

Prince Gupta

Contact Information	Department of Physics Central University of Kashmir Ganderbal-191131, Jammu and Kashmir	Email:gprince@cukashmir.ac.in Phone:+919906123291
Personal Details	Date of Birth: 01/03/1989 Citizenship: Indian	Place of Birth: India Gender: Male
Objective	I aim to pursue an interdisciplinary research specific in plasmonic metasurfaces consisting of both electronics and photonics research, focused on utilizing cutting edge technologies to make more advance and precise interaction of light with matter at nano-metric dimension and their spectroscopic/thermal applications, which will lead to the next generation of sensitive and specific state-of-art nanophotonic devices.	
Research Interests	Experimental fabrication/characterization and numerical simulation modelling of plasmonic metsurfaces for thermoplasmonics, molecular/bio-plasmonics, bio/chemical sensing, and thermal emission/detection application.	
Education	Indian Institute of Technology Kanpur , Kanpur-208016, India Ph.D., Physics , (Specialization in Nanoplasmonics) June 2018 • Thesis Topic: <i>Strong Interactions of Surface Plasmon Resonances with Molecular Resonances on Corrugated Gold Gratings</i> • Advisor: Professor S. Anantha Ramakrishna • Collaborator: Professor Harshawardhan Wanare Indian Institute of Technology Roorkee , Roorkee-247667, India M.Sc., Physics (Specialization in Laser Physics), June 2010 • Master's Thesis: <i>Integrated Optic Waveguide Polarizer Filters Based on Leaky structure</i> • Master's Review Project: <i>Integrated Optic Waveguide Amplifiers and Lasers</i> • Advisor: Professor Vipul Rastogi (University of Allahabad), Allahabad-247667, India B.Sc., Physics , Chemistry and Mathematics , June 2008 • B.Sc. Review Project: <i>Ultrasonic Transducer and its Applications</i>	
Scholastic Achievements	• CNRS post-doc fellowship, France. • Aforsk Visiting research scientist fellowship, Sweden. • CheckNANO Interreg Deutschland-Danmark project: post-doc fellowship, Denmark. • Brain Korea (BK 21 PLUS) post-doc fellowship, South Korea. • Qualified IIT JAM, Joint Admission to M.Sc. • Qualified IIT GATE, Graduate Aptitude Test in Engineering. • Qualified CSIR-UGC JRF (NET), National Lectureship Eligibility Test.	
Academic Experience	Central University of Kashmir , Department of Physics, Tulmulla-191131, Jammu and Kashmir Assistant Professor (Permanent), July 2024 to Present	

- Nature of work: *Teaching undergraduate and postgraduate Physics students and supervising their dissertations*

CNRS-UMR 6303, 9 Av. Alain Savary, Dijon-Burgundy, France

Postdoc Researcher, Carnot de Bourgogne Interdisciplinary Laboratory,
March 2023 to July 2024

- Project Topic: *Design of Plasmonic Arithmetic and Logic Units using Hybrid Artificial Intelligence (DALHAI)*

KTH Royal Institute of Technology, SE-11419, Albanova-Stockholm, Sweden

Postdoc Research Scientist, Department of Applied Physics,
January 2022 to January 2023

- Project Topic: *Metamaterial Thermal Emitters for Gas Sensing Application*

University of Southern Denmark, Sonderborg-6400, Denmark

Post-doctoral Research Associate, NanoSYD, Mads Clausen Institute,
November 2019 to October 2021

- Project Topic: *CheckNano Project - Nanophotonic Bio-Sensor for Fast Detection of Nano-Particle Intoxicant in Food Matrix*

Yonsei University, Seoul-120749, Republic of Korea

Post-doctoral Research Fellow, School of Mechanical Engineering,
December 2017 to October 2019

- Project Topic: *Plasmonics Perfect Absorber for Thermophotovoltaics*

Indian Institute of Technology Kanpur, Kanpur-208016, India

Project Associate, Metamaterials and Plasmonics Laboratory,
October 2010 to December 2010

- Project Topic: *Compound Plasmonic Nanostructure*

Hands-on experimental Skills

Nano/Micro-fabrications: Clean Room ISO 5(Class 100)

- Electron Beam Lithography, Laser Interference Lithography, UV Lithography, Spin-Coating, PDMS/Aerogel Imprint Lithography, Aanodic Alumina Nanowire/Pores Fabrication, Electron Beam Deposition, Thermal Vapor Deposition, Lift-off of metal coating, Sputtering Deposition, Capillary Force Assisted (CAPA), Nanoparticle Assembly (CAPA), Rapid-Template Assisted, Nanoparticle Assembly (rTASA).

