

Dr. Anurag Gartia

Ph.D.



Personal Info

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Nationality

Indian

DOB

30th June 1994

Languages

English
Hindi
Odia

I have completed my Ph.D. in experimental condensed matter physics with **six years** of research experience in the field of thin film, material science, Nanotechnology, device fabrication, MEMS, Electronic material and devices, infrared detector, and sensor. Adequate expertise in material synthesis, characterization, and device fabrication. Highly motivated, enthusiastic, and proficient in both independent and collaborative work to faster personal and professional growth. Expertise of five year in highly advanced thin film deposition instruments such as Sputtering, thermal evaporation, Rapid thermal processing, chemical vapour deposition. Hands on experience in operating AFM, KPFM, Hall measurement, Keithley I-V and I-T system.

Research Interest

- Thin film
- Materials characterization
- Infrared Detector
- Transition metal dichalcogenides (TMDCs)
- Microstructural and electrical properties
- Nanotechnology
- IC fabrication process
- Materials synthesis
- Condensed matter Physics
- Heterojunction

Experience

- 2022 - 2025** **Senior Research Fellow (SRF) (Thesis submitted on 21th Aug 2025)**
- Teaching Assistant
 - Experimentation & Data analysis
 - Research articles & Project proposal writing
- 2019 - 2021** **Junior Research Fellow (JRF)**
- Teaching Assistant
 - Experimentation

Education

- 2019 - 2026** **Ph. D.**, National Institute of Technology Rourkela, Odisha, India
Supervisor: Prof. Jyoti Prakash Kar (Email: karjp@nitrkl.ac.in)
- 2015 - 2017** **M. Sc.** in Physics, First class with 8.56 CGPA, National Institute of Technology, Durgapur, West Bengal, India. Specialization: Optoelectronics
- 2012 - 2015** **B. Sc.** in Physics Honours, First class with 78.38% from Sambalpur University, Odisha, India
- 2009 - 2011** **Higher Secondary (12th)** in Science, First class with 69%, from Newton college of +2 science, Sambalpur, Odisha, India
- 2009** **Secondary (10th)**, First class with 73.16% from Jaring High School, Jaring, Bijepur, Bargarh, Odisha, India

Awards and Achievements

- 2023** **Best presentation award** in 5th International Conference on Processing and Characterization of Materials (ICPCM 2023), NIT Rourkela
- 2021 -2025** Senior Research Fellow (SRF)
- 2019- 2021** Junior Research Fellow (JRF)
- 2019-2023** During Ph.D worked as Project Assistant in **DRDO** project entitled "Fabrication of ultrathin MoTe₂/MoS₂ heterostructure based Infrared Detector by chemical vapor deposition technique"
- 2018** Qualified **NET** (June, 2018)
- 2015** Qualified **IIT-JAM** (Feb, 2015)
- 2012** Qualified **AIEEE** (Feb, 2012)

Skills and Expertise

Materials & Synthesis: Sputtering, thermal evaporation, Rapid thermal processing, chemical vapour deposition, Lithography, spin coating, dip coating, spray pyrolysis, masking, electroding.

Material Characterization: X-ray Diffraction (XRD), Field Emission Scanning Electron Microscopy (**FESEM**), Atomic Force Microscopy (AFM), Kelvin probe Force Microscopy (KPFM), Raman Spectroscopy, FTIR spectroscopy, Optical Microscope, Thickness measurement, current-voltage measurement, current-time measurement, Hall effect measurement, capacitance-voltage measurement

Device fabrication: Optoelectronics device fabrication with shadow mask, lithography, junction fabrication, photoresist coating

Plotting: Origin, ImageJ, Chem draw 3D

Software: MS Office, origin, Mercury 3.8, ImageJ, powDLL converter, X'pert HighScore

