



ECORD Training Course 2017

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Expedition 364: a promising petrophysics dataset
Bend-Fault Serpentinization MagellanPlus Workshop
Expedition 381 Corinth Active Rift Development
ICDP Oman Drilling Project

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The International Ocean Discovery Program (IODP) is an international research programme dedicated to advancing the scientific understanding of the Earth through drilling, coring, and monitoring the sub-seafloor. The European Consortium for Ocean Research Drilling (ECORD) supports the participation of European and Canadian scientific communities in IODP and provides funding for the implementation of mission-specific platform expeditions. ECORD is funded by 15 countries: Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and The United Kingdom.

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Cover: early-career scientists at the ECORD Training Course 2017 (see page 11) (photo V. Diekamp ©MARUM).

Right: the drill string below the Lifiboot Myrtle during Expedition 364 (photo D. Smith, ECORD/IODP).





Gilbert Camoin

ECORD News



Michael Webb

ECORD membership and mid-term renewal

After Poland and Belgium, we regrettably learnt a few weeks ago that Israel has also decided to withdraw from our Consortium, which now numbers 15 members. As with Poland and Belgium, the Israeli participation to ECORD was reliant on funding from a single institute. This emphasises the need for member nations who plan to join ECORD either to be funded at the national level or to try to form a national consortium to ensure funding and secure their ECORD membership on a reasonable time scale. Over the last few months, promising exchanges with Turkey have developed regarding joining ECORD. In addition, good progress has been made regarding negotiations with the A.P. Karpinsky Russian Geological Research Institute from St Petersburg (VSEGEI), Russia, concerning the provision of an in-kind contribution to ECORD for IODP Expedition 377 Arctic Ocean Paleoceanography, which is scheduled for 2018.

As of last month, ECORD entered its post FY18 renewal process that will include an external review of its activities (*see page 4*) and the decision by the current ECORD funding agencies as renewal of their participation in the Consortium for the second phase of the International Ocean Discovery Program.

MSP expeditions

ECORD's renewal will rely on a range of criteria in which ECORD's visibility in IODP, through an ambitious MSP operational plan, will be of prime importance. After the successful completion of the two last MSP expeditions, **357 Atlantis Massif Serpentinization and Life** (16 ECORD sailing scientists, including a Co-chief) and **364 Chicxulub K-Pg Impact Crater** (13 ECORD sailing scientists, including a Co-chief), ECORD has secured the funding for expeditions **381 Corinth Active Rift Development** and **377 Arctic Ocean Paleoceanography (ACEX-2)**, which will be implemented in late 2017 and Arctic summer 2018 respectively. These expeditions are possible despite a decreasing budget related to strong fluctuations in exchange rates between the US dollar and European currencies. This significantly impacts the contribution of five member countries (France, UK, Denmark, Spain and Ireland), who pay their membership in their own currency and not in US dollar. The in-kind contributions that other IODP member and non-member countries may provide to ECORD to implement MSP expeditions provide opportunities to increase the available operational budget. ECORD anticipates that it will require a mix of in-kind and external co-funding to implement future MSP expeditions. For example, Expedition 377 requires full in-kind contributions towards ice management and ice-breaking capability, which will be provided by Germany (*R/V Polarstern* from the Alfred Wegener Institute) and, potentially,

Russia. **Expedition 373 Antarctic Cenozoic Paleoclimate**, which was initially scheduled for late 2017-early 2018 has been postponed to 2020 to further test the British Geological Survey's RD2 seabed drill to secure a 50 m penetration, as this is mandatory to achieve the scientific objectives of this expedition. The MSP 2019-2023 operational plan that the ECORD Facility Board will define within the next three years will be based on both the scientific excellence of drilling/coring proposals and, importantly, the available annual budget for expeditions (*see EFB page 5*).



The **Distributed European Drilling Infrastructure - DEDI-2 proposal**, with Achim Kopf (MARUM, Bremen) as P.I., was submitted in March 2017 in the framework of the EC H2020-INFRAIA (*page 7*). This proposal aims at fostering and improving European collaboration between DEDI-2 partners, research groups and industry through the development and sharing of new, innovative technologies for specialist sub-surface sampling, measurements, downhole logging and long-term monitoring. Five major ECORD stakeholders (BGS, MARUM, University of Leicester, University of Montpellier and CEREGE) are involved in DEDI-2. It is anticipated that ECORD would benefit greatly from the funding of this proposal, especially through the technological development of existing tools, thus increasing the suitability of the

systems used to implement MSP expeditions and ultimately lower their cost.

ECORD partnership: JOIDES Resolution and Chikyu expeditions

The implementation of two Complementary Project Proposals (CPP) by the *JOIDES Resolution* in the South China Sea (Expeditions 367 and 368 South China Sea Rifted Margin) after the completion of the Expedition 366 Mariana Convergent Margin in late 2016 and early 2017, will bring enough additional resources to our US partner to schedule five expeditions in 2018 and 2019. In addition to these two CPPs, the *JOIDES Resolution* is expected to implement a total of eight expeditions in the Pacific and the Southern oceans before March 2019 - <http://www.iodp.org/expeditions/expeditions-schedule>. With the likely scheduling of a CPP in the Gulf of Mexico in 2019, the most probable scenario considered by the *JOIDES Resolution* Facility Board currently consists of a ship track through the Atlantic Ocean, Mediterranean, Caribbean, and the Gulf of Mexico, lasting until at least 2021, dependant on the proposal pressure covering those regions.

Following the implementation of two expeditions in 2016 (365 NanTroSEIZE Shallow Megasplay Long-Term Borehole Monitoring System and 370 Temperature Limit of the Deep

Biosphere off Muroto), involving two ECORD Co-chiefs and seven ECORD scientists, the ECORD Council recently decided to resume its membership contribution to the *Chikyu* programme, which was suspended for 2015 and 2016. An engineering riserless expedition (380 NanTroSEIZE observatories) (see table page 13) and a riser drilling expedition (NanTroSEIZE C002) are scheduled for late 2017 and late 2018-early 2019 respectively and should ensure a continuity in *Chikyu* operations throughout the renewal time window, despite a general decrease in funding of this platform over the last few years (table page 13).

Forty-nine ECORD scientists, including five Co-chief Scientists have sailed on *JOIDES Resolution* and *Chikyu* expeditions in 2016. We anticipate that these numbers will remain at similar levels in 2017 and 2018 given the expedition schedule.

The continuous funding of the ECORD-ICDP MagellanPlus Workshop Series Programme illustrates the strong ECORD support towards development of innovative drilling proposals concerning diverse scientific topics that can be addressed by the three IODP platforms. This was reflected by the organisation of five workshops in 2017 (pages 20-21).

Educational activities

A major goal of ECORD is to train the next generation of scientists from its member countries. Over recent years, ECORD has designed a portfolio of science and educational activities aimed towards students, early-career scientists and educational officers, which have proved both attractive and efficient. In 2016, more than 150 students and early-career scientists participated in ECORD Summer Schools and Grants. In 2017, the two most recent ECORD initiatives, the ECORD Training Course (page 11) and the ECORD Summer School on Petrophysics (page 14) will be held for the third and second time respectively. This unique portfolio of science and educational activities, world-class capabilities, state-of-the-art technology and remarkable knowledge-based resources that ECORD offers to its science community exemplifies its outstanding contribution to the ground-breaking International Ocean Discovery Program.

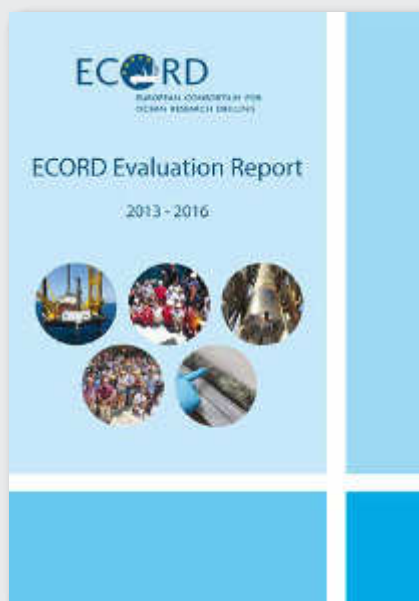
Gilbert Camoin, Director of the ECORD Managing Agency - camoin@cerege.fr - and Michael Webb, Chair of the ECORD Council - mwebb@nerc.ac.uk

ECORD post-2018 Renewal Processes

Like most of their IODP partners, the ECORD member countries will have to commit to the second phase (2019-2023) of the International Ocean Discovery Program before the end of 2018. At its two 2016 meetings, the ECORD Council approved the procedures for an external evaluation of ECORD's achievements and performance since 2013 to produce a basic document that will be submitted to all ECORD funding agencies.

The ECORD evaluation will be conducted from January to June 2017 by an **ECORD External Evaluation Committee (EEC)**, ending with a general meeting from 6 to 8 June 2017, in Bremen, Germany, and the production of a report soon after. The EEC members were appointed by the ECORD Council at its fall meeting, which was held in Bremen, Germany, on 23-27 October 2016. The committee includes:

- Helmut Weissert (Chair, Switzerland);
- Maria Ask (Sweden);
- Adrian Immenhauser (Germany);
- Eystein Jansen (Norway);
- Ralf Littke (Germany);
- Patrick Pinet (France);
- Katherine Richardson (Denmark);
- Johan Robertsson (Switzerland).



The ECORD evaluation will cover all aspects of ECORD activities: science, technology, management, education and outreach. It will concentrate primarily on science results as measured against the Science Plan, and the success of ECORD's financial model for platform operations during the first phase of IODP (2013-2018), in addition to the operational plans defined for mission-specific platform (MSP), *JOIDES Resolution* and *Chikyu* expeditions during the second phase of IODP (2019-2023). The ECORD Managing Agency (EMA) and the ECORD Science Operator (ESO) will be evaluated as part of this process and the ECORD Council will take the decision at its spring 2017 meeting as to whether to re-tender for the roles of both EMA and ESO at the end of 2018 and mid/late 2019 respectively, based on the findings of the review.

The ECORD mid-term renewal process will also encompass revisiting the two **Memoranda of Understanding (MoU)**, which summarise the agreement between ECORD and its partners, Japan (JAMSTEC and MEXT) and the USA (NSF) and their Associate Members. Preliminary discussions between ECORD and its partners started in late 2016 and will continue throughout 2017 with the MoU's being revisited in early 2018.



