Curriculum Vitae

Ritesh Haldar
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Date of Birth: 07.10.1986
Scientific publication (Google Scholar)
Home page

Expertise: Porous material
Membrane
Supramolecular Chemistry
Catalysis
Photophysics

Professional Experience

- May, 2021-till date, Reader-F, at Tata Institute of Fundamental Research (TIFR) Hyderabad, India
- 2018-Apriil, 2021, Research Associate (Group Leader), at Karlsruhe Institute of Technology (KIT), Germany
- 2016-2018, Alexander von Humboldt Postdoctoral Fellow, at Karlsruhe Institute of Technology (KIT), Germany
- 2015, Research Associate, at Pohang Institute of Science and Technology, Pohang, South Korea (5 months)
- 2015, Research Associate, at Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India (4 months)

Education

- 2015, PhD in Material Science, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
- 2009, Masters in Inorganic Chemistry, Department of Chemistry, University of Pune, India
- 2007, Bachelor's in Chemistry, University of Burdwan, West Bengal, India

Research Interests

- Metal-organic framework thin films
- Organic porous polymers and thin films
- Gas separation membranes
- Supramolecular chemistry
- Optoelectronics and sensors
- Heterogeneous catalysis

Achievements and Recognitions

- Merit-based Fellowship from NCL, Pune
- 1st rank in master's in Inorganic Chemistry, Department of Chemistry, University of Pune, India
- Travel grant from DST and CSIR, Govt. of India
- Best poster award in JNCASR in-house symposium, 2013.
- Postdoctoral Fellowship from Alexander von Humboldt Foundation (AvH) foundation, Germany
- Invited research article contribution to the special issue of Journal of Physics: Condensed Matter, on "Metal-organic Frameworks in Physics". 2020
- Invited research article: Emerging Investigator issue in "Molecular Systems Design and Engineering" 2022
- Invited perspective: "The new talent: Asia Pacific" issue in Dalton Transaction 2023
- Invited article for "Chemical Science 15th anniversary: Leading investigator collection"

Research Grants

- TIFR-Infosys Leading Edge Research Grant, 2022-2023

- SERB Starting Research Grant, 2022-2024
- CSIR extramural grant, 2023-2026

Scientific Presentations

- "*Supramolecular metal-organic hybrids: Charge transfer emission and molecular recognition of aromatic amines*": JNCASR-University of Melbourne Workshop on Functional Materials, May. 2014, JNCASR, Bangalore, India
- "*Surface anchored "Designer Solids": Metal-organic/organic thin films and their applications"*: Invited seminar, 28th Dec. 2018, JNCASR, Bangalore, India
- "Photophysics of the acenes in the enforced π stack: Design by a metal-organic, epitaxial thin film approach". Invited talk, 18th Dec, 2020, CPMU Silver Jubilee Meeting, JNCASR, Bangalore, India
- "*Exciton coupling and diffusion anisotropy in surface-anchored MOF thin films"* Invited talk, 30th July. 2021, ePorMat-Webinar, organized jointly by NISER Bhubaneswar, VIT Chennai and IIT Jammu, India
- "Epitaxially grown nanochannel membranes for chemical separation" TIFR Annual Chemistry Conference, 2021
- "Bottom-up membrane design strategies for chemical separation" In-house TIFR Hyderabad, 2022
- "Insight of molecular diffusion within nanopores: Bottom-up strategies for membrane design" Invited talk, Gitam Chemistry Research Conference, Vijag, 2023
- "Insight of molecular diffusion in the oriented nanochannels of metal-organic framework thin films" ACS meeting 2024
- "Tailored molecular diffusion in nanoporous material for separation and catalysis" CACEE 2024, TIFR Mumbai
- "Tailored molecular diffusion in nanoporous material for separation and catalysis" PARAM 2025, NISER Bhubaneswar
- "Molecular diffusion in nanoporous material for chemical separation" H3AC 2025, IIT Hyderabad -TIFR Hyderabad

