

Curriculum Vitae

Ganesh Narasimha

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Education:

2015 – 2022: Doctoral researcher at the Molecular Electronics lab, Chemistry and Physics of Materials Unit (CPMU), Jawaharlal Nehru Center for Advanced Scientific Research (JNCASR), Bengaluru, Karnataka, India- 560064.

2013 - 2015: Master of Sciences, Physics, Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, Andhra Pradesh, India – 515134

Research History:

2023 – Present: Post-doctoral Research Associate,

- Automated experimental discovery of structured-property relationship using Deep-Kernel Learning. This was utilized as a search methodology for property-guided structure discovery of atomic structures.
- Implemented Bayesian Optimization for real time convergence of scanning tunneling microscopy controls to automatically improve imaging quality.

2015-2022: Doctoral Researcher

- Implemented microscopy methods to image the potential landscape and photocurrent dynamics in hybrid-perovskite based lateral device structures.
- Developed hybrid-perovskite based lateral devices for high-speed light switching applications.
- Demonstrated the **first** single-pixel color sensing device utilizing 2D/3D perovskite in the active layer.
- Fabricated and demonstrated the **first** hybrid perovskite-based position-sensitive detectors for optical tracking applications.

Engagement Activities

- Served as a teaching assistant to the Condensed Matter Physics Laboratory course for junior research students over a period of two semesters.
- Collaborated with researchers from Swansea University, UK, towards diagnosing the origins of differential performance and degradation effects of hybrid perovskite-based solar modules using light beam induced current (LBIC) methods.
- Scientific outreach: Taught high-school level science and demonstrated scientific experiments to visiting summer students across Karnataka state, India.

Publications:

1. **Narasimha, Ganesh.**, Hus, S., Biswas, A., Vasudevan, R., & Ziatdinov, M. (2023). Autonomous convergence of STM control parameters using Bayesian Optimization. arXiv preprint arXiv:2310.17765.
2. Purohit, S., **Ganesh, N.**, & Narayan, K. S. (2023). Solution Processed Active Materials for Pixel Sensor Element and Integrated Circuits. *IEEE Journal on Flexible Electronics*.
3. Ghosh, Sudeshna, Debasmita Pariari, Tejmani Behera, Pablo P. Boix, **Narasimha Ganesh**, Susmita Basak, Arya Vidhan et al. Buried Interface Passivation of Perovskite Solar Cells by Atomic Layer Deposition of Al₂O₃. *ACS Energy Letters* 8, no. 4 (2023): 2058-2065.
4. Das, S., Girish, K. H., **Ganesh, N.**, & Narayan, K. S. (2023). Structured hybrid photodetectors using confined conducting polymer nanochannels. *Nanoscale Advances*, 5(22), 6155-6161.
5. **Ganesh N.**, Ashar A.Z., Purohit Sumukh, Narasimhan, K. L., & Narayan, K. S (2022). Visualization of carrier transport in lateral metal-perovskite-metal structures and its influence on device operation. *Physical Review Applied* 17.2 (2022): 024060.
6. Dias, S., & **Ganesh, N.** (2021). Perovskite-Based Photodetectors in the Lateral Device Geometry. *Journal of Electronic Materials*, 50(12), 7214-7221.
7. **Ganesh, N.**, Schutt, K., Nayak, P. K., Snaith, H. J., & Narayan, K. S. (2021). 2D Position-Sensitive Hybrid-Perovskite Detectors. *ACS Applied Materials & Interfaces*.
8. Dhamaniya, B. P., Kumar, A., **Ganesh, N.**, Chhillar, P., Ghorai, A., Ganesan, K. P., Puthanveetil, S. E., Narayan, K. S., & Pathak, S. K. (2021). Morphology and Crystallinity Amelioration of MAPbI₃ Perovskite in Virtue of PbI₂ Thermal Absorption Drifted

Performance Enhancement in Planer n-i-p Solar Cells. *Advanced Engineering Materials*, 23(3), 2000990.

9. **Ganesh, N.**, Ghorai, A., Krishnamurthy, S., Banerjee, S., Narasimhan, K. L., Ogale, S. B., & Narayan, K. S. (2020). Impact of trap filling on carrier diffusion in MAPbBr₃ single crystals. *Physical Review Materials*, 4(8), 084602.
10. **Ganesh, N.**, Shivanna, R., Friend, R. H., & Narayan, K. S. (2019). Wavelength-dependent charge carrier dynamics for single-pixel color sensing using graded perovskite structures. *Nano Letters*, 19(9), 6577-6584.
11. Kumar, P., **Ganesh, N.**, & Narayan, K. S. (2019). Electrospun fibers containing emissive hybrid perovskite quantum dots. *ACS applied materials & interfaces*, 11(27), 24468-24477.
12. Sett, S., Sengupta, S., **Ganesh, N.**, Narayan, K. S., & Raychaudhuri, A. K. (2018). Self-powered single semiconductor nanowire photodetector. *Nanotechnology*, 29(44), 445202.
13. Ashar, A. Z., **N. Ganesh**, and K. S. Narayan. "Hybrid Perovskite-Based Position-Sensitive Detectors." *Advanced Electronic Materials* 4.2 (2018): 1700362.
14. Conference Paper: **Ganesh N.**, Ashar A.Z., Purohit Sumukh, Narasimhan, K. L., & Narayan, K. S (2022). Transport Regimes in lateral metal-perovskite-metal device structures (May 2021), *13th Conference on Hybrid and Organic Photovoltaics*

Conferences and Workshops:

- 2023: *Materials Research Society (MRS) Fall meeting*, Boston, MA, USA. Oral Presentation titled "Autonomous convergence of STM control parameters using Bayesian optimization."
- 2023: Attended tutorials on "*Bayesian methods for the automated experiments*" organized by Prof. Sergei Kalinin, University of Knoxville, TN, USA.
- 2021: Hybrid and Organic Photovoltaics (HOPV). Oral presentation "Transport Regimes in lateral metal-perovskite-metal device structures", *13th Conference on Hybrid and Organic Photovoltaics*
- 2020: Presented the poster on "Excitation-position dependent Impedance Spectroscopy on lateral multi-electrode hybrid-perovskite devices" in the conference titled *Impedance spectroscopy and derived characterization for new generation optoelectronics*. Hosted by Prof. Juan Bisquert,

- 2019: Received Best Poster Price for my poster on “Spatially dependent photocurrent in hybrid perovskite device structures” in *International Conference on Perovskite and Hybrid Photovoltaics* (ICPHPV) held in Indian Institute of Technology (IIT) – Delhi, India
- 2018: *JNCASR – Cambridge Winter School* in “Frontiers in Material Science,” 2018, JNCASR, Bangalore, India – 560064
- 2017: Received Best Poster Prize in *13th JNCASR Materials Science Conference* held at Kovalam, Kerala, India.
- 2016: Attended the workshop on *Renewable Energy (Organic solar cells) and Curriculum Innovation in Science Education* (2016), SSSCU, Indian Institute of Science, Bangalore, India.