Gilles Lericolais

News from the ECORD Facility Board

On January 2017, three members of the ECORD Facility Board (EFB) rotated off, former Chair Karsten Gohl (Germany), Vice-chair Dominique Weis (Canada), and Gerald Dickens (USA). The EFB thank them for their valuable service and commitment to ECORD-IODP. Gretchen Früh-Green (Switzerland), Gabriele Uenzelmann-Neben (Germany) and Ellen Thomas (USA) joined the EFB for 3 years.

The operational review of the Expedition 357 Atlantis Massif Serpentinization and Life was held in Bremen, Germany on 24-25 October 2016. The review committee, which was composed of two external reviewers (Christopher MacLeod and Bo Barker Jørgensen) and three EFB members (Gilles Lericolais, Stephen Gallagher and Karsten Gohl) recognised the extraordinary complexity of this expedition compared to previous expeditions, and congratulated all parties for achieving this remarkable success despite exceptionally difficult circumstances. Based on this evaluation, the EFB decided to produce guidelines to be distributed before MSP expeditions and recommended the organisation of a pre-cruise meeting involving all parties.

The operational review of Expedition 364 Chicxulub K-Pg Impact Crater, which was successfully conducted in 2016, is

scheduled for 20 June 2017 in Lisbon, Portugal.

The fifth meeting of the EFB was held in Hannover, Germany on 8-9 March 2017 and was primarily devoted to the future programme of MSP expeditions. Expedition 373 Antarctic Cenozoic Paleoclimate, initially scheduled in late 2017 - early 2018, has been postponed to 2020 based on the ESO request to further test the RockDrill2 (RD2). The EFB endorsed the scheduling of Expedition 381 Corinth Active Rift Development in late 2017 ([page 6](#)). The EFB considered this expedition as a high priority for ECORD, as previously agreed during the 2016 meeting. The EFB also further discussed the planning of the Expedition 377 Arctic Ocean Paleoceanography (ACEX-2), which relies on significant in-kind contributions from Germany and Russia ([page 6](#)).

During the meeting, the EFB further shaped its long-term scheduling strategy based on the scientific excellence of the proposals, planned expedition costs and budget constraints. As three expeditions are currently scheduled ([table below](#)), over the course of the next three years the EFB will consider the potential scheduling of four additional expeditions to run before 2023.

The 2019-2023 MSP operational plan will be based on both active mission-specific platform proposals that are currently residing at the ECORD Facility Board ([map below](#)) and the Science Evaluation Panel, and on new proposals submitted to IODP. Active MSP proposals within the system include an Amphibious Drilling Proposal, whose scientific objectives can only be accomplished by combining land and ocean drilling, and a Multi-phase Drilling Proposal dealing with long piston-coring technology. The MSP active proposals reflect the need expressed by the scientific community to implement MSP expeditions involving various drilling and coring systems in diverse environments and conditions. Provisional reservations for 2020 and 2022 have been made for seabed drilling systems MeBo70/200 and RD2 to accommodate any proposal demands. The operation of these systems, as well as long-piston coring, can be conducted in the low-cost category provided that the research vessels are contributed in-kind.

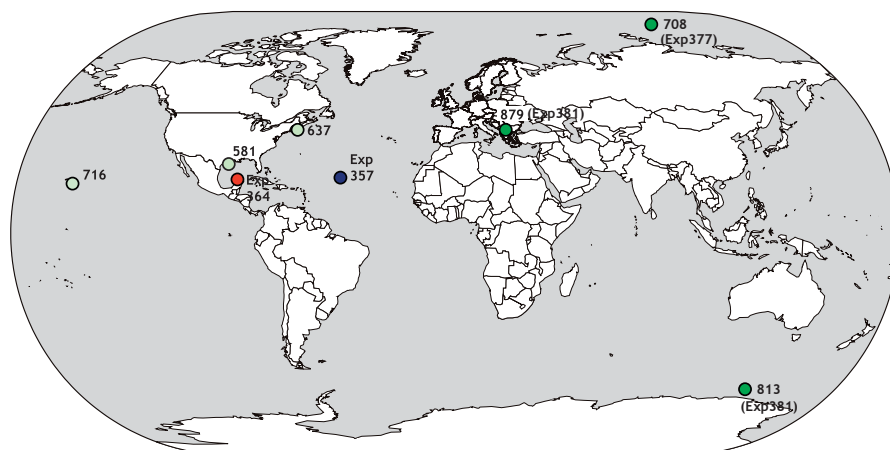
The next EFB meeting is scheduled for 6-7 March 2018 in Italy with the exact location to be decided.

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<http://www.ecord.org/about-ecord/management-structure/efb/>*

Long-term scheduling strategy of the EFB for MSP expeditions

2017	Exp 381 Corinth drillship (MC-HC)
2018	Exp 377 Arctic drillship (HC)
2019	tbd (LC)
2020	Exp 373 Antarctic RD2 (LC-MC)
2021	tbd (MC)
2022	tbd seabed drill (LC)
2023	tbd (HC)

LC: low-cost (<8M USD), MC: mid-cost (8-15M USD), HC: high-cost (>15M USD) - RD2: RockDrill2 (seabed drilling system).



● 2015 MSP expedition
● 2016 MSP expedition

● Scheduled MSP expeditions
○ MSP proposals in the EFB holding bin



David McInroy



Sarah Davies

ECORD Science Operator News and Views



Ursula Röhl



Dave Smith

In the previous ECORD Newsletter (#27, November 2016) we reported on the highly successful Expedition 364 Chicxulub K-Pg Impact Crater, co-led by Joanna Morgan (Imperial College, London, UK) and Sean Gulick (University of Texas, Austin, USA). While media and outreach activities are ongoing from this expedition, the ECORD Science Operator (ESO) have been planning the next two mission-specific platform (MSP) expeditions.

IODP Expedition 381 Corinth Active Rift Development Co-Chief Scientists: Lisa McNeill and Donna Shillington <http://www.ecord.org/expedition381/>

The major goal of this expedition is to resolve the syn-rift chronology and paleoenvironment and integrate this with an existing seismic database and onshore stratigraphy to address numerous objectives. The distribution of tectonic strain in time and space and the timescales of fault evolution in a young rift at high resolution will be established. Furthermore, the evolution of a rift-controlled, closed drainage system and the relative impact of tectonics and climate on sediment flux will be determined (*See page 16 for further information*).

At the end of 2016, ESO started the procurement exercise for a geotechnical vessel and coring rig for Expedition 381. This has now been completed and the ECORD Facility Board (EFB) has approved the final budget. Contract negotiations started in March 2017 with an aim to implement the offshore operation in the final quarter of 2017, with the Onshore Science Party (OSP) anticipated to be in early 2018. The water depths and penetration below seabed dictate that a similar vessel and rig combination to previous MSP expeditions (*e.g.* Expeditions 347 Baltic Sea Paleoenvironment and 325 Great Barrier Reef Environmental Changes) is used. As for previous MSP expeditions, ESO will provide the operational oversight, science support and containerised laboratories, and will provide in-house downhole logging services (similar to the recently completed Expedition 364). Following approval of the budget by EFB, ESO has initiated preparation of its various equipment and laboratory facilities for this expedition, including:

- Maintenance, renovation and upgrade of the ESO Bremen laboratory and curation containers;
- Maintenance of microscopes;
- General maintenance and upgrade of all physical properties equipment;
- Scoping acquisition of a 10' container to be designated to downhole logging equipment and personnel;
- Reorganisation and resupply of consumables.

The call for scientists was conducted early 2017, with all applications now being reviewed by IODP Program Member Offices. Short-lists are due to be forwarded to ESO in late March for selection of the Science Party in collaboration with the Co-chief Scientists.

IODP Expedition 377 Arctic Ocean Paleocyanography Co-Chief Scientists: Rüdiger Stein and Kristen St John <http://www.ecord.org/expedition377/>

Work continued on the scoping for Expedition 377 Central Arctic Paleocyanography, provisionally scheduled for August - September 2018. This projects aims to build on the success of the first MSP, Expedition 302 Arctic Coring Expedition, which took place in 2004. The proponents submitted a new addendum to the EFB in April 2016, and updated the IODP Site Survey Database with new data collected since the original proposal submission. The revised sites allow for the possibility of reaching some critical stratigraphic targets with less total penetration, putting it within reach of geotechnical coring rig capability. The new sites have been approved by the Science Evaluation Panel, and ESO will work with the proponents to define the final site strategy, which will remain flexible in order to accommodate ice conditions at the time of drilling.

ESO continue to scope potential drilling methodologies and ice management scenarios for this expedition. The realisation of this expedition is dependent on successfully securing in-kind contributions (IKCs) towards ice management, ice-breaking capability and other logistical support. Co-Chief Scientist Rüdiger Stein has facilitated the IKC of the *R/V Polarstern* by the Alfred Wegener Institute, Germany, and ESO continue to explore further opportunities for IKCs with other IODP and non-IODP countries. Planning of this complex expedition continues and currently has a departure date of 12 August 2018 from Tromsø for an envisaged 47 days on-site operation. It is envisaged that both a tender exercise for the drilling platform and the Call for Scientists will be initiated in Spring 2017 (*See page 17 for further information*).

Other Activities

In February 2017 the moratorium ended for Expedition 357 Atlantis Massif Serpentinization and Life. The IODP Proceedings were published online on 4 February, and all shipboard data have been made publicly available, having been transferred from the ExpeditionDIS and the Science Server to PANGAEA - www.pangaea.de, coincident with the release of the Proceedings - <http://publications.iodp.org/proceedings/357/357title.html>.

ESO are assisting with planning for the second post-cruise meeting for Expedition 357 Atlantis Massif Serpentinization and Life. This meeting will be held in Liguria on 4-6 September 2017, hosted by Science Party member Chiara Boschi of the Institute of Geosciences and Earth Resources, Italy.

ESO Bremen continues to monitor Expedition 364 Chicxulub K-Pg Impact Crater post-OSP sample activities, including organisation of thin section preparation and distribution, and setting up of sample loan agreements.

EC H2020 Proposal: Distributed European Drilling Infrastructure - DEDI-2 proposal

A consortium of research institutes and SMEs, including ESO partners (BGS, MARUM, University of Leicester and CNRS Montpellier) have submitted a proposal for ~5M € funding over three years to the European Union's Horizon 2020 Research & Innovation Actions programme. This programme seeks to emphasise scientific excellence, industrial leadership and the importance of addressing societal challenges, through removal of barriers to innovation and promotion and facilitation of cross-sector collaboration.

