

Dr. Suman Chirra

Ph.D. (Chemistry) | MSCA-CZ Postdoctoral Researcher

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RESEARCH PROFILE

Materials chemist with a Ph.D. from NIT Warangal, India, and an active research record in porous materials, metal-organic frameworks (MOFs), and heterogeneous catalysis. Currently, MSCA-CZ Postdoctoral Researcher at the University of Pardubice, with prior postdoctoral experience at NCKU, Taiwan, and a recent academic appointment as Assistant Professor & Head of Department, Chemistry, at Woxsen University. Research focus: design and synthesis of nanoporous catalysts for photocatalytic and electrocatalytic CO₂ reduction, H₂ production, and gas adsorption/separation. Demonstrated track record of independent publication, international collaboration, conference convening, and laboratory teaching at both undergraduate and postgraduate levels.

Citation metrics (Google Scholar, August 2026): 361 citations · h-index: 11 · i10-index: 12

Publication record: 26 peer-reviewed journal articles (incl. 6 first author), 4 conference proceedings, 2 Springer book chapters, 3 design patents filed/published.

RESEARCH POSITIONS

Oct 2025 – Present **MSCA-CZ Postdoctoral Researcher**

Department of Physical Chemistry, Faculty of Chemical Technology

University of Pardubice (UPCE), Czech Republic

Apr 2022 – Jul 2023 **Postdoctoral Fellow**

Department of Chemical Engineering

National Cheng Kung University (NCKU), Tainan, Taiwan

Oct 2021 – Dec 2021 **Research Associate**

Department of Energy & Environmental Engineering

CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad, India

***Note on career continuity:** The interval Aug 2023 - Jul 2024 was spent on professional relocation from Taiwan to India and on preparing the establishment of the new Department of Chemistry at Woxsen University; research outputs from this period appear in the 2024-2025*

EDUCATION

Dec 2014 – Aug 2020 **Doctor of Philosophy (Ph.D.) in Chemistry**

Department of Chemistry, National Institute of Technology (NIT) Warangal, India

Supervisor: Prof. N. Venkatathri

Thesis: Development of selected multi-valent metal ion-containing mesoporous materials and studies on their applications.

Jul 2009 – Jun 2011 **Master of Science (M.Sc.) in Chemistry**

Osmania University, Hyderabad, Telangana, India - 71.77% (First Division with Distinction)

Jun 2005 – Apr 2008 **Bachelor of Science (B.Sc.) - Biotechnology, Zoology, Chemistry**

Kakatiya University, Warangal, Telangana, India - 70.22% (First Division with Distinction)

ACADEMIC & TEACHING POSITIONS

Jul 2024 – May 2025 Assistant Professor & Head, Department of Chemistry

School of Sciences, Woxsen University, Hyderabad, India

Led the newly established Department of Chemistry; designed and delivered B.Sc. coursework; convened the InnoChem-25 international conference; and mentored undergraduate research projects.

May 2021 – Oct 2021 Assistant Professor in Chemistry

Balaji Institute of Technology & Science, Narsampet, Warangal, India

Dec 2014 – Dec 2019 Laboratory Instructor, Department of Chemistry

National Institute of Technology (NIT) Warangal, India

Conducted Chemistry laboratory courses for B.Tech (1st & 2nd year) and M.Sc. (1st & 2nd year) students while pursuing Ph.D. research (5 years).

Aug 2011 – Nov 2014 Lecturer in Chemistry

Shivani Degree & P.G. College, Karimnagar, Telangana, India

Taught postgraduate Chemistry courses over 3 years and 3 months.

