

# Curriculum Vitae

## Ram Prakash Shanmugam

Position: Postdoctoral Fellow, LCF, Institut d'optique Graduate School, Palaiseau, France

Citizenship: Indian

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### Education

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2019 – 2024	Ph.D., Indian Institute of Technology Roorkee, India <i>Supervisor: Prof. Anirban Mitra</i>
2016 – 2018	M.Sc. Physics, Bharathiar University, India <i>Thesis Supervisor: Prof. K Senthil Kumar</i>
2013 – 2016	B.Sc. Physics, Kongunadu Arts and Science College, India <i>Graduated with Distinction - University 2nd Rank</i>

### Research Experience

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2024 –	Postdoctoral Fellow, <i>Institut d'Optique Graduate School, Paris-saclay University, France</i> <i>Advisor: Prof. Henri Benisty</i>
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### Research Interests

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Photonics, Inverse design of photonic devices, Tunable photonic devices, Computational Nanophotonics, Metamaterials, AI for photonics, and Thin film depositions.

### Teaching and Mentorship

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2021 – 2024	Thesis Mentor, Indian Institute of Technology Roorkee, India. <i>(Mentored 2 Undergraduate and 4 Master's Students)</i>
2021 – 2023	Teaching Assistant, Indian Institute of Technology Roorkee, India
2018	Advance Physics Tutor, India (freelancing)

### Organization and Reviewing Activities

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2023	Optics Letters (Article review)
2024	Volunteer in the organizing team of the Workshop on Optics and Photonics: Theory and Computational Techniques (OPTCT-2024), Indian Institute of Technology Roorkee.
2022	Volunteer in the organizing team of the COPaQ Conference 2022 held at the Indian Institute of Technology Roorkee
2019	Organized Travelling Lecturer Program of Prof. Arti Agrawal on 14 November 2019 at Department of Physics, IIT Roorkee and sponsored by OPTICA

### Membership in Professional Societies

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2023 – 2024	Student member Physics Association, IIT Roorkee
2019 –	Optica (Optical Society), Student Member
2014 – 2016	President - Student Association, Department of Physics, Kongunadu Arts and Science College

### Awards and Fellowships

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2024	StAC Fellowship, IIT Roorkee, India
2024	Travel Grant CSIR, India
2024	Travel Grant, Science & Engineering Research Board, India

2023	Dean of Resources and Alumni Affairs, IIT Roorkee, Travel Support
2023	JSAP-Optica Travel Award
2021 – 2024	Senior Research Fellowship, MoE
2019 – 2021	Junior Research Fellowship, MHRD
2019	GATE Physics, All India Rank 427
2016 – 2018	INSPIRE Higher education scholarship, Department of Science and Technology, India

## Technical Skills

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- C++, Fortran, Python, Matlab
- COMSOL, CST Microwave Studio, MEEP-FDTD, RCWA
- Gaussian-09, Quantum Espresso, ADFT
- Machine learning and Deep Learning
- Thin film deposition - PLD, PVD, etc
- Ellipsometry, XRD, FESEM
- HTML, CSS
- LaTeX, Git