The Distributed European Drilling Infrastructure (DEDI) is proposed in response to a need to further enhance scientific investigation of the sub-surface through provision of transnational access to a combination of cutting edge technologies and proven scientific services to the European Earth and environmental scientific communities. The consortium will also seek to promote the development and use of new and innovative technologies for specialist subsurface sampling, measurement and monitoring. This will be achieved through enhancement of collaboration and engagement between the infrastructure partners, industry and other academic institutions and organisations. An earlier, unsuccessful version of this proposal was submitted in 2014. This new proposal builds on what was originally proposed, addressing

the comments provided by reviewers, incorporating additional partners, and refining the proposed mechanisms for delivery.

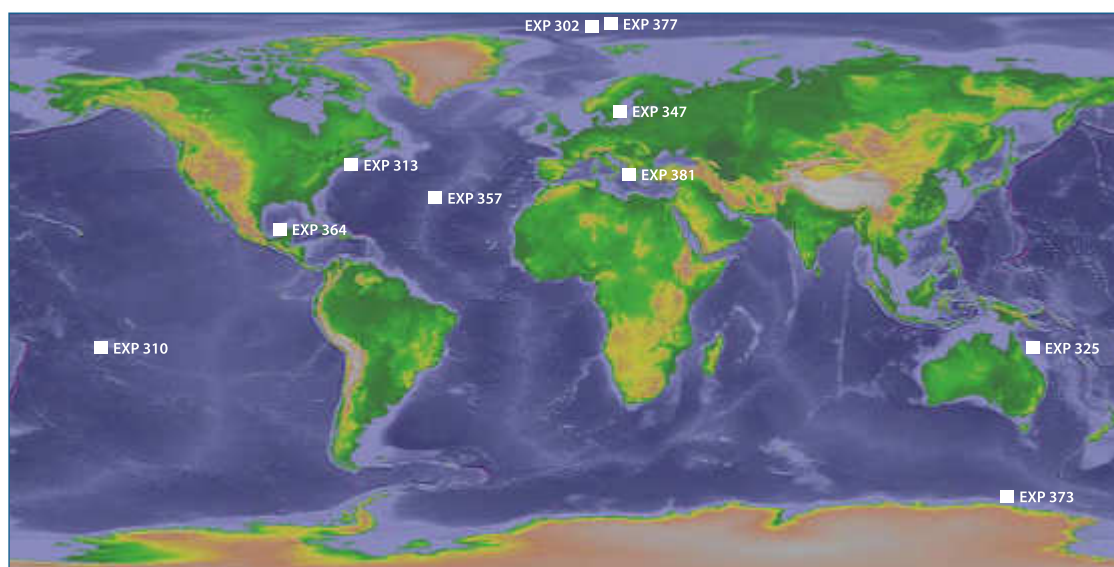
Seven work packages are proposed by the DEDI consortium covering networking (1, 2), transnational access (3, 4), joint research activities (5, 6), and management (7) of the infrastructure that will be required to deliver the objectives of this exciting proposal:

1. Establishing policies and procedures;
2. Partnering with industry and other entities;
3. Provision of transnational access to research facilities, services and training;
4. Education & outreach;
5. Development of new innovative technologies;
6. Proof-of-concept pilot projects;
7. Overall management.

The proposal was submitted at the end of March and is currently under review.

David McInroy, ESO Science Manager, Sarah Davies, EPC Manager, Ursula Röhl, ESO Curation and Laboratory Manager and Dave Smith, ESO Operations Manager
<http://www.ecord.org/about-ecord/management-structure/eso>

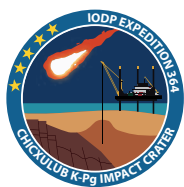
MSP Expedition Map and Schedule



Expedition	Exp #	Drillship	Dates	Co-chief Scientists
Corinth Active Rift Development	381	tbc	October - November 2017	L. McNeill - D. Shillington
Arctic Ocean Paleocyanography	377	Polarstern + icebreaker	August - September 2018	R. Stein - K. St. John
Antarctic Cenozoic Paleoclimate	373	Nathaniel Palmer + RD2	late 2019 - early 2020	C. Escutia - T. Williams

RD2: RockDrill2. ECORD Co-chief Scientists are marked in blue.

<http://www.ecord.org/expeditions/msp/2013-2023/>



Expedition 364 Chicxulub K-Pg Impact Crater: a promising petrophysics dataset

Johanna Lofi¹ and Erwan Le Ber²

During the offshore and onshore phases of IODP Expedition 364, a large high-quality petrophysical dataset was acquired both downhole and on cores. These measurements, some of which have been published in *Science* (Morgan *et al.*, 2016), will be used by the Science Party to improve our understanding of crater structure and formation mechanisms, to ground truth geophysical models and to integrate borehole data with 2-D and 3-D seismic data.

The petrophysics dataset at Site M0077 includes downhole-logging data where the acquisition was supported by funding from the International Continental Scientific Drilling Program (ICDP). Logging services coordinated by the European Petrophysics Consortium (EPC) were contracted from the University of Montpellier (France) for super-slimline wireline logging (right), and the Universities of Alberta (Canada) and Texas (Austin, USA) for the vertical seismic profiling (VSP). The set of downhole geophysical tools used was determined by the scientific objectives, the drilling/coring technique, hole conditions and the temperature in the borehole. Logs were acquired in three logging phases at intervals ~ 0-503, ~ 506-699 and ~ 700-1334 mbsf. They were recorded either with standalone or stackable logging tools, combined into tool strings, which were lowered into the hole after completion of coring operations over a given interval. For the first time in IODP, Expedition 364 deployed stackable super-slimline probes. Log data includes total gamma radiation, sonic velocity, acoustic and optical borehole images, resistivity, conductivity, magnetic susceptibility, caliper and borehole fluid parameters. The acquisition of exceptionally clear images of borehole wall structures was a key highlight of the logging programme and these should allow the cores to be effectively reoriented to the magnetic North after accurate core-log integration. VSP data were acquired from ~1325 to ~50 mbsf at various vertical resolutions ranging from 2.5 to 7.5 m. The majority of measurements were performed in open borehole conditions (no casing). The recovery and overall quality of the downhole logging data are generally very good due to the excellent borehole conditions.

The core petrophysics dataset acquired offshore on whole-round cores at Site M0077 includes density, resistivity, magnetic susceptibility and natural gamma radiation, measured using the multi-sensor core logger (MSCL) (photo right, page 9). This was the first mission-specific platform expedition to acquire natural gamma radiation measurements during the offshore phase, representing a significant time- and associated cost-saving for the pre-Onshore Science Party (OSP) period, when the dataset has traditionally been acquired. Other petrophysics measurements were performed onshore on half-round cores (line scan, colour reflectance and thermal conductivity) and on discrete samples (P-wave velocity, and moisture and density).



In preparation for downhole logging operations during Expedition 364, Gilles Henry and Laurent Brun, downhole logging engineers assemble a tool string of slimline probes (photo J. Lofi, ECORD/IODP).

The petrophysics dataset is under moratorium until October 2017 but we can already confirm an overall excellent match between downhole and core measurements (Figure 1, page 9). One of the main objectives of Expedition 364 was to drill the target rocks from which ~590 m of core was recovered. In addition, overlying post-impact melt rocks and suevite (~109 m), and carbonate sediments (~109 m) have been cored. Very distinct petrophysical responses have been acquired from the main drilled lithologies. The first published results in *Science* (Morgan *et al.*, 2016) and the Preliminary Report (Gulick *et al.*, 2017) illustrate how unusual the target rocks are, with a felsic basement displaying rather low densities and low resistivities. These observations have helped refine existing models of peak-ring formation and allowed hypotheses to be formulated on how life may have developed in peak-ring rocks, or on planets exposed to meteorite impacts.

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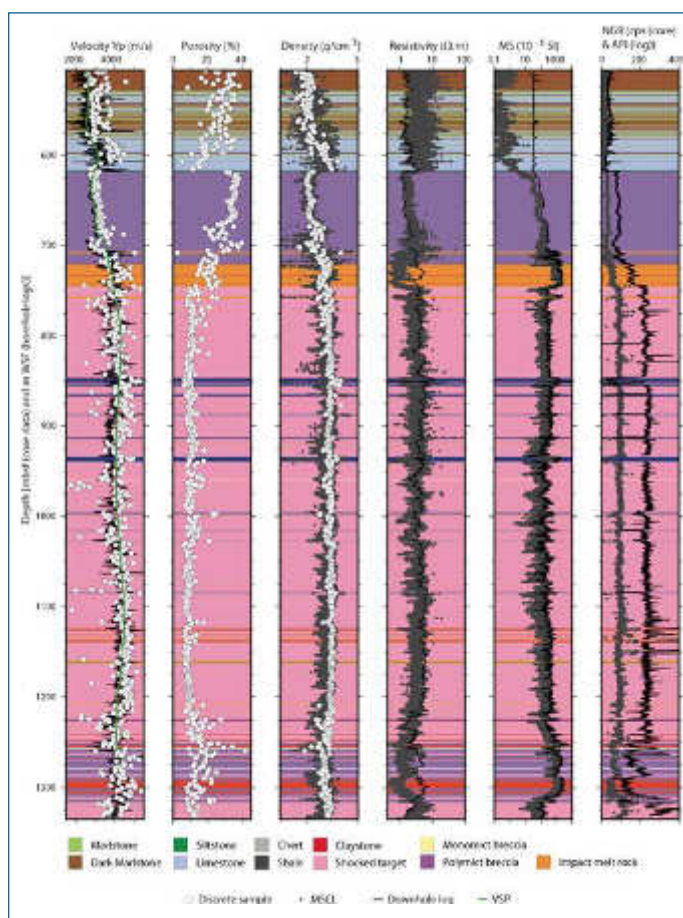


Figure 1. Expedition 364 core and downhole petrophysics data acquired over the cored interval at Site M0077 (modified from Gulick et al., 2017).

As the research continues, the high-quality borehole data and continuous petrophysics data collected on the cores will undoubtedly contribute to further revealing the secrets of Chicxulub's peak ring. For example, oriented borehole images will allow core spatial re-orientation and associated structural analyses of the target rocks. Sonic and density data will be used to generate synthetic seismograms. Cluster analysis approach will allow automatic evaluation of petrophysical parameters and may reveal trends that are not obvious to the human eye. Downhole logs will play a key role in interpreting lithologies/lithological changes in the upper, uncored, ~500 m thick carbonate interval.

Early results from this expedition were presented at the 48th Lunar and Planetary Science Conference (LPSC) in March 2017 during a session dedicated to Expedition 364, and both Johanna Lofi and Erwan Le Ber were named co-authors. Johanna Lofi (Expedition 364 Petrophysics Staff Scientist) will also present preliminary interpretations from the downhole data at the European Geosciences Union (EGU) General Assembly 2017 (See page 14).

