

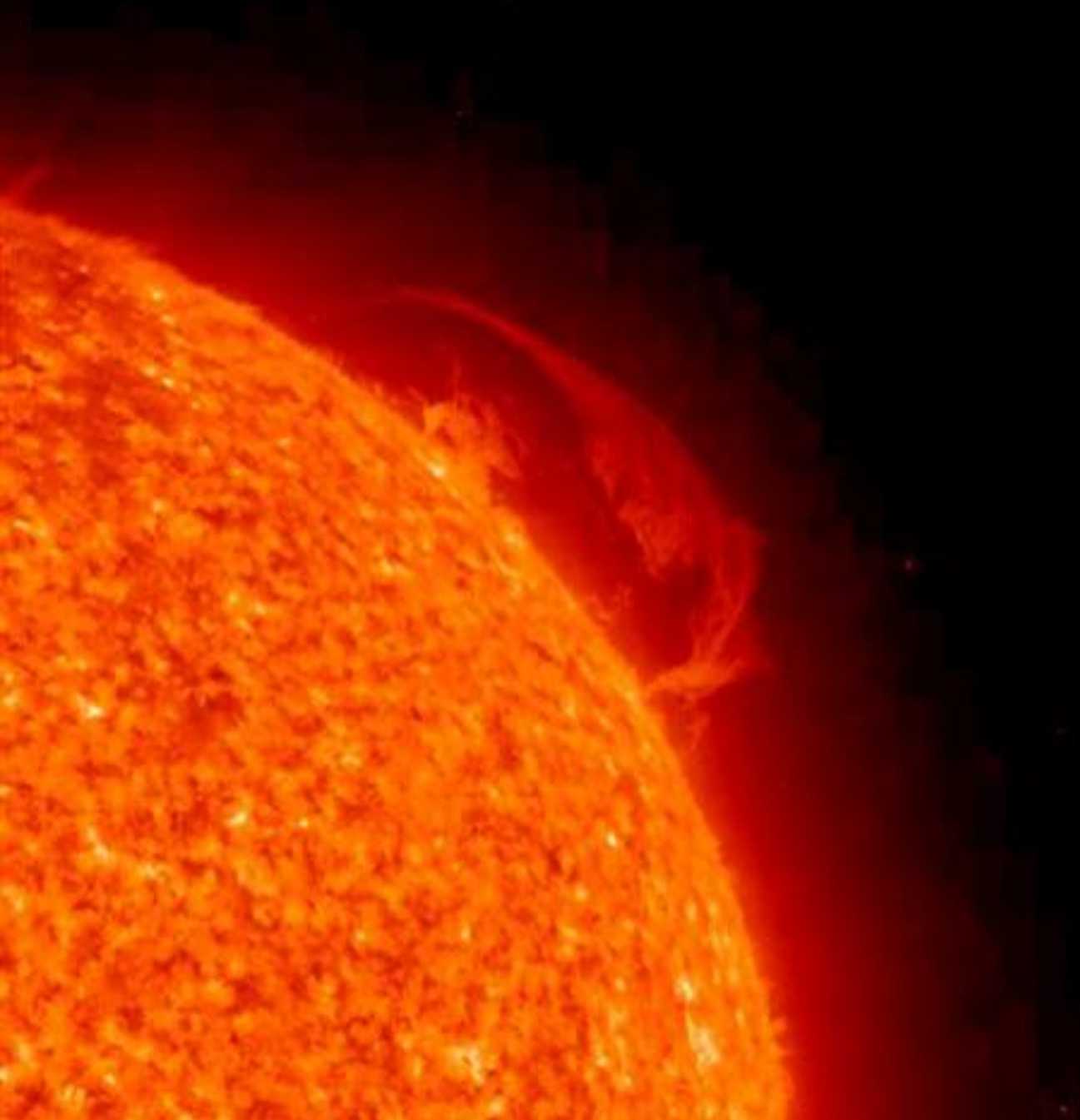


Theory, Modeling & Physics-based Numerical Simulation of Plasma Rockets at NASA

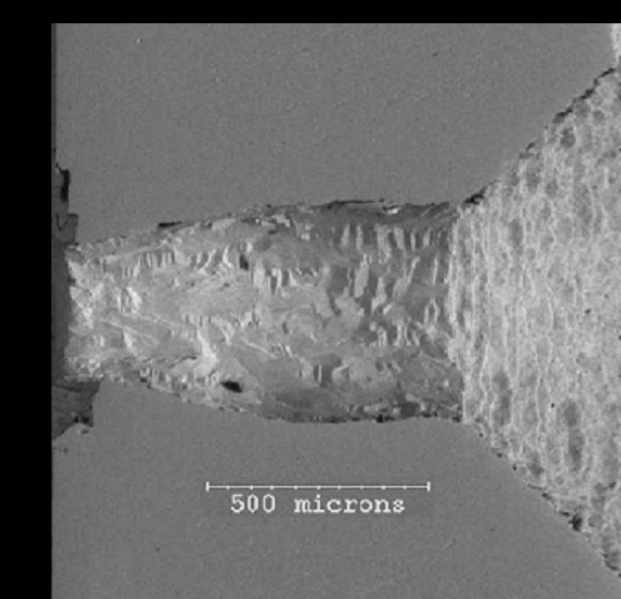
