

Jinal Tapar

PHYSICAL ADDRESS

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SUMMARY¹

Ms. Jinal Tapar is a Ph.D. scholar working under Dr. Naresh Emani ([Google Scholar](#)) at the department of Electrical Engineering, IIT Hyderabad and have submitted her thesis. Her research interest spans Semiconductor Nanophotonics, Non-Hermitian systems, All-dielectric tunable metasurfaces. In her Ph.D. with Dr. Emani's group, she investigated the prospects of parity-time (PT) symmetric nanophotonic devices for light generation and manipulation bridging nanophotonics and quantum physics.

EDUCATION

PhD, Electrical Engineering Indian Institute of Technology, Hyderabad, India	07.2017 - present
MTech, Electronics and Communication Engineering Amravati University, Amravati, India	08.2013 - 08.2015
BTech, Instrumentation Government College of Engineering, Amravati, India	07.2006 - 04.2010

PROFESSIONAL CAREER

External Project Staff (INUP) Indian Institute of Technology, Bombay	11.2016 - 04.2017
Assistant Professor at ECE Dept. HVPM College of Engineering, Amravati	01.2016 - 07.2017

PROFESSIONAL RECOGNITION, AWARDS AND HONOURS

- 2020 **Best Poster Award** in Plasmonics and Photonics Symposium, IEEE ICEE 2020 conference.
- 2015 **University Color coat holder** for best research project at state level.

RESEARCH PROJECTS

Thesis related: Optical gain enhancement in semiconductor nanostructures, Effect of surface recombination on carrier lifetime, PT -symmetric metasurfaces for light generation and manipulation, Multipole analysis of gain-loss nanoantenna, BIC cavity lasers.

Collaborative: Light generation from MIM plasmonic tunnel junctions, spatio-temporal modulation of permittivity, and Mid-IR photodetection.

TEACHING ASSISTANT EXPERIENCE

Undergraduate courses: Semiconductor Fundamentals, Electronic Devices and Circuits, Physics of MOS Transistors, Engineering Electromagnetics, NPTEL course - [Introduction to Semiconductor Devices](#)

Postgraduate courses: Introduction to Nanophotonics, VLSI Technology, and Microfabrication and Device Simulation Laboratory

¹Last Updated: November 15, 2021

RESEARCH ASSISTANT EXPERIENCE (STUDENTS MENTORED)

1. **Karthik Pagadala** (UG graduate, Jan 2021 - July 2021)
Current Affiliation: Graduate Research Assistant, Purdue University.
Project: GaN-InGaN QW LED Metasurface – Understanding Coherence for Tailored Directional Response.
2. **Akshita Ramya Kamsali** (UG graduate, Aug 2019 - July 2020)
Current Affiliation: Graduate Research Assistant, Purdue University.
Project: Investigation of Carrier Dynamics in GaAs using Fluorescence Lifetime Microscopy.

PUBLICATION SUMMARY

4 refereed journal articles, 8 Conference Proceedings/talks

SERIAL JOURNAL ARTICLES

4. **Jinal Tapar**, S. Kishen, and Naresh Emani, "Dynamically tunable asymmetric transmission in PT-symmetric phase gradient metasurface", ACS Photonics Article ASAP IF: 7.529 [doi]
3. **Jinal Tapar**, S. Kishen, and Naresh Emani, "Spectral singularities and asymmetric light scattering in PT-symmetric 2D nanoantenna arrays." Optics Letters 45, no. 18 (2020): 5185-5188. IF: 3.776 [doi]
2. **Jinal Tapar**, S. Kishen, P. Kumar, Kaushik Nayak, and Naresh Emani, "Enhancement of the optical gain in GaAs nanocylinders for nanophotonic applications." Journal of Applied Physics 127, no. 15 (2020): 153102. IF: 2.546 [doi]
1. Kishen, Saurabh, **J. Tapar**, and Naresh Emani, "Enhanced light emission from gap plasmons in nano-strip MIM tunnel junctions." Journal of Optics 22, no. 9 (2020): 095006. IF: 2.753 [doi]