RESEARCH INTERESTS

- Materials Chemistry and Porous Materials (MOFs, mesoporous silicas, zeolites)
- Photocatalytic and Electrocatalytic CO₂ Reduction and Hydrogen (H₂) Production
- Heterogeneous Catalysis and Gas Adsorption/Separation
- Dehydrogenation and Hydrogenation Reactions

SUMMARY OF RESEARCH EXPERIENCE

- Designed and synthesized novel metal-organic frameworks (MOFs), including NCKU-52, using new ligands, with successful single-crystal growth.
- Synthesized and characterized MCM-41, SBA-15, KIT-6, SAPO-35, ZIF-8, and various g-C₃N₄-based nanocomposite catalysts for photo- and electrocatalytic applications.
- Hands-on expertise in materials and surface characterization: PXRD, SEM, TEM, TG-DTA, BET, DLS, FT-IR, ESR, XPS, UV-Vis, UV-Vis-DRS, and GC.
- Conducted independent and collaborative research within international, interdisciplinary teams across India, Taiwan, Spain, and the Czech Republic.
- Proficient in literature and patent searching (SciFinder, Reaxys), project management, technical writing, and laboratory safety practices.

HONOURS, AWARDS & FELLOWSHIPS

- **MSCA-CZ Postdoctoral Fellowship** - Awarded under the MSCA Fellowships CZ scheme, funded by the Ministry of Education, Youth and Sports of the Czech Republic; hosted at the University of Pardubice (Oct 2025 - present).
- **Erasmus+ International Credit Mobility (E+KA107) Fellowship** - Three-month research fellowship at CIQUS, University of Santiago de Compostela (USC), Spain; supervisor Dr. Pablo del Pino (Sep - Dec 2018).
- **TEEP@AsiaPlus Short-Term Research Internship** - Two-month research internship at the Department of Medicinal & Applied Chemistry, Kaohsiung Medical University (KMU), Taiwan; supervisor Prof. Li-Fang Wang (Sep - Oct 2019).
- **DAAD SDG Graduate School RoHan Fellowship** - Awarded a 6-month South-South Postdoc Scholarship at GeViCat Center of Catalysis, HUST/VNU-HUS, Hanoi, Vietnam (RoHan programme, 2022). Not utilized due to COVID-19 mobility restrictions.

- **SPECTROCAT 2026 Summer School (Completed; Certificate of Attendance)** - Attended the lectures and lab practice sessions on Vibrational Spectroscopies Applied to Catalysis and Adsorption (in situ / operando IR and Raman), LCS Laboratory, ENSICAEN (CNRS, Normandie Université), Caen, France (29 June - 3 July 2026).
- **Guest Editor**, *Catalysts* (MDPI; Impact Factor 4.5, CiteScore 8.3) - Special Issue “New Insights into Photocatalytic CO₂ Reduction” (2026; manuscript submission deadline 30 January 2027). Certificate of Service issued by the Editor-in-Chief, Prof. Dr. Keith Hohn (June 2026).
- **Reviewer for international journals**, *ACS Omega*, *Scientific Reports*, *Materials Today Chemistry*, *Journal of Nanoparticle Research*, *Biomass & Bioenergy*, *Journal of Porous Materials*, *Silicon*, *Discover Materials*, *Journal of Cluster Science*, *Materials Today: Proceedings*, *Results in Engineering*, *In Silico Research in Biomedicine*, *Journal of Molecular Structure*, *Nanomaterials*, *Polymers*, *AppliedChem*, *Clean Technologies*, *Chemistry*, *Catalysts*, *Materials*, *International Journal of Molecular Sciences*, and *Journal of Materials Science: Materials in Electronics*.

PUBLICATIONS IN PEER-REVIEWED INTERNATIONAL JOURNALS

Total: 26 articles · First author: 6 · Self-name highlighted in bold throughout. Citation metrics (Google Scholar, August 2026): 361 citations, h-index 11, i10-index 12.

