

SHOURYA DUTTA GUPTA

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Materials Science and Metallurgical Engineering,
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RESEARCH INTERESTS

Plasmonics & Nanophotonics • Alloys for plasmonics • 2D Materials • Biosensing
Advanced Nanofabrication and synthesis • Integrated opto-electronic metasurface devices

PROFESSIONAL EXPERIENCE

- **Associate Professor** August 2023 – Till date
Materials Science and Metallurgical Engineering, I.I.T. Hyderabad.
- **Assistant Professor** August 2017 – August 2023
Materials Science and Metallurgical Engineering, I.I.T. Hyderabad.
- **Visiting Assistant Professor** May 2018 – July 2018
Applied and Engineering Physics, Cornell University.
- **Post-Doctoral Fellow** August 2016 – July 2017
Applied and Engineering Physics, Cornell University.
- **Post-Doctoral Fellow** May 2015 – July 2016
Department of Physics, University of Texas at Austin.

EDUCATION

- **Ph. D.** July 2010 – March 2015
Nanophotonics and Metrology Laboratory (NAM),
Swiss Federal Institute of Technology Lausanne (EPFL).
Thesis: **Plasmonic nanostructures for physical and biological applications**
- **Bachelor of Technology** June 2006 – May 2010
Materials and Metallurgical Engineering,
Indian Institute of Technology Kanpur.

AWARDS AND RECOGNITION

- INAE Young Associate (2023)
- Referee citation from JALCOM 2024
- Supervised Hadi Afnan (B.Tech. student) who received the Sri KC Narayan Research Excellence Award for MSME Student presented by IIT Hyderabad the year 2024 for his B.Tech. project work.
- Foreign thesis examiner for a thesis from EPFL, Switzerland (2023).
- Supervised Govardhan Reddy S. (B.Tech. student) who received the best B.Tech. thesis award from INAE in 2021.
- Referee citation from JALCOM 2021

- Ramanujan Fellowship from DST-SERB (2018)
- Distinguished referee award by EPJAP (2017)
- Visiting Assistant Professor at Cornell University (May-July 2018)
- Judged poster session at the international conference CoOpt 2017 (December 2017).
- Best B.Tech. project award for 2009-2010 by Materials and Metallurgical Engineering Department, IIT Kanpur.
- Awarded twice by IIT Kanpur for publishing in journals in ISI database during B.Tech.
- Awarded summer internship at EPFL, Switzerland for two months (July-August, 2009).
- Awarded scholarship for PhD at EPFL, Switzerland from 2010 to 2015.
- Reviewer for international journals like Optics Express, Optics Letters, European Physical Journal Applied Physics (EPJAP), Optics and Lasers in Engineering and Journal of Nanophotonics.

SPONSORED FUNDING

- Technology Development Grant (TDG, IIT Hyderabad) - PI
Title: **Development of online optical platform with an integrated microfluidic chip for monitoring and control of nanostructure synthesis**
Duration: 2024-2026; Funding Amount: INR 35.97 Lakhs
- Sponsored Project from Momentive Pvt. Ltd. - PI
Title: **Surface and cross section analysis of human hair**
Duration: 2023-2024; Funding Amount: INR 8.52 Lakhs
- DST-SERB CRG project - Co-PI
Title: **Hybrid transition metal redox catalyst nanocomposite platform for plasmon enhanced electrochemical/photochemical reduction of CO₂**
Duration: 2024-2027; Funding Amount: INR 58 Lakhs
- DST AMT project - Co-PI
Title: **Development of Transmission Electron Microscopy Holder and Laser Integrated Electron Microscopy Platforms for In-situ Experiments**
Duration: 2024-2027; Funding Amount: INR 120 Lakhs
- DST-SATHI -CISCoM project - Co-PI
Title: **Center for correlative and in-situ microscopy**
Duration: 2024-2028; Funding Amount: INR 8000 Lakhs (INR 80 Cr.)
- SOCH project (IIT Hyderabad) - Co-PI
Title: **Development of an organoid model with plasmonic biosensors**
Duration: 2022-2024; Funding Amount: INR 99.44 Lakhs
- JICA Project Phase 2 (JICA) - PI
Title: **Multi-axial strain sensing using photonic crystal rubber**
Duration: April 2022- November 2022; Funding Amount: INR 7.94 Lakhs
- Nanomission (Funding Agency - DST) - PI
Title: **Simultaneous monitoring of multiple cytokines via SERS signals using critically coupled optical perfect absorber sensor substrates**
Duration: 2019-2022; Funding Amount: INR 47.44 Lakhs

- Early Career Research Award (Funding Agency - SERB) - PI
Title: **Spinodal decomposition in Cu-Ag alloy thin films: A route to tunable plasmonics**
Duration: 2019-2022; Funding Amount: INR 49.7 Lakhs
- Ramanujan Fellowship (Funding Agency - DST) - PI
Title: **On-demand real time ultra-sensitive cytokine profiling with integrated nano-plasmonic platform**
Duration: 2018-2023; Funding Amount: INR 38 Lakhs
- Seed grant (IIT Hyderabad) - PI
Title: **Assembly of gold nanoparticles using templated silica platforms**
Duration: 2017-2019; Funding Amount: INR 3 Lakhs

PUBLICATION RECORD (GOOGLE SCHOLAR)