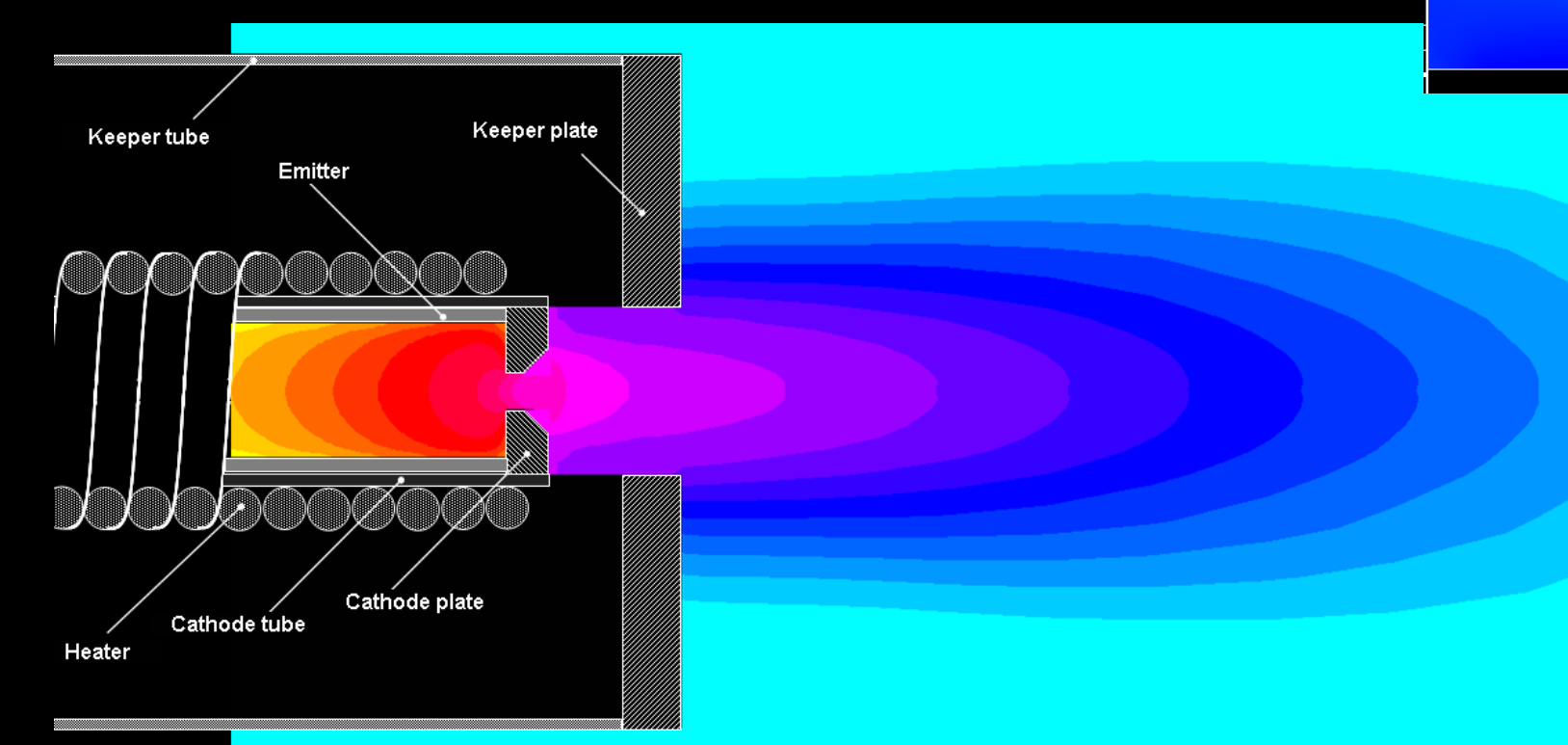
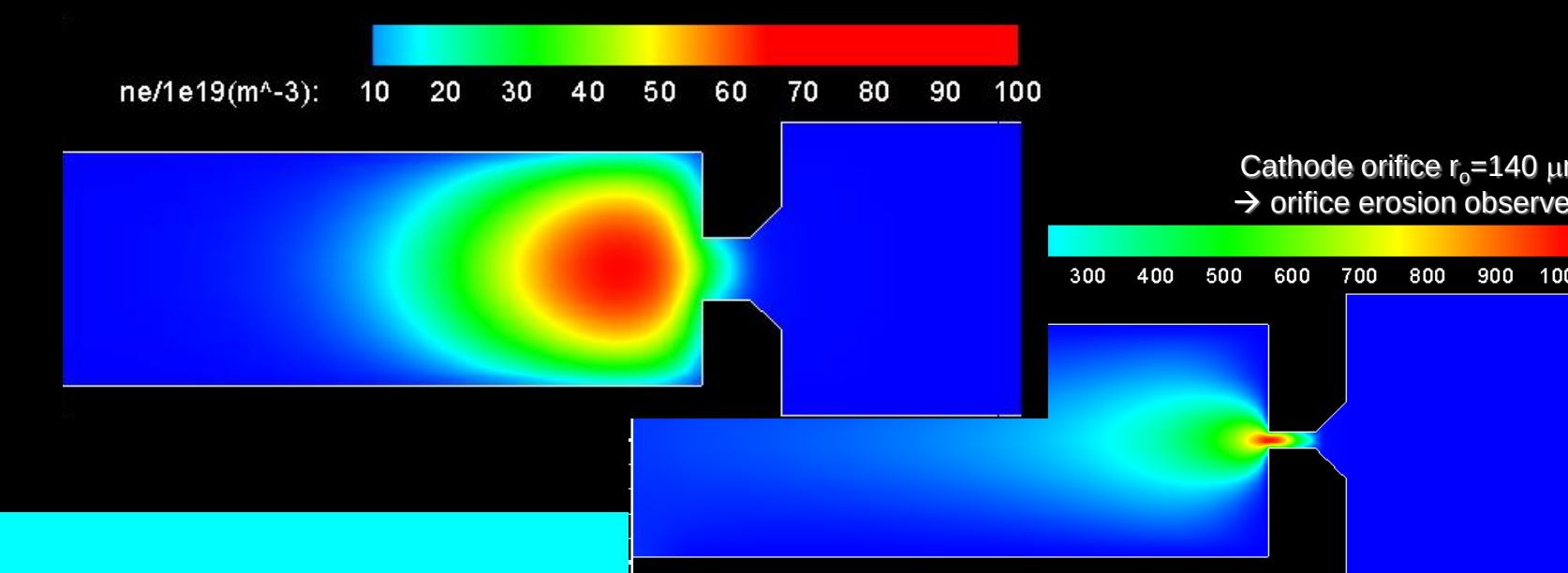
Dr. Ioannis G. Mikellides, Jet Propulsion Laboratory, California