

No.: Advt/ IITT/CSRC/26-27/09

Date: 21-07-2026

Applications are invited from eligible Indian nationals for the post of Junior Research Fellow in an **Indian Space Research Organisation (ISRO)** sponsored project undertaken in the Department of Chemical Engineering.

Temporary Position Essential Qualification	Post Name Junior Research Fellow (JRF) B.E./B.Tech. in Chemical / Biochemical / Petroleum / Process / Mechanical / Materials / Energy / Metallurgical Engineering or allied disciplines with a valid GATE score;OR (ii) M.E./M.Tech. in the above disciplines; OR (iii) M.Sc. in Chemistry/Physics/Materials Science/Energy Science or allied disciplines with a valid NET/GATE/JEST/INSPIRE qualification or listed in https://www.isro.gov.in/ResearchFellowships.html In Above, 60% marks as average of all semesters in aggregate or CGPA/CPI grading of 6.5 on a 10-point scale or equivalent.
Project number	CHE2627002ISRONILE
Project Title	Molecular Dynamic Simulation for Identifying the Suitable Binder to Shape Metal-Organic Frameworks Adsorbent for VOC Removal
Sponsoring Agency	Indian Space Research Organisation (ISRO)
No. of positions	1
Consolidated monthly Salary	37000 + 10 % HRA
Principal Investigator (IIT)	PI Dr. Nilesh Choudhary CO PIs Prof. Anki Reddy Katha and Sasidhar Gumma
Department	Department of Chemical Engineering
Project Duration	2 years
Brief Project Description and Nature of Work	Summary of the Proposed Research Porous Metal-Organic Frameworks (MOFs) can effectively remove volatile organic components (VOC) in the space domain that far exceeds the standard adsorbents considered to date, e.g. zeolites and activated carbons. Demonstrated the strong potential of MOFs (eg. MILs, UiO-66, DUT-4, ALFFIVE, SIFSIX series) for the capture of contaminants encountered in onboard and satellite systems. However, the shaping of MOFs is very crucial to promote their uses in real operating conditions. The challenge is to identify the

	best binder to combine with the selected MOFs to ensure an optimal adhesion of the two components into the resulting shaped adsorbent, with the major concern being to maintain the intrinsic performance of the MOFs for the capture of VOC. The MOF/binder composites have attracted extensive attention, however the interface formed between the two components is far from understood since its exploration is still challenging from both theoretical and experimental stand points. Indeed, there is a critical need to combine molecular simulations based on a reliable atomistic description of the MOF/binder composites and advanced experimental techniques (HRTEM, NMR, XPS, etc.) to extend the knowledge of the corresponding solid/solid or solid/matrix interface. Molecular Dynamic (MD) simulations for adhesion of MOFs and binders on optimal shaping of the MOF adsorbents are used on evaluating the impact of shaped MOFs upon gas adsorption properties. For this purpose, the commonly known binders such as inorganic (e.g. Silica and Mesoporous q-alumina) and organic (e.g. PVA and PVB binders) could be employed. Scope of the work: • Computational exploration of the adhesion of MOFs and usual binders for optimal shaping of the adsorbents implying the use of quantum (DFT) and classical (Molecular Dynamics) molecular simulations. • Evaluation of the impact of the shaping of MOFs on their contaminant capture properties. Linkages to Space Programme: • Molecular dynamic simulation will be useful for designing CO₂ removal and VOC removal systems for Gaganyaan, Bharatiya Antariksha Station and other future man missions. Nature of work 1. Molecular simulation & Thermodynamics modelling 60-70% 2. Data science 15-20% 3. Experiments 15-20 %
Age Limit	AGE LIMIT as on 01.04.2026. 1. 28 years 2. 31 years for OBC candidates and 33 years in case of SC/ST candidates. Persons with Disability are eligible for age relaxation as per rules
Last date of application	05 August 2026
Additional Note	It is expected that candidate will continue the project as regular Phd Program
Application Link	https://forms.gle/wZa7WXQgtcH1WqEB9

Eligible candidates must attach a detailed CV specifying their qualifications and experience, along with scanned copies of their mark sheets and certificates from X class to date. A brief statement of purpose (Why are they interested in this project topic?) is also attached to the application link. Essential qualifications will be relaxed for the outstanding candidate.

The shortlisted candidates will be informed by Email only. Selection will be based on the qualification, experience, and an in-person/online interview at IIT Tirupati. No TA/DA shall be paid to candidates appearing for an interview online or offline. The interview date will be notified to the shortlisted candidates by Email. For any queries, send mail to csrc_recruitment@iittp.ac.in

IIT Tirupati also reserves the right to discontinue the position with 1-month notice if the performance is not satisfactory.

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