

# USim

## HIGH ENERGY DENSITY PLASMAS

Extreme algorithms for extreme regimes.



High energy density physics is the study of matter at extreme pressures and temperatures. Only USim incorporates cutting-edge algorithms for these extreme plasmas for experimental geometries in commercial and defense applications.

### Two-fluid Simulation of Magnetic Reconnection

## Broad Range of Physics with the Matching Algorithms

Plasma torches, magnetic reconnection or implosions; whatever high energy density plasma you want to study, USim handles the broad range of conditions in high energy density laboratory plasma using robust code designed for three-dimensional unstructured meshes.

**USim supports massively parallel computing and scales to tens of thousands of processor cores, enabling solutions to problems that were previously unsolvable.**

## Choose the Right Package for Your Needs

*Want to understand the impact of turbulence on the flow through a plasma torch? How about the influence of chemical reactions? Combine your USim for High Energy Density Plasmas package with USim for Hypersonics to model interaction of these effects and more!*

*USim's flexible pricing model allows you to select the amount of physics you need at a cost your purchasing manager will love!*

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All the Features of USim for Basic Simulations **PLUS:**

Gas dynamic magnetohydrodynamics

Separate densities for ion and electrons

Separate velocities for ions and electrons

Separate temperatures for ions and electrons

Anisotropic temperatures for ions and electrons

Full Maxwell's equations

Ideal gas equation of state

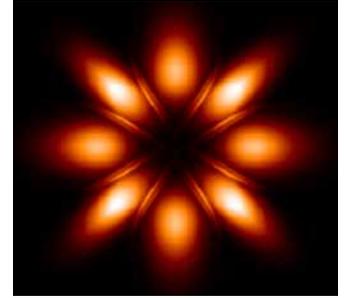
General equation of state

Ideal magnetohydrodynamics

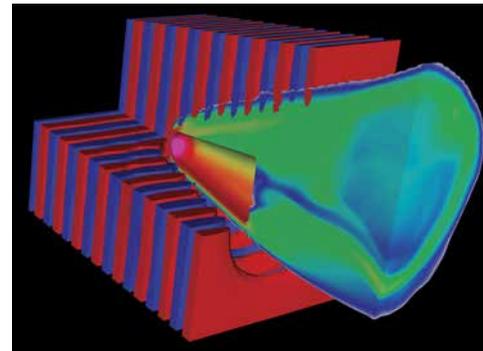
Ideal gas equation of state



*Anisotropic diffusion.*

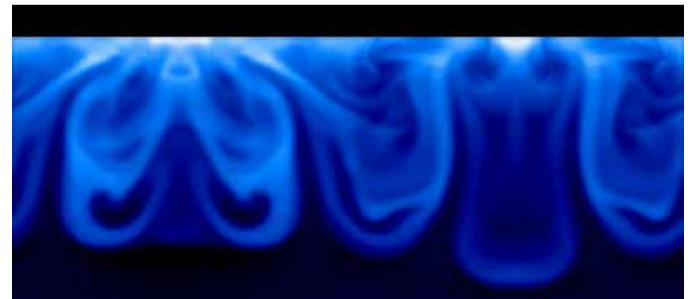


*Merging plasma jets for the Plasma Liner Experiment.*



*Radio communications blackout of re-entry vehicle.*

*Right: Density distribution in the non-linear phase of an unstable plasma z-pinch.*



## About Tech-X Corporation

Tech-X Corporation is committed to technical excellence and innovation. Our scientists and software engineers work together to deliver quantifiable results. We combine academic research with a commercial software company sensibility to deliver high-quality, cutting-edge software that takes advantage of the latest hardware and software advances.

## Consulting Services

Tech-X offers consulting and training services for all of its simulation software. In addition to the free support that comes with every purchase of a USim product, we have our experts ready to help you use USim to its full extent possible to solve your most challenging problems.

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