

Girija Shankar Papanai

CONTACT

Assistant Professor, Faculty of Physical Sciences, ES-103 1st Floor, South Asian University, Gaushala Rd, Maidan Garhi, Chhatarpur, New Delhi-110068, India.

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PERSONAL

Date of Birth: June 11, 1992

Place of Birth: Ranikhet, Uttarakhand

Nationality: Indian

ACTIVE RESEARCH PURSUITS

Synthesis and Raman spectroscopy of two-dimensional materials

Dry transfer of van der Waals heterostructures and device fabrication

Lifshitz transitions in trilayer graphene

Electric transport and conductance fluctuation spectroscopy (1/f noise)

Doppler-free saturated absorption spectroscopy in hot atomic vapors

Coherent population trapping and dark state physics

PROFESSIONAL EXPERIENCE

Assistant Professor | 2026 – Present, South Asian University, New Delhi

Research Roles | 2022 – 2026

- **Research Associate**

Quantum Technology Research Centre, SSPL-DRDO, New Delhi (2025-2026)

- **Post-Doctoral Fellow**

Tata Institute of Fundamental Research, Hyderabad (2024-2025)

Indian Institute of Science, Bangalore (2023-2024)

J. Heyrovsky Institute of Physical Chemistry, Czech Republic (2022-2023)

EDUCATION

Ph.D. (2022)

CSIR-National Physical Laboratory, New Delhi/Academy of Scientific and Industrial Research (AcSIR), Ghaziabad

Master of Science (2013)

S.S.J. Campus Almora, Kumaun University, Nainital, India

Bachelor of Science (2011)

Govt. P G College Ranikhet, Kumaun University, Nainital, India

PROFESSIONAL GRANTS

2023: Institute of Eminence Contingency Grant (IoE-IISc Bangalore)- Rs. 3 Lakh

JOURNAL PUBLICATIONS

1. Papanai, G. S.; Gupta, B. K.
“Spectroscopic studies on CVD-grown monolayer, bilayer, and ribbon structures of WSe₂ flakes”
Materials Chemistry Frontiers 2023, 7, 3102-3115.
2. Papanai, G. S.; Sahoo, K. R.; Reshma G, B.; Gupta, S.; Gupta, B. K.
“Role of processing parameters in CVD grown crystalline monolayer MoSe₂”
RSC Advances 2022, 12, 13428-13439.
3. Papanai, G. S.; Pal, S.; Pal, P.; Yadav, B. S.; Garg, P.; Gupta, S.; Ansari, S. G.; Gupta, B. K.
“New insight into growth of monolayer MoS₂ flakes by indigenously developed CVD setup: A study on shape evolution and spectroscopy”
Materials Chemistry Frontiers 2021, 5, 5429.
4. Papanai, G. S.; Singh, J.; Sharma, N. D.; Ansari, S. G.; Gupta, B. K.
“Temperature dependent Raman scattering of directly grown twisted bilayer graphene film using LPCVD method”
Carbon 2021, 177, 366-376.
5. Papanai, G. S.; Sharma, I.; Gupta, B. K.
“Probing number of layers and quality assessment of mechanically exfoliated graphene via Raman fingerprint”
Materials Today Communications 2020, 22, 100795.
6. Papanai, G. S.; Sharma, I.; Kedawat, G.; Gupta, B. K.
“Qualitative Analysis of Mechanically Exfoliated MoS₂ Nanosheets Using Spectroscopic Probes”
J. Phys. Chem. C 2019, 123, 27264-27271.
7. Sharma, I., Papanai, G.S., Paul, S.J. and Gupta, B.K.
“Partial Pressure Assisted Growth of Single-Layer Graphene Grown by Low-Pressure Chemical Vapor Deposition: Implications for High-Performance Graphene FET Devices”
ACS omega 2020, 5(35), pp.22109-22118.
8. Kumar, A., Husale, S., Pandey, H., Yadav, M.G., Yousuf, M., Papanai, G.S., Gupta, A. and Aloysius, R.P.
“On the switching current and the re-trapping current of tungsten nanowires fabricated by Focussed Ion Beam (FIB) technique”
Engineering Research Express 2021, 3(2), p.025017.
9. Aloysius, R.P., Husale, S., Kumar, A., Ahmad, F., Gangwar, A.K., Papanai, G.S. and Gupta, A.
“Superconducting properties of tungsten nanowires fabricated using focussed ion beam technique”
Nanotechnology 2019, 30(40), p.405001.

10. Gangwar, A.K., Kanika, Kedawat, G., Papanai, G.S. and Gupta, B.K.
“Single excitable dual emissive novel luminescent pigment to generate advanced security features for anti-counterfeiting applications”
Journal of Materials Chemistry C, 2019, 7(44), pp.13867-13877

CONFERENCE PROCEEDINGS

1. Backes, C., Behera, R.K., Bellamy-Carter, A., Bianco, A., Caps, V., Casiraghi, C., Chhowalla, M., Criado, A., Davies, T., Ferrari, A.C., Fornasaro, S., Papanai, G. S. et al.
3-Dimensional graphene-like structures and applications: general discussion.
Faraday discussions 2021, 227, pp.359-382.
2. Papanai, G.S., Husale, S., Singh, A., Gupta, A., Ojha, V.N., and Aloysius, R. P.
Superconducting properties of tungsten meander structures fabricated by focused ion beam technique
Proceedings of 29th Annual General Meeting of Materials Research Society of India and National Symposium on Advances in Functional and Exotic Materials.,
eI-Conference Proceedings, Tiruchirappalli, 2018, pp. 179.
3. Papanai, G.S., Husale, S., Singh, A., Gupta, A., Ojha, V.N., and Aloysius, R. P.
Analysis of shot noise in sns junctions in the diffusive regime.
Proceedings of the seventeenth international conference on thin films: abstracts. 2017.