Student Supervision Experience

- 7 TIFR graduate students (ongoing)
- 19 short term project students (Project A)
- 2 Summer research intern
- 2 Junior research fellow (1 ongoing)
- 3 Postdoctoral researcher (1 ongoing)

Teaching

- "Supramolecular Chemistry", 4 credit course, 2022, 2023, 2024, 2025
- "Chemistry of Transition Metals and Lanthanides", 2 credit course, 2023, 2024
- "Research publication and ethics"- Plagiarism, 2024, 2025

Scientific Collaborations

- TIFR Hyderabad: Prof. J. Mondal, Prof. T. N. Narayanan, Dr. S. Ghosh
- IIT Delhi: Dr. D. Ghosh

Research Patent

- "Process for purification of hydrocarbons", Indian patent number: WO 2021/144813A1, T.K. Maji, S. Laha, R. Haldar

- "A system, a method and a metal-organic framework catalyst film for enhancing catalytic reaction" Indian patent application: 202541024416, S. Panda, R. Haldar

Other academic activities

- Scientific journal review: Nature, Nature Chemistry, Nature Communications, JACS, Chemical Science, ACS Nano, Inorganic Chemistry, Chemical Communications, Small, Dalton Transactions, ACS Applied Materials Interfaces, Journal of Physical Chemistry, Langmuir
- External faculty member for JRF to SRF upgradation: IIT Bombay
- External expert for new chemistry course proposal in NISER Bhubaneswar
- Invited resource person: Training programme on "Chemical Science: Molecules to Materials" UGC-MMTTC, Assam University, Silchar, Sep, 2024
- Delivered a scientific lecture in TIFRH-OU (Osmania University) lecture series in chemistry: Outreach activity, 2025

List of selected publications

1. S. Panda, T. Maity, S. Sarkar, A. K. Manna, J. Mondal and R. Haldar,* "Diffusion-programmed catalysis in nanoporous material" ***Nat. Commun*****.** 2025, 16, 1231.
2. Z. Xu, A. Chandresh, A. Mauri, M. Esmaeilpour, V. Monnier, F. Odobel, L. Heinke, W. Wenzel, M. Kozlowska, S. Diring, R. Haldar and C. Wöll. "Regulated charge transfer in donor-acceptor metal-organic frameworks for highly-sensitive photodetectors" ***Angew Chem. Int. Ed****.* 2024, 63, e202414526.
3. T. Maity, S. Sarkar, S. Kundu, S. Panda, A. Sarkar, K. Mandal, S. Ghosh,* J. Mondal* and R. Haldar,* "Steering diffusion selectivity of chemical isomers within aligned nanochannels of metal-organic framework thin film" ***Nat. Commun*****.** 2024, 15, 9636.
4. S. Panda, S. Kundu, P. Malik, and R. Haldar* "Leveraging metal node-linker self-assembly to access functional anisotropy of zirconium-based MOF-on-MOF epitaxial heterostructure thin film" accepted article, ***Chem. Sci*****.** 2024 15 2586-2592.
5. S. Laha, N. Dwarkanath, A. Hazra, R. Haldar,* S. Balasubramanian* and T. K. Maji* "Noncovalent Interaction Guided Selectivity of Haloaromatic Isomers in a Flexible Porous Coordination Polymer" accepted article, ***Chem. Sci*****.** 2023, 14, 12321-12330
6. Z. Liu, Y, Liu, A. Chandresh, P. B. Pati, V. Monnier, L. Heinke, F. Odobel, S. Diring,* R. Haldar* and C. Wöll,* "Nanographene-based Metal-organic Framework Thin Films: Optimized Packing and Efficient Electron-Hole Separation Yielding Efficient Photodetector" accepted article, ***Adv. Funct. Mater.*** 2023, 2308847
7. T. Maity,# P. Malik,# S. Bawari, S. Ghosh, J. Mondal, and R. Haldar,* "Chemically Routed Interpore Molecular Diffusion in Metal-organic Framework Thin Films" ***Nat. Commun*****.** 2023, 14, 2212.
8. A. Nefedov,# R. Haldar,# Z. Xu, H. Kuehner, D. Hofmann, D. Goll, B. Sapotta, S. Hecht, M. Kritic, C. Rockstuhl, W. Wenzel, S. Braese, P. Tegeder, E. Zojer and C. Wöll, "Avoiding The Center-symmetry Trap: Programmed Assembly of Dipolar Precusors into Porous, Crystalline Molecular Thin Films", ***Adv. Mater.*** 2021, 33, 2103287
9. S. Laha,# R. Haldar,# N. Dwarkanath, S. Bonakala, A. Sharma, A. Hazra, S. Balasubramanian and T. K. Maji, "A Dynamic Chemical Clip in Supramolecular Framework for Sorting Alkylaromatic Isomers using Thermodynamic and Kinetic Preferences", ***Angew. Chem., Int. Ed*****.** 2021, 60, 19921-19927.

