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8. First principles of new deep Earth mineral

Researchers have determined the first principles for a recently discovered mineral that may be the most common material in the Earth's core mantle boundary. Tsuchiya et al. obtained the first elasticity principles from a single crystal and of a larger amount of the rock like magnesium silicate mineral identified in high pressure, high temperature simulations of the Earth's core mantle boundary region. The authors compared the thermodynamic properties and seismic velocities of the newfound post perovskite mineral to perovskite, a known material found in abundance on the Earth's mantle and thought to make up almost the entirety of the planet's interior. They note that the new material is a heated and pressurized version of the perovskite and show that the new mineral possesses remarkably variable elastic properties, more so than simple perovskite, including an unusual layered structure but does not display the expected elasticity. The researchers suggest that the unusual elasticity could explain some of the abnormal seismic observations in the thick layer above the core mantle boundary region.

Title:

Elasticity of post perovskite MgSiO₃

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