TALKS & SEMINARS

1. Tutor in Academic Support to State Universities for Research Education (ASSURE) Workshop on Magnetism, Dec 11-21, 2024 organized by the Tata Institute of Fundamental Research, Hyderabad (TIFRH) and the Department of Physics, Osmania University, India.
2. Oral presentation "Advanced Spectroscopy for Emerging Materials" E-Workshop on Spectroscopic Techniques: Basics and Applications, organized by the Advanced Materials and Devices Metrology Division, CSIR-NPL, India, Dec 3-4, 2020.
3. Oral presentation “Analysis of shot noise in sns junctions in the diffusive regime” in 17th International Conference on Thin Films (ICTF), Nov 13-17, 2017, organized by CSIR-NPL, India.

POSTER PRESENTATIONS

1. Girija Shankar Papanai, Satyam Sahu, Otakar Frank, Matej Velický; “Unravelling the Stability of Atomically Thin α -RuCl₃: Insights from Raman Scattering”, International Union of Materials Research Societies-International Conference in Asia and the 6th Indian Materials Conclave, Dec 3-6, 2024 organized by UGC-DAE Consortium for Scientific Research, India.
2. Girija Shankar Papanai and Bipin Kumar Gupta, “Raman Fingerprint of Low-Pressure Chemical Vapor Deposited Bilayer Graphene Film: The Temperature Variation Studies”, International Conference on the Science and Application of Nanotubes and Low-Dimensional Materials, June 6-11, 2021 organized by Rice University, USA.
3. Girija Shankar Papanai and Bipin Kumar Gupta, “The Spectroscopic Method for Determination of Number of Layers in Mechanically Exfoliated MoS₂ Nanosheets” Chemistry of 2-dimensional materials: beyond graphene Faraday Discussion’ Virtual Conference 23-25 Nov 2020, organized by the Faraday Division in association with the Materials Chemistry Division, Royal Society of Chemistry.

TRAINING AND CERTIFICATION

1. 1st Workshop on Density Functional Theory Modelling of Materials (DFT-M), 16-22 Dec 2023 via Online Mode, organized by the Centre for Advanced Computational Studies, Delhi.
2. RPGR 2023, Nov 20-23, 2023 organized by IISc Bangalore, India.
3. IISc-BIU 2023 Workshop, Sept 11-12, 2023 organized by Department of Physics, IISc Bangalore, India.
4. INDIA NANO 2019, July 9, 2019 organized by Raith India in SNBNCBS, Kolkata, India.
5. Micro and Nano Fabrication and Characterization Symposium, July 11-12, 2019 organized by IISc, Bangalore, India.
6. School on Characterizations of Materials, Sept 4-9, 2017, organized by IUAC, New Delhi, India.

ACADEMIC SUPERVISION

1. Vedant Seth (BTech. CSE), VIT Bhopal, “Machine Learning-Based Light Shift Prediction System for Rb-87 Based Atomic Clock”, (Internship- SSPL):2026.
2. Risa Mahajan (BS-MS Physics), IACS Kolkata, “Experimental Investigation of the Cesium D1 Transition for Atomic Clock”, (Internship-SSPL):2026.
3. Sanvi Shan (BTech. CSE), KIIT Bhubaneswar, “Atomic Clock Stability Monitoring Framework for Cesium(¹³³Cs) Frequency Standards” (Internship-SSPL):2026.
4. Harshit Mishra (BTech. CSE), KIIT Bhubaneswar, “Atomic Clock Frequency Stability Framework for VCSEL-Pumped Rb-87 Frequency Standards” (Internship-SSPL):2026.

PROFESSIONAL MEMBERSHIP

Materials Research Society of India (Life Member 2024 Onwards)

HONOURS AND AWARDS

Award of Research Associateship, DRDO Jodhpur (2025)

Institute of Eminence (IoE) Postdoctoral Fellowship, Indian Institute of Science, Bangalore (2023)

CSIR-Junior Research Fellowship (CSIR-JRF) in Physical Sciences [All India Rank-69] (2015)

Graduate Aptitude Test in Engineering (GATE) in Physics [All India Rank-170] (2015)

Joint Entrance Screening Test (JEST) in Physics [All India Rank-278] (2015)

1st Rank in Entrance Exam of Research Associate SSPL-DRDO, New Delhi (2025)

1st Position in B.Sc. graduating batch, Govt P G College Ranikhet, Uttarakhand (2011)

ADDITIONAL EXPERIENCE

Industry R&D, Scientist, MKS-Atotech Inc., Gurugram, India (2025)

Junior Research Fellow [Project- Electronic Structure Calculation], IIT Delhi, India (2016)