- Publications: 38
- Patents: 10
- Conference Proceedings (Peer-reviewed): 6
- Invited, conference and workshop talks and posters: 45
- H-index : 17
- i-10 index : 19

PUBLICATIONS

38. Arka Jyoti Roy, Sai Rama Krishna Malladi, and **Shourya Dutta-Gupta***, *Thermally Driven Resonance Tuning in Nanobipyramid Plasmonic Substrates*, **Journal of Materials Chemistry C** (in press, 2025)
37. Rama P., Jayakumar P., **Shourya Dutta-Gupta*** and Suhanya D.*, *Real-Time Optical Spectroscopy for In-Situ Single Droplet Analysis*, **Nanoscale** (Under review)
36. Govind Ummethala, Ravi Jada, **Shourya Dutta-Gupta**, Junbeom Park, Amir Tavabi, Shibabrata Basak, Robert Hooley, Hongyu Sun, Hugo Perez Garza, Rüdiger-A. Eichel, and Rafal Dunin-Borkowski and Sai Rama Krishna Malladi, *Real-time visualisation of fast nanoscale processes during liquid reagent mixing by liquid cell transmission electron microscopy*, **Communications Chemistry**, 8 (1), 8 (2025)
35. P. Jayakumar, and **Shourya Dutta-Gupta***, *Controlling and monitoring laser-mediated localized synthesis of silver nanoparticles within gold nanoapertures*, **Nano Futures**, 8 (4), 045001 (2024) (* - Corresponding author)
34. Govind U., Pravallika Bandaru, Subhradeep Chatterjee, **Shourya Dutta-Gupta*** and Sai Rama Krishna Malladi*, *Visualising spinodal decomposition in Ag-Cu alloy films using in situ transmission electron microscopy*, **Materials Characterization**, 216, 114297 (2024) (* - Corresponding author)
33. Talem Rebeda Roy, **Shourya Dutta-Gupta*** and Balaji VS Iyer*, *Deformation Induced Evolution of Plasmonic Response in Polymer Grafted Nanoparticle Thin Films*, **Nanoscale**, 16, 11705-11715 (2024) (* - Corresponding author) doi: 10.1039/D4NR00789A

32. Aswathy Vijay, Jagathpriya Lilly Mohandas, **Shourya Dutta-Gupta**, Renu John*, *Label-free detection and characterization of secondary microplastics from tea bags*, **Optical Engineering**, 63 (1), 013101 (2024)
31. Vivek C. Peddiraju, Pravallika Bandaru, **Shourya Dutta-Gupta** and Subhradeep Chatterjee*, *Substrate interaction mediated control of phase separation in FIB milled Ag-Cu thin films*, **APL Materials**, 12(1), 011101 (2024)
30. P. Priyesh, K. Sairam, Soumya Rajan Mishra, U. Govind, S. R. K. Malladi, **Shourya Dutta-Gupta**, M. S. Ramachandra Rao and B. S. Murty, *Effect of Zr content on the strain rate sensitivity of nanohardness of Ti-Zr-Cu-Ni-Al thin film metallic glass*, **Surface and Coatings Technology**, 130370 (2024).
29. Jagathpriya L. M., and **Shourya Dutta-Gupta***, *Effect of Mirror Characteristics on Critical Coupling in Plasmonic Nanostructures*, **Indian Journal of Pure and Applied Physics**, 61, 535-540 (2023). (* - Corresponding author)
28. Jagathpriya L. M., P. Jaya Kumar and **Shourya Dutta-Gupta***, *Tailoring cavity coupled plasmonic substrates for SERS application*, **Nanotechnology**, 34, 335501 (2023). (* - Corresponding author)
27. Mohit Kumar, Bhagatram Meena, Palyam Subramanyam, Govind Ummethala, Sai Rama Krishna Malladi, **Shourya Dutta-Gupta**, Challapalli Subrahmanyam, *CuInS₂ Nanosheet Arrays with a MoS₂ Heterojunction as a Photocathode for PEC Water Splitting*, **Energy Fuels**, 37, 3, 2340–2349 (2023).
doi: 10.1021/acs.energyfuels.2c03502
26. Eshita Mukherjee, P. Jaya Kumar, Dhruv Bhatnagar and **Shourya Dutta-Gupta***, *In-situ optical spectroscopy for monitoring the assembly of gold nanoparticles for plasmonic applications*, **Journal of Applied Physics**, 133, 073101 (2023). (* - Corresponding author)
doi: 10.1063/5.0132791
25. Pravallika B., S. Bhattacharya and **Shourya Dutta-Gupta***, *Insights into propagating surface plasmons in Ag-Cu alloy thin films: Enhancement of spin angular momentum of light*, **Journal of Applied Physics**, 132, 183101 (2022). (* - Corresponding author)
doi: 10.1063/5.0119124
24. Jaya kumar P. and **Shourya Dutta-Gupta***, *Controlled assembly of gold nanoparticles in resonant gold nanoapertures for SERS applications*, **Nanotechnology**, 33, 485301 (2022). (* - Corresponding author)
doi: 10.1088/1361-6528/ac8c49
23. Pravallika B., Govind U., S. R. K. Malladi, **Shourya Dutta-Gupta***, *Microstructure dictates the behavior of plasmons in Ag-Cu alloy thin films*, **Journal of Physical Chemistry C**, 126, 37, p. 15915–15923 (2022). (* - Corresponding author)
doi:10.1021/acs.jpcc.2c03099
22. Narender K. Dhanial, Vinod K. Chauhan, Dasari Abhilash, Vivek Thakur, R.K. Chaitanya, **Shourya Dutta-Gupta**, Aparna Dutta-Gupta, *Gut-specific arylphorin mediates midgut regenerative response against Cry-induced damage in Achaea janata*, **Comparative Biochemistry and Physiology Part B: Biochemistry and Molecular Biology**, 255, 110600 (2021).
doi: 10.1016/j.cbpb.2021.110600
21. Glen Kelp, Joy Li, Junlan Lu, Nicholas DiNapoli, Robert Delgado, Chao Liu, Donglei Fan, **Shourya Dutta-Gupta** and Gennady Shvets, *Infrared spectroscopy of live cells from a flowing solution using electrically-biased plasmonic metasurfaces*, **Lab on a Chip**, 20, 2136-2153

