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Sommario/riassunto	Published by the American Geophysical Union as part of the Geophysical Monograph Series, Volume 174.Discovery of the perovskite to post-perovskite phase transition in MgSiO3, expected to occur for deep mantle conditions, was first announced in April 2004. This immediately stimulated numerous studies in experimental and theoretical mineral physics, seismology, and geodynamics evaluating the implications of a major lower mantle phase change. A resulting revolution in our understanding of the D? region in the lowermost mantle is well underway. This monograph presents the