Dr. Mohd Zubair Ansari
Assistant Professor



Mailing Address:
Physics Department
National Institute of Technology Srinagar
Hazratbal, Srinagar-190006 (J&K) India
Mobile No. +91-95 827 83881
E-mail: **mhd.zubair1@gmail.com**

Work Experience

Nov. 2018 — Joined as **Assistant Professor** at **National Institute of Technology Srinagar** (http://www.nitsri.ac.in/)

Nov. 2017- Oct. 2018 — **Project Scientist, Nanoscale Research Facility, Indian Institute of Technology Delhi, India.** (http://nano.iitd.ac.in/)
Supervisor: Prof. Neeraj Khare
- Development of novel 2D materials.

(I handle the scientific aspect of the project from design of new materials to device fabrication and characterization)

Jul 2010- June 2011 — **Project Associate, IIT Delhi, India** (http://www.iitd.ac.in/)
Supervisor: Prof. Ashok N. Bhaskarwar
- Advance of hydrogen permeable membrane reactor

Jan 2010- June 2010 — **Project trainee, National Physical laboratory, India** (http://www.nplindia.in/)
Supervisor: Prof. Ameer Azam and (Chief Scientist) Dr. Sundeep Kumar Dhawan
- Synthesis of conducting polymers through rapid mixing method.

Education

Ph. D. : (Materials Science), Nov 2017, Department of Physics, IIT Delhi (http://www.iitd.ac.in/)
- **Thesis title:** Cu_2ZnSnS_4 Nanoparticles and Thin Films: Characterizations and Applications.

Master of Technology: (Nanotechnology) July 2010, 75.52%, AMU, Aligarh (https://www.amu.ac.in/)
- **Thesis title:** Synthesis of Polyaniline, Polyanisidine & Polyphenetidine Polymers by Rapid mixing.

Master of Science: (Physics), July 2007, 61%, Dr. BRAU, Agra, India (https://www.dbrau.org.in/)
Bachelor of Science: June 2005, 73.18% Dr. BRAU, Agra, India (https://www.dbrau.org.in/).

Experience and Expertise

- Semiconductor nanomaterials, thin films, perovskite materials and devices, hydrogen generation, device fabrication, energy conversion and renewable energy technologies.
- Instrument handling: X-ray photoelectron spectroscopy (XPS) and X-ray diffraction (XRD).

List of Publications

1. **Mohd Zubair Ansari**, N. Khare "Structural and optical properties of CZTS thin films deposited by ultrasonically assisted chemical vapor deposition" **Journal of Physics D: Applied Physics**, 47 (2014) 185101. **(IF: 3.207) https://doi.org/10.1088/0022-3727/47/18/185101**
2. **Mohd Zubair Ansari**, N. Khare "Thermally activated band conduction and variable range hopping conduction in Cu_2ZnSnS_4 thin films" **Journal of Applied Physics**, 117 (2015) 025706. **(IF: 2.877) https://doi.org/10.1063/1.4905673**