(2020)

doi: 10.1039/C9LC01054H

20. **Shourya Dutta-Gupta***, Polarization conversion in plasmonic traps, **Asian journal of physics**, 29 (1 & 2) p. 189-194 (2020). (*Invited article*) (* - Corresponding author)
19. Zhiyuan Fan, **Shourya Dutta-Gupta**, Ran Gladstone, Simeon Trendafilov, Melissa Bosch, Minwoo Jung, Ganjigunte R. Swathi Iyer, Alexander J. Giles, Maxim Shcherbakov, Boris Feigelson, Joshua D. Caldwell, Monica Allen, Jeffery Allen and Gennady Shvets, *Electrically defined topological interface states of graphene surface plasmons based on a gate-tunable quantum Bragg grating*, **Nanophotonics**, 8 (8), p. 1417-1431 (2019).
doi: 10.1515/nanoph-2019-0108
18. G. Kelp, N. Arju, A. Lee, E. Esquivel, R. Delgado, Y. Yu, **Shourya Dutta-Gupta**, K. Sokolov and G. Shvets, *Application of metasurface-enhanced infra-red spectroscopy to distinguish between normal and cancerous cell types*, **Analyst**, 144, p. 1115-1127 (2019).
doi: 10.1039/C8AN01433G
17. Minwoo Jung, **Shourya Dutta-Gupta**, et al., *Polarimetry Using Graphene-Integrated Anisotropic Metasurfaces*, **ACS Photonics**, 5 (11), p. 4283-4288 (2018).
doi: 10.1021/acsphotonics.8b01216
16. **Shourya Dutta-Gupta**, et. al., *Electrical Tuning of the Polarization State of Light Using Graphene-Integrated Anisotropic Metasurfaces*, **Phil. Trans. R. Soc. A.**, 375 (20160061) (2017).
doi: 10.1098/rsta.2016.0061
15. N. Dabidian*, **Shourya Dutta-Gupta***, I. Kholmanov, F. Lu, J. Lee, K. Lai, M. Jin, B. Fallahazad, E. Tutuc, M. A. Belkin and G. Shvets, *Experimental Demonstration of Phase Modulation and Motion Sensing Using Graphene-Integrated Metasurfaces*, **Nano Letter**, 16 (6), p. 3607-3615 (2016). (* - Equal contribution).
doi: 10.1021/acs.nanolett.6b00732
14. J. Butet, K. Y. Yang, **Shourya Dutta-Gupta** and O. J. F. Martin, *Maximizing Nonlinear Optical Conversion in Plasmonic Nanoparticles through Ideal Absorption of Light*, **ACS Photonics**, 3 (8), pp 1453-1460 (2016).
doi:10.1021/acsphotonics.6b00031
13. Mohsen Bahramipanah, **Shourya Dutta-Gupta**, Banafsheh Abasahl, and Olivier J. F. Martin, *Realization of Cavity-Coupled Plasmonic Device with Enhanced Sensitivity and Figure-of-Merit*, **ACS Nano**, 9 (7), pp 7621-7633 (2015).
doi:10.1021/acsnano.5b02977
12. **Shourya Dutta-Gupta** and Olivier J.F. Martin, *An insight into the eigenmodes of plasmonic nanoclusters based on Green's tensor method*, **JOSA B**, 32 (2), pp 194-200 (2015).
doi:10.1364/JOSAB.32.000194.
11. Jeremy Butet, **Shourya Dutta-Gupta** and Olivier J.F. Martin, *Surface second-harmonic generation from coupled spherical plasmonic nanoparticles: Eigenmode analysis and symmetry properties*, **Physical Review B**, 89, pp 245449 (2014).
doi:10.1103/PhysRevB.89.245449.
10. B. Abasahl, **Shourya Dutta-Gupta**, C. Santschi and O. J. F. Martin, *Coupling strength can control the polarization twist of a plasmonic antenna*, **Nano Letters**, 13 (9), pp 4575-4579 (2013).
doi:10.1021/nl4029363

