Genia Victoria Vogman

Graduate Institution: University of California-Berkeley

Graduate Discipline: Computational Plasma Physics

Hometown: Olympia, WA

Relevant SC Research: Fusion Energy Sciences

Research Interest:

My research is focused on advancing our understanding of multi-scale dynamics of plasmas, which have fluid, kinetic, and electromagnetic properties. In particular, I am interested in developing high fidelity and high performance models that capture the vast range of spatial and temporal scales exhibited in plasma phenomena such as magnetic reconnection and field-reversed configurations. Plasmas are typically modeled with either magnetohydrodynamic (MHD) or kinetic models. MHD assumes low-frequency dynamics, whereas kinetic models are completely general, but computationally costly. Model selection thus limits the temporal and spatial scales that can be resolved. To extend the range of scales that can be captured, my research aims to develop a hybrid plasma model that couples a kinetic representation to a fluid MHD representation, whilst maintaining desirable conservation properties for algorithms: conservation of mass, momentum, and energy.

About Me:

I completed my undergraduate work at the University of Washington in Seattle, where I received a BS in Aeronautics and Astronautics and a BA in Mathematics. My previous research projects include developing spectroscopic diagnostics on the ZaP Flow Z-pinch experiment at the University of Washington, and working at the NASA Ames Research Center to advance current radiative heat transfer models of hypersonic vehicle bow shocks. My current research allows me to split my time between UC Berkeley and DOE's Lawrence Berkeley National Lab, which houses the supercomputing resources I use in my research. Outside of research and academics, I enjoy reading, foreign films, traveling, yoga, tennis, and swimming. Having been inspired by great advisors (Professor Uri Shumlak and Dr. Phillip Colella), I intend to pursue a career in academic research.