

# An Introduction To Astrophysical Hydrodynamics

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22-07-2022 · In this paper we use the astrophysical hydrodynamics code, MAESTROeX (Nonaka et al.2010;Fan et al.2019b), to perform millimeter-scale nuclear ame simulations using a neural network to accelerate the reaction steps. We demonstrate that we can train neural networks using data from a traditional MAESTROeX simulation that utilizes sti

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New developments in relativistic magnetohydrodynamics Koichi Hattori,1,2, Masaru Hongo,3,4, yand Xu-Guang Huang5,6,7, z

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The MHD approximation I Assume the plasma behaves as a uid I Macroscopic (low frequency, long wavelength) behavior I Assume that the gyroradius is small I Ignore the most signi cant physics advances since 1860: I Relativity ( $v \ll c$ ) I Quantum mechanics I Displacement current in Ampere's law I Assume the plasma is fully ionized I Limited applicability to weakly ionized plasmas like the