

WHITE DWARFS IN M4 AND THE PHYSICS OF CRYSTALLIZATION

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We explore the physics of crystallization in the dense Coulomb plasma of the deep interiors of white dwarf stars using the color-magnitude diagram and luminosity function constructed from Hubble Space Telescope photometry of the globular cluster M 4 and compare it with our results for proper motion cleaned Hubble Space Telescope photometry of the globular cluster NGC 6397. We demonstrate that the data are consistent with a binary mixture of carbon and oxygen crystallizing at a value of Gamma higher than the theoretical value for a One Component Plasma (OCP). We show that this result is in line with the latest Molecular Dynamics simulations for binary mixtures of C/O. We discuss implications for future work.