

Expedition 381 successfully completed



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ECORD School of Rock 2017

News from the Chikyu

ICDP Oman Drilling Project - Phase 2

MSP expeditions scheduled for 2019 & 2020



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The International Ocean Discovery Program (IODP) - <http://www.iodp.org> - 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.

IODP is funded by the US National Science Foundation (NSF), Japan's Ministry of Education, Culture, Sports, Science, and Technology (MEXT); ECORD; the Australia-New Zealand IODP Consortium (ANZIC); India's Ministry of Earth Sciences; China's Ministry of Science and Technology; the Korea Institute of Geoscience and Mineral Resources (KIGAM); and Brazil's Ministry of Education (CAPES).

The ECORD Newsletter is prepared twice a year by the ECORD Outreach & Education Task Force and is published by the ECORD Managing Agency, CRPG-CNRS-OTELo, BP 20, 5400 Vandoeuvre lès Nancy, France.

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Electronic copy of the ECORD Newsletter is available online at <http://www.ecord.org/resources/ecord-newsletter/>

Printed by Vagner Graphic in France

Dépôt légal avril 2018 - ISSN 2264-1556

Thanks to all authors who contributed to this issue.

Cover and back cover: Science Party of Expedition 381 Corinth Active Rift Development in the IODP Bremen Core Repository (photo Volker Diekamp, ECORD/IODP).

Right: The derrick of the drillship Fugro Synergy at night, during the offshore phase of Expedition 381 Corinth Active Rift Development (photo ECORD/IODP).





Gilbert Camoin

ECORD News



Guido Lüniger

Over the last months, ECORD has continued to build on its current capabilities, especially through the successful completion of the offshore phase of the mission-specific platform (MSP) Expedition 381 Corinth Active Rift Development from 20 October to 18 December 2017 and its onshore phase from 31 January to 28 February 2018, with Lisa McNeill (ECORD-UK) and Donna Shillington (USA) as Co-chief Scientists (*cover and pages 6-8*). In addition to fulfilling its IODP Platform Provider's tasks, including the maintenance of excellent sample and data curation facilities at the Bremen Core Repository and the promotion of ECORD and IODP activities and accomplishments to large audiences, ECORD has managed the organisation of **five MagellanPlus workshops** and the training of **more than 150 students and early-career scientists in ECORD Summer Schools and Training Course** in 2017. In parallel, the current involvement of **428 scientists in active IODP proposals**, the participation of **53 ECORD scientists on six IODP expeditions** and the publication of more than 180 papers related to ocean drilling programmes in 2017 demonstrate the outstanding intellectual contribution of ECORD scientists to IODP and the attractiveness of this programme for the geoscience community - see *ECORD Annual Report 2017 (right)* - <http://www.ecord.org/resources/reports/activities/>

ECORD post-2018 renewal

2018 will be of pivotal importance for ECORD as its member countries will have to take a decision regarding their commitment in the second phase of IODP (2019-2023) and to define their level of participation. This will determine ECORD's capability for the next few years. In our view, the success of ECORD mid-term renewal primarily relies on ECORD's scientific and operational excellence in the international research landscape, as well as the operational plans defined for MSPs, the *JOIDES Resolution (JR)* and the *Chikyu* in the second phase of IODP until 2023.

After the very positive evaluation of ECORD's structure, activities and scientific achievements by an ECORD External Evaluation Committee (EEC) in June 2017 - <http://www.ecord.org/resources/reports/activities/> - the ECORD Managing Agency (EMA), the ECORD Council and other ECORD entities have revised the **ECORD Memorandum of Understanding (MoU)** that will be distributed to the ECORD Funding Agencies for approval and signature later this year. In parallel, ECORD and the US National Science Foundation (NSF) have revised their joint MoU and defined the post-2019 financial and operational agreement regarding **ECORD's**

membership in the JR Consortium and, in reciprocity, the access to MSP expeditions for our partners' scientists. No revision of the MoU linking ECORD and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) was needed as the MoU signed in 2013 covers the whole duration of IODP.

Post-2018 operational plans

Future operational plans defined for MSPs, the *JOIDES Resolution* and the *Chikyu* will be of prime importance in the current phase of IODP renewal, emphasising the crucial role played by the Facility Boards of the three IODP entities.



After the cancellation of Expedition 377 Arctic Ocean Paleooceanography (ArcOP) that was initially scheduled for August to October 2018, the ECORD Facility Board (EFB) has recently considered two potential scheduling scenarios for MSP expeditions in the 2019-2021 time window (*page 5*). These two scenarios include two expeditions for 2019 and 2020:

- **Expedition 373 Antarctic Cenozoic Paleoclimate** (Co-chief Scientists: Carlota Escutia, ECORD-Spain, and Trevor Williams, USA),
- **An expedition based on Proposal 716 Hawaiian Drowned Reefs** (Lead Proponent: Jody Webster, Australia),
- potentially followed by the scheduling of a **'low-cost' expedition in 2021**.