3. **Mohd Zubair Ansari**, S. Munjal, V. Kumar, N. Khare "Electrical conduction noise and its correlation with structural properties of Cu_2ZnSnS_4 thin films" **Materials Research Express**, 3 (2016) 076404-076413. **(IF: 1.94) https://doi.org/10.1088/2053-1591/3/7/076404**
4. N. Agrawal, **Mohd Zubair Ansari**, A. Majumdar, R. Gahlot, N. Khare "Efficient up-scaling of organic solar cells" **Solar Energy Materials & Solar Cells**, 157 (2016) 960–965. **(IF: 7.26) https://doi.org/10.1016/j.solmat.2016.07.040**
5. D. Chaudhary, **Mohd Zubair Ansari**, N. Khare, V. D. Vankar, Preparation, Characterization and Photocatalytic activity of Anatase, Rutile TiO_2/Multiwalled Carbon Nanotubes Nanocomposite for Organic Dye Degradation, **Journal of Nanoscience and Nanotechnology, 17** (2017) 1894-1900. **(IF: 1.35) https://doi.org/10.1166/jnn.2017.12814**
6. N. Khare, **Mohd Zubair Ansari**, R. L. Z. Hoye, D. C Iza, J. L. M. Driscoll "Elucidation of barrier homogeneity in ZnO/P3HT:PCBM junctions through temperature dependent I–V characteristics" **Journal of Physics D: Applied Physics**, 49 (2016) 275302. **(IF: 3.20) https://doi.org/10.1088/0022-3727/49/27/275302**
7. **Mohd Zubair Ansari**, N. Khare "Intrinsic strain and its effect on optical properties of nanostructured Cu_2ZnSnS_4" **Materials Science in Semiconductor Processing** 63 (2017) 220. (**IF: 3.92) https://doi.org/10.1016/j.tsf.2018.05.003**
8. **Mohd Zubair Ansari,** M. Faraz, S. Munjal, V. Kumar, N. Khare, Highly dispersible and uniform size Cu_2ZnSnS_4 nanoparticles for photocatalytic application, **Advanced Powder Technology 28** (2017) 2402. **(IF: 4.83) https://doi.org/10.1016/j.apt.2017.06.023**
9. N. Agrawal, S. Munjal, **Mohd Zubair Ansari**, N. Khare, Superhydrophobic palmitic acid modified ZnO nanoparticles, **Ceramics International 43** (2017) 14271. **(IF: 4.52) https://doi.org/10.1016/j.ceramint.2017.07.176**
10. Sunil Kumar, **Mohd Zubair Ansari,** Neeraj Khare, Influence of compactness and formation of metallic secondary phase on the thermoelectric properties of Cu_2ZnSnS_4 thin films, **Thin Solid Films 645** (2018) 300. **(IF: 2.18) https://doi.org/10.1016/j.matchemphys.2023.127304**
11. N. Agrawal, **Mohd Zubair Ansari,** A. Majumdar, N. Khare, Study of barrier height inhomogeneity at zinc oxide/polymer: fullerene interface in polymer solar cells, **Polymer for Advanced Technologies 29** (2018) 1-7**. (IF: 3.66) https://doi.org/10.1002/pat.4332**
12. M. Faraz, **Mohd Zubair Ansari,** N. Khare**,** Synthesis of nanostructure manganese doped zinc oxide/polystyrene thin films with excellent stability, transparency and super-hydrophobicity, **Materials Chemistry and Physics 211** (2018) 137-143. **(4.09) https://doi.org/10.1016/j.matchemphys.2018.02.011**
13. **Mohd Zubair Ansari**, S. Munjal, N. Khare, Intrinsic strain dependent redshift in optical band gap of Cu_2ZnSnS_4nanostructured thin films, **Thin Solid Films 657** (2018) 95–100. **(IF: 2.18) https://doi.org/10.1016/j.tsf.2018.05.003**
14. **Mohd Zubair Ansari**, S, Singh, N. Khare, Visible light active CZTS sensitized CdS/TiO_2 tandem photoanode for highly efficient photoelectrochemical hydrogen generation, **Solar Energy** 181 (2019) 37-42. (**IF: 5.74**) **https://doi.org/10.1016/j.solener.2019.01.067**
15. Mohammad Shahadat, Momina, Suzylawati Ismail, Mohd Faraz, **Mohd Zubair Ansari**, Shaikh Ziauddin Ahammad, S. Wazed Ali, "Chapter 17 - Graphene–metal oxide–supported nanohybrid materials for treatment of textile dyes" Graphene-Based Nanotechnologies for Energy and Environmental Applications, **Micro and Nano Technologies** (2019) 315-328. **https://doi.org/10.1016/b978-0-12-815811-1.00017-x**
16. Rais Ahmad Dar, **Mohd Zubair Ansari,** Effect of pH variations on structural and morphological properties of ZnO nanocrystals, The European Physical Journal Plus **137** (2022) 1093. **https://doi.org/10.1140/epjp/s13360-022-03293-3**
17. Towseef Ahmad, **Mohd Zubair Ansari**, Enhancement of infrared shielding property of SnO2 using Sb as a dopant, Materials Research Express **9** (2022) 10. **https://doi.org/10.1088/2053-1591/ac9778**