Morphological Characterizations

- AFM, FE-SEM, SNOM, DF/BF imaging, Thermal imaging, Fluorescence imaging, Confocal imaging, Nonlinear PL imaging.

Optical/Thermal Characterizations

- 3D Depolarized DLS, SPR, FTIR, SERS, Fluorescence, Integrated/Time resolved PL, UV-VIS-NIR, Photo-Current measurement, AF4 Microfluidic, IQE and EQE, Non-linear PL, Thermocouple temperature measurement.

Software Skills

- **Computer Programming:** Matlab, Mathematica, Python
- **Numerical Software:** COMSOL MultiPhysics®, Lumerical FDTD
- **Plotting/Imaging Software:** ImageJ, OriginLab

Refereed Journal Publications

1. Vivek Kumar Gupta, **Prince Gupta**, Satyendra Prakash Pal, Dheeraj Pratap, Govind Dayal: "Angle-independent and polarization-insensitive coloured daytime radiative cooler design based on ultra-broadband metasurface thermal emitter. *Advanced Theory and Simulations*, **9**, e70505, 2026 .
2. A. Bhat, **Prince Gupta**, Pankaj Sahoo, Mandeep Singh: "Angle-Tolerant Guided-Mode-Resonance Biosensor for Detection of 3-Nitro-L-Tyrosine Biomarker in Human Breath. *4th International Conference on Innovation in Engineering and Management ICIEM 26*, March 2026.
3. Harsh Sharma, Ritika Jaryal, Archana Dhyani, Shubham Sharma, Aaysha Pandey, **Prince Gupta**: "SPASER *Book Chapter 12: Applications in Chemical Sensing and Radiation Detection Elsevier Publication*, 315-338, 2026.
4. Vivek Kumar Gupta, Narendra Kumar Yadav, **Prince Gupta**, Satyendra Prakash Pal, Vivek Singh, Govind Dayal: "Anisotropy-induced Fano resonance and strong coupling in a two-dimensional black phosphorus-based infrared metasurface. *Journal of the Optical Society of America B* **43**, 581-587, 2026.
5. Yuanrong Zhang, **Prince Gupta**, Deming Liu, Shuang Zheng, Max Yan, Minming Zhang: "Power-efficient Metasurface Thermal Emitter for Mid-IR Gas Sensing Application. *CLEO: Science and Innovations JTh2A*. **50**, Optica Publishing Group, May 2024.
6. Myoung-Kyu Oh, Hyeonju Kim, **Prince Gupta** and Kyoungsik Kim: "High sensitive SERS film of Ag-coated aggregated nanowire structure and benzene gas detection. *Japanese Journal of Applied Physics* **63**, 015003, 2024.
7. Myoung-Kyu Oh, Hyeonju Kim, **Prince Gupta** and Kyoungsik Kim: "Ultrahigh sensitive SERS film of silver nanorods grown on nanohole array template by oblique angle deposition. *Optical Materials* **147**, 114714, 2024.
8. Myoung-Kyu Oh, Hyeonju Kim, **Prince Gupta** and Kyoungsik Kim: "Ultrahighly Sensitive Surface-Enhanced Raman Spectroscopy Film of Silver Nanoparticles Dispersed in Three Dimensions on a Thin Alumina Nanowire Framework. *Nanomaterials* **13**, 3169, 2023.
9. Ayoub Laghrissi, **Prince Gupta**, Horst-Gnter Rubahn, and Jacek Fiutowski, Rapid Template-Assisted Self-Assembly: A Practical Route to the Fast Assembly of Colloidal Particles. *Journal of Nanoparticle Research*, **25**, 103, 2023.
10. W. Greenbank, **Prince Gupta**, J. Fiutowski, and T. Ebel, "Layer-by-layer Printed Dielectrics: Scalable Nanocomposite Capacitor Fabrication for the Green Transition". *International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, PCIM Europe*, **368-374**, 2022.
11. **Prince Gupta**, Misun Kang, Ho Seong Jang, and Kyoungsik Kim, Enhancing the Up-conversion Luminescence Using All Dielectric Three-Dimensional Multiscale Anodized Aluminum Oxide Nanowire Structure. *Applied Surface Science*, **571**, 151278, 2022.
12. **Prince Gupta**, Yeonhong Kim, Jonghyeok Im, Gumin Kang, Augustine M Urbas, and Kyoungsik Kim, Enhancing the Efficiency of GaSb Photovoltaic Cell Using Thin-Film Multiscale Haze and Radiative Cooling. *ACS Applied Energy Materials*, **4**(9), 9304-9314, 2021.
13. **Prince Gupta**, Yeonhong Kim, and Kyoungsik Kim, Controlling the Multiscale Topography of Anodized Aluminum Oxide Nanowire Structures for Surface-Enhanced Raman Scattering and Perfect Absorbers. *ACS Applied Materials and Interfaces*, **12**(52), 58390-58402, 2020.