9. A. Farhang, B. Abasahl, **Shourya Dutta-Gupta**, A. Lovera, P. Mandracci, E. Descrovi, O. J. F. Martin, "*Broadband wide-angle dispersion measurements: Instrumental setup, alignment, and pitfalls*", **Review of Scientific Instruments**, 84, p. 033107 (2013).
doi:10.1063/1.4795455
8. V. Auzelyte, V. Flauraud, Ch. Santschi, B. Gallinet, **Shourya Dutta-Gupta**, Olivier J.F. Marin and J. Brugger, *Direct nanoimprint of gold plasmonic nanostructures using gold-parylene bilayer*, **Advanced Optical Materials**, 1 (1), p. 50-54 (2013).
doi:10.1002/adom.201200017
7. **Shourya Dutta-Gupta**, R. Deshmukh, A. V. Gopal, Olivier J.F. Martin and S. Dutta Gupta, *Coherent perfect absorption of light using a grating: Anomalous reflection and refraction*, **Optics Letters**, 37 (21) p. 4452-4454 (2012).
doi: 10.1364/OL.37.004452
6. **Shourya Dutta-Gupta**, Olivier J.F. Martin, S. Dutta Gupta and G. S. Agarwal, *Controllable coherent perfect absorption in a composite film*, **Optics Express**, 20 (2) p. 1330-1336 (2012).
doi: 10.1364/OE.20.001330
5. **Shourya Dutta-Gupta** and Olivier J.F. Martin, *Strongly coupled bio-plasmonic system: application to oxygen sensing*, **Journal of Applied Physics**, 110, p. 044701 (2011).
doi:10.1063/1.3626786
4. Ashutosh Kumar Dubey, **Shourya Dutta-Gupta** and Bikramjit Basu, *Optimization of electrical stimulation parameters for enhanced cell proliferation on biomaterial surfaces*, **Journal of Biomedical Research B**, Vol. 98B, Issue 1, p. 18-29 (July, 2011).
doi: 10.1002/jbm.b.31827
3. **Shourya Dutta-Gupta**, Subimal Deb and S. Dutta Gupta, *Signature of strong atom-cavity interaction on critical coupling*, **Journal of Optics**, Vol. 12, No 7 (2010).
doi: 10.1088/2040-8978/12/7/075103
2. Ashutosh Kumar Dubey, **Shourya Dutta-Gupta**, Ravi Kumar, Abhishek Tewari and Bikramjit Basu, *Time constant determination for electrical equivalent of a biological cell*, **Journal of Applied Physics**, 105 (2009) 084705.
doi:10.1063/1.3086627
1. Subimal Deb, **Shourya Dutta Gupta**, J. Banerji and S. Dutta Gupta, *Critical coupling at oblique incidence*, **J. Opt. A: Pure Appl. Opt.**, 9 (2007) 1-5.
doi: 10.1088/1464-4258/9/7/001

PATENTS

10. **A Method Of Preparing Substrate With Tunable Optical Resonance**, Arka Jyoti Roy, Shourya Dutta Gupta And Sai Rama Krishna Malladi (Indian Patent Filed 2024)
9. **A System For Collecting A Reflective Light Beam Spectrum**, Arka Jyoti Roy, Shourya Dutta Gupta And Sai Rama Krishna Malladi (Indian Patent Filed 2024)
8. **An Optical Apparatus For Real-Time Monitoring Of An Ongoing Chemical Reaction In A Sample Solution**, Arka Jyoti Roy, Shourya Dutta Gupta And Sai Rama Krishna Malladi (Indian Patent Filed 2024)
7. **A Method Of Preparing Bipyramid Nano-Gold Particles**, Arka Jyoti Roy, Shourya Dutta Gupta And Sai Rama Krishna Malladi (Indian Patent Filed 2024)

6. **A Method Of Preparation Of Cadmium Sulphide Quantum Dots**, Karthika Devi, Jayakumar Pillanagrovi, Shourya Dutta Gupta (Indian Patent Filed 2024)
5. **A One-Pot Syntilfsis For Preparing Silver Nanowires (AgNWs)**, Jayakumar Pillanagrovi, Jagathpriya L.M., Vikram Soni, Prithvi Shree Shankar, Dr. Shourya Dutta Gupta (Indian Patent Granted 2025)
4. **A System And Method For Detection Of Molecules**, Reshma I R, Dr Shourya Dutta Gupta, Dr Subha Narayan Rath, Pillanogravi Jayakumar (Indian Patent Granted 2025)
3. **Dynamic Cavity-Coupled Plasmonic Sensor For Surface-Enhanced Raman Spectroscopy (SERS)**, Jagathpriya L. M., Shourya Dutta Gupta (Indian Patent Granted 2025)
2. **Stimuli Responsive Electrospun Polydimethylsiloxane (EPDMS) Membrane And Method Of Preparation Thereof**, Reshma I R, Shourya Dutta Gupta, Subha Narayan Rath, Gokula Nathan Kasinathan (Indian Patent Granted 2025)
1. **System and method for reflective spectroscopy of a cell membrane using a fiber with a plasmonic metasurface**, G Shvets, SD Gupta (US Patent 12,061,145), 2024

CONFERENCE PROCEEDINGS (PEER-REVIEWED)