Based on an expected stable ECORD budget during the second phase of IODP, such a scenario would allow the implementation of **four to five additional MSP expeditions** before the end of the programme in 2023. This includes Expedition 377 Arctic Ocean Paleooceanography (ArcOP), which is still considered as a high-priority MSP expedition by ECORD. However, significant levels of in-kind contribution (IKC) and/or external co-funding from IODP and/or non-IODP members will be required in the near future, especially to implement complex and costly multi-platform expeditions, such as Expedition 377 ArcOP. EMA and the ECORD Council will now actively seek IKCs and also encourage the community to help ECORD seek these opportunities. For the future, a **higher MSP proposal pressure** including different science themes and involving various potential drilling/coring systems in diverse environments would be desirable to identify additional mid- to long-term scientific, operational and funding opportunities. This will also assist in developing any post-2023 scientific ocean drilling initiatives.

The *JOIDES Resolution* Facility Board (JRFB) has scheduled **nine JR expeditions in the Pacific and Southern Ocean** before the end of 2019 (*below and page 14*) and <http://www.iodp.org/expeditions/expeditions-schedule> - when the vessel enters the Gulf of Mexico to implement Expedition 386 Gulf of Mexico Methane Hydrate (21 January - 22 March 2020). The most probable scenario considered by the JRFB involves a ship track in the Atlantic Ocean, the Mediterranean, Caribbean, and the Gulf of Mexico during most of the second phase (2020-2023) of IODP (*below*) provided that the proposal pressure concerning these regions provides enough opportunities. The ECORD science community will certainly play a pivotal role in this endeavour.

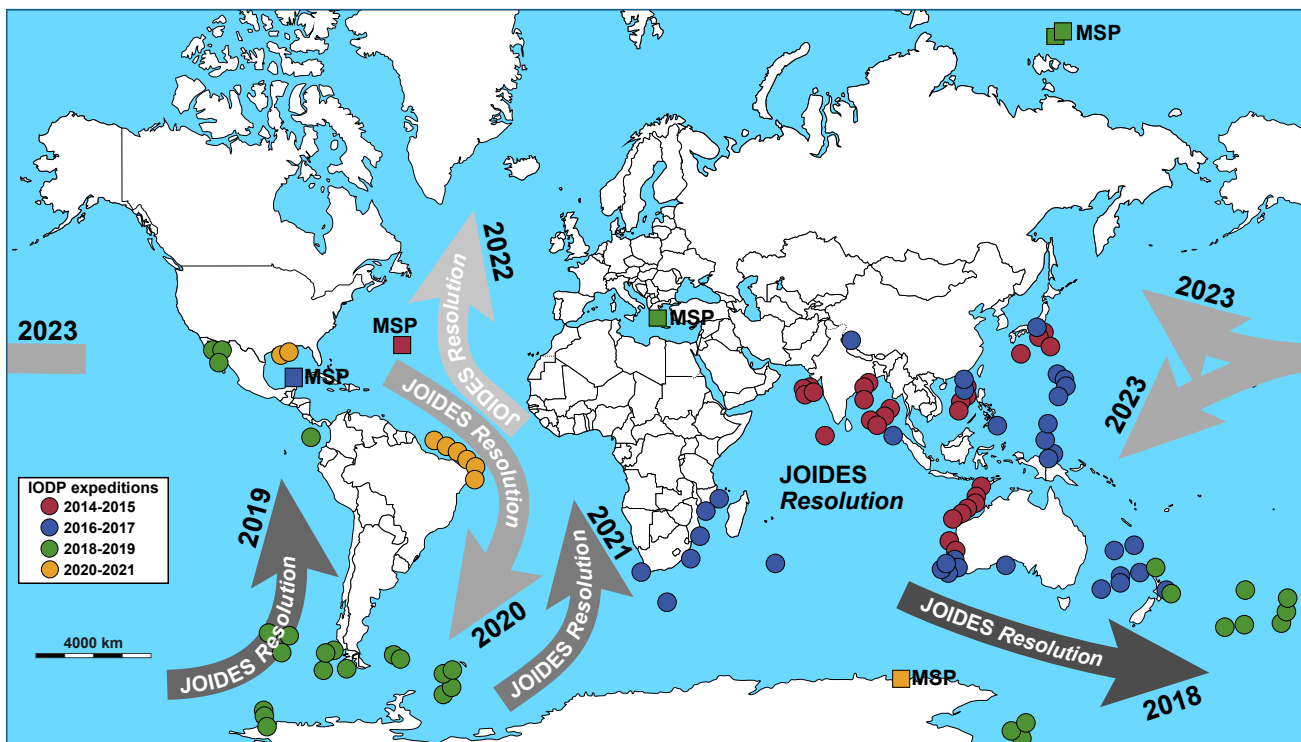
The scheduling of an engineering riserless expedition, **Expedition 380 NanTroSEIZE Stage 3 Frontal Thrust Long-Term Borehole Monitoring System**, in early 2018 (*page 21*) and of a riser drilling expedition, Expedition 359 NanTroSEIZE: Riser Hole at C0002, in late 2018-early 2019 respectively, materialises a continuity in *Chikyu* operations throughout the renewal time window. The *Chikyu* IODP Board will soon consider the post-2019 scheduling of *Chikyu* expeditions, possibly including the implementation in 2020 of a riser expedition based on Proposal 871-CPP Lord Howe Rise Continental Ribbon (Lead Proponent: R. Hackney, Australia).