## Publications

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### Full Length Articles

- [1] Dinesh Dudi, Kartikey Bhardwaj, **Ram Parkash S**, Tanuj Kumar, M.I. Hossain, Brahim Aissa, and Anirban Mitra, "Plasmon-Enhanced Hot Electron Collection in Au-Ag Alloy-Based Zero-Bias Silicon NIR Photodetectors Fabricated via Pulsed Laser Deposition," *J. Mater. Sci.: Mater. Electron* (2025) (Accepted)
- [2] Trideeb Bhattacharya, Marie-Anne Burcklen, Mathilde Larché, Mondher Besbes, **Ram Prakash S**, Stéphane Monfray, and Henri Benisty, "Optimization strategy of ultra-compact metasurface-based filter ordering on sensors for improved spectral retrieval," *Photonics Nanostructures: Fundam. Appl.* **66**, 101409 (2025)
- [3] **Ram Prakash S**, Aastha Jain, Rajesh Kumar, and Anirban Mitra, "AI-Enabled Inverse Design and Molecular Identification Using Phase Change Metamaterial Absorber," *Adv. Opt. Mater.* **13(9)**, 2402407 (2025)
- [4] Dinesh Dudi, **Ram Prakash S**, Kartikey Bhardwaj, Brahim Aïssa, and Anirban Mitra, "Ni/n-Si Schottky junction Self-biased infrared photodetection via hot carrier photoemission," *Optik* **318**, 172093 (2024)
- [5] **Ram Prakash S**, Rajesh Kumar, and Anirban Mitra, "Electrically reconfigurable phase change material-based metamaterial absorber for broadband molecular fingerprint retrieval," *ACS Photonics* **11(4)**, 1793–1803 (2024)
- [6] **Ram Prakash S**, Rajesh Kumar, and Anirban Mitra, "Inverse design of dynamically tunable phase-change material based metamaterial absorber induced structural color," *Photonics Nanostructures: Fundam. Appl.* **54**, 101135 (2023)
- [7] **Ram Prakash S**, Rajesh Kumar, and Anirban Mitra, "Reconfigurable and spectrally switchable perfect absorber based on a phase-change material," *Appl. Opt.* **61(10)**, 2888-2897 (2022)
- [8] Savita Chaoudhary, Avijit Dewasi, **Ram Prakash S**, Vipul Rastogi, Rui N Pereira, Alessandro Sinopoli, Brahim Aïssa and Anirban Mitra, "Laser ablation fabrication of a p-NiO/n-Si heterojunction for broadband and self-powered UV-Visible-NIR photodetection," *Nanotechnology* **33(25)**, 255202 (2022)

### Conference Proceedings/Papers

- [1] **Ram Prakash S**, Mondher Besbes and Henri Benisty, "Miniaturized Spectrometer with Angle Retrieval Ability using CMOS-Compatible Metasurface Filters," in *IEEE Photonics Conference (IPC)* (2025) (Accepted)
- [2] **Ram Prakash S**, Mondher Besbes and Henri Benisty, "Simultaneous Spectrum and Angle Retrieval using CMOS-Compatible Metasurface based Fabry-Perot Resonators," in *Advanced Photonics congress* (2025)

- [3] **Ram Prakash S**, Rajesh Kumar, and Anirban Mitra, "Free-form inverse design of dynamically tunable metamaterial absorber for Mid-Infrared applications," in *The 14th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META)*, 1505-1506, (2024)
- [4] **Ram Prakash S**, Rajesh Kumar, and Anirban Mitra, "Dynamically tunable structural color filter using a phase change material," in *JSAP-Optica Joint Symposia*, paper 20aA6023, (2023)

## Conferences

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### Contributed Talk

- Simultaneous Spectrum and Angle Retrieval using CMOS-Compatible Metasurface based Fabry-Perot Resonators, *Optica Advanced Photonics Congress*, Marseille, France, 14-17 July 2025
- Dynamically tunable structural color filter using a phase change material, *JSAP-Optica Joint Symposia*, Kumamoto, Japan, 19-23 September 2023

### Poster Presentation

- Tunable photodetector using a phase change material *Conference on Optics, Photonics & Quantum Optics (COPaQ)*, Indian Institute of Technology, Roorkee, 2022
- Free-form inverse design of dynamically tunable metamaterial absorber for Mid-Infrared applications *META-2024, the 14th International Conference on Metamaterials, Photonic Crystals, and Plasmonics*, Toyama, Japan, July 2024
- Electrically tunable color filter using a phase change material *Workshop on Optics and Photonics: Theory and Computational Techniques*, Indian Institute of Technology Roorkee, February 2024.

## References

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Available upon request from:

1. Prof. Henri Benisty, LCF, Institut d'optique Graduate School, [henri.benisty@institutoptique.fr](mailto:henri.benisty@institutoptique.fr)
2. Prof. Rajesh Kumar, IIT Roorkee, [rajesh.kumar@ph.iitr.ac.in](mailto:rajesh.kumar@ph.iitr.ac.in)
3. Prof. Anirban Mitra, IIT Roorkee, [anirban.mitra@ph.iitr.ac.in](mailto:anirban.mitra@ph.iitr.ac.in)