Acknowledgements: the acquisition of petrophysical data during a MSP expedition is always a team effort involving science party



The multi-sensor core logger (MSCL) container busy with cores during the Expedition 364 (photo M. Rebolledo-Vieyra, ECORD/IODP).

members and ESO-EPC staff, with the support from ESO-MARUM. As Petrophysics Staff Scientist (PSS), Johanna Lofi (EPC - University of Montpellier) was in charge of operation supervision with support from Erwan Le Ber (EPC - University of Leicester). EPC staff consisted of Laurence Phillpot, Zeinab Adeyemi, Grace Howe (EPC - University of Leicester), Annick Fehr (University of Aachen), Nataliya Denchik (University of Montpellier) and Christopher Nixon (University of Alberta). MARUM support staff consisted of Vera Lukies, Timo Fleischmann and Thomas Westerhold. Offshore logging operations were conducted by Laurent Brun, Gilles Henry, Jehanne Paris (University of Montpellier), Doug Schmitt, Randy Kofman, Christopher Nixon (University of Alberta) and Steffen Saustrop (University of Texas). The four members of the science party involved in data acquisition and reporting were Gail Christenson (University of Texas), Catalina Gebhardt (Alfred Wegener Institute), Auriol Rae (Imperial College London) and Mario Rebolledo-Vieyra (Centro de Investigación Científica de Yucatán).

References

- Morgan JV, Gulick SPS and IODP Expedition 364 scientists. 2016. The formation of peak rings in large impact craters. *Science*, 354, 6314, 878-882. doi: 10.1126/science.aah6561
- Gulick S, Morgan J, Mellett CL and the Expedition 364 Scientists, 2017. Expedition 364 Preliminary Report: Chicxulub: Drilling the K-Pg Impact Crater. International Ocean Discovery Program. doi:10.14379/iodp.pr.364.2017



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ECORD Outreach & Education News and Activities



Hanno Kinkel



Patricia Maruéjol

Since November 2016, the ECORD Outreach & Education Task Force (E-OETF) has promoted ECORD and IODP at AGU 2016 in collaboration with ICDP, produced various resources (newsletter, flyers, etc.), and supported educational activities and public events. On 26-27 January 2017, the Task Force met in Aix en Provence, France, to coordinate ECORD programme's outreach and education activities with ICDP colleague, Carola Knebel, who replaced Thomas Wiersberg. The meeting was hosted by Gilbert Camoin and Nadine Hallmann at the CEREGE-CNRS, the ECORD Managing Agency (EMA's) home in Aix en Provence.

ECORD at AGU 2016

For the first time, a joint booth presenting "ICDP and IODP Scientific Drilling Programs" was organised at AGU (12-16 December 2016) in San Francisco, USA, in collaboration with colleagues from the USSSP and CDEX-JAMSTEC (*above*). Separate IODP and ICDP Town Hall meetings were held during the conference.



Members of the E-OETF with USSSP and CDEX-JAMSTEC colleagues at AGU 2016 (photo T. Wiersberg).

Resources

ECORD/IODP information materials (newsletter, flyers, etc.) were provided to the participants of the ECORD Training Course (*page 11*) and at a science public event in Portugal (*page 25*). Resources from Expedition 364 Chicxulub K-Pg Impact Crater include the launch of a TV documentary commissioned by Nova (USA) and the BBC (UK) with an anticipated airing date in late April or May 2017. In addition, NHK (Japan) will air a documentary on May 18. In preparation for the start of Expedition 381 Corinth Active Rift Development, promotional materials (logo, leaflet, expedition webpage) were designed to create the individual identity of the expedition (*see page 16*). **ODP-IODP core replicas** - <http://www.ecord.org/pi/core-replicas.html> - were distributed to support teaching and several public events in France (*page 24*) and Germany.

Media events

Two media conferences related to Expedition 364 Chicxulub K-Pg Impact Crater were organised at AGU 2016 and the Lunar Planetary Science Conference (LPSC) 2017. The first results from the expedition were presented by the Co-chief Scientists, J. Morgan and S. Gulick, to the press.

Educational activities

Two ECORD teachers sailed as Education/Outreach officers onboard the *JOIDES Resolution*. Martin Böttcher took part in

Expedition 366 (*page 12*) and Alessia Cicconi in Expedition 367. Results will be presented at EGU 2017 by Alessia Cicconi and Marion Burgio, who sailed on Expedition 360.

Kevin Kurtz, Education Officer on MSP Expedition 364 Chicxulub K-Pg Impact Crater launched a 'kickstarter page' for an e-book on Chicxulub - <https://www.kickstarter.com/projects/kevcurtz/blast-from-the-past-a-free-childrens-ebook-about-s>

ECORD online

With the launch of the new ECORD website launched in September 2016 and its ability to distribute online news, more than 200 new subscribers have joined the ECORD mailing list. After

being tested at conferences throughout 2016, the ECORD web app was updated and will be launched by mid-April 2017. The use of mobile platforms will help make information more widely available and also enable the E-OETF to capture details of interested parties more easily when attending conferences.

Upcoming events / activities

ECORD and ICDP exhibition booths will be organised at **EGU 2017** - 23-28-April 2017 (#60-61-62-63) in the main entrance hall in Vienna, Austria, and at AGU 2017 in New Orleans in collaboration with JAMSTEC, USSSP and ICDP, in conjunction with IODP-ICDP sessions. Support to early-career scientists at the Goldschmidt 2017 in Paris, is being discussed.

ECORD will continue to encourage and support national IODP educational initiatives, ECORD School of Rock 2017, and international events like the International Earth Science Olympiad (IESO) 2017. The E-OETF is setting up educational and outreach activities to address large audiences during the next MSP expeditions, Expedition 381 Corinth Active Rift Development and Expedition 377 Arctic Ocean Paleoenvironment. Teachers and outreach/video specialists will be invited to take part in the different phases of these expeditions. New resources arising from Expedition 364 Chicxulub K-Pg Impact Crater include post- and syn-impact core replicas, the release of a TV documentary by Barcroft on NOVA and the BBC, and an educational workshop for teachers.

Patricia Maruéjol, EMA, Carol Cotterill and Ulrike Prange, ESO, and Hanno Kinkel, ESSAC - <http://www.ecord.org/outreach/> and <http://www.ecord.org/education/>

ECORD Training Course 2017: "Virtual Ship Experience" 6-10 March 2017, Bremen (Germany)

For the next generation of IODP scientists the MARUM (Center for Marine Environmental Sciences, University of Bremen), is an important hub. Located at the MARUM, the Bremen Core Repository (BCR), one of only three IODP repositories in the world, is where scientists can train, and enhance their abilities at an early stage in their career.

From 6 to 10 March 2017, the third ECORD Training Course was held at the BCR with 30 participants from 11 different countries, including non-ECORD IODP member countries (Australia, Brazil and USA).

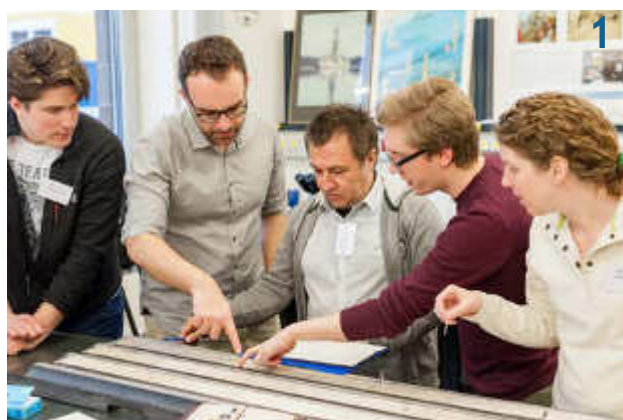
This five-day course started with an introductory session on the structure and objectives of ECORD and IODP, and a general tour of the MARUM and BCR, before focussing on the IODP core-flow and typical expedition laboratory procedure practicals in smaller groups. These IODP-style lab exercises formed the foundation of the course, following the pattern of the unique "Virtual Ship" approach developed for the popular Bremen ECORD Summer Schools - <http://www.marum.de/en/>

[ECORD_Summer_Schools.html](http://www.marum.de/en/ECORD_Summer_Schools.html). The course was customised to prepare the participants for sailing on an IODP expedition, and to give them an appreciation of the high standards required for all kinds of coring projects. The detailed programme is posted on http://www.marum.de/en/ECORD_Training_Course_2017.html.

The course concluded with an IODP proposal writing exercise on the last day. The brainstorming in breakout groups was great fun and has already resulted in several promising new ideas that may evolve into pre-proposals in the future. The participants (*below and cover*) were exceptionally lively, taking part in practical exercises and contributing to discussions, gaining first-hand insights into the multidisciplinary team effort that is a crucial part of the success of any ocean drilling programme.

Ursula Röhl, ESO Curation and Lab Manager, IODP Bremen Core Repository, MARUM, University of Bremen - uroehl@marum.de

<http://www.ecord.org/education/training-course/>



3 *Visual-core description in MARUM labs: 1, 2, sediments, 3, 4, hard rocks.*



5: Pore-water acquisition and analysis

All photos V. Diekamp © MARUM

ECORD Teachers at Sea

Expedition 366 Mariana Convergent Margin and South Chamorro Seamount

Martin Böttcher*

Mountains almost nobody knows about. This could describe the serpentinite mud volcanoes of the Mariana fore-arc region. Indeed, when Expedition 366 sailed on 9 December from Guam, I asked myself if there would be enough news out there to write and talk about. But once we were out on the Pacific, those questions were not a concern anymore. In fact, the mud volcanoes turned out to be very exciting. Apart from the geological challenge the rough sea conditions gave us an exciting start and an impression of what seasickness can mean. Fortunately we reached our first sites quickly and sea conditions calmed down. Everybody was excited when the first cores came up on deck and all of us wanted to see the mysterious blue-green serpentinite mud. When we finally got it up onto the description table, it was greenish-blue, light and dark blue. Most of us had never seen anything like this before (*photo top right*).

As the serpentinite mud-volcanoes turned out to be difficult to drill into, we did not recover kilometres of core. Nevertheless, the results were very good for the geologists, geochemists and also microbiologists on board, and it will be years before all the samples are fully analysed. We expect some surprises!

