

The ESF Magellan Workshop



“Beyond 2013—The Future of European Scientific Drilling Research”, convened by G. Camoin, R. Stein, and M. Wagreeich, was held at the Geocenter, University of Vienna, Austria on 24–25 April. Its main objectives were to define and document the European interests in an international scientific drilling program beyond 2013, and to prepare the INVEST Conference (Bremen, Germany, 23–25 September 2009). Eighty scientists from sixteen countries and from various expertise attended the workshop, which included general sessions and breakout group discussions. The topics that were discussed during the workshop included (1) the future of ECORD and IODP; (2) the new research initiatives and emerging fields in scientific drilling; (3) the relationships between IODP and other programs, and the collaboration between academia and industry; and (4) new technologies and the Mission Specific Platform approach. The major outcomes of the workshop and outlooks will be summarized in a white paper on

the Future of European Ocean Drilling Research that will be edited prior to the INVEST Conference.

“Smart-Plug” Packer Systems Used for NanTroSEIZE



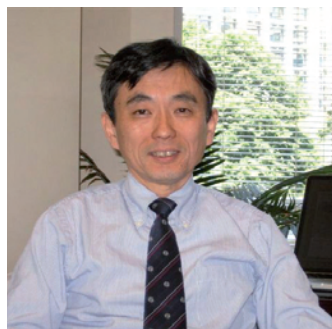
The multi-expedition IODP Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) will complete a transect of holes drilled through the Nankai accretionary prism. Coring, logging, and long-term monitoring experiments conducted in these drill holes will reach faults and wall rock at various depths, including the seismogenic part of the subduction thrust fault. During Stage 2 operations (*DV Chikyu* Expeditions 319 and 322), two holes will be drilled and cased along the transect in July–August 2009 to prepare for later installation of CORK observatories. To make use of these holes during the time between drilling and final CORK installation, a group of

Canadian, U.S., German, and Japanese scientists have designed and built temporary “Smart-plug” packer systems to record formation pressures and temperatures. The data will document ambient conditions and provide proxies for strain and fluid flow related to tectonic and seismic activity. During NanTroSEIZE Stage 3, the “Smart-plugs” will be recovered and replaced by the permanent CORK observatories, and will ultimately be connected to the seafloor fiber-optic cable network DONET. These observatories will include seismometers, strain meters, thermistors, and pressure sensors.



Assembly of the interior of the “Smart-plug” (left); Smart-plug housing (center, with L-R: Martin Heesemann (University of Bremen), Bob Meldrum (Pacific Geoscience Center), Demian Saffer (Penn State University), Earl Davis and Bob Macdonald (both PGC).

Message from New President of IODP-MI, Dr. Kiyoshi Suyehiro



In my new role as IODP-MI President, I first would like to congratulate all the dedicated people who have contributed in many different ways bringing IODP to its current level of operations, achievement, and international regard. We have embarked on a truly unique international scientific undertaking and must continue to deliver exciting science, and thus attract young scientists who will lead future scientific ocean drilling investigations.

Because Earth’s ocean is vast, a huge magnitude of unexplored space awaits your challenge. This ‘inner space’ invites you to understand Earth in four dimensions, in finer resolution, and to a wider extent. A dynamic system and

supporting biosphere, Earth should genuinely arouse your curiosity in many ways. Confronting climate change and geohazards when the world population is rapidly growing, for example, immediately demands your greater understanding of the complex Earth system.

To meet such grand challenges, IODP will need to increase its interface with other scientific programs, each of which should consider IODP to be a vital partner. IODP already demonstrates such a strategic partnership. And there are others who construct Earth in the cyber world or in labs, and who are developing observational networks, who are also natural partners.

As the scientific ocean drilling community gathers in Bremen to constructively look ahead constructively and build its future, I look forward to a successful INVEST meeting as a watershed event. Another step preparing for the future is the reorganization of IODP-MI into a single international office in Tokyo, starting in 2010.

Finally, I would like to emphasize that IODP-MI is about international access and mutual connection. We will strive further to gain your support for providing unbiased oversight and integration.