Conferences/Workshop attended

1. XXIII International Workshop on Physics of Semiconductor Devices (IWPSD 2025), IIT Roorkee took place from December 15 to 18, 2025.
2. International Conference On Laser & other Deposition techniques iCOLD25, IIT Hyderabad during 06 - 08, March 2025.
3. The 15th International Conference on Advanced Materials Research (ICAMR 2025) in Bali, Indonesia during January 17-19, 2025
4. 61st Assembly of Advanced Materials Congress held at Jodhpur, India during 24th – 26th September 2024
5. 1st International Conference on Advanced Technology in Material Science and Engineering (ICATMSE-24), held at ITER, SOA, Bhubaneswar from 5th-6th April, 2024.
6. 8th Edition of International Conference on Nanotechnology for Better Living NBL-2023, held at NIT Srinagar from 25th-29th May 2023.
7. Five Days National Workshop cum Hands-on training Program on Raman Spectroscopy held at NIT Rourkela, India during 24th-28th July 2023.
8. 5th International Conference on Processing and Characterization of Materials (**ICPCM-2023**) held at National Institute of Technology Rourkela, India during 8th- 10th December 2023
9. School on Fundamental Crystallography and workshop on Rietveld Refinement analysis held at NIT Rourkela, India during 10th-14th July 2023.
10. 2nd International Conference on Processing and Characterization of Materials (ICPCM-2019) held at National Institute of Technology Rourkela, India during 12nd - 14th December 2019

Research Publications

1. “Role of growth temperature on microstructural and electronic properties of rapid thermally grown MoTe₂ thin film for IR detection”, **Anurag Gartia**, Diana Pradhan, Kiran Kumar Sahoo, Sameer Ranjan Biswal, Somesh Sabat, and Jyoti Prakash Kar, **Nanotechnology**, 2024, 35(50), 505704.
2. “Fabrication and Characterization of reduced graphene oxide on MoS₂ film for IR detectors”, **Anurag Gartia**, Diana Pradhan, Kiran Kumar Sahoo, Sameer Ranjan Biswal, Somesh Sabat , and Jyoti Prakash Kar, **International Journal of Materials Research** 116(2), 2025, 91-101. <https://doi.org/10.1515/ijmr-2024-0074> .
3. “Effect of Mo growth duration on rapid thermally processed metal chalcogenide thin films for IR detection”, **Anurag Gartia**, Diana Pradhan, Kiran Kumar Sahoo, Sameer Ranjan Biswal, Somesh Sabat, A. Mahapatra, and J.P. Kar,, **Journal of physics D** (Accepted- JPhysD-139866.R1).
4. “Investigation of Raman spectral characteristics with variation of RTP process parameters”, **Anurag Gartia**, Diana Pradhan, Kiran Kumar Sahoo, Sameer Ranjan Biswal, Somesh Sabat, Tanmay Parida, R.S. Saxena, and J.P. Kar,, **Bulletin of material science** (Accepted- BOMS-D-25-00030)
5. “Optimization of growth duration for the microstructural and electronic properties of rapid thermally grown MoTe₂ thin film for IR detection”, **Anurag Gartia**, Diana Pradhan, Kiran Kumar Sahoo, Sameer Ranjan Biswal, Somesh Sabat, and Jyoti Prakash Kar, (Communicated)
6. “Feasibility study of MoS₂ based junctions for infrared detection” Diana Pradhan, **Anurag Gartia**, Kiran K. Sahoo, Surya P. Ghosh, Tanmoy Parida, Raghvendra S. Saxena, Jyoti P. Kar, **Physica B: Physics of condensed matter** (2025) 417135.
7. “Low-temperature growth of CuS thin film on flexible substrates for photodetection”, Somesh Sabat, **Anurag Gartia**, Kiran Kumar Sahoo, Sameer Ranjan Biswal, Diana Pradhan and Jyoti Prakash Kar, **Semiconductor Science and Technology**, 2024, 39(12), 125002.
8. “Enhancement of carrier concentration in chemical bath deposited copper sulfide (Cu_xS) thin film by post-growth annealing treatment”, Somesh Sabat, **Anurag Gartia**, Kiran Kumar Sahoo, Sameer Ranjan Biswal, Diana Pradhan and Jyoti Prakash Kar, **Engineering Research Express**, 2024, 6(4), 045320.
9. “Study of temperature-dependent copper iodide thin film by thermal evaporation system”, Sameer Ranjan Biswal, Diana Pradhan, **Anurag Gartia**, Kiran Kumar Sahoo, Somesh Sabat, Jyoti Prakash Kar, **Physica Scripta**, 2024, 99(9), 095909.