Institute of Technology **JPL**

THE MISSION OF THE MODELING & SIMULATION PROGRAM IN PLASMA PROPULSION AT JPL IS

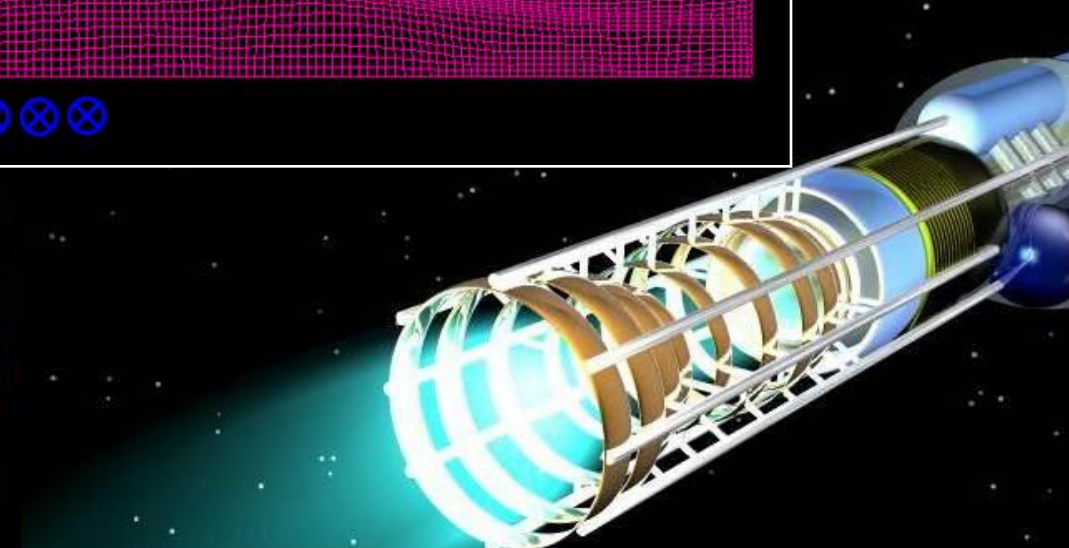