6. Bharadwaj Peela, Pravallika B. and **Shourya Dutta-Gupta***, *Janus Nanoparticles for Dual Wavelength Surface Enhanced Raman Scattering Applications*, **2022 Workshop on Recent Advances in Photonics (WRAP)**, 21724084, p1-p2 (doi: 10.1109/WRAP54064.2022.9758206) (* Corresponding author)
5. Pravallika B., S. Bhattacharyya, and **Shourya Dutta-Gupta***, *Numerical study of propagating surface plasmons in complex alloy thin films*, **2022 Workshop on Recent Advances in Photonics (WRAP)**, 21709261, p1-p2 (doi: 10.1109/WRAP54064.2022.9758306) (* Corresponding author)
4. Jagathpriya L. M., and **Shourya Dutta-Gupta***, *Simulation and fabrication of multi-layer plasmonic substrates for potential SERS application*, **2022 Workshop on Recent Advances in Photonics (WRAP)**, 21724122, p1-p2 (doi: 10.1109/WRAP54064.2022.9758268) (* Corresponding author)
3. Pravallika B., and **Shourya Dutta-Gupta***, *Effect of phase separation on the behavior of surface plasmons in ag-Cu alloy thin films*, **2022 Workshop on Recent Advances in Photonics (WRAP)**, 21724105, p1-p2 (doi: 10.1109/WRAP54064.2022.9758198) (* Corresponding author)
2. Jayakumar P. and **Shourya Dutta-Gupta***, *Facile fabrication of nanoapertures with tunable plasmonic resonances*, **2022 Workshop on Recent Advances in Photonics (WRAP)**, 21724114, p1-p2 (doi: 10.1109/WRAP54064.2022.9758360) (* Corresponding author)
1. Eshita Mukherjee, Jayakumar P., D. Bhatnagar, and **Shourya Dutta-Gupta***, *Real time monitoring of assembly of plasmonic nanoparticles on polyelectrolyte coated surfaces*, **2022 Workshop on Recent Advances in Photonics (WRAP)**, 21724119, p1-p2 (doi: 10.1109/WRAP54064.2022.9758318) (* Corresponding author)

INVITED TALKS, CONFERENCES AND WORKSHOPS (TOTAL = 45)

46. **Shourya Dutta-Gupta**, *Integrating technology in Pegagogy*, Workshop for Jawahar Navodaya Vidyalaya (JNV) teachers organized by CCE IIT Hyderabad, 12-11-2024.

45. **Shourya Dutta-Gupta**, *Lecture on etching processes for semiconductor processing*, SPARC workshop (Phase 1) 2024, IIT Hyderabad.
44. **Shourya Dutta-Gupta**, *Detection of bio-analytes and deformation in polymer grafted nanoparticle networks using plasmonic nanoplatforms*, ICFO-TIFRH International School on the Frontiers of Light, 25-10-2023 to 27-10-2023, TCIS Hyderabad (Invited speaker)
43. **Shourya Dutta-Gupta**, *Understanding plasmons in multi-phase thin films and nanostructures: An example of Ag-Cu alloy system*, Photonics 2023, 05-07-2023 to 08-07-2023, IISc Bangalore (Invited speaker)
42. **Shourya Dutta-Gupta**, *Spectroscopy Techniques for material characterization. (UV, FTIR, Raman)*, Online Short Term Course on "Nanomaterial Characterization Techniques", 04-01-2021 to 09-01-2021 (Organized by JNTU Hyderabad).
41. **Shourya Dutta-Gupta**, *Plasmonic metasurfaces for biosensing: Potential for disease diagnosis*, A One Week AICTE Sponsored online Short-term Training programme on "Synthesis, Characterization and its applications of Nanomaterials", 24th-29th August, 2020 (Organized by JNTU Hyderabad).
40. Understanding the effect of spinodal decomposition in Ag-Cu alloy thin films for plasmonic applications, APMC 2020, Hyderabad (March 2020) Pravallika Bandaru, Saswata Bhattacharya, and **Shourya Dutta-Gupta**
39. *Sub-wavelength plasmonic structures for opto-electronic and sensing applications*, T.C.I.S., Hyderabad, 2019.
38. *Sub-wavelength plasmonic structures for opto-electronic and sensing applications*, R.R.C.A.T., Indore, 2019.
37. **Shourya Dutta-Gupta**, *Plasmonic metasurfaces for cancer diagnosis and active light modulation*, MRSI Annual Meeting and 1st Indian Materials Conclave, I.I.Sc. Bangalore, 12-15 February 2019.
36. **Shourya Dutta-Gupta**, QuantOEM (TEQIP 3) workshop at IIT Hyderabad (14-19 October 2019) (Coordinator- Dr. P. Bandopadhyay)
35. **Shourya Dutta-Gupta**, Biosensing using metasurface enhanced infrared absorption spectroscopy, WRAP2019, IIT Guwahati, 13-14 December 2019.
34. **Shourya Dutta-Gupta**, Advanced material characterization techniques (TEQIP 3) workshop (26-31 August 2019) (Coordinator- Dr. S.R.K. Malladi and Dr. C. Murapaka)
33. *Plasmonic metasurfaces: From active opto-electronic devices to cancer diagnosis platform*, I.I.T. Delhi, New Delhi, India, 2019
32. *Analyzing proteins and cells using surface enhanced vibrational spectroscopy*, C.U.N.Y., New York City, U.S.A., 2018.
31. Implications of spinodal decomposition on the plasmonic properties of alloy thin films, AP Science Congress 2018, Yogi Vemana Central University Kadapa. Pravallika Bandaru, and **Shourya Dutta-Gupta**
30. **Shourya Dutta-Gupta**, *Active modulation of light using graphene integrated plasmonic metasurfaces*, GNP 2018, T.I.F.R. Mumbai