Forward look

While still working on their renewed commitment to the second phase of the current IODP, most IODP member countries and consortia - including ECORD - are already planning efforts designed to consider the future of scientific ocean drilling beyond 2023. Based on the renewal model that was applied for the transition between the Integrated Ocean Drilling Program and the International Ocean Discovery Program, including the organisation of the INVEST Conference in 2009 to initiate the writing of the current IODP Science Plan, a multi-year workshop-based approach to outline a **Science Plan** and to assess the technologies needed to reach its full potential has recently been endorsed by the IODP Forum.

ECORD, as a unique international research programme which has demonstrated its well-established operation model, its successful implementation and its competitiveness in the international research landscape, can play a cardinal role in future endeavours. However, a full mobilisation of both member and non-member scientific communities and funding agencies will be necessary as the challenges towards building a future scientific drilling programme will be colossal.

Gilbert Camoin, Director of the ECORD Managing Agency - camoin@cerege.fr - and Guido Lüniger, Chair of the ECORD Council - guido@luniger.de



Implemented and scheduled IODP expeditions in 2014-2020. Planned JOIDES Resolution ship track for 2020-2023.



Gilles Lericolais

News from the ECORD Facility Board

The last ECORD Facility Board (EFB) meeting (6-7 March 2018) was held at the "Cultural Center Don Orione Artigianelli", Venice, Italy. In 2017, Expedition 381 Corinth Active Rift Development was carried out from 23 October to 18 December 2017 (offshore) with the Onshore Science Party occurring in Bremen from 31 January to 28 February 2018. The expedition drilled four sites (M0078A, M0078B, M0079A, M0080A) using the *Fugro Synergy*, and was a huge success. The preliminary results are very promising (see ESO pages 6-8).

There are few MSP proposals in the EFB waiting room and none were forwarded by the Science Evaluation Panel (SEP) at its last meeting in January 2018 (below). Only one of the MSP proposals at SEP was sent out for external review.

During the 2017 EFB meeting in Hannover, Expedition 373 Antarctic Cenozoic Paleoclimate was postponed for technical reasons. During the 2018 meeting, ESO informed the EFB that BGS are still testing upgrades to RD2 and so ESO are not willing to put it forward as a potential drilling technology for IODP at this point. Nevertheless, ESO presented an alternative option to hire a commercial seafloor drill with a company arranging the support vessel. The advantage of using a commercial drill, which

is faster at coring than the RD2 or MeBo, is that it de-risks the project because less time is spent at every site.

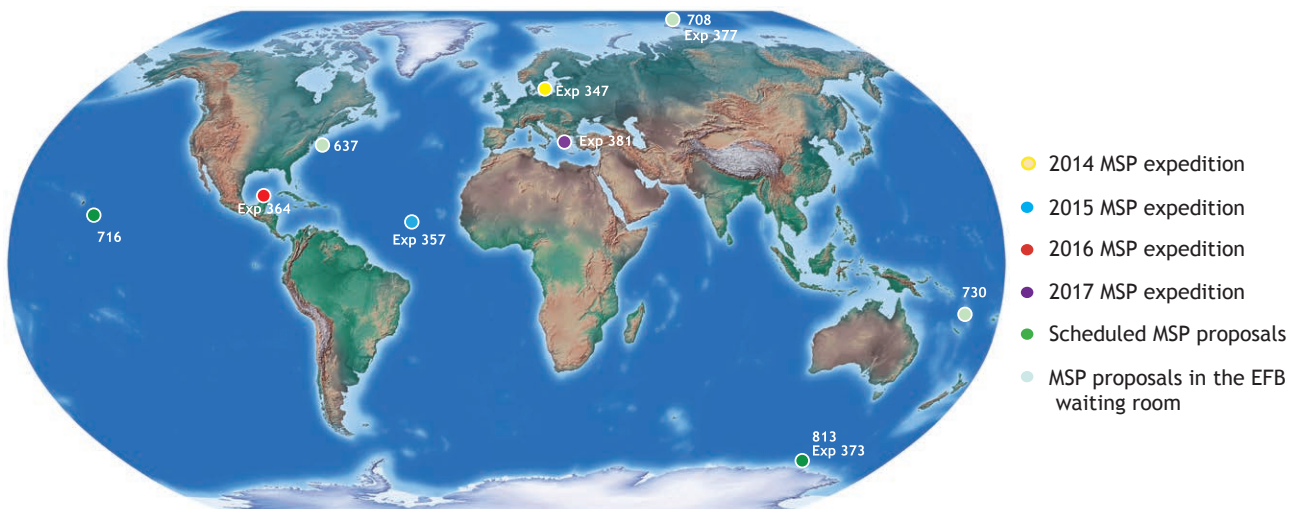
During the 2018 meeting, the EFB proposed two possible scenarios to implement **Expedition 373** using a commercial drill in 2019. This will allow ECORD and ESO to carry out an expedition in 2020 and the EFB asked ESO to scope implementation of the **Proposal 716 Hawaiian Drowned Reefs**. In case of ESO unable to implement Expedition 373 in 2019, the EFB recommends scheduling Proposal 716 for 2019 and Expedition 373 for 2020. The EFB also recommends to schedule a 'low-cost' expedition for 2021.