18. Ummer Altaf, **Mohd Zubair Ansari**, Seemin Rubab, Influence of aluminium doping on structural and optical properties of tin oxide nanoparticles, Materials Chemistry and Physics **297 (**2023) 127304. **https://doi.org/10.1016/j.matchemphys.2023.127304.**
19. Towseef Ahmad, **Mohd Zubair Ansari,** Structural and optical characteristics of Sb doped SnO2 nanoparticles and their boosted photocatalytic activity under visible light irradiation, Ceramics International **49** (2023), Issue 22, Part B, 35740-35756. https://doi.org/10.1016/j.ceramint.2023.08.253.
20. **Mohd Zubair Ansari**, Raunak Sharma, Tin Sulfide Nanoparticles as a p-Type Semiconductor Material: Synthesis and Characterization, Journal of Condensed Matter, **VOL. 1 No. 02** (2023): JUL-DEC https://doi.org/10.61343/jcm.v1i02.42.
21. Ummer Altaf, **Mohd Zubair Ansari**, Seemin Rubab, Low temperature dielectric studies of aluminum doped tin oxide nanoparticles, Physica B: Condensed Matter, **676**, (1 March 2024), 415620. https://doi.org/10.1016/j.physb.2023.415620
22. Towseef Ahmad Sheergojri, **Mohd Zubair Ansari,** Temperature-dependent structural and optical properties of Sb-doped SnO2 nanoparticles and their electrochemical analysis for supercapacitor application, New Journal of Chemistry, 2024, Accepted Manuscript, DOI https://doi.org/10.1039/D4NJ00918E.
23. Rais Ahmad Dar, **Mohd Zubair Ansari**, Impact of Ion Beam Irradiation on optical and structural properties of Nanocomposite ZnO thin films, Radiation Effects & Defects in Solids, 10.1080/10420150.2024.2347474

Conference Proceeding Publications

24. **Mohd Zubair Ansari**, N. Khare, Mott variable range hopping conduction mechanism in single-phase CZTS thin film, in: 59th DAE Solid State Physics Symposium 2014, **AIP Publishing, 2015**, pp. 110012.
25. **Mohd Zubair Ansari**, N. Khare, Rapid synthesis of flower shaped Cu_2ZnSnS_4 nanoparticles by microwave irradiation for solar cell application, in (ICC 2015) Proceeding of International Conference on Condensed Matter and Applied Physics, **AIP Publishing, 2016**, pp. 020563.
26. **Mohd Zubair Ansari**, N. Khare, V. Kumar, Synthesis of Cu_2ZnSnS_4 nanoparticles by solvothermal route, in: 60th DAE Solid State Physics Symposium 2015, **AIP Publishing, 2016**, pp. 120024.
27. S. Kumar, **Mohd Zubair Ansari**, N. Khare, Transparent $CH_3NH_3SnCl_3$/Al-ZnO pn heterojunction diode, in: 60thDAE Solid State Physics Symposium 2015, **AIP Publishing, 2016**, pp. 120025.
28. S. Munjal, P. Kumari, **Mohd Zubair Ansari**, N. Khare, Bipolar resistive switching in $Bi_{25}FeO_{40}$: PCBM nanocomposite thin film, in: Proceeding of International Conference on Condensed Matter and Applied Physics, **AIP Publishing, 2016**, pp. 020540.
29. S. Kumar, **Mohd Zubair Ansari**, N. Khare, Enhanced thermoelectric power factor of Cu_2ZnSnS_4 in the presence of $Cu_{2-x}S$ and SnS_2 secondary phase, in: 61th DAE Solid State Physics Symposium 2016, **AIP Conference Proceedings 1832 (2017)** 120033.

Oral Presentations

- **Mohd Zubair Ansari**, N. Khare, "Synthesis of single phase CZTS thin film by CVD and Its use for solar cell" **International Union of Materials Research Society- 2013** Indian Institute of Science, Bangalore, India, December 16th -20th, **2013**.
- **Mohd Zubair Ansari**, N. Khare, "Synthesis of CZTS Nanoparticles using solvothermal Method for Solar Cells Application" **International Conference on Nanoscience and Nanotechnology ALIGARH NANO-IV,** Aligarh Muslim University, Aligarh, India, March 8th-10th, **2014**.
- **Mohd Zubair Ansari**, S. Munjal, V. Kumar, N. Khare "Electrical Conduction Noise of Cu2ZnSnS4 thin films" **International conference Aligarh Nano V & STEMCON 2016,** Aligarh Muslim University Aligarh, India, March 12th-15th, **2016.**

