Cite abstracts as **Author(s) (2010), Title, Abstract xxxxx-xxxx presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.**

Your query was:
nedimovic

1340h
U43A-0018 ***Poster***
The MoHole: a Crustal Journey and Mantle Quest

***Ildefonse, B**
benoit.ildefonse@um2.fr
Géosciences Montpellier, CNRS, Montpellier, France
Abe, N
abenatsu@jamstec.go.jp
JAMSTEC, Yokosuka, Japan
Isozaki, Y
isozaki@jamstec.go.jp
JAMSTEC, Yokosuka, Japan
Blackman, D K
dblackman@ucsd.edu
UCSD, La Jolla, CA, USA
Canales, J
jpcanales@whoi.edu
WHOI, Woods Hole, MA, USA
Kodaira, S
kodaira@jamstec.go.jp
JAMSTEC, Yokohama, Japan
Myers, G
gmyers@oceanleadership.org
COL, Washington, DC, USA
Nakamura, K
kentaron@jamstec.go.jp
JAMSTEC, Yokosuka, Japan
Nedimovic, M R
mladen@dal.ca
Dalhousie Univ., Halifax, NS, Canada
Seama, N
seama@kobe-u.ac.jp
Kobe Univ., Kobe, Japan
Teagle, D A
dat@noc.soton.ac.uk
NOC, Southampton, United Kingdom
Umino, S
sesumin@staff.kanazawa-u.ac.jp
Kanazawa Univ., Kanazawa, Japan
Wilson, D S
dwilson@geol.ucsb.edu
UCSB, Santa Barbara, CA, USA
Yamao, M

yamao@jamstec.go.jp
JAMSTEC, Yokosuka, Japan

Drilling an ultra-deep hole in an intact portion of oceanic lithosphere is a long-standing ambition of scientific ocean drilling. The 2010 MoHole workshop in Kanazawa, Japan, followed from several scientific meetings on ocean lithosphere drilling, which reached a consensus that a deep hole through a complete section of fast-spread crust is a renewed priority for the community. New deep drilling technologies now make it possible to fulfill our aspiration to drill completely through intact oceanic crust and into the upper mantle, and address a number of first-order scientific goals: what is the geological nature of the Moho? How is the oceanic crust formed at mid-ocean ridges, and what processes influence its subsequent evolution? What are the geophysical signatures of these processes? What are the interactions with the oceans and biosphere, and their influence on global chemical cycles? What are the limits of life, and the factors controlling these limits? What is the physical and chemical nature of the uppermost mantle, and how does it relate to the overlying magmatic crust? The selected MoHole target would ideally meet a suite of scientific requirements including fast spreading rate, simple tectonic setting, and strong reflectivity of Moho. Several constraints limit the range of possible sites, particularly the trade-off between seafloor depth (shallow enough), and temperature at Moho/upper mantle depths (low enough) to allow ultra deep drilling (+6000 m below seafloor). Prospective geophysical site surveys will be conducted in three areas in the Pacific (Cocos plate, off Southern/Baja California, and N of Hawaii) over the next years. Technology and engineering development should be launched jointly with site surveys, and be directed to ensure that our scientific goals are achieved. To do so, establishing a realistic technology roadmap is imperative. The provision for continuous mud circulation is a top priority requirement. Other areas requiring engineering consideration include logging and coring in HT formation, drill bits (designed for abrasive, hard rocks) and drill string (high tensile strength), drilling mud (for HT environment), and casing/cementing materials and strategies (specifically designed, ideally to the bottom of the hole). The size and duration of the MoHole project will require an appropriately funded, centralized, international science operations and engineering management group to oversee the project from planning to successful completion. The keys for a successful MoHole project include scientific considerations, as well as technology development, industry engagement, and public engagement through outreach activities and education. The MoHole project aims to be one of the largest scientific endeavors in Earth science history, and this formidable challenge should provide precious opportunities to diverse scientific and technology communities.

[0456] BIOGEOSCIENCES / Life in extreme environments
[3035] MARINE GEOLOGY AND GEOPHYSICS / Midocean ridge processes
[3036] MARINE GEOLOGY AND GEOPHYSICS / Ocean drilling
[3614] MINERALOGY AND PETROLOGY / Mid-oceanic ridge processes
Union (U)
2010 Fall Meeting

New Search

AGU Home