29. **Shourya Dutta-Gupta**, *Surface enhanced IR absorption spectroscopy for non-destructive diagnosis*, AP Science Congress 2018, Yogi Vemana University, Kadapa (9-11 November 2018).
28. **Shourya Dutta-Gupta**, *Fast and non-destructive diagnosis using plasmon enhanced IR spectroscopy*, CoOpt 2017 IISER Kolkata 2017 (18-19 December 2017).
27. **Shourya Dutta-Gupta**, G. Shvets, *Shaping laser pulses with graphene-integrated metasurfaces*, Proc. SPIE 10112, Photonic and Phononic Properties of Engineered Nanostructures VII, (28 April 2017)
26. *Optical spectroscopy for cancer diagnosis*, University of Hyderabad - Academic Staff College, Hyderabad, 28 November 2017.
25. *Nanofabrication of optical devices*, University of Hyderabad - Academic Staff College, Hyderabad, 21 August 2017.
24. *Analyzing proteins and cells using plasmonic nanostructures*, TIFR, Hyderabad, 5 May 2016.
23. *Plasmonic structures for protein and cell analysis*, IISc, Bangalore, 2 May 2016.
22. *Motion Detection and Bio-sensing using Plasmonic Structures*, IIT Hyderabad, Hyderabad, 25 April 2016.
21. *Eigenmode analysis of plasmonic nanoclusters: Effect of symmetry*, TIFR, Mumbai, 17 February 2015.
20. *Eigenmodes of plasmonic nanoclusters and their effects on circular polarization and second harmonic generation*, IACS, Kolkata, 19 February 2015.
19. *Single particle SERS spectroscopy and second harmonic generation from plasmonic clusters*, University of Hyderabad, Hyderabad, 15 February 2015.
18. **Shourya Dutta-Gupta**, G. Suarez, C. Santschi and Olivier J.F. Martin, *Ultrasensitive system for the real time detection of H_2O_2 based on strong coupling in a bio-plasmonic system*, Proc. SPIE 8234, Plasmonics in Biology and Medicine IX, 82340K (February 9, 2012).
17. **Shourya Dutta-Gupta**, Olivier J.F. Martin and S. Dutta Gupta, *Novel biosensor for detecting Hemoglobin and its oxygenation state based on nonreciprocity in a coupled waveguide system*, Proc. SPIE 8234, Plasmonics in Biology and Medicine IX, 82341C (February 9, 2012).
16. G. Suarez, C. Santschi, **Shourya Dutta-Gupta** and Olivier J.F. Martin, *Biophotonic tool for sensing the dynamics of H_2O_2 extracellular release in stressed cells*, Proc. SPIE 8229, Optical Diagnostics and Sensing XII: Toward Point-of-Care Diagnostics; and Design and Performance Validation of Phantoms Used in Conjunction with Optical Measurement of Tissue IV, 822908 (February 1, 2012).
15. **Shourya Dutta-Gupta**, *Graphene Integrated Active Plasmonic Metasurfaces*, Recent Advances in Optical Sciences 2 (RAOS2), Hyderabad (2016).
14. M. Bahramipanah, **Shourya Dutta-Gupta**, B. Abasahl and O. J. F. Martin, *Interaction of LSP resonances and Fabry-Perot cavity modes*, META 2015 - The 6th International Conference on Metamaterials, Photonic Crystals and Plasmonics, New York, U.S (2015).
13. M. Bahramipanah, **Shourya Dutta-Gupta**, T. Scharf and O. J. F. Martin, *Tunable cavity-coupled plasmonic perfect absorber for ultra-compact thermo-optical switching*, META 2015 - The 6th International Conference on Metamaterials, Photonic Crystals and Plasmonics, New York, U.S (2015).

12. C. Yan, **Shourya Dutta-Gupta**, K. Y. Yang, O. J. F. Martin, *Controlling the phase in plasmonic systems for applications in color routing and coherent perfect absorption*, The 7th Int. Conf. on Surface Plasmon Photonics SPP7, Canada (2015) (Oral presentation).
11. **Shourya Dutta-Gupta**, Ch. Santschi, Davide Stadler, Sandrine Gerber, L. Juillerat-Jenneret and O. J. F. Martin, *Biosynthesis of gold nanostructures using human cells*, META 2014 - The 5th international conference on metamaterials, photonic crystals and plasmonics, Singapore (2014) (Oral presentation).
10. T. Siegfried, **Shourya Dutta-Gupta**, Y. Ekinici, O. J. F. Martin, *Near-field enhancement in crescent shaped arrays*, META 2014 - The 5th international conference on metamaterials, photonic crystals and plasmonics, Singapore (2014) (Oral presentation).
9. G. Suarez, C. Santschi, **Shourya Dutta-Gupta**, L. Juillerat-Jenneret and O. J. F. Martin, *Biophotonic sensor for real-time and non-invasive detection of extracellular H_2O_2 released by stimulated cells*, Eurosensors 2012, Krakow, Poland (September 2012) (Oral presentation).
8. *Biosynthesis of gold nanoparticles in human cells*, ICNP 2012- Sixth International Conference on Nanophotonics, Beijing, China (2012) (Oral presentation).
7. *Detecting oxidative stress in cells based on biosynthesis of gold nanoparticles*, Gordon research conference on Nobel Metal Nanoparticles, USA (17-22 June 2012) (Poster presentation).
6. *Tunable coherent perfect absorption using a composite film*, META 2012, Paris, France (19-22 April 2012) (Oral presentation).
5. **Shourya Dutta-Gupta**, G. Suarez, C. Santschi, L. Juillerat-Jenneret and O. J. F. Martin, *Biosynthesis of Gold Nanoparticles: Towards a Rapid Oxidative Stress Assay*, USBBE, Lausanne, Switzerland (6-7 February 2012) (Poster presentation).
4. *Biophotonic Tool for Sensing the Dynamics of Oxidative Stress in Living Cells*, USBBE, Lausanne, Switzerland (6-7 February 2012) (Poster presentation).
3. *Biosensor based on plasmon resonance energy transfer for real time H_2O_2 detection*, Oral presentation at Frontiers in optics and photonics, IIT Delhi, Delhi, India (2 - 5 December 2011) (Oral presentation).
2. *Strong coupling between surface plasmon polaritons and Hemoglobin: Application to oxygen sensing*, 5th International conference on surface plasmon photonics (SPP 5), Busan, Korea (15 - 20 May 2011) (Poster presentation).
1. *Biosensing based on plasmon resonance energy transfer (PRET)*, SPIE, Sandiego, USA (August 2011).

