

DR. RAZA SHAHID, PH.D.

Assistant Professor, Department of Physics, Jamia Millia Islamia, New Delhi

New Delhi, India | rshahid1@jmi.ac.in | ORCID: 0000-0003-1078-XXXX

Biosketch

Experienced professor of experimental condensed matter physics with over a decade of research expertise in energy storage materials and quantum multiferroics. Specializes in structure–property relationships in functional materials, with a Ph.D. focused on olivine phosphates for battery applications. Current research addresses cathode, anode, and electrolyte materials for lithium-ion batteries (LIB), sodium-ion batteries (SIB), and solid oxide fuel cells (SOFCs), using impedance spectroscopy, synchrotron-based methods, and X-ray absorption spectroscopy (XAS) to elucidate charge transport mechanisms. Additional research interests include the synthesis and design of quantum multiferroic materials for spintronic, ferroelectric, and piezoelectric device applications.

RESEARCH INTERESTS

Energy storage & harvesting devices • Battery cathodes, anodes & electrolytes • Solid oxide fuel cell electrodes & electrolytes • Multiferroic & quantum materials • Impedance spectroscopy & charge-carrier dynamics • Fundamental atomistic transport

TECHNICAL & INSTRUMENTAL EXPERTISE

- Programming: Python, C, C++, C#, Java, .NET, MATLAB, Maple; Windows & Linux environments
- Documentation & analysis: MS Office, LaTeX, Origin, Igor
- XRD & Rietveld refinement: Bruker, Rigaku, PANalytical, TOPAS, HighScore Plus, FullProf
- Morphological characterization: SEM, TEM, EDX, Gatan
- Spectroscopy: XAS, XPS, UV-Vis, Raman, FTIR, Mossbauer
- Charge transport: Novocontrol Broadband Dielectric/Impedance Spectroscopy
- Electronic-structure modelling: Quantum Espresso, VASP

ACADEMIC & PROFESSIONAL APPOINTMENTS

Assistant Professor — Jamia Millia Islamia, New Delhi

2016–Present

Developed curriculum and course materials for undergraduate and graduate programs; supervises doctoral, master's, and undergraduate research.

Assistant Professor — St. Stephen's College, Delhi

Assistant Professor — Sri Venkateswara College, Delhi

Guest Faculty — Jamia Millia Islamia, New Delhi

Guest Lecturer — Jamia Millia Islamia, New Delhi

Across appointments: delivered lectures across UG/PG/Pre-Ph.D. levels; designed curricula, lesson plans, and assessments; supervised student research; mentored students on academic and career pathways; integrated technology and multimedia into instruction.

EDUCATION

Ph.D., Physics — Dept. of Physics & Astrophysics, University of Delhi

Thesis: Structure and Charge Transport Mechanism in Nano-Structured Olivine Phosphate Materials for Energy Storage Applications. Ranked in top 1% of class

M.Sc., Physics (Electronics specialization) — University of Delhi

Dr. N.S. Subrahmanyam Award for First Position
capstone project on a VHDL-based moving robot.

B.Sc. (Hons.), Physics — Kirori Mal College, University of Delhi

Ranked in top 1% of class Project on water level indicator

SELECTED PUBLICATIONS

- Enhanced ferroelectricity in Sm/Ga co-doped BiFeO₃-BaTiO₃ ceramics — Materials Today Communications
- Structural and dielectric analysis of Na⁺-substituted Sr₃Si₃O_{9-δ} — Materials Today Communications
- K-doped monomeric SrSiO₃: phase stability and electrical characteristics — Inorganic Chemistry Communications
- Phase transition behavior of VO₂ thin films under ion irradiation — Ceramics International
- Structural evolution and ionic conductivity in Ba₃NbMoO_{8.5} perovskite — Applied Physics A
- Na⁺/Ge⁴⁺ bi-substitution effects on Sr₃Si₃O_{9-δ} — Journal of Applied Electrochemistry
- Tunable electronic structure of heterosite FePO₄: role of defect engineering — RSC Advances
- Flame-retardant gel polymer electrolyte for lithium-ion batteries — Journal of Energy Storage
- Influence of lithium vacancies on polaronic transport in olivine phosphate — Journal of Applied Physics
- Particle-size-dependent confinement and lattice strain in LiFePO₄ — Physical Chemistry Chemical Physics
- Effect of crystallite size on heterosite FePO₄ nanocrystals — Physical Chemistry Chemical Physics

Full list of peer-reviewed publications and book chapter available on request

AWARDS & PROFESSIONAL RECOGNITION

- Dr. N.S. Subrahmanyam Award for Academic Excellence
- CSIR Junior & Senior Research Fellowships (JRF/SRF), Council of Scientific and Industrial Research, India
- UGC-NET (Assistant Professor) & GATE (Physics) qualified
- IELTS (Academic): Band Score 8
- Certified Programmer in C, Delhi University Computer Centre

Complete list of certifications and recognitions from internationally acclaimed divisions available in complete CV

SELECTED TALKS, ROLES & SERVICE

- Invited lectures/seminars at CUSB, ICTP (Italy), IGDTUW, and CSIR-CECRI
- Session Chair — ICNOC 2022, ASMET 2021, ASMET 2020
- Manuscript reviewer — Ceramics International, Journal of Energy Storage, Physica B: Condensed Matter; reviewer for Springer Nature book Recent Advances in Nanotechnology
- Institutional service — IQAC Nodal Officer, Departmental Research Committee, Board of Studies, Curriculum Committee
- Supervised 4 Ph.D., 12 master's and 200+ UG research projects (completed and ongoing)

Full list available on request

COURSES TAUGHT

Quantum Mechanics, Solid State Physics, Electricity & Magnetism, Optics, Mathematical Physics, Nuclear and Particle Physics, Modern Physics, Atomic and Molecular Physics, Characterization Techniques, Instruments & Measurements, Mechanics lab, Thermal Physics lab, Optics lab, Modern Physics Lab, Electronics Lab — across UG, PG, and Pre-Ph.D. levels.

LANGUAGES

English (C2, Proficient) • Hindi (C2, Proficient) • Urdu (Native) • Arabic (B1) • Spanish (A2) • Italian (A1) • Chinese (A1) • Russian (A1) • Persian (A1)