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Lattice Structure in Astrophysics: A reconsideration of White Dwarfs, Variables, and Wolf-Rayet Stars. PIERRE-MARIE ROBITAILLE, The Ohio State University — Stars of the main sequence display a mass-luminosity relation which indicates that they share a common building block (hydrogen) and lattice structure (hexagonal planar) with the solar photosphere. White dwarfs however display very low luminosity in spite of their elevated color temperature. Rather than postulate that these stars represent degenerate matter, as Eddington and Chandrasekhar were forced to assume given their gaseous models, within the context of a Liquid Metallic Hydrogen Solar Model white dwarfs might simply be thought as possessing a different lattice structure (e.g. body centered cubic) and hence a lowered emissivity. They do not need to possess exceeding densities, reduced radii, and degeneracy in order to account for their lowered emissivity. Similarly, variable stars might well be oscillating between lattices types wherein the energy differences involved in the transformations are small. Other stars, such as Wolf-Rayet stars, which lack photospheric emission, might be too hot to enable a discrete lattice to form. Though condensed, the photosphere in that case would have a lattice which is so poorly organized that its emissivity is trivial. Nonetheless, the broad emission lines of Wolf-Rayet stars indicates that these objects are not breaking apart but rather, are important sites of condensation.

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