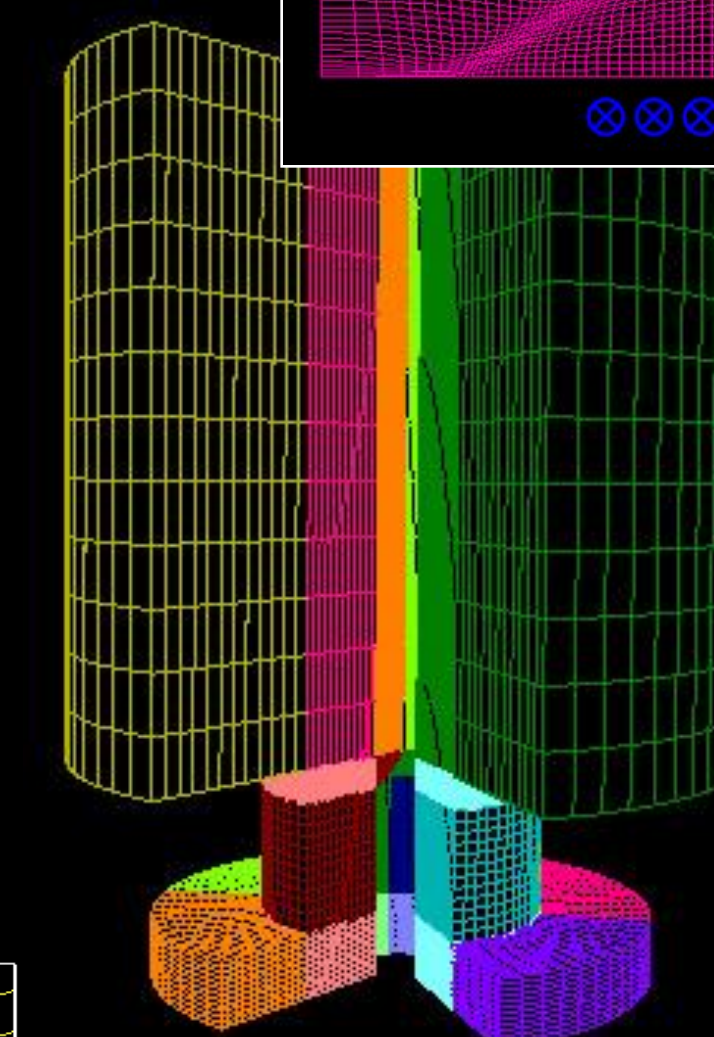
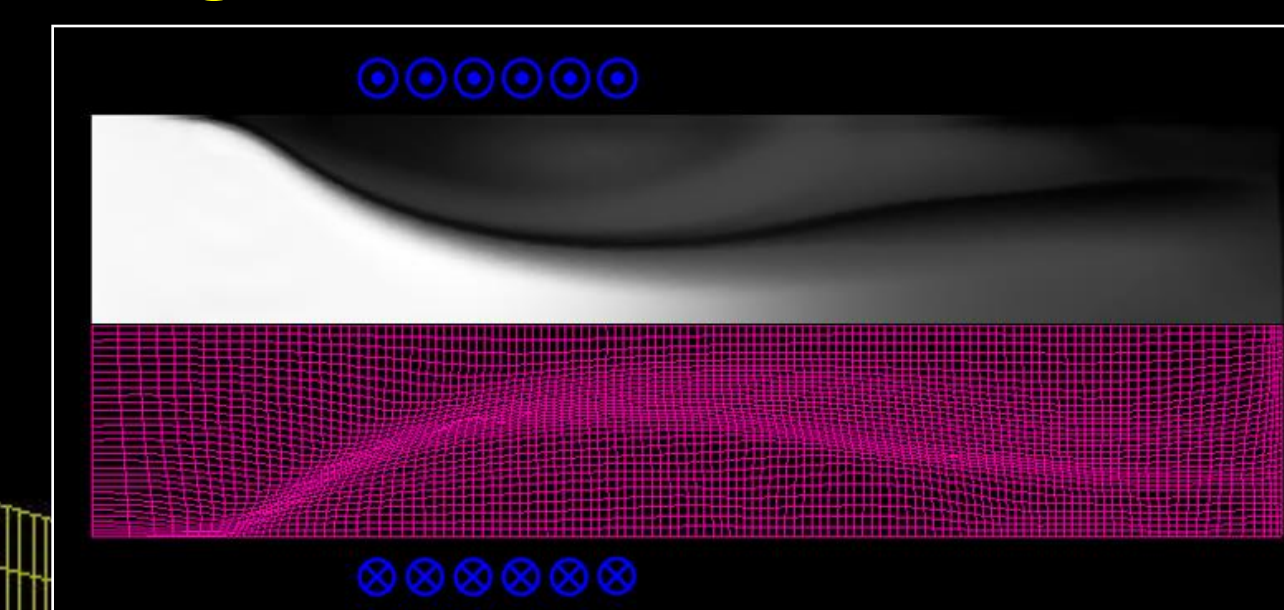
- To Understand Driving Plasma Physics
- To Guide Designs
