Chemistry Section, School of Sciences
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Dr Rohullah

CURRENT DESIGNATION/ INVOLVEMENT:

- Currently working as a Assistant Professor (contractual) in the Chemistry Section, School of Science.

AREA OF SPECIALIZATION:

- Mechanophotonics • Organic photonics • Manipulation of Flexible organic crystals • Confocal Microscopy • Nanophotonics

ONGOING ACADEMIC RESEARCH/PROJECTS

INNOVATION WITH FIELD OF STUDY AND COLLABORATIVE EFFORTS:

My research focuses on advancing the field of nanophotonics through the development of organic crystal-based photonic systems, with particular emphasis on mechanophotonics and adaptive optical devices. A central aspect of my work has been to demonstrate that organic microcrystals can function as dynamic and mechanically responsive photonic elements, rather than passive materials. Through my publications in high-impact journals such as Nature Communications and Angewandte Chemie International Edition, I have introduced concepts such as mechanically tunable waveguides, micromechanically driven optical systems, and flexible crystal-based photonic architectures. These innovations enable real-time control over light propagation, which is critical for next-generation integrated photonic circuits.

In addition, my work incorporates bioinspired design strategies, including neural network-like waveguide architectures and amphibian-inspired flexible optical fibres, which offer adaptive and multifunctional light-guiding capabilities. I have also contributed to scalable fabrication approaches, such as self-assembly and thermo-welding of polymer microstructures, facilitating the development of rollable and flexible photonic devices with practical applicability. Beyond photonics, my research extends to functional materials for sensing applications,

demonstrating the translational potential of my work.

My projects inherently combine chemistry, physics, and materials engineering, requiring close interaction with experts in synthesis, advanced characterization, and device fabrication. I have actively contributed to multidisciplinary teams, utilising my expertise in nanofabrication, spectroscopy, and micro-instrumentation to support both independent and collaborative investigations.

Overall, my work reflects a combination of innovative research in organic photonic materials and strong collaborative engagement, positioning me to contribute meaningfully to interdisciplinary research programs and the development of advanced photonic technologies.

ACADEMIC AND ADMINISTRATIVE EXPERIENCE:

Academic and Administrative Experience

Member, Organising Committee, **ChemFest–2025**, School of Chemistry, University of Hyderabad; coordinated scientific events and managed logistics.

Mentorship: Guided M.Sc. thesis projects; trained and supervised junior Ph.D. scholars, contributing to capacity building and collaborative research culture.

Laboratory Management: Experience in lab management and oversight of daily laboratory operations, ensuring efficient research workflow.

Project Management: Involved in project design, execution, and adherence to research timelines.

Device Physics & Nanofabrication:

Micromanipulation of organic materials for fabrication of photonic components and integrated circuits.

Self-assembly of organic small molecules to develop functional microstructures and optical cavities.

Performance evaluation and optimization of organic photonic devices.

Advanced Characterization & Spectroscopy:

Proficiency in XRD, SEM, TEM, AFM, and Confocal Raman Microscopy.

Expertise in UV–Vis spectroscopy and analysis of organic materials.

Software & Data Analysis:

Skilled in Origin, Mercury, TopSpin, and ChemDraw.

Strong capabilities in data interpretation and scientific analysis.

Scientific Communication:

Experience in manuscript preparation and technical presentations.

EDUCATIONAL QUALIFICATION:

- Doctor of Philosophy (PhD) in Organic Materials Chemistry | Awarded: 11 June 2025 University of Hyderabad, India (Supervisor: Prof. Rajadurai Chandrasekar) Thesis: Flexible and Mechanically Dynamic Organic Crystal Waveguides
- Master of Science (M.Sc.) in Chemical Sciences | 2015 – 2017 University

of Kashmir, India.

- Bachelor of Science (B.Sc.) | 2011 – 2014 University of Kashmir, India.

TEACHING PROFICIENCY

- English, Urdu, Hindi and Persian.

RESEARCH PUBLICATION DETAILS

- Papers published: **9** International journals, h-index: **6**, Total citations: **185**– 29 April 2026.
- Google Scholar link: Rohullah Mehdi - Google Scholar
- Cumulative impact factor: >105

2025

9. Supradecoration induced homogenous electrochemical sensing: development of Ru(II) half sandwich complex as isoniazid and rifampicin dual sensor
M. Mustafa,[a] T. Jan,[a] **M. Rohullah**,[b] M. H. Masoodi,[c] N. U. D. Reshi *[d], M. A. Rizvi*[a]
RSC Advances, **2025**, *15*, 7004. (IF–4.6)

8. Thermo-Welded Periodic Arrays of Fluorescent Polymer Microspheres for Rollable Coupled-Resonator Optical Waveguides
K. Yadav, J. Hazarika, **M. Rohullah**, M. Chosenyah, R. Chandrasekar*
Small, **2025**, *21*, 2502583. (IF–13.0)

7. Hierarchical Optical Waveguides Based on Serpentine-Like Organic Pseudo-Plastic Crystals that Mimic Neural Networks
M. Rohullah, A. Vinod Kumar, M. Chosenyah, G. Sindhuja, R. Chandrasekar*
Angew. Chem. Int. Ed. **2025**, *64*, e202502122. (IF–16.823).

