

**Title** Exploration of Deep Life and Deep Carbon through Scientific Ocean Drilling: What do we learn from Earth's ecosystems?

**Speaker** Dr. Fumio Inagaki  
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 Japan Agency for Marine-Earth Science and Technology (JAMSTEC)



**Date & Time** Friday, February 14, 2014 4:00 p.m.

**Place** I<sup>2</sup>CNER Hall, Ito campus, Kyushu University

### Abstract

Over the past decade, the deep seafloor biosphere has been explored systematically through scientific ocean drilling, revealing that numerous numbers of microbial cells are present in the sediment down to over 1,000 meters below the seafloor. The seafloor microbial community consists of diverse Bacteria and Archaea; however, most species and its genomic constituents are far distinct from any known isolates from the Earth's surface biosphere (that is, terrestrial and marine habitat), and hence their genetic, metabolic, and physiological characteristics remain largely elusive. Nevertheless, multiple line of evidences suggest that the seafloor microbial ecosystem plays important ecological roles in biogeochemical carbon and other elemental cycles on our planet; for example, biological degradation of the buried organic matter to methane. In this seminar, I would like to present overview of our current knowledge of the deep seafloor biosphere, including some new insights from the Integrated Ocean Drilling Program (IODP) Expeditions 329 "The deep coalbed biosphere off Shimokita Peninsula, Japan" using the deep-sea drilling vessel *Chikyu*, and then discuss some fundamentally and societally significant issues: What is the nature and extent of the deep seafloor biosphere? What do we expect from power potentials of geological and biological functions in Earth's ecosystems to establish sustainable carbon and energy conversion systems in the future?

### About the Speaker

Dr. Fumio Inagaki is a group leader of the Geomicrobiology Group, Kochi Institute for Core Sample Research, JAMSTEC, who specializes in microbial ecology and biogeochemistry on Earth's extreme environments such as deep-sea hydrothermal systems, high CO<sub>2</sub> and low pH extremes, mud-volcanoes, and deep seafloor environments. He obtained his PhD at the Kyushu University in 2000. In 2005, he was a guest researcher of the Max-Planck-Institute for Marine Microbiology in Bremen, Germany. He has extensive experience in deep-sea research and scientific ocean drilling expeditions; in 2010 and 2012, he was a co-chief scientist of the IODP Expeditions 329 in the South Pacific Gyre and 337 in the northwestern Pacific off Shimokita Peninsula, Japan, respectively. Since 2011, he is also taking a lead of the Geobio-Engineering and Technology Group, Submarine Resources Research Project, JAMSTEC.

**Host:** Associate Professor Takeshi Tsuji

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