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Title: Molecular dynamics simulations of astrophysical plasma crystals

Name: Horowitz, Charles

Affiliation: Indiana University and ORNL

We report large-scale molecular dynamics simulations of astrophysical plasma crystals in the interior of white dwarfs and in the crust of neutron stars. Here each ion has long ranged coulomb interactions with thousands of neighbors. We determine many transport properties including diffusion coefficients, thermal conductivity, and shear viscosity. We find that neutron star crust is the strongest material known, with a breaking stress 10 billion times larger than steel. Neutron star crust can support large masses. Gravity from these ?mountains?, on a rapidly rotating star, may generate detectable oscillations of space and time, known as gravitational waves.