In addition to the coring, some other objectives made this expedition unique. Three drill sites were equipped with a screened casing, complete with re-entry-cones and ROV-landing platforms for future investigation. We spent time on geo-engineering activities to establish the hardware for monitoring the mud volcanoes in the future, as it is known that their eruptions correlate with subduction earthquakes. It took a lot of time to set the casings, so there was time for the geologists to work on their reports and finish them while still on board. For myself and Kristen Weiss, my American E&O partner, there was time to concentrate on the work being done by the different groups on board, and to write about them. The drill crew also did an excellent job, and were happy to collaborate as we documented their hard and dangerous work on the rig floor through videos and posts (*photo right*). The same for the kitchen and the bridge crews.

After Christmas the number of videoconferences increased and we had interesting live events with the USA, Germany, France, Belgium, Italy, UK, Korea and Morocco. The scientists were happy to take part in "ask-a-scientist-sessions" with students in the onshore classrooms when available.

During the expedition I wondered what these mountains looked like down there in the dark of the deep sea. Of course we had bathymetric maps for drilling and we could see the cores, but it is not the same as actually seeing a mountain the size of Mt Kosciuszko, Australia's highest peak on land when it is 3000 metres beneath the ship. So I built a scale model out of the original mud



Martin Böttcher, left, and SIEM personnel, stand near the moonpool of the JOIDES Resolution, shortly before the re-entry cone (background) is lowered. Hard hat, ear protection, glasses, steel-toed shoes and life vest are prescribed for everybody working near the moonpool (photo IODP-JRSO).

to give my imagination shape, and to bring back home to show the students what a serpentinite mud volcano might look like.

On 7 February 2017 we reached Hong Kong, where we left the ship. What remains apart from the samples and the scientific results is the memory of great teamwork in an unforgettable atmosphere of friendship and spirit of discovery. Nevertheless, eight weeks are a long time when you can't leave. If I was asked, what is required most from an E&O Officer on board the *JOIDES Resolution* I would say full commitment to the expedition team and expedition goals.

*Rabanus-Maurus-Schule, Fulda, Germany - mboceanethics@gmail.com



Jan Behrmann

ESSAC News

Since early spring of 2016, the ESSAC Office has been located at GEOMAR, Kiel, Germany. Moving the office to Kiel from its previous location at ETH Zurich, Switzerland was done in a "soft" fashion, to take advantage of thorough and sequential transfer of knowledge. This approach proved very successful for an easy start-up of operations for novices in the positions of ESSAC Chair and ESSAC Science Coordinator.

Eight IODP expeditions were completed in 2016. Five of them used the *JOIDES Resolution (JR)*. As part of ECORD's mission-specific platform (MSP) programme, Expedition 364 Chicxulub K-Pg Impact Crater successfully completed its offshore and onshore phases in May and September/October 2016 respectively - <http://www.ecord.org/expedition364/>. Two expeditions were completed by the *Chikyu* at the Nankai convergent margin offshore SW Japan. In 2016, a total of **62 scientists**, including **six Co-chief Scientists** from ECORD member countries participated in IODP expeditions. Two scientists were chosen following special calls for participation. Currently (February-June 2017) the *JR* is sailing on two consecutive expeditions (Expeditions 367 and 368) in the South China Sea. These expeditions are implementing a successful Complementary

Project Proposal (CPP) with China. Twelve scientists from 6 ECORD countries are onboard, including a Co-chief Scientist from Denmark, and two Education/Outreach Officers, Martin Böttcher ([page 12](#)) and Alessia Cicconi.

The selection of ECORD scientists to participate in upcoming expeditions operated by the *JR*, the *Chikyu* and MSPs during 2017 has either been completed or is ongoing.

We are pleased to be able to provide many students and early-career researchers with the opportunity to participate in IODP expeditions. Young scientists continue to make up approximately 50% of the ECORD participants. More information about the scientific objectives and dates of all expeditions can be found in the [table below](#) and on the IODP website at <http://www.iodp.org/expeditions>.

Applicants for these IODP expeditions have greatly benefited from information provided by online, interactive "webinars", an initiative originally organised by the US Consortium for Ocean Leadership. Webinars have become an integral part of the application process for all IODP expeditions.

IODP Expedition Drilling Schedule

Expedition	Exp #	Drillship	Dates	Co-chief Scientists
Mariana Convergent Margin	366	JR	8 Dec 2016 - 7 Feb 2017	P. Fryer - G. Wheat
South China Sea Rifted Margin A	367	JR	7 Feb - 9 April 2017	Z. Sun - J. Stock
South China Sea Rifted Margin B	368	JR	9 April - 11 June 2017	Z. Jian - HC. Larsen
Tasman Frontier Subduction and Paleogene Climate	371	JR	27 July - 26 Sep 2017	R. Sutherland - G. Dickens
Australia Cretaceous Climate and Tectonics	369	JR	26 Sep - 26 Nov 2017	B. Huber - R. Hobbs
Corinth Active Rift Development	381	MSP	October - November 2017	L. McNeill - D. Shillington
NanTroSEIZE Frontal Thrust Borehole Monitoring System	380	Chikyu	26 Oct - 5 Dec 2017	M. Kinoshita - H. Tobin
Creeping Gas Hydrate Slides & Hikurangi LWD	372	JR	26 Nov - 4 Jan 2017	I. Pecher - P. Barnes
Ross Sea West Antarctic Ice Sheet History	374	JR	4 Jan 2017 - 8 March 2018	R. McKay - L. De Santis
Hikurangi Subduction Margin Observatory	375	JR	8 March - 5 May 2018	D. Saffer - L. Wallace
Brothers Arc Flux	376	JR	5 May - 5 July 2018	C. de Ronde - S. Humphris
Arctic Ocean Paleooceanography	377	MSP	August - September 2018	R. Stein - K. St John
South Pacific Paleogene Climate	378	JR	14 Oct - 14 Dec 2018	tbd
Amundsen Sea West Antarctic Ice Sheet History	379	JR	18 Jan - 20 March 2019	tbd
Antarctic Cenozoic Paleoclimate	373	MSP	late 2019 - early 2020	C. Escutia - T. Williams

JR: JOIDES Resolution, MSP: mission-specific platform - <http://www.iodp.org/expeditions/expeditions-schedule>. ECORD Co-chief Scientists are marked in blue.

On the IODP Advisory Panels, ECORD has **nine members in the science sub-group and five members in the site sub-group of the Science Evaluation Panel (SEP)** (*table page 15*). SEP is responsible for the evaluation of all IODP proposals.

The **2017 ECORD Distinguished Lecturer Programme (DLP)** has been successfully implemented, with four lecturers covering the major themes defined in the IODP Science Plan. Currently 36 lectures are scheduled or planned with the DLP lecturers visiting 13 ECORD countries. Further information is available on <http://www.ecord.org/education/dlp/>

ESSAC continues to support initiatives to train the next generation of ocean-drilling scientists through the ECORD Summer Schools. In 2017, young scientists will have the opportunity to participate in **three summer schools** sponsored by ECORD and related to marine science research and ocean drilling:

- **ECORD Summer School on Petrophysics**, Leicester, UK, 2-7 July 2017 - <http://www2.le.ac.uk/departments/geology/research/gbrg/projects/iodp/summerschool17>.
- **Urbino Summer School in Paleoclimatology (USSP)** on Past Global Change Reconstruction and Modelling Techniques, University of Urbino, Italy, 12-28 July 2017 - <http://www.urbinossip.it>
- **ECORD Bremen Summer School 2017** on Current-Controlled Sea Floor Archives: Coral Mounds and Contourites, MARUM, University of Bremen, Germany, 21 August - 1 September 2017 - https://www.marum.de/en/ECORD_Summer_School_2017.html

As in previous years, ESSAC will award **ECORD Scholarships** to young scientists to attend the USSP, Bremen and Petrophysics summer schools. The deadline for applications was 24 March 2017 - <http://www.ecord.org/education/scholarship/>

The ESSAC office has issued a call for applications for **ECORD Research Grants**, to support outstanding young scientists in IODP-related research, with a deadline of 30 January 2017. These short-term, merit-based awards contribute to travel and laboratory expenses, and are particularly intended to support studies that promote new collaborations and/or the acquisition of new scientific expertise. The applications are presently being evaluated by ESSAC - <http://www.ecord.org/education/research-grant/>

Further ESSAC activities include the EGU 2017 General Assembly in Vienna, Austria (23-28 April 2017), where a session entitled "Achievements and Perspectives in Scientific Ocean and Continental Drilling (Session SSP1.3)" has been jointly organised with the International Continental Drilling Program (ICDP) (*below*). This session has now become a regular event at the EGU General Assembly, and continues to attract a large number of oral and poster contributions. More information about ECORD, IODP and ICDP, and possibilities to get involved in the programmes, are available at the joint ECORD/IODP-ICDP booth in the exhibition hall, and at the IODP-ICDP Town Hall Meeting (*see dates and locations below and on page 18*).

Jan Behrmann, ESSAC Chair - essac@geomar.de
<http://www.ecord.org/about-ecord/management-structure/essac/>

IODP-related sessions at 2017 science conferences



EGU 2017, Vienna - ICDP-IODP Town Hall Meeting
 Tue 25 April, 19:00-20:00, Room G2
<http://meetingorganizer.copernicus.org/EGU2017/session/25131>



EGU 2017, Vienna - Achievements and Perspectives in Scientific Ocean and Continental Drilling (SSP1.3)
 Thu 27 April, 13:30 - 17:00, Room 1.85 & Hall X2 Posters until 19:00

<http://meetingorganizer.copernicus.org/EGU2017/session/23640>



Goldschmidt 2017, Paris, France
 Session 05e - Lithosphere evolution during subduction and collision
<https://goldschmidt.info/2017/>



LPSC 2017, The Woodlands, USA
 IODP-ICDP Expedition 364 to the Chicxulub Impact Crater
<http://www.hou.usra.edu/meetings/lpsc2017/programAbstracts/specialSessions/>

ECORD Representatives in IODP advisory panels

Science Evaluation Panel (SEP)					
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Philippe Lapointe	France	philippe.lapointe@total.com	Dieter Strack	Germany	ddhstrack@aol.com

<http://www.iodp.org/boards-and-panels/science-evaluation-panel>

ESSAC Delegates and Alternates

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<http://www.ecord.org/about-ecord/management-structure/essac/>

Focusing on IODP Science

MSP Expedition 381 Corinth Active Rift Development

Lisa McNeill¹ and Carol Cotterill²

The proposal upon which this expedition is based was submitted as IODP Proposal 879-Full "Drilling the Corinth Rift: Resolving the detail of active rift development". Continental rifting is fundamental for the formation of ocean basins, and active rift zones are dynamic regions of high geohazard potential. This project proposes drilling within the active Corinth Rift, Greece where deformation rates are high, the syn-rift succession is preserved and accessible, and a dense, seismic database provides a high-resolution fault network and seismic stratigraphy for the recent rift history.