JOURNAL ARTICLES UNDER REVIEW/PREPARATION

3. **Jinal Tapar**, S. Kishen, and Naresh Emani, "Generalized Kerker effect in PT-symmetric nanoantenna array" (*Under review*)
2. Vinod Sharma, **J. Tapar**, S. Kishen, and Naresh Emani, "Tunable mid-infrared photodetection using graphene nanoribbons" (*Under review*)
1. Saurabh Kishen, **J. Tapar**, and Naresh Emani, "Tunable Directional Emission from Electrically-driven Nanostrip Tunnel Junctions" (*Under preparation*)

CONFERENCE PROCEEDINGS/TALKS

9. **Jinal Tapar**. Non-Hermitian nanophotonics: Tailoring light with gain and loss. SPIE IITB student chapter Online Invited Lecture Series - 2021. (*Invited Talk*)
8. **Jinal Tapar**, S. Kishen, Naresh Emani, "Dynamically Tunable Asymmetric Transmission in PT symmetric Metasurfaces" SPIE Active Photonic Platforms XIII, San Diego, USA, 1-5 August 2021 [link] (*Oral*)
7. **Jinal Tapar**, S. Kishen, Naresh Emani, "Spectral singularities and broadband unidirectional invisibility in 2D PT-symmetric metamaterial" META, University of Warsaw, Poland, 20-23 July 2021 [link] (*Poster*)
6. Kishen Saurabh., **J. Tapar**, Naresh Emani, "Enhanced light generation due to hybridization of lattice and gap plasmon modes in periodic MIM tunnel junction" META, University of Warsaw, Poland, 20-23 July 2021 (*Poster*)

5. **Jinal Tapar**, Naresh Emani, "Exceptional scattering in PT-symmetric GaInP nanoantenna metasurfaces." Photonics and Plasmonics symposia, IEEE ICEE, IIT Delhi (virtual), 26-28 November 2020 (Best poster award) [\[link\]](#)
4. **Jinal Tapar**, S. Kishen, and Naresh Emani, "Tunable Spectral Singularities with Asymmetric Directional Response in PT-symmetric 2D Nanoantenna Array." In Frontiers in Optics, pp. FM2E-3. Optical Society of America, 2020. (Oral) [\[doi\]](#)
3. Ramya Akshita, **J. Tapar**, and Naresh Emani, "Experimental Verification of Enhanced Photoluminescence in p-doped GaAs using Fluorescence Lifetime Measurements." In 2019 Workshop on Recent Advances in Photonics (WRAP), pp. 1-3. IEEE, 2019. [\[doi\]](#) (Poster)
2. Kishen, Saurabh, **J. Tapar**, and Naresh Emani. "Study of Gap Plasmons in 2D Finite Metal-Insulator-Metal Tunnel Junctions." In 2019 Workshop on Recent Advances in Photonics (WRAP), pp. 1-4. IEEE, 2019. [\[doi\]](#) (Poster)
1. **Jinal Tapar**, S. Kishen, K. Nayak, Naresh Emani, "Optimizing the Gain in Semiconductor Nanostructures for All-Dielectric Active Metamaterial Applications." ICMAT, Marina Bay Sands, Singapore, 23-28 June 2019 (Poster)

TECHNICAL SKILL SET

- **Computational Simulation:** Finite element modeling (FEM) - COMSOL, Finite difference time domain (FDTD) - Ansys Lumerical, and Density functional theory (DFT) atomistic simulation tool – Synopsys™ Quantum ATK.
- **Experimental:** Clean-room (Class 1000 and 100) experience with hands-on e-beam lithography - Crestec 9500C, SEM - Zeiss EVO, and RIE etching (Cl chemistry) - Oxford PlasmaPro. Fluorescence Lifetime Imaging Microscopy (FLIM) ISS Q2.
- Good coding proficiency with Python and MATLAB scripts
- Proficiency with graphics softwares like Adobe Illustrator, Pov-ray, Blender.

INTERPERSONAL SKILLS

- Teamwork and adaptability
- Organized, punctual and diligent
- Self-motivated and creative