



ICDP Oman Drilling Project



News from the Scientific Drilling in the Samail Ophiolite Sultanate of Oman

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The Oman Drilling Project (OmanDP) is the most recent example of a successful ICDP-IODP cooperation.

The Samail Ophiolite in the Sultanate of the Oman and the United Arab Emirates is the largest, best-exposed section of oceanic crust and upper mantle in the world. The Oman Drilling Project is a multi-national collaboration bringing together more than 100 geo-scientists from a broad spectrum of disciplines in order to address a diverse range of scientific questions relating to the formation, hydrothermal alteration and weathering of oceanic crust and upper mantle. The drillsite science teams include many of these scientists, along with students from Sultan Qaboos University and German University of Technology in Oman, as well as staff from the Public Authority of Mining and Ministry of Regional Municipalities and Water Resources, Oman, who receive hands-on training in drillsite core curation.

The ICDP OmanDP, with lead Principal Investigators Peter Kelemen (LDEO, USA), Jürg Matter and Damon Teagle (both at University of Southampton, UK), will be executed in two phases. The successful drilling operations of the **first OmanDP phase** in Oman started in December 2016, and will be completed by mid April 2017. Data management of the drilling operations, inventory of the sample material, and the initial visual core description are supported by the Drilling Information System (DIS) and the DMT whole-round Core Scanner of the ICDP's Operational Support Group.

In total four-wireline diamond coring (HQ/NQ in diameter) and two rotary drilling holes (6 1/8" in diameter) are planned to retrieve core and cuttings, (respectively) from a drilled depth of 400 m of drilling depth per hole. The drilling operations for five holes are complete, and coring of the sixth hole is at about 50% (as



of 17 March 2017). Overall the coring has been a great success, with approximately 100% recovery of core and continuous cuttings profiles in 1-m sampling intervals.

The first two cored holes are located in the crustal section of Wadi Gideah (Tayin Massif), which gently dips to the south, exposing deeper levels upstream to the north, and shallower levels to the south. The third cored hole is located to the northwest, in Wadi Abdah, capturing the sheeted dyke-gabbro transition (*above*). The cores recovered provide a representative section through the Samail ophiolite, revealing petrological, geochemical and structural features. A key science objective of these sites is to understand the mechanisms of accretion and subsequent hydrothermal alteration and cooling of oceanic crust. The cores from BT1 (listvenite and basal thrust) in Wadi Mansah will be used to investigate the processes that result in 100% hydration and carbonation of oceanic peridotite.

The two rotary drilling sites (BA1 and BA2) are located near the village Batin.

The main research objectives here will be to study active serpentinisation of oceanic lithospheric mantle, and hydrogeology and microbial communities in these rocks.

OmanDP Phase 1 operations will culminate in a detailed core description campaign that will take place onboard the IODP drillship *Chikyu*, thanks to generous contributions from JAMSTEC and JSPS, and Japanese science team members of OmanDP. The shipboard core description is scheduled from 15 July to 15 September 2017. We are looking for a range of expertise in igneous petrology, alteration and metamorphism, structural geology, geochemistry, paleomagnetism, physical properties, and individuals with data processing capabilities (*e.g.* X-ray tomography). Scientists interested in participating are encouraged to apply through www.omandrilling.ac.uk/application-form - the deadline for applications is 1 May 2017.

The science party will be divided into two groups, each working for one month onboard the *Chikyu*, which can accommodate up to 30 scientists per month. The first group will board on 15 July while the ship is docked at Sasebo (southern Japan). On 10 August the ship will leave Sasebo and sail to Shimizu (near Tokyo), where the first group of the science party will disembark on 15 August. The second group will embark at Shimizu on 15 August and disembark on 15 September in Hachinohe (northern Japan).

The second phase of OmanDP is scheduled to take place during winter 2017/2018, with subsequent core description intended to be performed onboard the IODP drillship *JOIDES Resolution* during mid to late 2018.

Visit oman.icdp-online.org and www.omandrilling.ac.uk and follow @OmanDrillProj

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