The Corinth Rift offers access to sedimentary sequences that will enable an unprecedented level of precision of timing and spatial complexity of rift-fault system development and rift-controlled drainage system evolution in the first 1-2Myr of rift history. The main rift is accommodated across a marine basin, although there are onshore elements of the rift, which provide a wealth of information on the stratigraphy, basement composition and some chronology (from uplifted syn-rift sediment exposures). The closed drainage system of the basin with a high sedimentation rate make this location ideal for studying surface processes driven by tectonics and climate.

We propose to resolve at a high temporal (c. 20 - 50kyr) and spatial (c. 1 - 10's km) resolution how faults evolve, how strain is redistributed, and how the landscape responds within the first few Myrs to the active rifting process, as modulated by Quaternary changes in sea level and climate.

A multidisciplinary approach to core sampling, integrated with log and seismic data, will generate a Quaternary chronology for the syn-rift stratigraphy down to orbital timescale resolutions and resolve the paleoenvironmental depositional history of the basin in order to address the key objectives:

- **Fault and rift structural evolution in an active continental rift:** To establish the distribution of tectonic strain in time and space and the timescales of fault evolution in a young rift at high resolution. What are the controlling parameters on strain localisation? How and when does a "mature" fault network emerge?



Location of drill sites of IODP Expedition 381 Corinth Active Rift Development (for references see Proposal 879).



- **Surface processes in active rifts:** To determine the evolution of a rift-controlled, closed drainage system in time and space at high temporal resolution (20-50kyr) and the relative impact of tectonics and climate on sediment flux.

Three primary drill sites have been chosen to target the syn-rift sediments up to 750 m below the seabed. The expected lithologies range from lacustrine to marine basinal hemipelagic and gravity flow clay, silt and sand to likely fluvial deposits and basement limestone. The vessel used to target these sites will be a geotechnical vessel similar to that used on Expedition 347 in the Baltic Sea. Contract negotiations are ongoing (as of March), with the offshore operation provisionally scheduled for 47 to 56 days in October - December 2017 and the Onshore Science Party scheduled for Spring 2018.

Expedition webpage: <http://www.ecord.org/expedition381/>

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² British Geological Survey - ECORD Science Operator, Edinburgh, UK - cjcott@bgs.ac.uk

MSP Expedition 377 Arctic Ocean Paleoceanography

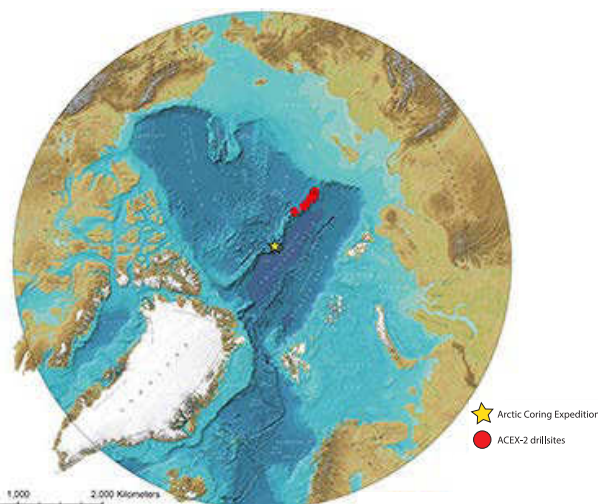
Rüdiger Stein*

Prior to 2004, geological sampling in the Arctic Ocean was mainly restricted to near-surface Quaternary sediments. Thus, the long-term Pre-Quaternary geological history is still poorly known. With the successful completion of the Arctic Coring Expedition - ACEX (IODP Expedition 302) in 2004, a new era in Arctic research has begun. Employing a novel multi-vessel approach, the first mission-specific platform (MSP) expedition of IODP has proven that drilling in permanently ice-covered regions is possible.

The original ACEX sequence possibly contains a large hiatus spanning the time interval from late Eocene to middle Miocene (based on the original biostratigraphic age model) or an interval of strongly reduced sedimentation rates (based on results from a new Os-Re-isotope-based age model). This is a critical interval, as it spans the time when prominent changes in global climate took place during the transition from the early Cenozoic Greenhouse world to the late Cenozoic Icehouse world.

The overall goal of the proposed drilling campaign is the recovery of a continuous stratigraphic record of the long-term Cenozoic climate history of the central Arctic Ocean. This sedimentary sequence from the central Arctic Ocean will be studied to answer the following key questions:

- Did the Arctic Ocean climate follow the global climate evolution during its course from early Cenozoic Greenhouse to late Cenozoic Icehouse conditions?
- Are the Early Eocene Climate Optimum and the Oligocene and Mid-Miocene warmings also reflected in Arctic Ocean records?
- Did extensive glaciations (e.g., the OI-1 and Mi-1 glaciations) develop synchronously in both the Northern and Southern Hemispheres?
- What is the sedimentary record of timing of repeated major (Plio-)Pleistocene Arctic glaciations as compared to that postulated from sediment echosounding and multi-channel seismic reflection profiling?
- What was the variability of sea-ice in terms of frequency, extent and magnitude?



Location of drills sites for IODP Expedition 377 Arctic Ocean Paleoceanography (for references see Proposal 708).

- When and how did the change from a warm, fresh-water-influenced, biosilica-rich and poorly ventilated Eocene ocean to a cold, fossil-poor, and oxygenated Neogene ocean occur?
- How critical is the exchange of water masses between the Arctic Ocean and the Atlantic and Pacific for the long-term climate evolution as well as rapid climate change?
- What is the history of Siberian river discharge and how critical is it for sea-ice formation, water mass circulation and climate change?
- How did the Arctic Ocean evolve during the Pliocene warm period and subsequent cooling? How do the ACEX2 records with the terrestrial record from the Siberian Lake El'gygytyn?
- What is the cause of the major hiatus recovered in the ACEX record? Does this hiatus in fact exist?

Proposal: 708-Full (cover) and Addendum 708-Add Arctic Ocean Paleoceanography: Towards a Continuous Cenozoic Record from a Greenhouse to an Icehouse World (ACEX2).

A call for application is open from 17 April to 2 June 2017

Expedition webpage: <http://www.ecord.org/expedition377/>

* Alfred Wegener Institute, Bremerhaven, Germany - ruediger.stein@awi.de

Calendar of Workshops and Conferences

<p>2017</p> <p>23 - 28 April EGU 2017 Vienna, Austria www.egu2017.eu</p> <p>14 - 18 May GAC-MAC Kingston, ON, Canada www.kingstongacmac.ca</p> <p>20 - 25 May JpGU-AGU 2017 Chiba, Japan www.jpгу.org/meeting_e2017</p> <p>23 - 23 May IODP-ICDP Workshop Freshwater Resources along New England Continental Shelf Woods Hole, MA, USA usoceandiscovery.org/</p>	<p>10 - 12 July IODP Workshop Indian Ocean Regional Synthesis Narragansett, RI, USA usoceandiscovery.org/workshop-indian-ocean-regional-synthesis/</p> <p>17 - 21 July International Clay Conference Granada, Spain www.16icc.org/</p> <p>6 - 11 August AOGS 2017 Singapore www.asiaoceania.org/society/index.asp</p> <p>13 - 18 August Goldschmidt 2017 Paris, France goldschmidt.info/2017</p> <p>7 - 9 September IODP-PAGES Workshop on Global Monsoon</p>	<p>Shanghai, China www.pastglobalchanges.org/calendar/upcoming</p> <p>10 - 12 October IMS 2017 Toulouse, France www.sedimentologists.org/ims2017</p> <p>22 - 25 October GSA 2017 Seattle, WA, USA www.geosociety.org/meetings/2017/</p> <p>31 Oct- 3 Nov 3P Arctic Calgary, Canada www.3parctic.com</p> <p>11 - 15 December AGU 2017 New Orleans, LA, USA meetings.agu.org</p>	<p>2018</p> <p>8 - 13 April EGU 2018 Vienna, Austria www.egu.eu</p> <p>11 - 17 August Goldschmidt 2018 Boston, USA goldschmidt.info/2018/</p> <p>13 - 18 August ISC 2018 Québec, Canada www.isc2018.org/</p> <p>4 - 7 November GSA 2018 Indianapolis, IN, USA www.geosociety.org/meetings/2018/</p> <p>10 - 14 December AGU 2018 Washington DC, USA meetings.agu.org</p>
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Calendar of ECORD & IODP Meetings

<p>EPSP 2 - 3 May 2017 College Station, TX, USA</p> <p>ESSAC #8 9 - 11 May 2017 Graz, Austria</p> <p>JOIDES Resolution Facility Board 16 - 17 May 2017 Arlington, VA, USA</p> <p>ECORD Evaluation Committee 6 - 7 June 2017 Bremen, Germany</p>	<p>Exp 364 Review 20 June 2017 Lisbon, Portugal</p> <p>SEP 21 - 23 June 2017 Lisbon, Portugal</p> <p>ECORD Council Spring #3 29 June 2017 Amsterdam, Netherlands</p> <p>IODP Forum 11 - 12 September 2017 Shanghai, China</p>	<p>ECORD Outreach & Education Task Force #12 late September-October 2017 Potsdam, Germany</p> <p>ESSAC - ECORD Council #5 23 - 25 October 2017 <i>tbd</i></p> <p>ECORD Facility Board #6 6 - 7 March 2018 <i>tbd</i>, Italy</p> <p>Chikyu IODP Board 19 - 20 March 2018 Kobe, Japan</p>
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Reports of Symposia and Workshops

MEDSALT Symposium

Angelo Camerlenghi, Aloisi Vanni and Johanna Lofi

The COST Action CA15103 Uncovering the Mediterranean salt giant - MEDSALT <https://medsalt.eu> - has established an international scientific network to address the causes, timing, emplacement mechanisms, and consequences at local and planetary scale of the largest and most recent 'salt giant' on Earth: the late Miocene (Messinian) salt layer in the Mediterranean basin. The origin of the salt giant is linked to an extraordinary event in the geological history of the Mediterranean region, commonly referred to as the Messinian Salinity Crisis.

A MEDSALT Symposium, co-organised with the French ANR MEDSALT project, was held in Sicily from 24 to 28 October 2016, hosted by the University of Palermo. A two-day field excursion, attended by about 100 scientists from 26 countries helped stimulated discussion on scientific questions addressing:

- the causes, processes, and timing of the Messinian Salinity Crisis;

- the influence of salt deposition in the deep basin in terms of deformation and fluid migration;
- the abundance and diversity of microbial life associated with deep, hyper-saline, possibly high-temperature environments;
- the consequences of base-level change on river behavior, erosion, supply, transport of sediment, and landscape-relief resulting from salt giant deposition.

