

# Radiation hydrodynamics in high-energy-density plasmas

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Most celestial bodies in the Universe are high-energy-density plasmas with extreme conditions of matter of very high temperature and pressure. These high-energy-density matter is found on Earth in the explosion of nuclear weapons and in laboratories with high-power lasers or pulsed-power machines.

In the realm of high-energy-density physics, the presence of radiation can have a significant effect on many transport processes. At high enough temperature, radiative transport becomes the dominant transport mechanism.

This presentation is concerned with the basic description of dynamic systems in which radiation transport and hydrodynamics both may matter. It then in the first half, discuss the physical mechanisms by which laser light is absorbed in matter, radiation transport in matter, and the basics of hydrodynamics. And in the second half, it discuss the computational modeling of radiation-hydrodynamics phenomenology.