1. Goskula, S., Gujjula, S. R., Siliveri, S., **Chirra, S.**, & Narayanan, V. (2026). Fabrication of porous La₂O₃/r-GO nanocomposites for enhanced post-combustion CO₂ capture. *Journal of Porous Materials*, 33(1), 339–347.
2. Gujjula, S. R., Chanda, N., Karingula, S., Goskula, S., **Chirra, S.**, Pal, U., & Narayanan, V. (2025). MOF-derived synergistic Co₉S₈@C/Ag₃VO₄ nanohybrids for enhanced photo- and electrocatalytic hydrogen production. *Journal of Materials Science*, 60(36), 16240–16260.
3. Waghmode, M. S., Sahoo, D. K., Patil, N. N., Abhyankar, P. S., **Chirra, S.**, & Sohajda, T. (2025). Unveiling the environmental threat of acetaminophen: ecotoxicology, microbial remediation and molecular modelling insights. *Environmental Monitoring and Assessment*, 197(12).
4. Reddy, G. N., Aash, A., **Chirra, S.**, Karmakar, S., & Roymahapatra, G. (2025). Hydrogen storage on a star-like CBe₅Li⁺ superalkali cluster featuring planar pentacoordinate carbon. *Computational and Theoretical Chemistry*, 1253, 115447.
5. **Chirra, S.**, Gujjula, S. R., Siliveri, S., Goskula, S., Andugula, C. M., Ponnala, V. K., & Narayanan, V. (2025). Characterisation and drug-delivery potential of ibuprofen using modified high-surface-area porous materials. *Silicon*, 17(6), 1481–1491. **[First author]**
6. **Chirra, S.**, Gujjula, S. R., Manda, S., Goskula, S., & Narayanan, V. (2025). Fabrication of porous nano-silica materials by template-assisted strategy for controlled drug-delivery studies. *Journal of Porous Materials*, 32(2), 761–772. **[First author]**
7. Goskula, S., Siliveri, S., Gujjula, S. R., Adepur, A. K., **Chirra, S.**, & Narayanan, V. (2024). Activated sustainable porous carbon adsorbents from Karanja shell biomass and their CO₂ adsorption. *Biomass Conversion and Biorefinery*, 14(24), 32413–32425.
8. Fu, S., Chang, C., Ivanov, A. S., Popovs, I., Chen, J., Liao, Y., Liu, H., **Chirra, S.**, Chiang, Y., Lee, J., Liu, W., Kaveevivitchai, W., & Chen, T. (2023). Mixed-valence Cu^I/Cu^{III} metal–organic frameworks with non-innocent ligand for multielectron transfer. *Angewandte Chemie International Edition*, 62(50), e202312494.
9. Gujjula, S. R., Pal, U., Chanda, N., Karingula, S., **Chirra, S.**, Siliveri, S., Goskula, S., & Narayanan, V. (2023). Versatile bifunctional Ag@g-C₃N₄/r-GO catalyst for efficient photo- and electrocatalytic H₂ production. *Energy & Fuels*, 37(13), 9722–9735.
10. Gujjula, S. R., Karingula, S., Shajahan, S., Siliveri, S., Goskula, S., **Chirra, S.**, Gobi, K. V., & Narayanan, V. (2023). Rational design of MOF-derived porous Au@Co₃O₄/C nanocomposite materials for electrochemical overall water splitting. *Journal of Materials Science*, 58(22), 9130–9147.
11. Goskula, S., Siliveri, S., Gujjula, S. R., **Chirra, S.**, & Narayanan, V. (2023). Synthesis of sustainable acid biochar catalysts derived from waste biomass for esterification of glycerol. *ChemistrySelect*, 8(11).
12. Goskula, S., Siliveri, S., Gujjula, S. R., **Chirra, S.**, Adepur, A. K., & Narayanan, V. (2023). Sustainable development of activated porous carbon materials from gum-arabic seed shell for CO₂ capture. *Water, Air & Soil Pollution*, 234(8).