Continental Drilling Training Held in Sweden

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A specific ICDP Training Course on continental scientific drilling was organized in cooperation with the Swedish Deep Drilling Program. From 18 to 22 May 2009, members of this working group, other interested scientists, and lecturers invited by the Operational Support Group met at Skokloster, Sweden to discuss key aspects of scientific drilling projects. In addition to basic modules of the ICDP training from planning to drilling, other topics that included data handling, long-term experiments, and specific projects currently under development in Sweden were addressed (<http://www.sddp.se/projects>). Furthermore, the capabilities and limits of truck-mounted drill rigs were presented and discussed, as the Swedish group has decided to develop and deploy such comparatively low-priced drilling tools with slimhole wireline coring capabilities to 2.5 km depth.



Integration of Deep Biosphere Research into Continental Drilling Campaigns

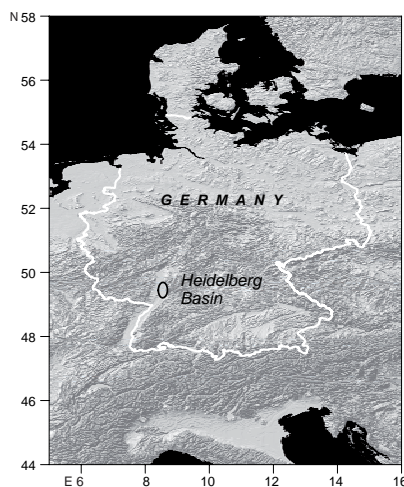
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An ICDP workshop on the integration of deep biosphere research into continental drilling will be held at the German Research Centre for Geosciences–GFZ in Potsdam on 27–29 September 2009. This workshop will address scientific, technical, administrative, and logistical prerequisites for the integration of deep biosphere research into land-based scientific drilling. The development of adequate technical protocols to recover appropriate contamination-controlled sample material and the integration of

a newly developed mobile microbial laboratory (GFZBUGLab) will be issues of paramount importance. Furthermore, identification of upcoming ICDP drilling projects for deep biosphere research and new targets for dedicated continental deep biosphere drilling projects in the future will be in the focus of the meeting. Researchers are invited from disciplines such as microbiology, bio-geochemistry, geology, and geochemistry, along with engineers with experience and interest in deep biosphere research and drilling. Interested scientists and engineers are requested to contact Kai Mangelsdorf: k.mangelsdorf@gfz-potsdam.de or Jens Kallmeyer: jens.kallmeyer@geo.uni-potsdam.de.

Scientific Drilling of the Heidelberg Basin (Germany)

The Heidelberg Basin, part of the northern Upper Rhine Graben, hosts one of the thickest successions of Pliocene and Quaternary sediments in Central Europe. Since 2006 the basin has been explored by new core drillings of up to 500 m depth. The drilling activities are embedded in an interdisciplinary project that aims to better understand the geological evolution of the basin, the control by climate change and tectonics, and the correlation of the Alpine and North European glacial evolution.



First results are published by Gabriel et al. (*Quaternary Science Journal*, 57:3–4, 2008). Beyond a summary of the project, eight papers deal with

aspects such as the geophysical pre-site surveys, concise descriptions of the core material, first results from geophysical downhole logging, and palynological analysis. The volume also includes a discussion of Pleistocene mollusks and exemplary studies on luminescence dating of fluvial sediments. The data indicate that Pleistocene deposits are more than 500 m thick and well-resolved in terms of the early Pleistocene pattern of cold and warm periods.

Lake El'gygytyn Scientific Drilling Successfully Completed

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Between October 2008 and May 2009, an international team of scientists from Germany, the U. S., Russia, and Austria staged scientific drilling operations at Lake El'gygytyn, located in a 3.6-million-year-old impact crater in NE Russia. The project completed three holes in the center of the lake, reaching a depth of 517 m below lake floor, and one hole down to 141 m into permafrost deposits in the western lake catchment. The retrieved cores will provide new insights into the millennial-scale climate evolution of the Arctic, the formation of the meteorite crater, and the history of the permafrost. The successful completion of the project marks the end of years of challenging logistical planning (see previous issue of *Scientific Drilling*) and the development of international partnerships to share in the scientific goals.

Magma Drilled on Iceland!

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An exciting event occurred on 24 June in the Iceland Deep Drilling Project (IDDP) at 2104 m depth. Suddenly the weight-on-bit declined while the rate of penetration and the torque shot up. After pulling up the drillstring a few meters, glassy rhyolitic cuttings followed by dark obsidian shards were circulated out, and it became clear that magma had been drilled.