Scientific drilling is the final goal of the network. With the Multiphase Drilling (MDP) Proposal "Uncovering a Salt Giant" (Proposal 857 MDP2) endorsed by IODP, the assessment of the project is in progress through Pre-proposal 857B Deep-sea Record of Mediterranean Messinian Events (DREAM).

Contact: Angelo Camerlenghi - acamerlenghi@inogs.it
<https://medsalt.eu/>



MEDSALT Symposium participants visiting the Italkali salt mine of Realmonte in Sicily (photo Luca Mariani).

Reports of MagellanPlus Workshop Series

Bend-Fault Serpentinization (BFS+ H-ODIN): Oceanic Crust and Mantle Evolution from Ridge through Trench - 19-21 June 2016, London (UK)

Convenors: Jason P. Morgan, Gou Fujie, Ingo Grevemeyer, Tim Henstock, Tomoaki Morishita and Damon Teagle

The MagellanPlus Bend-Fault Serpentinization (BFS) workshop held at Royal Holloway, University of London, in June 2016 brought together 38 scientists from 7 countries that were interested in drilling-related exploration of bend-fault serpentinisation that occurs as plates bend and subduct at oceanic trenches. This workshop was co-sponsored by *Chikyu* IODP Board (CIB) and UK-IODP. During the last decade, multiple independent geophysical studies have revealed that plate bending-induced normal faults in outer rise regions around the world are associated with significant hydration along the bend-faults that develop between the outer rise and trench axis. Bend-Fault Serpentinization, with its associated physical and chemical changes, is one of the most significant geological discoveries of the last 15 years. It has the potential to reshape our understanding of Earth's deep water and carbon cycles, the ecology and evolution of species in deep-sea chemosynthetic environments, and even the fundamental mechanism by which slabs bend and unbend, thereby driving plate tectonics. The goal of this workshop was to move forward with organising, coordinating and writing two full IODP proposals for drilling at two distinct sites, offshore from the Japan Trench (pre-proposal H-ODIN) and Middle America (pre-proposal BFS). In addition, the first day of the workshop was used to provide a brief, broad overview of the interdisciplinary science approaches and opportunities for exploring bend-fault serpentinisation.

The workshop comprised a series of scientific oral sessions with posters followed by breakout group discussions on different

drilling targets and strategies. This generated much discussion and sharing of data and ideas that led to a strong consensus on how best to initially approach this topic using scientific drilling. There was a clear mandate from the attendees to work toward the development of two complementary H-ODIN and BFS full proposals, one aimed at characterising bend-fault serpentinisation in old, cold, subducting seafloor, and the other at characterising this process in a young, warm subducting plate. The consensus was that a staged drilling approach would be best, using the *Chikyu* for initial Japan Trench drilling, and the *JOIDES Resolution* for initial Middle American objectives. In both regions, the first drilling legs would only aim to explore the BFS system's impact on sediments and uppermost crust, while gaining experience in drilling and sampling bend-fault serpentinised-fault zones with associated fluid sampling and monitoring. A priority site along the Japan Trench was deemed to be the region offshore Tohoku where the outer rise is still responding to the sudden strain transient associated with the Tohoku event. Offshore Middle America, regions offshore Nicaragua/Costa Rica were favoured for logistical, site-survey, and science-synthesis reasons. In both regions, more site survey work is still needed to better define the identified ideal target locations for drilling. This is an exciting time for research on bend-fault serpentinisation - it looks like we will finally be able to use *in-situ* samples to study this fascinating and enigmatic geological process.

Contact: Jason P. Morgan - jason.morgan@rhub.ac.uk
<http://www.ecord.org/science/magellanplus>

MagellanPlus Workshop Series in 2017

Caldera Drilling - Campi Flegrei

25-28 February 2017, Naples, Italy

Tyrrhenian Magmatism & Mantle Exhumation (TIME)

5-7 June 2017, Bologna, Italy

Registration before 30 April 2017

Contact: nevio.zitellini@bo.ismar.cnr.it

Australasian Regional Workshop for building new IODP proposals

13-16 June 2017, Sydney, Australia

Contact: karsten.gohl@awi.de

Santorini-Kolumbo Marine Volcanic System

Athens, Greece, dates TBD

Contact: t.druitt@opgc.univ-bpclermont.fr

Carbon Cycling at the Ultraslow Arctic Spreading Ridge System

dates and location TBD

Contact: steffen.jorgensen@bio.uib.no



ECORD and ICDP helping you develop your drilling proposal

The **ECORD/ICDP MagellanPlus Workshop Series Programme** is designed to support ECORD and ICDP member country scientists when developing new and innovative scientific drilling proposals for submission to IODP and ICDP. MagellanPlus particularly welcomes proposals for workshops that integrate marine and continental coring with scientific topics such as climate change, Earth's surface environmental change, processes and effects, the deep biosphere and sub-seafloor ocean, as well as solid Earth cycles and geodynamics, as outlined in the IODP and ICDP Science Plans.

The annual deadline for applications is **15 January**.

Proposals are reviewed by the MagellanPlus Science Steering Committee (SSC). Proponents will be notified of the outcome within two months. Workshops should be held no later than 12 months after approval by the MagellanPlus SSC. A typical workshop is expected to take place over 2-4 days, and have 20-35 participants. The workshop should be located in an ECORD or ICDP member country.

Funding/participation:

The contribution by the MagellanPlus Programme will not exceed 15,000€ per workshop.

Priority is given to applicants from ECORD or ICDP member countries.

The participation of young scientists is particularly encouraged.

Contact: Lucas Lourens – magellan.plus@uu.nl

<http://www.ecord.org/science/magellanplus/>





ICDP Oman Drilling Project



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

Ronald Conze¹, Judith Ann Coggon² and Jürg Matter²

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

¹ Scientific Drilling, Operational Support Group ICDP, GFZ-Potsdam - conze@gfz-potsdam.de

² University of Southampton, NOCS, UK - j.matter@southampton.ac.uk and jude.coggon@soton.ac.uk

News from ECORD Member Countries

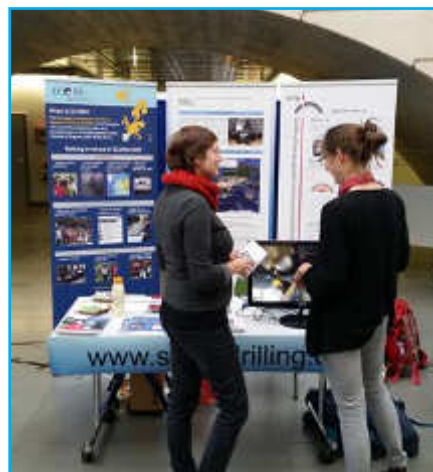
Switzerland

We are pleased that two young scientists from Swiss universities took part in recent IODP expeditions. **Lorenzo Lagostina**, PhD student at the ETH Zurich, participated as a microbiologist in Expedition 370 aboard the *Chikyu*, which aimed to explore the activity of microbial communities living in the seafloor near the Muroto Transect (Nankai Trough). **Philip Eickenbusch** (PhD student at the ETH Zurich) participated as a microbiologist in Expedition 366, which cored the summits and flanks of serpentinite mud volcanoes on the fore-arc of the Mariana system (western Pacific).

We are also pleased that **Mark Lever** and **Gretchen Früh-Green** (both at ETH Zurich) have been selected

as ECORD Distinguished Lecturers for 2017 - <http://www.ecord.org/education/dlp/>.

For the second time, SwissDrilling.ch had a successful booth at the **Swiss Geoscience Meeting** on 19 November 2016, in Geneva (*right*). Visitors to the booth could pick up a variety of information materials, give-a-ways, and could view video clips from past drilling expeditions on a big monitor. Young researchers (MSc students and PhD students) in particular visited the booth to obtain information about how to become involved in scientific drilling. However delegates from organisations and industry also showed interest in the Swiss participation in the international scientific drilling programmes.



The SwissDrilling exhibition booth at the 2016 Swiss Geoscience Meeting in Geneva.

Mareike Trauerstein, SwissDrilling Coordination Office, and Gretchen Früh-Green, Swiss ESSAC delegate and ESSAC Vice-Chair
<http://www.swissdrilling.ch>

Canada

Canada is pleased to renew as a **ECORD member for 2017**. Funds for membership were achieved using a "bottom-up" community-driven approach, with important contributions from members of the Canadian Consortium for Ocean Drilling (CCOD) and their respective universities.

Dominique Weis (University of British Columbia) (*above right*) has taken over as Interim Chair of IODP-Canada for 2017, replacing



Anne de Vernal (Université du Québec à Montréal) who served as Chair for almost 10 years. Dominique now represents Canada

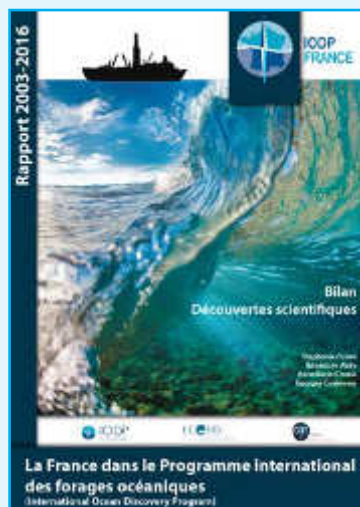
on the ECORD Council and also continues her role as Canada's ESSAC delegate.

Canadian-based researchers and students remain very active in the programme: requesting samples, publishing/presenting IODP results, applying for expeditions, ECORD Summer Schools and research grants, and as proponents on drilling proposals.

Diane Hanano, CCOD Scientific Coordinator
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<http://www.iodpcanada.ca>

France

The **IODP-France Days** were organised at the CNRS headquarters in Paris on 29-30 November 2016. About 120 colleagues attended this event, including representatives of the French funding agency, the Institut des Sciences de l'Univers (INSU). The meeting started with general presentations about the structure of IODP-ECORD and the major objectives of the programme, and continued with keynotes on scientific achievements of recent expeditions, outreach and education activities and future projects. Antony Morris, UK ESSAC delegate, convincingly demonstrated that IODP is one of the most successful programme in Earth Sciences, triggering international cooperation among major and smaller contributors and nurturing



fundamental discoveries with a high scientific and social impact. "IODP is a true democracy", he said. A broadcast was organised with Luc Beaufort onboard the *JOIDES Resolution*. It was a nice opportunity to get live news from Expedition 363 Western Pacific Warm Pool,

during drilling operations off Papua New Guinea. In their concluding statements, Pascale Delécluse, INSU Director, and Éric Humler, INSU Deputy Director and ECORD Council Delegate, reaffirmed the full support of the CNRS to this unique international programme. A report of the meeting is available on <http://www.iodp-france.org/pro/wp-content/uploads/2017/01/BilanIODP-France2016.pdf>

Louis Géli is a new member of the IODP Science Evaluation Panel, in charge of the Site Characterization. Louis is a marine geophysicist, responsible of the Géoscience Marine Laboratory at IFREMER, Plouzané-Brest, France.