13. Siliveri, S., Pinnepalli, S. S. K., Joshi, D., **Chirra, S.**, Goskula, S., Gujjula, S. R., Oyler, N. A., & Narayanan, V. (2021). Promoter-induced rapid non-aqueous synthesis of SAPO-35 and methanol-to-olefin reaction. *ACS Omega*, 6(8), 5661–5669.
14. **Chirra, S.**, Wang, L.-F., Aggarwal, H., Tsai, M.-F., Soorian, S. S., Siliveri, S., Goskula, S., Gujjula, S. R., & Narayanan, V. (2021). Rapid synthesis of a novel nanocrystalline mesoporous faujasite-type ZIF-8 catalyst and NaBH₄-assisted catalytic Rhodamine-B degradation. *Materials Today Communications*, 26, 101993. **[First author]**
15. Adepu, A. K., Siliveri, S., **Chirra, S.**, Goskula, S., Gujjula, S. R., Anumula, R., & Narayanan, V. (2020). Porous Fe₃O₄/titanosilicate/g-C₃N₄ ternary nanocomposites for photocatalytic Rhodamine-B degradation under sunlight. *Journal of Water Process Engineering*, 34, 101141.
16. **Chirra, S.**, Siliveri, S., Gangalla, R., Goskula, S., Gujjula, S. R., Adepu, A. K., Anumula, R., Sivasoorian, S. S., Wang, L.-F., & Narayanan, V. (2019). Multivalent metal-ion functionalised mesoporous silica with enhanced antimicrobial and cytotoxicity activity. *Journal of Materials Chemistry B*, 7(45), 7235–7245. **[First author]**
17. **Chirra, S.**, Siliveri, S., Adepu, A. K., Goskula, S., Gujjula, S. R., & Narayanan, V. (2019). Pd-KIT-6: synthesis of a novel three-dimensional mesoporous catalyst and its enhanced catalytic applications. *Journal of Porous Materials*, 26(6), 1667–1677. **[First author]**
18. Siliveri, S., **Chirra, S.**, Tyagi, C., Gandamalla, A., Adepu, A. K., Goskula, S., & Venkatathri, N. (2019). Porous TiO₂ anatase/SAPO-35 mild Brønsted-acidic nanocomposite for enhanced photocatalysis. *ChemistrySelect*, 4(31), 9135–9142.
19. Adepu, A. K., Goskula, S., **Chirra, S.**, Siliveri, S., Gujjula, S. R., & Narayanan, V. (2019). High-surface-area V₂O₅/TiO₂-SiO₂ catalyst for visible-light photocatalytic methylene-blue degradation. *RSC Advances*, 9(42), 24368–24376.
20. Adepu, A. K., Goskula, S., **Chirra, S.**, Siliveri, S., Gujjula, S. R., & Venkatathri, N. (2019). Magnetically separable porous titanosilicate/Fe₃O₄ hybrid nanocomposites with enhanced UV photocatalysis. *Journal of Porous Materials*, 26(5), 1259–1267.
21. **Chirra, S.**, & Venkatathri, N. (2018). Novel synthesis and new insight into vanadium incorporation in three-dimensional mesoporous KIT-6. *Materials Research Express*, 6(1), 015021. **[First author]**
22. Anumula, R., Adepu, A. K., **Chirra, S.**, Siliveri, S., & Narayanan, V. (2016). Titanium aminophosphates: synthesis, characterisation and crystal-violet dye degradation. *RSC Advances*, 6(1), 507–514.
23. Rajini, A., Suman, C. (**Chirra, S.**), Ajay Kumar, A., Suresh, S., & Venkatathri, N. (2016). Titanium aminophosphates as recyclable catalysts for xanthenedione synthesis. *Synthetic Communications*, 46(20), 1671–1677.
24. Rajini, A., Adepu, A. K., **Chirra, S.**, & Venkatathri, N. (2015). Porous palladium aminophosphates: synthesis, characterisation, antimicrobial and cytotoxicity studies. *RSC Advances*, 5(82), 66956–66964.
25. Rajini, A., Adepu, A. K., **Chirra, S.**, & Venkatathri, N. (2015). Titanium aminophosphates: synthesis, characterisation, antimicrobial and cytotoxicity studies. *RSC Advances*, 5(106), 87713–87722.
26. Rajini, A., Nookaraju, M., **Chirra, S.**, Adepu, A. K., & Venkatathri, N. (2015). Titanium aminophosphates: synthesis, characterisation and orange G dye degradation studies. *RSC Advances*, 5(129), 106509–106518.

