO₃/Au tunnel junctions grown using pulsed laser deposition," *AIP Conference Proceedings*, 1447 (2012), 775-776
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