TEACHING EXPERIENCE

- One module at University of Hyderabad on Optics as part of the Engineering Physics II course (2025)
- Diffraction and Spectroscopy - 2025
- Spectroscopy - 2025
- Digital Fabrication (ID1051) -2024, 2025
- Micro and Nanofabrication (SD5040) - 2023, 2024

- Non-Destructive Testing of Materials (MS5589) - 2022
 - Semiconductor Materials Characterization Lab (SD5011) - 2022
 - Spectroscopic Techniques in Materials Science (MS3340) - 2022
 - Imaging in Materials Science (MS2250)- 2022, 2024
 - Introduction to Materials Science and Engineering (MS1210) - 2021
 - Physics of Solids II (MS2230) - 2021, 2022
 - Thin films (MS3040) - 2021
 - Functional Properties Characterization Lab (MS2011) - 2021
 - Materials Characterization - I (MS1030) -2020
 - Seminar (MS4016) - 2020
 - Semiconductor Materials (MS1070) - 2017, 2018, 2019.
 - Introduction to Nanofabrication (MS4070) - 2017, 2018, 2020.
 - Electronic Materials (MS2090) - 2018, 2019, 2020
 - Plasmonics: From fundamentals to applications - 2019, 2025
 - 2D Materials: Synthesis, characterization and applications (MS5270)- 2017, 2018, 2021, 2022, 2023, 2024
 - Biomaterials-Materials in medicine (MS5110, MS4190) - 2018
 - Materials Lab-1 (Synthesis & Characterization) (MS5011) - 2018, 2019, 2020, 2021, 2022
 - Materials Lab II - 2018
- * *The complete list of courses along with the course feedback is provided in the form submitted along with the application.*

STUDENTS SUPERVISED AT IIT HYDERABAD

- Ph.D. students: 6 (ongoing)
 - Achal Singh(August 2024 - till date) (Co-supervisor: Dr. Suhanya D. (Chemical Engineering))
 - N. J. Lakshmi Sivani (January 2023 - till date) (Co-supervisor: Dr. S. R. K. Malladi)
 - Reshma I. R. (August 2022 - till date) (ID Ph.D., Co-Supervisor: Prof. S. N. Rath (BME))
 - Arka Jyoti Roy (August 2020 - till date) (Co-supervisor: Dr. S. R. K. Malladi)
 - Jagatpriya L. M. (January 2020 - till date)
 - Jayakumar P. (January 2018 - till date)
 - Pravallika B. (August 2017 - 25-07-2023) (Graduated)
- M.Tech. students: 7 (graduated)
 - Priyanka (2024-till date)
 - Ranadheer (2024-till date)

- Rajeshwar (2023-2025)
- Nikhil K. (2021-2023) (Co-Supervisor: Dr. Fudouzi (NIMS, Japan))
- Pyae Oh Kin (2019 - 2021) (International student through ICCR fellowship)
- Eshita Mukherjee (2019 - 2021) - Currently a PMRF student at IIT Roorkee
- Dhruv Bhatnagar (2018-2020)
- Mohd. Shahnawaz (2018-2020) - Currently a PhD student at IIT Kanpur
- P. Lavanya Devi (2017-2019)
- B. Tech. students:
 - Navin Joshi (Summer Project, 2025)
 - Yash Sonawar (Semester Project, 2025)
 - Avantika Nair (Semester Project, 2025)
 - Amandeep Saha (Semester Project, 2023-2024)
 - Raj S. (B.Tech. NIT Trichi, SURE Intern, 2023)
 - Asmi (B.Tech. Natesan Intern, 2024)
 - Dhanushikaa (B.Tech. IIT Hyderabad, Project, 2023)
 - Prithvi Shree (Internship student from NIT Trichi, 2023)
 - Anubhav (Semester Project, 2023)
 - Tatparya (Semester Project, 2023)
 - Vikram Soni (Semester Project, 2023-2024)
 - Samyak Joshi (Project, 2022)
 - Hadi Afnan (Project, 2022)
 - Manaal R. (B.Tech. Mini project, 2021)
 - P. Bharadwaj (B.Tech. Honors Project, 2020-2021) - Currently a PhD student at Rice University
 - S. Govardhan (B.Tech. Mini project, 2020)
 - Abhiram K. (B.Tech. Mini project, 2020)
 - Mohd. Ayaz (B.Tech. Mini project, 2019)
 - Anand Swain (Project, 2019) - Currently a PhD student at UT Austin
 - Nitish Chandra (B.Tech. Mini project, 2019)
 - Ashish (B.Tech. Mini project, 2019)
 - Revanth Reddy (B.Tech. Mini project, 2018)
 - Joshua Jullian (B.Tech. Mini project, 2017)
- International visiting students:
 - Ryosuke B. (Japan, 3 week internship)
- Post-Doctoral Fellow:
 - Narender Dhanania (September - December 2019) - Currently a faculty at Delhi University
- External students: 2 (graduated)

