Harsh Gupta

Via Morego 63 • Genova, GE-16163, Italy • +39-3383447878 • harsh.gupta@iit.it

Personal Information

Surname: Gupta
Name: Harsh
Nationality: Indian
Date of Birth: April.09.1996
Google Scholar: click here
LinkedIn: www.linkedin.com/in/harsh-gupta9496
E-mail: harsh.gupta@iit.it

Education

Italian Institute of Technology — **Genova, Italy**
Research Fellow — Nov-2024 – Present

Italian Institute of Technology- University of Genova — **Genova, Italy**
Ph.D. candidate in the research line of Nanophotonic Devices — Nov-2021- Nov-2024

C.C.S University — **India**
M.Sc. Physics specialization in Electronics with CGPA: **8.18/10** — July 2019

University of Delhi — **New Delhi, India**
B.Sc. (Honors) Physics with CGPA: **8.21/10** — July 2016

Research Interests

Nanophotonic Devices fabrication for controlled light-matter interaction with 2D materials. Cleanroom nanofabrication expertise with more than three years of hands-on Experience. Band gap engineering, Photonic simulations (HFSS-Ansys).

Research Experience

Italian Institute of Technology- IIT Italy and **University of Genoa** — **Genova, Italy**
Ph.D. Research Scholar — Nov-2021-Oct 2024

- Hands-on experience of more than three years in nanofabrication of nanophotonic devices in cleanroom facilities such as (Electron Beam Lithography (EBL), Photolithography, Dry or Wet etching (ICP-RIE), Deposition Techniques (ALD, CVD, PVD, etc.))
- Numerical FEM Simulations through HFSS-Ansys for nanophotonic devices
- Working experience on linear optical setup for Photonic crystal, Holography, and Metasurfaces
- Exfoliation and Characterization of 2D materials
- Hands-on experience with characterization tools, i.e., SEM-FIB, FTIR, AFM, n-SNOM
- Programming skills in Python and MATLAB for designing and fabricating the nanostructures

City University of New York (Advance Science Research Center) — **New York, U.S.A**
Visiting Research Scholar — April-2024 to July-2024

- Research and managing the projects headed by ***Prof. Andrea Alu***

Indian Institute of Technology, IIT-Mandi — **India**
Junior Research Fellow-Physics — Feb-2021 to Nov-2021

- Synthesis and Characterization of 2D materials and their applications for energy storage devices
- Teaching Assistance for master students for their coursework and projects

Guru Gobind Singh Indraprastha University — **New Delhi, India**
Junior Research Fellow — Sept. 2019- Feb. 2021

- Working on SERB-Government of India project titled “Development of Wearable Sensor Arrays for Chemical Warfare Agents (CWAs).”
- Research led to create a low-power-driven, lightweight wearable sensor array for real-time monitoring of CWAs and electrochemical sensing.

Awards/Certificates/Achievements

- 2024 Siegman International School on Lasers-McMurthy **Second Paper Prize** (Poster) Recipient, Honorable Mention at Stanford University, USA.
- Qualified CSIR-UGC National Eligibility Test with All India Rank 40
- Qualified Graduate Aptitude Test in Engineering (Gate)-Physics -2021
- Qualified Joint Entrance Screening Test (JEST)-2019
- **The Academic Excellence Award** (2020-2021) is given by CCS University for Excellency in the master's program in Physics.
- **University Rank-3** in M.Sc. Physics at C.C.S University-2019
- Meritorious Student in Secondary School Education and Got a Scholarship from Govt of NCT of Delhi

Workshops/ Conference Talks

Oral communications

- Gupta, H.; Tamagnone, M. "Investigating the Bound States in the Continuum Phenomenon in hBN Nano-antenna Arrays." The 13th International Conference on Metamaterials, Photonic Crystals, and Plasmonics, Paris (France), July, 18-21, 2023.
- Gupta, H.; Tamagnone, M. "Unraveling the phononic mysteries: BIC revealed in hBN resonators through phonon polaritons. "The 9th International School and Conference on Photonics, Belgrade (Serbia), August-September 28-01, 2023.
- Seminar given Modulating light-matter interactions by Quantum engineering 2D materials for Nanophotonic Devices, Nanoseminar at IIT, February 24, 2023.
- Oral Presentation titled "Bound State in the Continuum in Resonant hBN Metasurfaces" at a days international workshop on Plasmonics at Plasmonica 2022 in Torino from July 07.2022 to July 08.2022.

Poster Communications

- Dual Reststrahlen Band Analysis Reveals Bound States in the Continuum in Hexagonal Boron Nitride (Second best poster) in Optica Siegman School-2024 at Stanford University.
- Modulating light-matter interactions by Quantum engineering 2D materials for Nanophotonic Devices, Nanoseminar at IIT, February 24, 2023
- Poster Presentation titled "Bound State in the Continuum in Resonant hBN Antenna Arrays" at 12th International Conference on Metamaterials, Photonic Crystals, and Plasmonics, META 2022 in Torremolinos, Spain on **July 19 – 22, 2022**.

Scientific Publications

Papers and reviews:

- Bound States in the Continuum and Long-Range Coupling of Polaritons in Hexagonal Boron Nitride Nanoresonators doi.org/10.1021/acsphotonics.4c00358
- Pre-treated biomass waste melon peels for high energy density semi-solid-state supercapacitors doi.org/10.1016/j.jpowsour.2024.235511
- Symmetry Protected Topological Polaritonic Bound States in the Continuum (In Progress)
- Ultra confined Dielectric resonances in hexagonal Boron Nitride (In Progress)

Skills

Language

- Hindi (Native)
- English (Full professional proficiency)

Simulations Handling and Programming

- HFSS-Ansys
- Python
- MATLAB
- Origin and FORTRAN-77

References

- **Dr. Michele Tamagnone**
  Italian Institute of Technology
  Michele.tamagnone@iit.it
  +39 010 2896 586
  Via Morego 30, 16163 – Genova (GE), Italy

- **Dr. Giorgio Divitini**
  Italian Institute of Technology
  giorgio.divitini@iit.it
  Via Morego 30, 16163 – Genova (GE), Italy

- **Prof. Tapan Sarkar**
  Guru Gobind Singh Indraprastha University
  tapan@ipu.ac.in
  011-25302476
  Room No: BFR-001, GGSIPU, Sector 16C, Dwarka, Delhi-110078 (India)