- To Diminish Technology Risk
- To Reduce Qualification Costs and
- To Shorten Time To Flight for NASA Science Missions



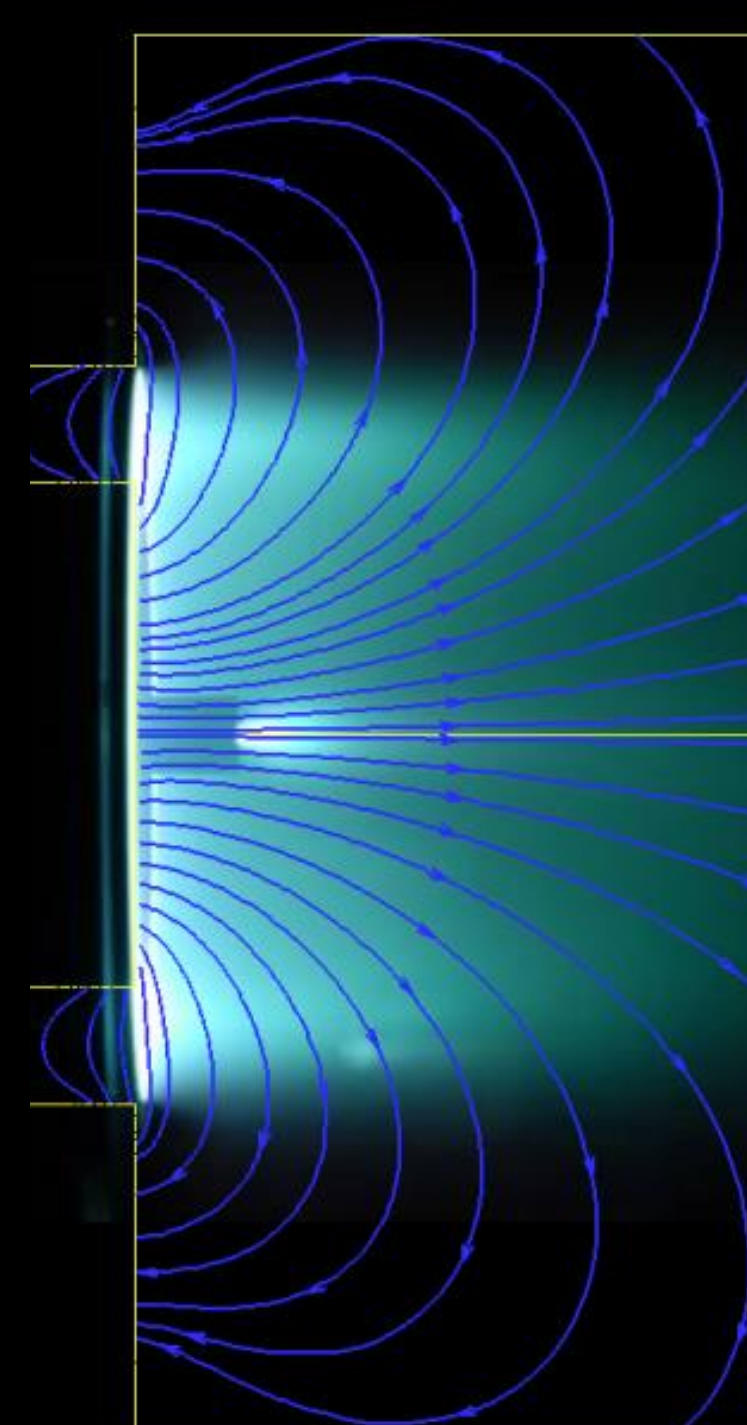
