

Abstract Submitted
for the APR09 Meeting of
The American Physical Society

Demixing of Hydrogen and Helium at High Pressures WINFRIED LORENZEN, BASTIAN HOLST, NADINE NETTELMANN, RONALD REDMER, University of Rostock — We have performed quantum molecular dynamics simulations based on finite-temperature density functional theory for warm dense hydrogen-helium mixtures for conditions relevant for the interior of giant planets. We derive the miscibility gap from the EOS data and discuss the consequences for the interior structure of Jupiter and Saturn. Calculations of the electrical conductivity show that demixing is mainly caused by metallization in the hydrogen component. The results can be used to explain or motivate layer structures inside planets and have a strong impact on the luminosity and age of Saturn which has long been assumed.

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Date submitted: 09 Jan 2009

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