

Mantle Drilling Projects: M2M, Fore Arc M2M and ICDP OmanDP

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Drilling into mantle has been a long-time aspiration since the first Mohole project in 1961. The (Moho-to-Mantle) M2M project, submitted to IODP in 2012, addressed the reachable goals of sampling the *in situ* upper mantle peridotite and investigating the nature of the Mohorovicic seismic discontinuity (Moho) with the drilling vessel *Chikyu*. The growing technology can accomplish the proposed drilling through ~6,000 m of igneous oceanic crust formed from a fast-spreading ridge, and an additional ~500 m into the ocean lithosphere mantle. Fore Arc M2M project has been submitted to IODP in April 2016 for sample relatively young oceanic mantle. The target site of Fore Arc M2M is the fore-arc mantle/crust section exposed on the landward slope of the Bonin Trench, near the drill sites for the recently completed IODP Expedition 352 and will sample the fresh lower igneous crust and the uppermost mantle peridotite, including the intervening boundary layer, that were accreted during the tectonism and magmatism associated with initiation of subduction at ~52-48 Ma. The Samail Ophiolite, in Oman and the United Arab Emirates, is the largest, best-exposed section of oceanic lithosphere in the World. The Oman Drilling Project (OmanDP) is a comprehensive ICDP drilling program that will sample the whole ophiolite sequence, from crust through to upper mantle, in a series of diamond- and rotary-drilled boreholes. The OmanDP in Phase I has already been achieved in early December 2016, through April 2017. Phase II is scheduled for autumn/winter 2017/2018. Moreover, drilling cores in Phase I will be sent to the IODP research drilling vessel *Chikyu* in Japan for core description by its dedicated core logging facilities in mid-July to mid-September 2017.

Keywords: Mantle Drilling, Oman Ophiolite, Ogasawara/Bonin Trench, Peridotite

