Dear Max-Planck INSTITUT team

I am writing to express my interest in numerical methods in plasma physics. With a Ph.D. in plasma physics from the University of Science and Technology of China and my current postdoctoral appointment at the University of California, Davis, I bring a unique combination of expertise in kinetic modeling and hands-on experience with fusion diagnostics, positioning me to make a meaningful contribution to your team.

My research background centers on computational plasma modeling. I developed a kinetic solver that combines the spectral method with the object-oriented program, enabling efficient simulation of 0D2P runaway electron dynamics under time-varying discharge conditions. This solver self-consistently incorporates electric field acceleration, collisions, synchrotron damping, and avalanche growth, making it a powerful tool for exploring non-thermal electron behavior and validating theoretical models. In addition, I have created a 2D FDTD beam tracing program to optimize wave propagation and diagnostic design, which further strengthened my skills in high-performance simulation and algorithm development.

While my primary interest lies in modeling, I also bring deep experience in fusion plasma diagnostics, having led the development and upgrade of millimeter-wave and laser-based diagnostics for NSTX-U, DIII-D, and EAST. These projects demanded cross-disciplinary collaboration, optical design, automation software development (LabVIEW and Python), and hands-on experimental commissioning—experience that gives me a strong understanding of the practical constraints and physics requirements that computational tools must support.

I am enthusiastic about applying my modeling expertise to advance the predictive understanding of plasma behavior and support diagnostic design and interpretation. I believe my combined skills in simulation, code development, and experimental collaboration will allow me to contribute effectively in fusion research.

Thank you for considering my application. I would welcome the opportunity to discuss how my background aligns with your needs in computational plasma modeling and diagnostics.

Sincerely,
**Xinhang Xu**