14. Qiang Li, Jun Lu, **Prince Gupta**, and Min Qiu, Engineering Optical Absorption in Graphene and Other 2D Materials: Advances and Applications. *Advanced Optical Materials (Wiley)*, **7**(20), 1900595, 2019.
15. Yeonhong Kim, Seunghwa Baek, **Prince Gupta**, Changwook Kim, Kiseok Chang, Sung-Pil Ryu, Hansaem Kang, Wook Sung Kim, Jaemin Myoung, Wounjhang Park, and Kyoungsik Kim, Air-like Plasmonics with Ultralow Refractive-indexed Silica Aerogels. *Scientific Reports (Nature)*, **9**(2265), 1-9, 2019.
16. **Prince Gupta** "Surface Plasmon Assisted Modification of $\chi^{(3)}$ Non-linearity in a Three-level Active Medium Near Gold Grating." *Plasmonics (Springer)*, **14**, 425-433, 2019.
17. Dongheok Shin, Gumin Kang, **Prince Gupta**, Sawaswati Behera, Hyungsuk Lee, Augustine M. Urbas, Wounjhang Park, Kyoungsik Kim "Thermoplasmonic and Photothermal Metamaterials for Solar Energy Applications." *Advance Optical Materials (Wiley)*, **6**(18), 1800317, 2018.
18. **Prince Gupta** "Controlling Level Splitting by Strong Coupling of Surface Plasmon Resonances with R6G on Gold Grating." *Plasmonics (Springer)*, **13**, 2067-2077, 2018.
19. **Prince Gupta**, S. Anantha Ramakrishna, and Harshawardhan Wanare "Strong Coupling of Surface Plasmon Resonances to Molecules on a Gold Grating." *J. of Optics (IOP Science)*, **18**, 105001, 2016.
20. P. Mandal, **Prince Gupta**, A. Nandi, and S. Anantha Ramakrishna "Surface Enhanced Fluorescence and Imaging with Plasmon Near-Field in Gold Corrugated Gratings." *J. of Nanophotonics*, **6**(1), 063527, 2012.
21. **Prince Gupta**, Raghawendra Kumar, and S. Anantha Ramakrishna "Surface Plasmon Assisted Nonlinearity of Corrugated Gold Grating Structure." *International Conference on Fibre Optics and Photonics. Optical Society of America*, **P1A**, 9, 2016.
22. **Prince Gupta**, P. Mandal, and S. Anantha Ramakrishna "Loss Compensation for Surface Plasmon Resonance on Corrugated Gold Gratings Using an Amplifying." *International Conference on Fibre Optics and Photonics. Optical Society of America*, **M3B**, 2, 2012.
23. A. Laghrissi, **Prince Gupta**, J. Fiutowski, H. G. Rubahn, "Rapid Template-Assisted Self-Assembly: A Practical Route to the Fast Assembly of Colloids". Nanotechnology and Innovation in the Baltic Sea Region 2021.
24. J. Fiutowski, **Prince Gupta**, A. Laghrissi, J. Adam, J. Beermann, T. Yezekyan, H. Rehmann, A. Labes, H. G. Rubahn, "CheckNano: nanoparticle detection and sizing". Nanotechnology and Innovation in the Baltic Sea Region 2021.
25. Vipul Rastogi, **Prince Gupta**, N.Ashok, and Ajeet Kumar "Waveguide Polarizer Based On Dual Core Leaky Structure." *International Conference on Fibre Optics and Photonics. Optical Society of America*, **WTO**, 2, 2010.

