

## Romil Audhkhasi

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- Education**
- **Doctor of Philosophy in Electrical Engineering (Fall 2017 –)**  
University of Southern California  
GPA: 3.87/4
  - **Bachelor of Technology in Engineering Physics (Fall 2013 – Spring 2017)**  
Indian Institute of Technology, Delhi, India  
GPA: 9.38/10
- Research Interests**
- Nanophotonics, Plasmonics, Metamaterials, Thermal emission control, Secure communication
- Awards and Honors**
- Ming Hsieh Scholar, USC (Fall 2020 – Spring 2021)
  - Annenberg Fellow, USC (Fall 2017 – Spring 2021)
  - Ranked 1<sup>st</sup> out of 65 students in the 2013 B. Tech. Engineering Physics batch of IIT Delhi for four consecutive semesters from Fall 2014 to Spring 2017.
  - Summer Undergraduate Research Award, IIT Delhi (2015).
  - Awarded Dean's Merit Award for being among top 7% students of IIT Delhi for four consecutive semesters during 2014–2016.
  - Ranked 3139 out of 1,400,000 candidates from all over India in IIT Joint Entrance Examination (JEE) – Mains and 3460 in IIT JEE – Advanced during 2013.
- Journal Publications**
1. M. Sakib, **R. Audhkhasi** and M. L. Povinelli, "Using tunable inter-resonator coupling to reshape the mid-infrared absorption spectrum of graphene-based metamaterials," *Optics Continuum* **1**, 5 (2022)
  2. **R. Audhkhasi**, B. Zhao, S. Fan, Z. Yu and M. L. Povinelli, "Spectral emissivity modelling in multi-resonant systems using coupled-mode theory," *Optics Express* **30**, 6 (2022)
  3. **R. Audhkhasi** and M. L. Povinelli, "Generalized multi-channel scheme for secure image encryption," *Scientific Reports* **11**, 22669 (2021)
  4. **R. Audhkhasi** and M. L. Povinelli, "Vanadium-dioxide microstructures with designable temperature-dependent thermal emission," *Optics Letters* **46**, 7 (2021)
  5. **R. Audhkhasi** and M. L. Povinelli, "Gold-black phosphorus nanostructured absorbers for efficient light trapping in the mid-infrared," *Optics Express* **28**, 13 (2020)

6. **R. Audhkhasi** and M. L. Povinelli, "Spectral emissivity design using aluminum-based hybrid gratings," *Optics Express* **28**, 6 (2020)
7. **R. Audhkhasi** and M. L. Povinelli, "Design of far-field thermal rectifiers using gold – vanadium dioxide micro-gratings," *Journal of Applied Physics* **126**, 063106 (2019)
8. R. Verma, **R. Audhkhasi**, K. Thyagarajan and V. Banerjee, "Photonic crystals: role of architecture and disorder on spectral properties," *Journal of the Optical Society of America A* **35**, 3 (2018)

**Conferences  
proceedings**

1. **R. Audhkhasi** and M. L. Povinelli, "Enhanced thermal emission tunability using vanadium-dioxide microstructures (oral presentation)," SPIE Photonics West (2022)
2. **R. Audhkhasi** and M. L. Povinelli, "Designable, temperature-dependent thermal emission using vanadium-dioxide microstructures (oral presentation)," IEEE Photonics Conference (2021)
3. **R. Audhkhasi** and M. L. Povinelli, "Vanadium-dioxide microstructures with enhanced thermal emission tunability (oral presentation)," SPIE Optics+Photonics (2021)
4. M. L. Povinelli, A. M. Morsy and **R. Audhkhasi**, "Modulation of emissivity in coupled-resonator systems (oral presentation)," SPIE Optics+Photonics (2021)
5. **R. Audhkhasi** and M. L. Povinelli, "Microstructures with designable temperature-dependent thermal emission (oral presentation)," CLEO: Applications and Technology (2021)
6. **R. Audhkhasi** and M. L. Povinelli, "Enhanced light trapping in the mid-infrared using gold-black phosphorus nanostructured absorbers (oral presentation)," SPIE Photonics West (2021)
7. **R. Audhkhasi** and M. L. Povinelli, "Spectral emission tailoring using aluminum-based hybrid gratings (oral presentation)," SPIE Photonics West (2021)
8. **R. Audhkhasi** and M. L. Povinelli, "Efficient light trapping in the mid-infrared using gold-black phosphorus nanostructured absorbers (oral presentation)," *Metamaterials* (2020)
9. **R. Audhkhasi** and M. L. Povinelli, "Aluminum-based hybrid gratings for infrared spectral emissivity design (oral presentation)," *Metamaterials* (2020)
10. **R. Audhkhasi** and M. L. Povinelli, "Efficient Light Trapping in the Mid-infrared Using Gold-black Phosphorus Nanostructured Absorbers (oral presentation)," *FiO LS* (2020)
11. **R. Audhkhasi** and M. L. Povinelli, "Design of Aluminum-based Hybrid Gratings with Predefined Infrared Spectral Response (oral presentation)," *FiO LS* (2020)
12. **R. Audhkhasi** and M. L. Povinelli, "Achieving efficient light trapping in the infrared using gold-black phosphorus nanostructured absorbers (poster presentation)," SPIE Optics+Photonics (2020)
13. **R. Audhkhasi** and M. L. Povinelli, "Aluminum-based hybrid gratings for spectral synthesis in the infrared (poster presentation)," SPIE Optics+Photonics (2020)

14. **R. Audhkhasi** and M. L. Povinelli, "Achieving far-field thermal rectification using gold-vanadium dioxide micro-gratings (oral presentation)," SPIE Photonics West (2020)
15. **R. Audhkhasi** and M. L. Povinelli, "Enhanced far-field thermal rectification using gold-vanadium dioxide micro-gratings (poster presentation)," MHI Research Festival (2019)
16. **R. Audhkhasi** and M. L. Povinelli, "Design of tunable infrared absorbers based on vanadium dioxide (oral presentation)," SPIE Optics+Photonics (2019)

**Teaching Assistance**

- Serving as TA for EE539. Holding weekly discussion sessions and helping with exam and homework grading.
- Served as TA for an undergraduate course in Mathematical Physics during Fall 2016. Held discussion sessions and helped with exam grading.
- Held discussion sessions for PHYS 171 at USC (one session during Spring 2019 and four sessions during Spring 2020).

**Mentorship**

Mentored four undergraduate researchers as part of the USC Viterbi CURVE program. The undergrads worked on building a computer-based program for encrypting and decrypting binary images and tested it in real-world conditions.

**Computer Skills**

- **Languages and packages:** MATLAB, Octave, C/C++
- **Maxwell Equation Solver packages:** Lumerical FDTD Solutions, TMM
- **Optical Simulation Softwares:** WinLens 3D, OSLO
- **Operating systems:** Linux, Windows, Mac OS