Conferences Attended/Poster Presentations

- Towseef Ahmad and Mohd Zubair Ansari, Antimony doped tin oxide and their effect on structural and optical properties, International Conference on Nanotechnology for better living, 7-11 Sept 2021.
- Towseef Ahmad and Mohd Zubair Ansari, Effect of Sb doping on structural and optical properties of tin oxide, Material research society of India (MSRI), 4 Feb. 2022.
- Towseef Ahmad and Mohd Zubair Ansari, Growth and Characterizations of Doped Tin Oxide Nanoparticles, International Conference on Advances in Chemical and Material Sciences, 14-16April 2022.
- Towseef Ahmad and Mohd Zubair Ansari, Development of Tin oxide and doped Tin oxide nanostructures and their application, Indian Nano electronics Users' Programme - Idea to Innovation INUP i2i Familiarization Workshop on Nanofabrication Technologies, work shop at IIT Delhi, 25-26 April 2022.
- Towseef Ahmad and Mohd Zubair Ansari one week online course on Recent Advances in Nanoscience and Nanotechnology (RANN-2020), National Institute of Technology Srinagar, 24-28 August 2020.
- Towseef Ahmad and Mohd Zubair Ansari, online SciPy India 2020 Conference, FOSSEE, IIT Bombay on 19 and 20 December 2020.
- Towseef Ahmad and Mohd Zubair Ansari, International webinar on Empowering Diversity in Science, Department of chemistry, kamla Nehru Mahavidyalaya, Nagpur and Association of Chemistry Teachers (ACT), Homi Bhabha centre for Science Education (TIFR) Mumbai, 09 Feb 2020.
- Towseef Ahmad and Mohd Zubair Ansari, International Webinar on Innovation in Science and Technology (IWIST-2021), Department of chemistry, Smt. Narsamma Arts, Commerce and Science College Homi Bhabha centre for Science Education (TIFR) Mumbai, 27 Feb 2020.
- Rais Ahmad Dar and Mohd Zubair Ansari, Study of Structural and Optical Properties of Ag doped ZnO Nanostructures, Indian Materials Conclave (IndMac) and 32nd Annual General Meeting of MRSI, Indian Institute of Technology Madras, 20-23, December 2021.
- Rais Ahmad Dar and Mohd Zubair Ansari, Effect of pH variations on Structural and morphological properties of ZnO Nanocystals, International e-Conference on Nanomaterials & Nanoengineering APA NANOFORUM-2022, Asian Polymer Association and CSIR- National Physical Laboratory (CSIR-NPL), February 24-26, 2022.
- Mohd Zubair Ansari, Raunak Sharma, Tin sulfide nanoparticles as a p-type semiconductor material: synthesis and characterization, 4th International Conference on Condensed Matter and Applied Physics held at Engineering College Bikaner, Karni Industrial Area, Pugal Road, Bikaner (Rajasthan) India - 334004 from 09 to 10th Oct 2023.
- Dr. Mohammad Zubair Ansari, INUP - i2i, 6th Hands-on Training on "Fabrication of Semiconductor Device," held at IIT DELHI during 4 – 6 January, 2024.
- Mohd Zubair Ansari, Towseef Ahmad, Structural and Optical Characterizations of Sb-doped SnO2 Nanoparticles and Their Improved Photocatalytic Activity under Visible Light Irradiation, Conference on Innovations in Materials Science and Workshop on Characterization Techniques (I-MAT) at IIT Roorkee, April 24-27, 2024)

Projects Details:

