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Nature of the interiors of Uranus and Neptune WILLIAM NELLIS, Harvard University, N. OZAKI, Osaka University, R. AHUJA, Uppsala University, T. MASHIMO, Kumamoto University, M. RAMZAN, T. KAEWMARAYA, Uppsala University — Ever since the spacecraft flyby missions to Uranus and Neptune the nature of the interiors of these similar planets have been puzzles. Planetary materials are H-He; "ice," hydrogenous molecular and ionic fluids; rock (oxides); and Fe. Measured gravitational moments cannot resolve mass distribution between 3-layer and 2-layer models, the former with sharp mass discontinuities and the latter with mass varying continuously. Also a puzzle is the material distribution that would produce the spherical annulus proposed to explain a dynamo that would generate the tilted magnetic fields. A mass distribution needs to be identified that is consistent with both the gravitational and magnetic data. If all materials become conductors then miscibility and dynamos are both possible. $Gd_3Ga_5O_{12}$ is a strong insulator with Gd-O and Ga-O bond strengths similar to Mg-O and Si-O. We have measured optical reflectivities of shock fronts in melted $Gd_3Ga_5O_{12}$ from 0.5 to 2 TPa at the Osaka laser facility. Measured reflectivities are ~ 0.1, in reasonable agreement with optical properties of amorphous Gd-Ga-O calculated in the corresponding density range. Thus, "ices", rock, decomposed hydrogenous molecules, pure H, and Fe are probably all poor metals at conditions in the deep planetary interiors and thus miscible to a significant degree. A qualitative picture of the interiors with radially continuous mass distributions will be proposed. [1]Harvard University, [2]Osaka University, [3]Uppsala University, [4]Kumamoto University

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