Navier-Stokes plasma solvers for hollow cathodes



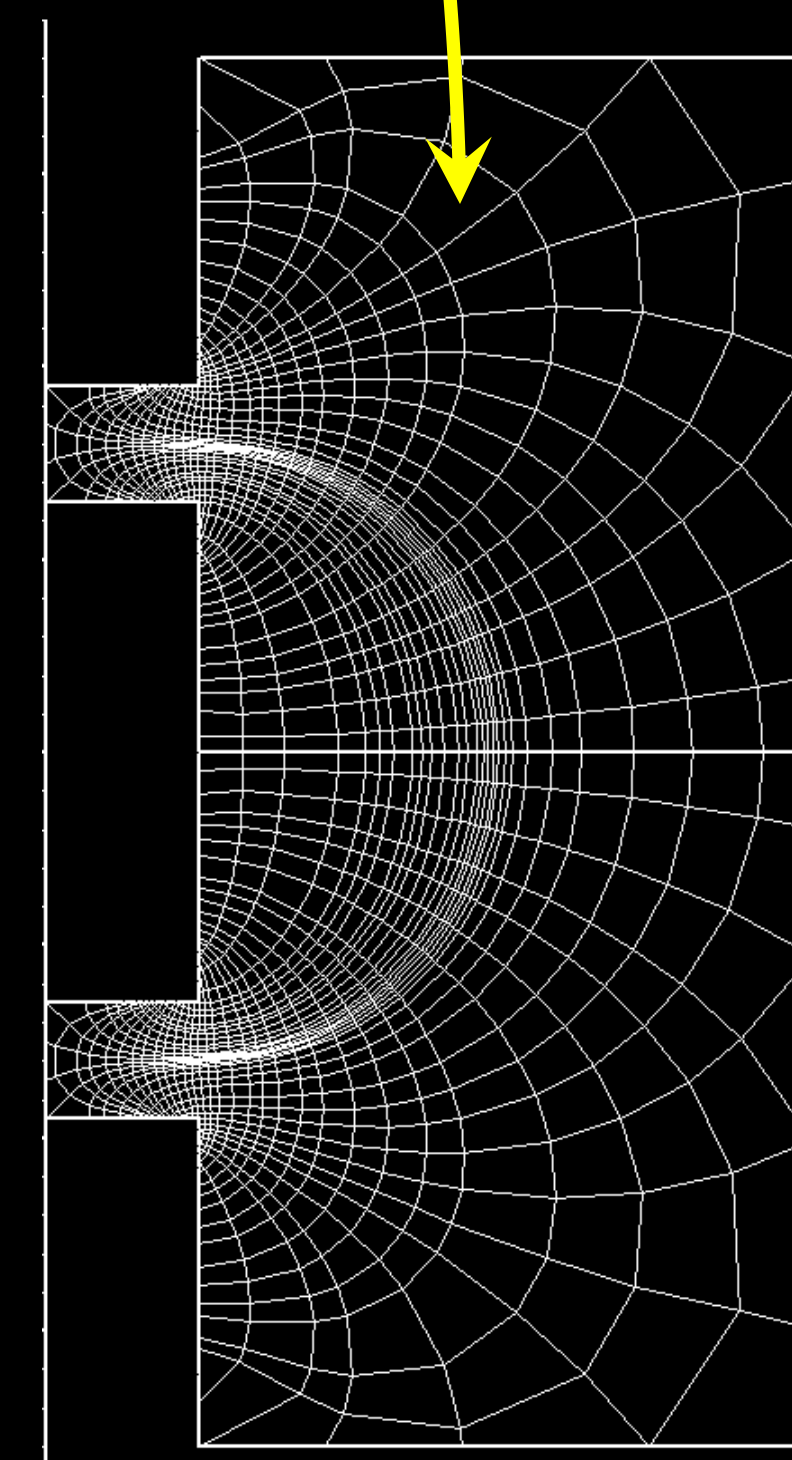
2D & 3D resistive-Hall magnetohydrodynamics for a variety