

Indian Institute of Science
Project Associate Position in Aerospace Engineering

Research area: *CFD Simulations of Supersonic/Hypersonic Turbulent Flow*

Job Description: Scramjet engines, jet engines with supersonic combustion capabilities that operate at hypersonic speeds, are at the forefront of space research across the world. One of the most critical and complex flow phenomena encountered in the intake of a scramjet engine is the shock-wave turbulent boundary layer interaction (SWTBLI). SWTBLI induces a separation of the turbulent boundary layer and results in low-frequency unsteadiness of the reflected shock structure. Both these features have a direct impact on the performance of the scramjet engine and warrant a deeper understanding. Large-Eddy Simulations (LES) resolves the unsteady flow physics and majority of the turbulence scales, and can therefore capture such unsteady and intricate phenomena with accuracy.

Applications are invited for the position of a Project Associate to join the *Turbulence Physics and Computational Research Lab* (<https://tpcrl.com/>), led by *Prof. Rishita Das*, to pursue research in numerical simulation and analysis of compressible turbulent flow. The project will involve conducting large LES simulations of turbulent flow in a hypersonic inflow scramjet engine intake and applying data-driven methods to understand the complex flow physics of the SWTBLI occurring inside the intake.

Essential Qualifications: Candidates must have a BTech or MTech degree in Aerospace Engineering, Mechanical Engineering or related fields.

Desired Qualifications: Candidates must have a strong background and interest in fluid dynamics and turbulence. Candidates with prior experience in programming in C, C++ or FORTRAN, specifically in DNS/LES simulations, and High-performance computing are preferred for this position.

Preferred Skills: Computational Fluid Dynamics, LES, High-performance computing

Duration: 2 years with a 3-month probation period.

Preferable Start Date: 01-May-2024

Salary: As per IISc norms

Application procedure: To apply, please send an email to Prof. Rishita Das at rishitadas@iisc.ac.in with a *cover letter* expressing your research interests and experiences in this area, your latest *CV* including names of *at least two references* for letters of recommendation, and University transcripts if available. Last date to send your application is 05-May-2024.

If you have any questions or need further information, please email Prof. Rishita Das.

Date of Announcement: 13-April-2024