2024

6. Cornu-Spiral-Like Organic Crystal Waveguide Providing Discriminatory Optical Pathway for Smart Organic Photonic Circuit
M. Rohullah, A. Vinod Kumar, M. Chosenyah, R. Chandrasekar*
Small, **2024**, *21*, 2407498. (IF–13.0).

5. Mechanically-controlled multifaceted dynamic transformations in twisted
organic crystal waveguides.
M. Rohullah, V. V. Pradeep, S. Singh, R. Chandrasekar*
Nat. Commun. **2024**,*15*, 404. (IF–14.7).

4. A Hybrid Organic-Crystal-based Curved Waveguide Network for Producing, Splitting, and Transducing Multi-Color Outputs.
M. Rohullah, A. Vinod Kumar, R. Chandrasekar*
Laser & Photonics Reviews, **2024**, *18*, 2400020. (IF–11).2023

2023

3. Amphibian-like Flexible Organic Crystal Optical Fibres for Underwater/Air Micro-Precision Lighting and Sensing
M. Rohullah, A. Vinod Kumar, M. Chosenyah, J. Ravi, U. Venkataramudu, R. Chandrasekar* *Angew. Chem. Int. Ed*. **2023**, *62*, e202300046. (IF – 16.823)

2022

2. Micromechanically-Powered Rolling Locomotion of Twisted-Crystal Optical-Waveguide-Cavity as a Mobile Light Polarization Rotor.
M. Rohullah, V. Vinay Pradeep, J. Ravi, A. Vinod Kumar, R. Chandrasekar*
Angew. Chem. Int. Ed. **2022**, *61*, e202202114. (IF – 16.823)

2021

1. Mechanophotonic Aspects of a Room Temperature Phosphorescent Flexible Organic Microcrystal.
A. Vinod Kumar, M. Rohullah, J. Ravi, M. Godumala, M. Annadhasan, R. Chandrasekar*
CrystEngComm, **2021**, *23*, 5774 - 5779. (IF – 3.756)

DETAILS OF CONFERENCE/ SEMINAR /WORKSHOP/FDP (ATTENDED/ PRESENTED)

- **March-2023:** Presented a global online poster titled as "Mechanically-controlled multifaceted dynamic transformations in twisted organic crystal waveguides" on LinkedIn, organized by RSCPoster 2024.
- **March-2023:** Delivered a talk and also presented a poster entitled as "Amphibian-like Flexible Organic Crystal Optical Fibres for Underwater/Air Micro-Precision Lighting and Sensing" at the in-house symposium ChemFest- 2023, School of Chemistry, University of Hyderabad, Hyderabad.
- **April-2022:** Presented a poster entitled as "Micromechanically-Powered Rolling Locomotion of Twisted-Crystal Optical-Waveguide-Cavity as a Mobile Light Polarization Rotor." at the in-house symposium ChemFest- 2022, School of Chemistry, University of Hyderabad, Hyderabad.
- **September-2022:** Presented a poster entitled "Micromechanically-Powered Rolling Locomotion of Twisted-Crystal Optical-Waveguide-Cavity as a Mobile Light Polarization Rotor." at the International Conference on Frontier Areas of Science and Technology, ICFAST-2022, University of Hyderabad, Hyderabad. (**International conference**).
- **June-2022:** Attended summer school on "Optics & Photonics: Fundamentals and Applications"organized online by the Optics and Photonics Centre, Indian Institute of Technology Delhi.

DETAILS OF KEYNOTE SPEAKER/RESOURCE PERSON/ SESSION CHAIR ETC.

- Session chaired at the in-house symposium ChemFest- 2025, School of Chemistry, University of Hyderabad, Hyderabad.

DETAILS OF

SUPERVISION (M.PHIL/M.TECH/P.HD.)

PROFESSIONAL MEMBERSHIPS

Member of Royal Society of Chemistry (MRSC)

PERSONAL DETAILS:

Father's Name:	Sheikh Ghulam Abass
Date of Birth:	07-11-1991
Gender:	Male
Marital Status:	Married
Nationality:	Indian
Language Known:	English, Urdu, Persian, Ladakhi

Date: 30-04-2026
Place: Hyderabad, Telangana

[Last update on: 30 /04/2026]