Georges Ceuleneer, ESSAC Delegate
iodp-france@get.obs-mip.fr
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Ireland

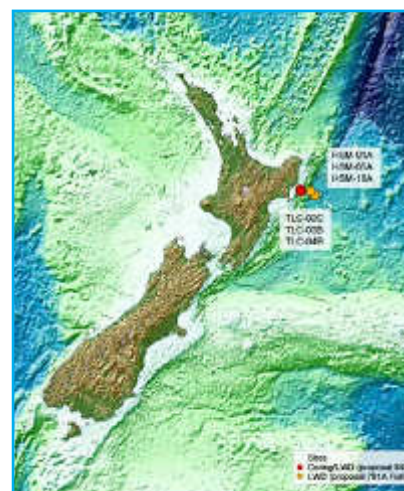
Ireland's ongoing support to IODP-ECORD will be strengthened by upcoming participations from the Irish-based scientific community.

Two senior Irish-based scientists will take onboard positions on the International Ocean Discovery Program (IODP) Expedition 372 Creeping Gas Hydrate Slides and Hikurangi LWD - http://iodp.tamu.edu/scienceops/expeditions/hikurangi_gas_hydrate_slides.html.

Dr Aggeliki Georgiopolou, lecturer in sedimentology in UCD School of Earth Sciences and

Dr David McNamara, Lecturer in structural geology in the Department of Earth and Ocean Science, NUI Galway. Expedition 372 will take place later in 2017/early 2018 in the Hikurangi subduction trench, off the East Coast of New Zealand, in an attempt to improve our knowledge on the behaviour of slow slip earthquakes in subduction zones, and to understand the relationship between gas hydrate deposits and deep-water landslides.

Xavier Monteys, ESSAC Delegate, and Koen Verbruggen, ECORD Council Delegate



Drillsites of Expedition 372

Norway

From Bergen to the Western Pacific Warm Pool. I am a PhD candidate at the University of Bergen working on clumped isotope measurements in foraminifera as a tool to reconstruct past ocean temperatures during the Neogene. I am part of the CLIP project funded by the Bergen Research Foundation. The project focuses on improving the clumped isotope calibration for *foraminifera* and using this proxy to reconstruct ocean temperatures during the Pliocene and across the Northern

Hemisphere glaciation. Shortly after I started my PhD studies in late 2015, I got the news that I was accepted to sail on IODP Expedition 363 Western Pacific Warm Pool as part of the shipboard scientific party. From October to December 2016, I spent nine weeks onboard the *JOIDES Resolution* as one of the sedimentologists on the night shift. The expedition sites were selected to enable reconstructions of Neogene climate on different time scales. I will have the opportunity to apply the clumped isotope proxy on *foraminifera* samples from the expedition.



photo Takuya Sagawa and IODP

This will not only allow for a direct comparison with other tools for the reconstruction of ocean temperatures (and thus improve our understanding of the proxies) but also help study the evolution of the

Western Pacific Warm Pool in comparison with other sites I am working on in the North Atlantic.

*Niklas Meinicke,
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Portugal

In January 2017, **Cristina Veiga-Pires**, ESSAC Alternate, presented ECORD and IODP at the CIMA Challenges workshop on "New challenges for deep sea exploration" (*right*). The workshop was held at the Municipal Library of Faro (Algarve) and was attended by more than 50 participants. Its main objective was to bring together academics, stakeholders and the general public to discuss the scientific and technological challenges and future developments in deep-sea exploration. The discussion also outlined the main implications that it is expected deep-sea studies could bring to society.

Vitor Magalhães (IPMA) sailed on the *JOIDES Resolution* on Expedition 366 Mariana Convergent Margin (16 December 2016 - 17 February 2017) and presented his experience and first scientific results in a seminar at IPMA in March 2017. The meeting was well attended by scientists from institutes around Lisbon.



Cristina Veiga-Pires presenting ECORD at the CIMA workshop.

Three young scientists from the Lisbon area attended the ECORD Training Course "Virtual Drillship Experience" at MARUM in March 2017.

Antje Voelker, ESSAC Delegate - antje.voelker@ipma.pt, Cristina Veiga-Pires (ESSAC Alternate) and Luis Pinheiro, Council Delegate - lpmp@geo.ua.pt

United Kingdom

Kirstin Johnson took over from Sean Burke as UK IODP Science Coordinator in October last year. Kirstin is a petroleum and marine geologist based at the British Geological Survey, Edinburgh. The Science Coordinator's role continues to be the same as it ever was - authorising expenses, organisation of the UK IODP conference and annual meeting and creating UK IODP newsletters. For any information and queries, please email ukiodp@bgs.ac.uk.

Last November we held our **annual UK IODP meeting** at the Royal Geographical Society, London. We had excellent attendance with around 80 scientists from over 30 different academic institutes. Keynote speakers were



Lisa McNeill, Chris MacLeod, Ian Hall and Joanna Morgan, with topics covered such as "Earth in Motion" and "Oceans and Climate". There were nine additional lecture presentations and 26 poster presentations given by UK IODP scientists. The UK IODP team would like to thank everyone who attended, especially those who presented their outstanding and innovative work.

Kirstin Johnson, UK IODP Science Coordinator
ukiodp@bgs.ac.uk
<http://www.bgs.ac.uk/iodp>

Sweden

ESSAC Delegation from Sweden. We would like to warmly thank Ian Snowball (Department of Earth Sciences, Uppsala University) for his long-standing commitment as the Swedish delegate to ESSAC. Since November 2008, Ian has successfully promoted ECORD and IODP activities to the Swedish community, and has contributed to the ranking and nomination of ECORD scientists on numerous IODP expeditions. His hosting of the 2015 ESSAC meeting in Uppsala and active participation in IODP Expedition 347 Baltic Sea Paleoenvironment are also worth a separate mention.



Left, Jorijntje Hendricks, and right, Helen Coxall (© Mikael Axelsson/Eva Dalin).

As of January 2017, the Swedish delegate baton has been handed to Jorijntje Henderiks (Department of Earth Sciences, Uppsala University), who has served as the alternate delegate since 2014. She can count on the support of Helen Coxall (Department of Geological Sciences, Stockholm

University) who will take over the role as the ESSAC alternate delegate. The new ESSAC delegation from Sweden has expertise in marine micropaleontology and related deep-sea drilling-based research, and both have sailed on ODP Legs and more recent IODP Expeditions.

Post-cruise activities. In February, Jan Backman (Department of Geological Sciences, Stockholm University) participated in the Editorial Meeting of IODP Expedition 362 Proceedings at College Station (USA). It is exciting to report that Swedish participation in recent IODP Expeditions 362 Sumatra Seismogenic Zone and 356 Indonesian Throughflow has generated fruitful international collaborations and that post-cruise research is already in advanced stages of peer-review, or in press.

Jorijntje Hendricks, ESSAC Delegate - jorijntje.henderiks@geo.uu.se - and Helen Coxall, ESSAC Alternate - helen.coxall@geo.su.se

Denmark

The **Danish IODP community** is presently engaged in two drilling proposals. One is Proposal 879 to drill at the northern margin of the South China Sea (SCS) with Chinese, Danish and US scientists as Lead Proponents. Proposal 879 is scheduled for Expeditions 367 & 368 in early 2017 (*right*). Hans Christian Larsen, the Danish proponent, will participate as one of the four Co-chief Scientists. The other proposal is Pre-Proposal 909 that was submitted to IODP in October 2016. This proposal targets drilling off northwest Greenland, and was developed by researchers of the National Geologic Survey of Denmark and Greenland (GEUS) with international collaborators from Canada, UK and the USA.

Expeditions 367 & 368 SCS Rifted Margin will address fundamental questions related to continental breakup at a margin showing a high



The JOIDES Resolution during port call of Expedition 367 in Hong Kong (photo Zenon Mateo, IODP JRSO).

degree of crustal extension, but no indications of excessive magmatism. Drilling will investigate whether or not the highly extended crust includes mantle exhumation (Iberia-Newfoundland margin type), or

whether an alternative process of lithospheric weakening took place.

Pre-proposal 909 takes advantage of an exceptionally high quality seismic data grid over a large, glacial through-mouth-fan system located on the West Greenland margin in northeast Baffin Bay. Drilling into this system and associated contourite deposits will address the greater questions of northern hemisphere cooling, as well as the late Cenozoic history of the Greenland Ice Sheet. In the latest review round the Science Evaluation Panel has recommended the development of a full proposal. It is anticipated that additional site survey data, e.g. shallow acoustics and seabed sampling, will be collected in 2017.

Hans Christian Larsen - hanschristian.larsen@yahoo.com, Marit-Solveig Seidenkrantz, ESSAC Delegate - mss@geo.au.dk and Paul Knutz, ESSAC Alternate - pkn@geus.dk

Finland

Finland's new delegate for the ECORD Council is Dr. Minna Räisänen (*right*) from the Academy of Finland. She started as a Science Adviser on 9 January 2017 in the area of geosciences. Prior to her current employment, Minna was a senior researcher in inorganic chemistry at the University of Helsinki where she obtained her PhD in 2007.

Minna Räisänen, Council Delegate - minna.raisanen@aka.fi - <http://iodpfinland.oulu.fi>





ECORD Contacts

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Vice-chair: Magnus Friberg - magnus.friberg@vr.se

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ESSAC Office: essac@geomar.de

Vice-chair: Gretchen Fröh-Green - frueh-green@erdw.ethz.ch

EMA - ECORD Managing Agency

Director: Gilbert Camoin - camoin@cerege.fr

EMA Office: ema@cerege.fr

ESO - ECORD Science Operator

Chair: Robert Gatliff - rwga@bgs.ac.uk

Science Manager: David McInroy - dbm@bgs.ac.uk

Operations Manager: Dave Smith - djsm@bgs.ac.uk

<http://www.ecord.org>

