

Shashank Ravichandir

[in shashankravichandir](#) | [shashankravichandir.github.io](#) | [✉ ravichandir@ipfdd.de](mailto:ravichandir@ipfdd.de)

EDUCATION

- **Lebniz Institute of Polymer Research and Technical University Dresden** Aug'24 - Present
Dresden, Saxony, Germany
Ph.D. in Physics
Advisors: [Prof. Jens-Uwe Sommer](#) and [Prof. Abhinav Sharma](#)
- **Jawaharlal Nehru Centre for Advanced Scientific Research** Sep'20 - Aug'23
Bengaluru, Karnataka, India
MS (Engg.) in Fluid Mechanics (GPA : 9.15/10.0)
Advisor : [Prof. Meheboob Alam](#)
- **National Institute of Technology Karnataka** Aug'16 - Jun'20
Surathkal, Karnataka, India
B.Tech in Mechanical Engineering (GPA : 8.88/10.0)

RESEARCH EXPERIENCE

- **Leibniz Institute of Polymer Research** Nov'23 - Present
Dresden, Saxony, Germany
Doctoral Researcher at the [Institute Theory of Polymers](#)
Advisors: [Prof. Jens-Uwe Sommer](#) and [Prof. Abhinav Sharma](#)
Important Projects
 - **Partially active polymers**
 - * Studied the accumulation behaviour of active-passive hybrid polymers in activity gradients by considering active Brownian particles in a Rouse model using the coarse-grained Fokker Planck equation (theory) and Langevin dynamics (simulations).
 - * Currently studying the conformational behaviour of such partially active polymers.
 - **Dynamics of odd systems**
 - * Studying the dynamics of particles with "odd" diffusive terms using Langevin dynamics simulations.
- **Jawaharlal Nehru Centre for Advanced Scientific Research** Jul'21 - Aug'23
Bengaluru, Karnataka, India
Graduate Researcher at the [Engineering Mechanics Unit](#)
Advisor: [Prof. Meheboob Alam](#)
Important Projects
 - **Study of dense granular flows**
 - * Implemented a Fast Spectral code to numerically solve the Boltzmann and generalized Enskog collision operators to study various dilute and dense flows of molecular and granular gases.
 - * Studied the hydrodynamics and rheology of various dense granular flows for a range of Knudsen numbers, coefficients of restitution and packing fractions.
 - **Study of rarefied dilute granular flows**
 - * Developed a parallelized DSMC solver that can simulate a variety of rarefied granular flows.
 - * Studied the hydrodynamics and rheology of granular Poiseuille flows for a range of Knudsen numbers and coefficients of restitution.
- **Indian Institute of Science** May'19 - Jul'20
Bengaluru, Karnataka, India
Research Intern (part-time/remote) at the [Department of Aerospace Engineering](#)
Advisor: [Prof. S V Raghurama Rao](#)
Important Projects

– **Novel discrete kinetic flux splitting scheme for Euler equations**

- * Developed a novel finite volume scheme for the Euler equations based on velocity splitting of the Boltzmann equation and used upwinding at the mesoscopic scale for each flux.
- * Implemented and validated the scheme for the 1D equations and worked on implementing a truly multi-dimensional scheme by incorporating distinct multidimensional upwinding schemes for each flux.

SKILLS

Programming Languages	C/C++ , Python, Matlab
Programming Techniques	Object Oriented Programming, Parallel computing, GPU Computing
Other Skills	Git, \LaTeX , ParaView, COMSOL

AWARDS AND HONORS

DAAD Doctoral Research Grant (2024 - Present)
DST India Graduate Scholarship (2020-2023)

PUBLICATIONS

- **Transport of molecules via polymerization in chemical gradients** [\[arxiv\]](#)
S. Ravichandir, B. Valecha, P.L. Muzzeddu, J.U. Sommer, and A. Sharma | *Under Review* (2024)
- **Scale dependence and non-isochoric effects on the thermohydrodynamics of rarefied Poiseuille flow** [\[link\]](#)
S. Ravichandir and. M Alam | *Journal of Fluid Mechanics* 996, A30 (2024)
- **Hydrodynamics, normal stress differences and heat transfer in rarefied pressure driven Poiseuille flow** [\[link\]](#)
S. Ravichandir and M. Alam | *AIP Conference Proceedings. Vol. 2996. No. 1* (2024)
- **Shear-induced heat transport and the relevance of generalized Fourier's law in granular Poiseuille flow** [\[link\]](#)
M. Alam, R. Gupta and S. Ravichandir | *Physical Review Fluids* 6.11 (2021)

TALKS AND POSTERS

- **Chemotaxis of an active particle connected to a semiflexible cargo**
S. Ravichandir, A. Sharma, and J.U. Sommer | *Talk at the DPG Spring Meeting, Berlin* (2024)
- **Active polymers in inhomogeneous environments**
S. Ravichandir, A. Sharma, and J.U. Sommer | *Poster at the Conference on Dynamics of Interfaces, Augsburg* (2024)
- **Hydrodynamics and rheology of rarefied molecular and granular gases**
S. Ravichandir and M. Alam | *Poster at Engineering Mechanics Unit, JNCASR, Bengaluru* (2022)
- **Hydrodynamics, normal stress differences and heat transport in rarefied pressure driven Poiseuille flow**
S. Ravichandir and M. Alam | *Talk at the 32nd International Symposium on Rarefied Gas Dynamics, Seoul* (2022)

TEACHING

Applied Mathematics Teaching Assistant at JNCASR (January 2023 - May 2023)