(Before joining TIFR Hyderabad)

10. R.Haldar, M. Kozlowska, M. Ganschow, S. Ghosh, M. Jakoby, H. Chen, F. Ghalami, W. Xie, S. Heidrich, Y. Tsutsui, J. Freudenberg, S. Seki, I. A. Howard, B. S. Richards, U. H.F. Bunz, M. Elstner,

W. Wenzel and C. Wöll, “Interplay of Structural Dynamics and Electronic Effects in an Engineered Assembly of Pentacene in a Metal-organic Framework” ***Chem. Sci.*** 2021, 12, 4477-4483

11. R.Haldar,* Z.-H. Fu, R. Joseph, D. Herrero, L. Martín-Gomis, B. S. Richards, I. A. Howard, A. Sastre-Santos and C. Wöll, “Guest-Responsive Polaritons in Porous Framework: Chromophoric Sponges in Optical QED Cavities” ***Chem. Sci.*** 2020, 11,7972-7978
12. N. Sikdar, A. Hazra, D. Samanta, R.Haldar and T. K. Maji, “Guest-Responsive Reversible Electron Transfer in a Crystalline Porous Framework Supported by Dynamic Building Node” ***Angew. Chem. Int. Ed.*** 2020, 59, 18479-18484
13. R.Haldar, L. Heinke and C. Wöll, “Advanced Photoresponsive Materials Using Metal-Organic Framework Approach” ***Adv. Mater***. 2020, 32, 1905227
14. D.-H. Chen, R.Haldar, B.L Neumeier, Z.-H. Fu, C. Feldman, C. Wöll, and E. Redel,“Tunable Emission in Heteroepitaxial Ln-SURMOFs” ***Adv. Funct. Mater***. 2019, 29, 1903086
15. R.Haldar, A. Mazel, M. Krstić, Q. Zhang, M. Jakoby, I. A. Howard, B. S. Richards, N. Jung, D. Jacquemin, S. Diring, W. Wenzel, F. Odobel and C. Wöll, “A de novo Strategy for Predictive Crystal Engineering to Tune Excitonic Coupling” ***Nat. Commun***. 2019, 10, 2048
16. R.Haldar,*# M. Jakoby,# A. Mazel, Q. Zhang, A. Welle, T. Mohamed, P. Krolla, W. Wenzel, S. Diring, F. Odobel, B. S. Richards, I. A. Howard and C. Wöll, “Anisotropic Energy Transfer in Crystalline Chromophore Assemblies” ***Nat. Commun***. 2018, 9, 4332
17. R.Haldar,* S. Diring, P. K. Samanta, M. Muth, W. Clancy, A. Mazel, S. Schlabach, F. Kirchhöfer, G. B.-Weiß, S. K. Pati, F. Odobel and C. Wöll, “Enhancing Selectivity and Kinetics in Oxidative Photocyclization by Supramolecular Control” ***Angew. Chem. Int. Ed.*** 2018, 57, 13662-13665
18. R.Haldar, R. Matsuda, S. Kitagawa, S. J. George and T. K. Maji, “Amine Responsive Adaptable Nanospaces: Fluorescent Porous Coordination Polymers for Molecular Recognition” ***Angew. Chem. Int. Ed.*** 2014, 53, 11772-11777

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