S.No.	Project Title	Funding Agency	Amount	PI & Co PI
1.	Grant under the fund for the improvement of S&T infrastructure (FIST Program 2021)	Department of Science and Technology (DST)	Rs. 1,35,00,000/-	Prof. M.A. Shah, Prof. Mohd Ikram Prof. Seemin Rubab Prof. P A Ganai Dr. Vijay Kumar **Dr. Mohd Zubair Ansari** Dr. Harkirat Singh
2.	Fabrication of Cu2ZnSnS4/MoS2 Nanocomposites Photoelectrodes for Hydrogen Evolution	CRG, SERB India	25,78,554/-	**Dr. Mohd Zubair Ansari**
3.	Growth and Characterizations of visible light active Cu2ZnSnS4/MoS2 nanocomposites for hydrogen generation	JKSTIC-DST	10,80,000/-	Dr. Mohd Zubair Ansari
4.	Effect of Sb doping on structural, optical and electrical properties of SnO_2	INUP-i2i Programme Indian Institute of Technology Delhi	Providing TA, DA and Research support (synthesis, Characterization & Fabrication) with zero charges	**Dr. Mohd Zubair Ansari**
5.	Development of CZTS/MoS2 based Nanocomposites Photoelectrodes photodetection	INUP-i2i Programme Indian Institute of Technology Delhi	Providing TA, DA and Research support (synthesis, Characterization & Fabrication) with zero charges	**Dr. Mohd Zubair Ansari**

Workshop, Conferences, Hands on session, FDP, Short Term Courses Organized

- One-week short term course on Materials Characterization Techniques from 24/06/2019 to 28/06/2019 at NIT Srinagar. Coordinators: Dr. Vijay Kumar, Dr. Harkirat Singh and Dr. Mohammad Zubair Ansari.
- Short Term Course on "Recent Advances in Nanoscience and Nanotechnology" was organized by department from 24-28 August 2020. Coordinators: Dr. Vijay Kumar, Dr. Harkirat Singh and Dr. Mohammad Zubair Ansari.
- Virtual Lab- Hands on Session – in collaboration with IIT Delhi, 18th April 2022 (Coordinator: Dr. M Z Ansari)
- STUTI Program in collaboration with PMU, Banasthali Vidyapith, Rajashan 20th -26th of May,2022 at NIT Srinagar (Coordinator: Dr. M Z Ansari).
- I-STEM (With IISc Bangalore), 23rd of May,2022
- 2nd Edition of Environment symposium, 05th of June 2022 (Coordinator: M Z Ansari)
- STUTI Program in collaboration with Punjabi University, Chandigarh 29thMay to 5th June 2022.
- STUTI Program in collaboration with Aligarh Muslim University 28th June to 4th July 2022.
- Physics Curriculum Development Weeklong workshop for UG/PG courses 25th to 29th August 2022. (Coordinator: Dr. M Z Ansari).

- Short Term Course titled Journey of semiconductor physics to smart devices to intelligent automation, 16th to 20th Feb 2023. (Coordinator: Dr. M Z Ansari)
- 8th edition of International conference on Nanotechnology for Better Living NBL-2023, 25th to 29th May 2023 (Coordinator: Dr. M Z Ansari).
- Virtual Lab- Hands on Session – in collaboration with IIT Delhi, 27th June 2023 (Coordinator: Dr. M Z Ansari).
- One day workshop on 6th November 2023 for awareness program at NIT Srinagar by NRF, INUP -i2i Team from IIT Delhi.
- One-week Short Term Course (STC) on "Recent Trends and Applications of Nanotechnology in Engineering" 22th –26th July, 2024.

Award/Membership/Recognition

- Recipient of Rupees One Lac as International Travel Grant from Indian Institute of Technology Delhi to attend MRS Meeting at San Francisco, USA
- Centre for International Co-operation in Science (CICS) travel grant award 2015.
- Maulana Azad National Fellowship (MANF) award by University Grant Commission (UGC) for PhD Course (2011).
- Member, Materials Research Society, USA for the session 2015-2016.
- Volunteer OPEN-HOUSE-2013 and 2014 at Physics Department, IIT Delhi.
- Journal Referee, American Chemical Society (ACS) Omega (2021)
- Journal Referee, ACS Energy & Fuels (2020)
- Life time member, Materials Research Society of India (MRSI). No. **LMB3323**
  https://www.mrsi.org.in/member-details.php
- Life time member, Indian Association of Physics Teachers (IAPT). (**No. L8540)**
  https://www.indapt.org/iapt-members
- Life time member, Indian Physics Association (IPA) **LM-2022-DEL-13654**
  https://www.tifr.res.in/~ipa1970/ipa/view_profile.php?r=VS9uUVJLWFpReDZhV0Q3ZVJVUnd0QT09
- Member, Materials Research Society, USA for the session 2015-2016.
- Member, Central Research Facility Centre (CRFC) at NIT Srinagar (2018 to till date)
- Library committee member, NIT Srinagar (2018 to till date).
- Hostel warden, NIT Srinagar (2020 to till date).