10. "Modulation of electrical properties of sputtered Ta₂O₅ films by variation of RF power and substrate temperature", Kiran K Sahoo, Diana Pradhan, Surya P Ghosh, **Anurag Gartia**, Jyoti P Kar, **Physica Scripta**, 2024, 99(2), 025934.
11. "Dependence of Microstructure of Thermally Evaporated CuI Films on the Flow Rate of Argon Gas", Sameer Ranjan Biswal, Diana Pradhan, **Anurag Gartia**, Kiran Kumar Sahoo, Somesh Sabat, and Jyoti Prakash Kar, **Journal of Materials Engineering and Performance**, 2024, 33(11), 5331-5339.
12. "Suppression of Oxide and Interface Charge Density in Radio Frequency Sputtered Ta₂O₅ Thin Films", K. K. Sahoo, D. Pradhan, **A. Gartia**, S. P. Ghosh, J. P. Kar, **Physica Status Solid a**, 2023, 221(2) 2300292.
13. "Fabrication of p-MoS₂/n-Si heterojunction by AuCl₃ treatment for IR detection", Diana Pradhan, **Anurag Gartia**, Kiran K. Sahoo, Surya P. Ghosh, Jyoti P. Kar, **Applied Physics A**, 2022, 128, 248.
14. "Modulation of electronic properties of MoS₂ thin films by benzyl viologen treatment for IR detection", Diana Pradhan, **Anurag Gartia**, Kiran K. Sahoo, Jyoti P. Kar, **Solid State Communications**, 2021, 340, 114518
15. "Impact of H₂ gas on the properties of MoS₂ thin films deposited by sulfurization of Mo thin film", D. Pradhan, **A. Gartia**, S. P. Ghosh, K. K. Sahoo, G. Bose and J. P. Kar, **Micro and Nano letters**, 2021, 16, 525.
16. "Modulation of microstructural and electrical properties of rapid thermally synthesized MoS₂ thin films by the flow of H₂ gas", D. Pradhan, S. P. Ghosh, **A. Gartia**, K. K. Sahoo, G. Bose and J. P. Kar, **Superlattices and Microstructures**, 2020, 145, 106598.
17. "Modulation in the Electrical and Microstructural Characteristics of MOS Device using Ni-doped TiO₂ thin Film" Prajna Lopamudra, Hara Prasada Tripathy, Sameer Ranjan Biswal, Somesh Sabat, Kiran Kumar Sahoo, **Anurag Gartia**, Tanmoy Parida & Diana Pradhan, **Semiconductors**, 59(4), 311-317.
18. "Electrical Tuning and Enhanced UV Detection Capabilities in Zn-Doped CuI Thin Films", S.R. Biswal, D. Pradhan, **A. Gartia**, S. Sabat, and J.P. Kar, **Semiconductors**, 2026, 60(2), 249–262.
19. "Enhancement of the electrical properties of flexible CuS photodetector by the incorporation of magnesium at low temperature", S. Sabat, **A. Gartia**, S. R. Biswal, and J. P. Kar, **Solid State Communications**, 413 (2026) 116437.
20. "Sn-doping induced enhancement in mobility of the CuS thin film grown on a flexible substrate for optoelectronic applications", S. Sabat, **A. Gartia**, S. R. Biswal, and J. P. Kar, **ceramic international**. (accepted).

Referrers

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