CONFERENCE PROCEEDINGS

1. Pathak, A., Patra, S., Babar, S. S., & **Chirra, S.** (2025). Advanced porous materials for lead removal from water: synthesis, mechanisms, sustainability, and future perspectives. *Atlantis Advances in Applied Sciences*, pp. 333–350. Atlantis Press International BV. **[Corresponding author]**
2. Kothapalli, S. S. K., Sahoo, D. K., Kumar, T. S., & **Chirra, S.** (2025). Artificial intelligence in drug discovery: a comprehensive review. *Atlantis Advances in Applied Sciences*, pp. 180–200. Atlantis Press International BV. **[Corresponding author]**
3. **Chirra, S.**, Kalakuntala, R., Siliveri, S., Goskula, S., Gujjula, S. R., Naresh Yadav, D., Gurram, V. R. B., Srinath, S., & Venkatathri, N. (2021). Bifunctional mesoporous Ti-SBA-15-SO₃H catalyst: enhanced performance and kinetic modelling of lactic-acid esterification with n-butanol. *Materials Today: Proceedings*, 45, 3699–3708. **[First author]**
4. Siliveri, S., **Chirra, S.**, Goskula, S., Reddy Gujjula, S., & Narayanan, V. (2021). Pd/SAPO-35: synthesis, characterisation and Suzuki–Miyaura cross-coupling. *Materials Today: Proceedings*, 45, 3778–3783.

BOOK CHAPTERS

1. **Chirra, S.**, Aepuru, R., & Sathish, M. (2026). Tailored conducting polymers for photocatalytic treatment of water. *Springer Series on Polymer and Composite Materials*, pp. 81–114. Springer Nature Switzerland. [**First author**]
2. SK, S., Sathish, M., **Chirra, S.**, Rao, B. V. B., & Singh, N. (2026). Hybrid conducting polymers as sensors and biosensors. *Springer Series on Polymer and Composite Materials*, pp. 205–235. Springer Nature Switzerland.

PATENTS & INTELLECTUAL PROPERTY

No granted patents to date. Three Indian Design Patent applications have been successfully registered by the Indian Patent Office:

1. Indian Design Patent (Registered) – "Portable Reaction Flask Device for Real-Time Monitoring," Application No. 496567-001 / CBR No. 207663; filed 29/03/2026. Registered with certificate issued on 20/05/2026 (Class 10-05). Co-applicants: **S. Chirra**, R. K. Jain, M. K. Sahani, S. S. K. Kothapalli, S. Panchal, A. Mandal.
2. Indian Design Patent (Registered) – "Compact Pharmaceutical Testing Device," Application No. 497040-001 / CBR No. 207990; filed 01/04/2026. Registered with certificate issued on 10/06/2026 (Class 24-01). Inventor: **S. Chirra**; Applicant: Woxsen University. A licensing agreement has been executed with Woxsen University, demonstrating direct industrial-innovation uptake of the design.
3. Indian Design Patent (Registered) – "Portable Smart Device for Textile Waste Management," Application No. 504821-001 / CBR No. 213157; filed 07/06/2026. Registered with certificate issued on 30/07/2026 (Class 15-99). Co-applicants: D. A. Pradeep, **S. Chirra**, G. M. Nibrad, S. E. Ali, M. Afzal, M. Kumar.

INVITED TALKS, CONFERENCES & WORKSHOPS ORGANISED

Invited Talks

- **Invited Speaker**, 2nd International Conference on Sustainable Science and Technology for Tomorrow (SciTech-25), School of Sciences, Woxsen University, in association with UTEM Chile and INTI International University, Malaysia (8–12 December 2025).