Institute Responsibilities

S.No.	Title	Position	
1.	Library	Member	
2.	CRFC	Member	
3.	Virtual lab	Coordinator	
4.	Warden	Tawi Hostel Warden	From December 2020 to June 2023
5.	NBA	Criterion 10	
6.	NIRF	Outreach & Inclusivity (OI)	
7.	SUGC	member	Convener DUGC, Physics Department 04-03-2022
8.	DPGC	member	18-01-2022

Departmental Responsibilities

S.No.	Title	Position	
1.	Library	Coordinator	
2.	B. Tech	Coordinator	
3.	PhD	Coordinator	
4.	M.Sc. Electronics lab	Coordinator	

Technical Skills

Device fabrication:

- Fabrication of CZTS nanoparticles and thin film based solar cell.
- Fabrication of photoelectrodes for the hydrogen generation.
- Fabrication of polymer-fullerene derivative based organic solar cells.

Setup design (Indigenous)

- Ultrasonic assisted chemical vapor deposition setup for thin film deposition.
- Solar simulator (AM 1.5G) for solar cell electrical characterization.
- Setup for solar cell parameters measurement like as ideality factor and barrier height from temperature 170K to 380K.

Materials synthesis: Synthesis/deposition: Semiconductor materials (Cu_2ZnSnS_4, CdS), Polymer-fullerene, perovskite ($CH_3NH_3PbI_3$), wide band gap semiconductor (ZnO, TiO_2)

- Synthesis of perovskite ($CH_3NH_3PbI_3$) in two-step through solution method and film preparation using spin coating and casting.
- Synthesis of CZTS nanoparticles by hydrothermal and microwave method.
- Deposition of thin film by ultrasonic assisted chemical vapor deposition technique.
- Synthesis of cadmium sulfide (CdS) film using chemical bath deposition (CBD) technique.
- Synthesis of titanium oxide (TiO_2) using hydrothermal method.
- Synthesis of Zinc Oxide (ZnO) via hydrothermal method.
- Thin film deposition of TiO_2 through spin coating.

Characterization Equipment

- **Structural:** X-ray diffraction (XRD) of thin films and powders.
- **Optical:** Absorption solutions and thin films and Raman
- **Morphological:** Transmission Electron Microscopy (TEM), High resolution-TEM, Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM).
- **Electrical measurements:** Hall measurement, low temperature resistivity measurement, Current-Voltage (I-V) measurement under dark and illumination, Electrical conduction noise measurement, Solar cell characteristic at low and above room temperature.
- Hand on experience of characterization techniques**: XRD, SEM, EDX, XPS**, Electrical measurements; **Low temperature resistivity**, **Current-voltage under dark & illumination**.
- **Others techniques:** Solar cell characteristic, Photoelectrochemical setup for hydrogen generation, Dye degradation for water cleaning.

Teaching Experience

- Mentoring higher degree B. Tech., M. M.Sc. & PhD students
- Teaching assistantship (TA) at Department of Physics on X-ray Photoelectron Spectroscopy (XPS) instrument.
- Operated and supervision of X-ray Diffractometer (XRD) at Nanoscale Research Facility, IIT Delhi

Present Research Interest

- Growth of semiconductor nanoparticles/Thin Films and devices fabrication, solar cell and hydrogen generation.

References

Prof. Neeraj Khare
Professor
FNASc, FAPAM, FInstP
Co-coordinator, Nanoscale Research Facility
Physics Department
Indian Institute of Technology Delhi
Hauz Khas New Delhi-110016, India
Phone: +91-11-2659 1352(O)

Prof. Pankaj Srivastava
Professor
Head, Central Research Facility
Physics Department
Indian Institute of Technology Delhi,
Hauz Khas New Delhi-110016, India
Phone: 011 2659 6558
Email ID: pankajs@physics.iitd.ac.in