The magma intrusion is presumably related to the nearby youngest eruptions in Northern Iceland (Krafla, 1975–1984). It may be a sill or dyke of unknown extension. However, due to the uncertainties it is now not feasible to continue drilling for supercritical fluids, the original goal of the IDDP. Nevertheless, the current surprise offers unique opportunities to study magma-fluid interaction at depth. Therefore, the well has been cased and cemented, and a slotted liner is set in

the lowermost section. After surface valves are installed, tracer injection and flow tests will be performed to test connectivity to nearby wells and to produce superheated steam for research and eventually energy production from magma.

Depending on the results of these tests, future possibilities might include creating the world's highest-temperature Engineered Geothermal System (EGS). Details: <http://iceland.icdp-online.org>



Colorless rhyolitic glass shard (~1 mm across) with spherical vesicles (photo from ISOR daily report).

Book Review: *Drill Me a Painting* by Christine Laverne

Reviewed by Catherine Mevel

Atlantica, 2008.
ISBN: 978-2-7588-0169-6

Understanding how the ocean crust is formed and evolves through time has been a major goal of the successive ocean drilling programs DSDP, ODP, and now IODP. A number of cruises over more than thirty years have been dedicated to drill as deeply as possible into the ocean crust, with the ultimate aim of penetrating the Mohorovicic Discontinuity (MOHO). However, drilling through the basaltic flows of the upper crust and the sheeted dike complex into the gabbros has proved as invaluable as it has proven difficult. Only by 2005 was the lower gabbroic crust reached below *in situ* upper crustal lavas and dikes (Wilson et al., *Science*, 312(5776):1016–1020, doi:10.1126/science.1126090, 2006). As an expert in the alteration of ocean crust, Christine Laverne participated in seven of the cruises on the *Glomar Challenger* and the *JOIDES Resolution* that contributed getting this far. She shares her fourteen

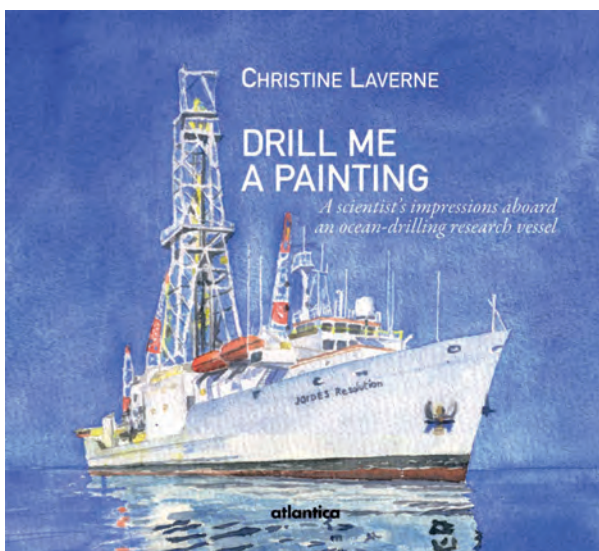


months of experience in a book *Drill Me a Painting*, beautifully illustrated with her own water colors.

The book is written in a lively, personal diary style telling about life on board. This narrative is interwoven with sections explaining the scientific goals placed in the general context of Earth dynamics, and providing information on the drill ships, the drilling techniques, and the measurements made on board. Christine elucidates how a drilling cruise is a team effort, with all the participants focusing on a single aim—to drill deep and explore the unknown. She conveys how discouragement and excitement can alternate in concert with the progress of the drilling. Readers can also sense how she herself evolves from an inexperienced young one to a recognized scientist in her field—a well of knowledge for the younger generations. She also clearly explains the scientific goals of drilling and how the results contribute to our current understanding of the ocean crust that cover two-thirds of our planet. The combination of watercolors and scientifically very sound explanations is particularly attractive.

Participation in ocean drilling is not only a scientific challenge. It is also a human adventure. This is the message that Christine Laverne conveys to the reader with her enthusiasm and painting skills. If you want to convince a relative, a friend, or a neighbor that ocean drilling is an exciting endeavor, offer him or her this book. For young people, especially, it could even attract them to a career in science.

Welcome on board!



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