



**International Center
for Hadron Astrophysics**
ICEHAP CHIBA UNIVERSITY

ICEHAP Seminar

Date Nov. 1 Wed. 16 : 00~17 : 30

Location [ICEHAP Office \(Engineering Research Bldg.1 Room609-1\)](#)

By **Dr. Hiroko Watanabe**

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Title

『Ocean Bottom Detector: exploring the Mantle with geoneutrinos』

Abstract

Anti-neutrinos emitted from radioactive isotopes (e.g. U, Th and K) inside the Earth, geoneutrinos, bring unique and direct information on the Earth's composition and yield insights into its heat balance and thermal evolution. KamLAND and Borexino experiments show that geoneutrino measurements can be translated into useful geoscientific insights, leaving a question of the mantle's contribution to the global signal. Distinguishing the mantle flux by current detectors, which are all located on the continents, is challenging, since the crustal signal is about 70 % of the total flux. Given the oceanic crust is thin, simple, and has low Th and U abundances, remotely placing a geoneutrino detector on the seafloor provides the ideal location for identifying those geoneutrinos originating from Earth's mantle. Since 2019, "Ocean Bottom Detector (OBD)" working group, involving physics, geoscience and ocean engineering, has been working on technological developments and detector design simulation in Japan. OBD project broadens our perspective and works across the disciplinary boundaries of particle physics, applied anti-neutrino science, geoscience, and ocean engineering. The kt scale detector will be a breakthrough in the interdisciplinary community.

I would like to present the status and future prospects of OBD project and further the discussion on technical and scientific coevolution.