

Exploring Deep Oceanic Crust off Hawaii: Online workshop for IODP 951-Full proposal development

Workshop Chairs: Susumu Umino (Kanazawa Univ.) and Gregory F. Moore (Univ. Hawaii)

Date and Time: June 30 (Tue) – July 3 (Fri), 2020

[Day 1-3] Breakout Session (A): 14:00-16:00 JST / 06:00-08:00 BST / 01:00-03:00 EDT / 19:00-21:00 HST

Breakout Session (B): 23:00-25:00 JST / 15:00-17:00 BST / 10:00-12:00 EDT / 04:00-06:00 HST

[Day 4] Wrap-up Session: 8:30-11:00 JST / 0:30-3:00 BST / 19:30-22:00 EDT / 13:30-16:00 HST

Over the past five decades, exploring a complete sequence of the oceanic crust through the Mohorovičić discontinuity and into the uppermost mantle has been one of the most challenging missions for scientific ocean drilling. In the long-range vision of the 2050 Science Framework, deep scientific ocean drilling with emerging drilling and logging technologies—“**Probing the Deep Earth**”—will be one of the five flagship initiatives. This scientific and technological challenge will provide humankind a pathway to the Earth's more profound realm and extend our fundamental insights into the nature of Earth's deep interior and its geodynamic behavior. Given compelling motivation over a half of century, we would like to develop here a full proposal to explore ~2 km-deep oceanic crust off Hawaii, as a pilot hole-study of the future mantle drilling using the D/V *Chikyu*.

Workshop Goals

During the online workshop, we will:

- Discuss scientific objectives/questions, hypotheses, and available approaches based on the background information of 951-Pre proposal entitled “Drilling Middle-Aged Oceanic Crust on North Arch off Hawaii”,
- Build an international and interdisciplinary proponent team and encourage collaborations therein, and
- Develop a 951-Full proposal from both science and technology and submit by the 1 October 2020 deadline.

Responding to comments and recommendations of the SEP watchdogs’ regarding 951-Pre, we will also discuss how to meet primary scientific objectives during the 2 km-deep crustal drilling, including construction of a 3-dimensional structure of the oceanic crust by integrating borehole logging and long-term observatory approaches. We also need to design combined operational (drilling/coring and logging) and scientific analytical strategies to maximize scientific outcomes. Prioritizing candidate drill sites based on the new seismic survey data from around the Hawaiian Islands may also be included as a workshop goal.

Important Information

- The workshop will use the Zoom online meeting platform. If you cannot use Zoom, please contact the meeting organizers.
- We will set up a project website (Basecamp) where all participants can download all relevant meeting materials (e.g., docx, pptx, pre-recorded videos, etc.). Basecamp will also be used for email communication & archiving.
- **Participants are requested to review all the pre-uploaded materials (see below) before the workshop.** since the workshop will be dedicated to discussions.
- There are **two time slots** for **each** breakout discussion item:
 - 14:00-16:00 JST
 - 23:00-25:00 JST

The breakout discussions focus on identifying scientific objectives/questions, hypotheses, and operational/analytical approaches. The discussion leaders make a summary (ppt) of the discussions, which will be presented at the wrap-up session on Day 4. The workshop co-chairs will summarize the outcomes of the workshop, and make consensus and action items toward the full proposal submission.

Pre-uploaded materials:

- 951-Pre proposal and SEP comments (doc)
- Overview of 951 presentation (recorded Keynote Talk)
- Site survey overview (ppt)
- Technology / operations overview (ppt)

Meeting Agenda

Day 1: June 30 (Tuesday)

Breakout Session 1: Crustal Evolution: Alteration & Aging

(A) 14:00-16:00 JST Discussion Leader: Takeshi Hanyu (JAMSTEC)

(B) 23:00-25:00 JST Discussion Leader: Damon Teagle (Univ. Southampton)

- Alteration & Metamorphism: Hydrothermal alteration/reaction zone/aging of lithosphere
- Plume-Lithosphere Interaction
- Subduction input: Geochemistry of lithosphere including volatiles

Day 2: July 1 (Wednesday)

Breakout Session 2: Crustal Architecture: Formation & Deformation

(A) 14:00-16:00 JST Discussion Leader: Michael Garcia (Univ. Hawaii)

(B) 23:00-25:00 JST Discussion Leader: Laura Crispini (Univ. Genova)

- Plate Accretion & Spreading Mode
- Geophysics: Seismic structure/Hawaiian swell
- Petrology & Volcanology: Hawaiian landslides and volcanic history

Day 3: July 2 (Thursday)

Breakout Session 3: Water & Deep Life

(A) 14:00-16:00 JST Discussion Leader: Fumio Inagaki (JAMSTEC)

(B) 23:00-25:00 JST Discussion Leader: Steven D'Hondt (URI)

- Abundance, Distribution, & Diversity
- Activity & Biogeochemistry
- Ecological and Evolutionary Roles

Day 4: July 3 (Friday)

Wrap-up Discussion: 8:30-11:00 JST

Discussion Leaders: Susumu Umino (Kanazawa Univ.) & Gregory F. Moore (Univ. Hawaii)

- Outcomes from breakout sessions
- Scientific Objectives/Questions, and Hypotheses
- Operational Approaches (drilling/coring & logging)
- Analytical Approaches (onshore and off-shore laboratories)
- Perspectives on Mantle Drilling
- Consensus and Action Items

Workshop Participation

This workshop will bring together scientists and engineers from the entire spectrum of disciplines, including petrologists, geophysicists, geochemists, microbiologists, geodynamic modelers, and drilling/logging engineers. We also encourage the participation of graduate students and early-career-scientists.

To register for this online workshop, please fill out the online registration here:

<https://forms.gle/G2ZLCN8J7qcM4V6V6>.