of pulsed and steady-state electromagnetic thrusters



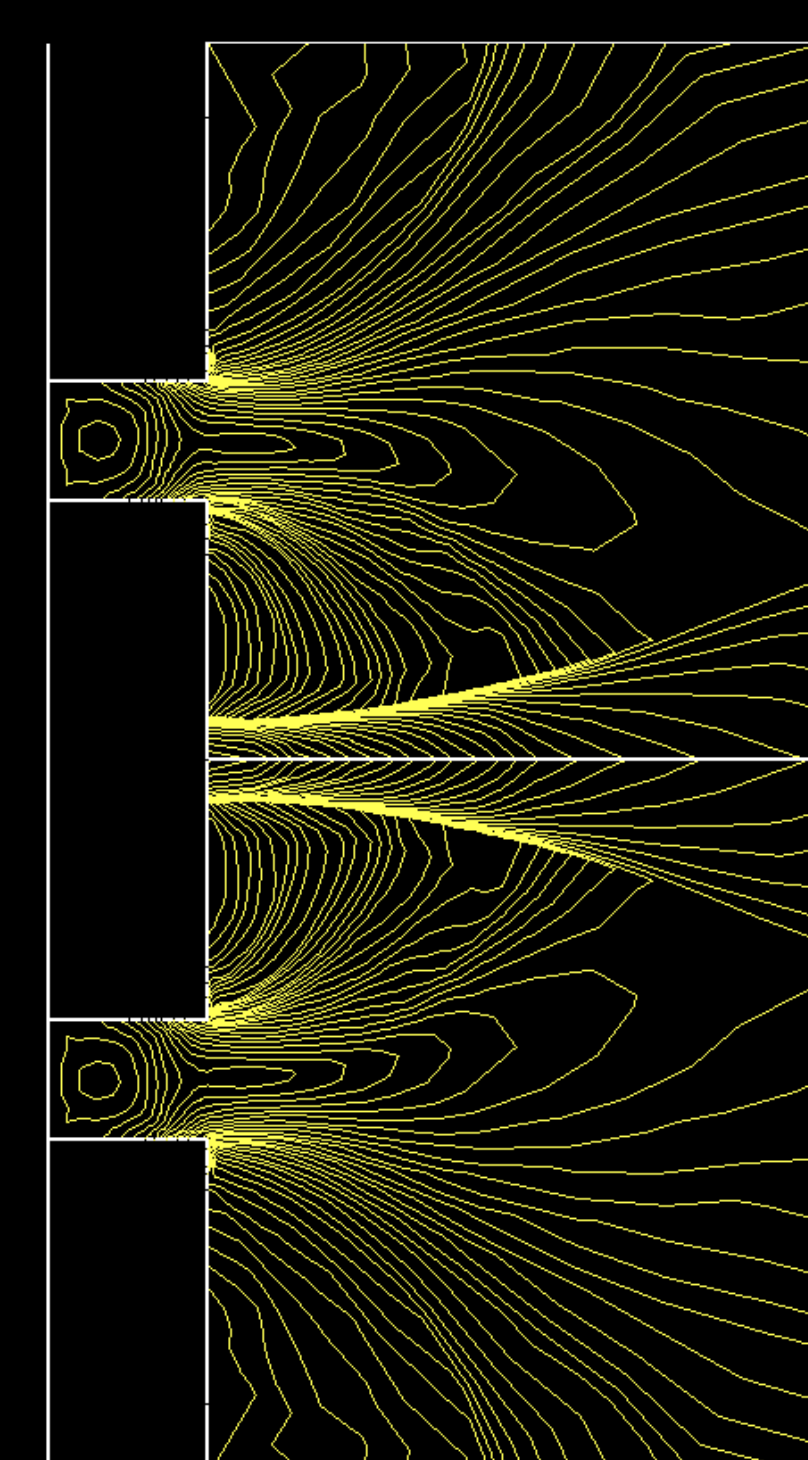
Magnetic-field-aligned mesh simulation of anisotropic plasmas in Hall-effect thrusters



Magnetic field streamlines



Hall2De computational mesh



Ion density line contours

2D & 3D ion optics in on engines