Conferences & Workshops Organised

- **Convenor**, InnoChem-25: 1st International Conference on Recent Breakthroughs in Chemical Sciences, School of Sciences, Woxsen University (8–11 April 2025).
- **Convenor**, 1st International Symposium on Frontiers in Discovery: Integrating Computational Intelligence & Experimental Innovation, Department of Chemistry, Woxsen University (11–12 February 2025, online).
- **Session Chair**, BioMACS-25: 1st International Conference on Biomedical and Applied Clinical Sciences (25–28 February 2025, hybrid mode).
- **Session Chair**, International Conference on Sustainable Science and Technology for Tomorrow (SciTech-24), Woxsen University, Hyderabad (16–20 September 2024).
- **Coordinator**, IPR Awareness Workshop, Woxsen University, Hyderabad (24 December 2024).
- **Organiser**, National Periodic Table Day Celebration, Woxsen University (7 February 2025).

DOCTORAL COMMITTEE MEMBERSHIP & MENTORING

- **Member, Scholar Research Committee (SRC)** - Ph.D. programme of Mr. Chiranjeevi Bobba (Reg. 2406C9C014), SR University, India (notified March 2026 – present). Responsibilities include research plan approval, progress monitoring, comprehensive examination, and synopsis evaluation alongside four other faculty members.
- Co-supervised (informal) undergraduate and early postgraduate research projects at Woxsen University and NIT Warangal, contributing to publications listed under Conference Proceedings (entries 1 and 2, 2025) and several joint journal articles with co-authors from these groups.

- Mentored junior Ph.D. students of Prof. N. Venkatathri's group at NIT Warangal (2014–2020) in materials synthesis, characterisation, and manuscript preparation.

TECHNICAL & COMPUTER SKILLS

Characterisation:	PXRD, SEM, TEM, TG-DTA, BET, DLS, FT-IR, ESR, XPS, UV-Vis, UV-Vis-DRS, GC
Synthesis:	MOFs (incl. single-crystal growth), mesoporous silicas (MCM-41, SBA-15, KIT-6), SAPO-35, ZIF-8, g-C ₃ N ₄ nanocomposites
Software:	Microsoft 365, EndNote, Adobe Photoshop, ChemDraw Ultra 12.0, OriginPro 9, MestReNova
Crystallography:	Mercury 3.8, CCDC
Databases:	SciFinder, Reaxys

LANGUAGES

Telugu:	Mother tongue
English:	Fluent (speaking and writing)
Hindi:	Conversational (speaking and writing)

PROFESSIONAL MEMBERSHIPS

- Catalysis Society of India (CSI) - Lifetime Member since 2018
- American Chemical Society (ACS) - Member (ID: 30899724) since 2019
- Indian Chemical Society (ICS) - Life Fellow since 2026 (elected June 2026; No. 2026-LM-8910)
- Society of Carbon Dioxide Research and Innovation (CO₂India) - Lifetime Member (ID: SCRI-S-00059) since 2026
- Czech Chemical Society (Česká společnost chemická, ČSCH) - Member (ID: 1756) since 2026

REFERENCES

1. Prof. N. Venkatathri (Ph.D. Supervisor) Professor & Head, Department of Chemistry National Institute of Technology, Warangal-506004 Telangana, India Mobile: +91 9491319976 venkatathrin@nitw.ac.in	2. Prof. K. V. Gobi Professor (HAG), Department of Chemistry National Institute of Technology, Warangal-506004 Telangana, India Mobile: +91 9701047107 kvgobichem@nitw.ac.in
3. Prof. Sudarsanam Putla Assistant Professor, Department of Chemistry Indian Institute of Technology (IIT) Hyderabad Kandi-502284, Telangana, India Mobile: +91 9347171451 sudarsanam.putla@chy.iith.ac.in	4. Prof. Ujjwal Pal Scientist-G & Professor (AcSIR) CSIR-Indian Institute of Chemical Technology (CSIR-IICT) Hyderabad-500007, Telangana, India Mobile: +91 9932549107 ujjwalpal@iiict.res.in