

**【Mathematics/Physics】**

<b>Title of Project</b>	Behavior of Fe-bearing materials under very high pressure and mineralogy of the lowermost mantle and the inner core
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<b>Abstract of Research Project</b> <b>Number of Researchers : 5</b> <b>Term of Project: 2008–2012</b>	Application of nano-polycrystalline diamond and sintered-polycrystalline diamond to ultra high-pressure generation will be pursued using both diamond anvil cell and multianvil apparatus to realize static pressures equivalent to the central part of the Earth. Using these techniques, combined with synchrotron X-ray and ultrasonic measurements, we will particularly focus on the crystal structure of metallic iron, nature of electron spin transitions in Fe-bearing minerals, and chemical compositions of the lower mantle and the core. First-principles calculation will also be adopted to investigate these subjects at the P, T conditions where the experiments are difficult to cover.