ADMINISTRATIVE ACTIVITIES AT IIT HYDERABAD

- Member of institute equipment usage committee (2022 - till date)
- Member of library committee (2018 - 2025)
- Faculty-in-Charge (FIC) of IITH-Japan Cooperation Cell (IJCC) (2023 - 2024)
- Member, Institute Innovation Committee (2022 - 2023)
- Member of MSME Building Maintenance Committee (2021 - 2023)
- DPGC Convener, MSME Department (2021 - 2023)
- Convener of departmental Website Team (2019 - 2023)
- Faculty advisor (M.Tech. 2019-2021)
- Coordinator for Faculty Shortlisting (2021, 2023)
- Ph.D. Admissions committee (2018, 2019, 2024)
- M.Tech. Admissions committee (2020)

RESEARCH INFRASTRUCTURE ESTABLISHED AT IIT HYDERABAD

- **Computational facilities**

1. Four high-end workstations (with RAM of 128 GB, 64 GB, 32 GB, 32 GB) are installed and functioning for numerical simulations
2. Numerical codes & software for determining the optical properties (scattering, absorption, near-field intensities etc.) of nanostructures is operational based on the following methods: SIE (homemade), BEM (open source), Transfer matrix method (homemade), Green's tensor approach and COMSOL (Commercial)

- **Nanofabrication and chemical synthesis related facilities**

1. Homemade CVD setup for synthesis of layered materials
2. Multi-source thermal evaporation system
3. Single target DC magnetron sputtering system
4. Chemical wet benches for synthesis of nanoparticles
5. Chemical hood for synthesis of nanoparticles
6. Microbalance
7. Oven
8. Syringe pump
9. 3D Printer (Ender 3)
10. Hotplates with magnetic stirring
11. Centrifuge (for purification of particles)
12. Vortexer (for mixing particles)
13. Spincoater
14. Dipcoater (Homemade along with the required electronics)

15. Laminar flow hood (used for assembly of nanoparticles)

The following fabrication/synthesis facilities have been developed

- Protocol for shadow sphere lithography-based structures
- Deposition of thin films using sputtering system (Au, Ag, Cu, ITO, Cr, Ti).
- Gold nanoparticle synthesis with different morphologies
- Silica and polystyrene nanoparticle synthesis
- 3D printing based microfluidic molds
- PDMS based micro- and milli-fluidic channel fabrication

• **Optical and functional characterization facilities**

1. Multiple optical tables for housing various optical platforms
2. Multiple LASERs (Diode laser at 532 nm, 594 nm, 640 nm and 785 nm)
3. Multiple spectrometers (Andor Kymera 328i with newton 920 CCD camera, Brolight portable spectrometer and Wasatch photonics portable spectrometer (785 nm))
4. Darkfield and brightfield spectroscopy setup for scattering/absorption measurements
5. Setup for surface enhanced Raman scattering (SERS) measurements
6. Dispersion measurement setup
7. Surface plasmon sensing setup
8. Optical setup for measuring the response of flexible substrates under strained conditions
9. Homemade Raman microscope small footprint
10. Optical platform for spectroscopy of freestanding droplets
11. Digital oscilloscope
12. Function generator
13. DC Power supply

Setup a lab for comprehensive investigation of surface plasmons and optical characterization

- Darkfield and brightfield spectroscopy setup for scattering/absorption measurements
- Dispersion measurement setup
- Optical setup for measuring the response of flexible substrates under strained conditions
- Small footprint Raman microscope
- Advanced platform for spectroscopy for free standing droplets

SCIENTIFIC EXPERTISE

- Experienced in nanofabrication with Ebeam lithography, Focussed Ion Beam (FIB), photo lithography, metal deposition, PDMS casting for microfluidic systems, SEM, AFM, electrical characterization of devices.
- Assembled optical setup for measuring scattering spectra as well as SERS spectrum from single plasmonic nanoparticles and clusters.
- Created and maintained human cell culture facility at UT Austin and Cornell University for biological experiments.

- Familiar with gold nanoparticle synthesis and requisite characterization techniques. Also, well versed with techniques used for coating gold nanostructures with proteins and antibodies.
- Extensively used computational tools like COMSOL, FDTD, surface integral approach and transfer matrix methods for optical calculations.