

Postdoctoral Researcher Positions in Computational Plasma Physics and Plasma Engineering

Prof. Yinjian Zhao's Group, Harbin Institute of Technology (HIT)

School of Energy Science and Engineering, Harbin, China

Location:	Harbin Institute of Technology, Harbin, China
Type:	Full-time postdoctoral researcher positions
Start date:	Flexible; applications will be reviewed on a rolling basis
Contact:	Prof. Yinjian Zhao, zhaoyinjian@hit.edu.cn
Profiles:	homepage.hit.edu.cn/zhaoyinjian ; Google Scholar; ResearchGate

International applicants are warmly encouraged to apply. Applications in English are welcome.

Position Description

One or more postdoctoral researcher positions are available in Prof. Yinjian Zhao's group at Harbin Institute of Technology. The group develops physical models, numerical algorithms, and high-performance simulation tools for plasma physics and plasma engineering. We welcome creative candidates interested in kinetic simulation, hybrid modeling, plasma theory, and computational methods. Specific research topics will be discussed with each candidate and shaped according to the candidate's background and strengths.

Possible Research Directions

- Electric propulsion plasmas: Hall thrusters, hollow cathodes, cusped-field thrusters, ion thrusters, electrospray/colloid thrusters, plumes, beam neutralization, and plasma-device interactions.
- Instabilities and transport: electron drift instability, azimuthal instability, anomalous electron transport, sheath physics, plasma-wall interaction, and discharge oscillations in magnetized low-temperature plasmas.
- Semiconductor and low-temperature plasma processing: photoionization, plasma etching, sheath dynamics, gas-phase chemistry, and plasma-surface reaction coupling.
- Simulation algorithms: particle-in-cell (PIC), particle-particle (PP) Coulomb models, Monte Carlo collision (MCC), fluid-particle hybrid models, conservative deposition, cylindrical geometry, and nonuniform meshes.
- High-performance computing: CPU/GPU parallelization, scalable code development, and open-source plasma simulation software.
- Broader plasma physics: dense plasma focus and fusion-relevant plasmas, plasma-based accelerators, wave-plasma interactions, turbulence, and collisional plasma dynamics.

Qualifications

- Ph.D. in plasma physics, aerospace engineering, electrical engineering, mechanical engineering, chemical engineering, materials science, applied mathematics, computational science, or a related field by the start date.
- Background in at least one relevant area such as kinetic plasma simulation, fluid/hybrid modeling, numerical methods, high-performance computing, electric propulsion, low-temperature plasma processing, or plasma diagnostics.
- Programming experience in C/C++, Fortran, Python, CUDA/HIP, MPI, OpenMP, or related scientific-computing tools is desirable.
- Strong technical writing ability, motivation to publish high-quality research, and ability to collaborate with graduate students and external partners.

Application Materials

Please email a single PDF package, or clearly organized PDF files, to Prof. Yinjian Zhao at zhaoyinjian@hit.edu.cn. Use the subject line "Postdoctoral Application - Your Name" and attach:

- Curriculum vitae with publication list.
- Brief cover letter or research statement describing research interests and relevant experience.
- One to three representative publications or preprints.
- Contact information for two or three references and earliest possible start date.

About the Group and HIT

Prof. Yinjian Zhao is an Associate Professor at Harbin Institute of Technology. His research spans electric propulsion, dense plasma focus and fusion-relevant plasmas, plasma-based accelerators, wave-plasma interactions, and computational plasma algorithms. Before joining HIT, he received his Ph.D. in Astronautical Engineering from the University of Southern California and worked as a postdoctoral fellow at Lawrence Berkeley National Laboratory, where he contributed to the open-source large-scale CPU/GPU parallel electromagnetic PIC code WarpX. HIT has strong traditions in aerospace, astronautics, energy, and engineering; the group offers opportunities to work on funded projects, develop independent research ideas, collaborate across disciplines, and build an international publication record.