**Book Edited/
Authored**

- Applied Nanoplasmonics Applications in Chemical Sensing and Radiation Detection, Volume 1, Edited by: B.S. Tewari and Prince Gupta P. Mandal., Elsevier Publication, May 2026.

Conferences Presentations	Poster Presentations	
	• Sensor Applications Based on Nano-and Micro -Technologies, University of Southern Denmark, 2021 • Nanotechnology and Innovation in the Baltic Sea Region, University of Southern Denmark, 2021 • Photonic Crystal Symposium, IIT Kanpur, 2017 • Optics and Photonics: Theory and Computational Techniques, IIT Delhi, 2017 • International Conference on Fibre Optics and Photonics, IIT Kanpur, 2016 • Discussion Meeting on Emerging Themes in Nanophotonics, Goa-India 2015 • 8th India-Singapore Symposium in Condense Matter Physics, IIT Kanpur 2015 • Focused Discussion Meeting on Metamaterials and Photonics Nanostructures , IIT Kanpur 2013	
School /Workshop	School	
	• Fifth SERC School on New Developments in Microfabrication with Focus on Synchrotron Radiation-based Deep X-ray Lithography held at Raja Raman Center for Advanced Technology (RRCAT), Indore-India 2012	
	Workshop	
	• One day IEEE MTT-S Workshop on THz Imaging, Systems and Technology, IIT Kanpur 2016	
Supervision Experience	• 11+ PG/UG projects supervision (Central University of Kashmir) • Photon tunneling through negative refractive index metmaterial SRR barrier for RF (Yonsei University) • Fabricating various meta-surfaces and measuring optical properties of metal coated self- aggregated funnel structure (Yonsei University) • Fabrication of various nanostructures using EBL and PDMS imprinting for nanoparticles trapping (University of Southern Denmark) • Simulation and experimental study of asymmetric flow field flow fractionation microfluidic to separate the nanoparticles in a mixed solution (University of Southern Denmark)	
Relevant Courses Taught	(1) Electromagnetic Theory, (2) Introduction to Laser physics, (3) Electromagnetic Theory of Metamaterials and Plasmonics, (4) Atomic and Molecular Physics, (5) Energy Sources, (6) Basic Quantum Mechanics, (7) Optics. (8) Fiber Optics, (9)Waves and Oscillations, (10) Nuclear Radiation Detectors, (11) Numerical Analysis	
Laboratory and Tutorials Experiences	Teaching Assistant	Two Semester
	• PHY 102 - Introduction to Classical Mechanics • PHY 210 - Thermal Physics	
	Laboratory Instructor	Seven Semester
	• PHY 101 - Physics 1 Laboratory • PHY 224 - Optical Physics And Optics Laboratory • PHY Labs - Physics Courses Laboratories for BSc. and MSc. at Central University of Kashmir	
	Instrument Operator	One Semester
	• Atomic force Microscope	

Positions of Responsibilities	• The March 1st Independence Movement ONE KOREA AMBASSADOR, Global Peace Youth (GPY), South Korea	2019
	• Global Partner as well as Public relations Ambassador, Governor, Gyeongsangbuk-do Province, South Korea	2019
	• Computer room administrator, Hall of Residence-IV, IIT Kanpur	2011
	• Certificate of appreciation for the contribution,as volunteer, in National Service Scheme (NSS), University of Allahabad	2006-2008
	• Certificate of appreciation for the contribution in “Cognizance 2010 as Sponsorship Coordinator, IIT Roorkee	2010

References	Kyoungsik Kim	
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	KTH Royal Institute of Technology	
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