The EFB still considers other MSP proposals in the EFB waiting room to be as of high scientific impact and will evaluate them again. In particular, EFB has recommended finding a solution to implement Expedition 377 ArcOP before the end of the programme. The next EFB meeting will be held on 21-22 March 2019 in Bremen (Germany).

Gilles Lericolais, Chair of the ECORD Facility Board - gilles.lericolais@ifremer.fr

2013-14	2015	2016	2017	2018	2019	2020	2021	2022	2023
Exp 347 Baltic	357 Atlantis	364 Chicxulub	381 Corinth	no exp.	373 Antarctic	Prop 716 Hawaii	LC	tbd	tbd
Drillship	Seabed drills RD2-MeBo	Liftboat	Drillship		Seabed drill	Seabed drill			
reviewed Nov 2014	reviewed Oct 2016	reviewed June 2017	Oct-Dec 2017-2018		Dec 2019 Jan 2020				

LC: low-cost (<8M USD),





David McInroy Sarah Davies

ECORD Science Operator News and Views



Ursula Röhl Dave Smith

In the previous ECORD Newsletter (#29, November 2017) we reported on the final preparations, mobilisation and first few operational days of our **eighth mission-specific platform (MSP) expedition, Expedition 381 Corinth Active Rift Development**. The expedition successfully concluded on 18 December 2017, after spending 58 days at sea and collecting almost 1,645 m of core from up to nearly 705 m below seafloor, the first deep cores ever taken from beneath the Gulf of Corinth.

After shipping the cores to the IODP Bremen Core Repository over the Christmas period, ESO started a 4-week pre-Onshore Science Party (OSP) programme of work on 4 January 2018, to acquire thermal conductivity data on the whole cores. The OSP took place from 31 January to 28 February at the IODP Bremen Core Repository and the MARUM - Center for Marine Environmental Sciences (*page 8 - 'Expedition 381 in numbers'*).

In parallel to the planning and implementation of Expedition 381, scoping and planning of future MSP expeditions continued. This included planning work for **Expedition 377 Arctic Ocean Paleooceanography (ArcOP)**, which is currently on hold after the cancellation of the expedition for 2018. Scoping of proposals that rely on seabed-drilling technology also continued, with all academic and commercial systems, and vessels that could potentially deploy them, under constant review.

Expedition 381 successfully completed
Co-chief Scientists: Lisa McNeill and Donna Shillington
Expedition Project Manager: Gareth Carter
Petrophysics Staff Scientist: Erwan Le Ber
Offshore Operations Manager: David Smith

The offshore phase of the expedition was successfully implemented from 22 October to 18 December 2017, when ESO staff, drilling contractors and the Science Party worked to recover and analyse the first deep cores ever taken from beneath the Gulf of Corinth. The material collected will reveal the relationship between rift development and faulting, and how the landscape responded to those forcing factors.

Expedition 381 provides the opportunity to achieve unprecedented precision of timing and spatial complexity of rift-fault system development and rift-controlled drainage system



(R. Gawthorpe, ECORD/IODP)

evolution in the first 1-2 My of rift history. Through integration of the core and downhole logging measurements with an extensive offshore seismic dataset and onshore outcrop data, the Science Party anticipate being able to determine how faults evolve, how strain is distributed, and how the landscape responds within the first few million years in a non-volcanic continental rift, as modulated by Quaternary changes in sea level and climate.

Three sites were carefully selected to sample the recent syn-rift sequence (**IODP Sites M0078 to M0080**). Two primary themes are addressed by drilling at these sites.

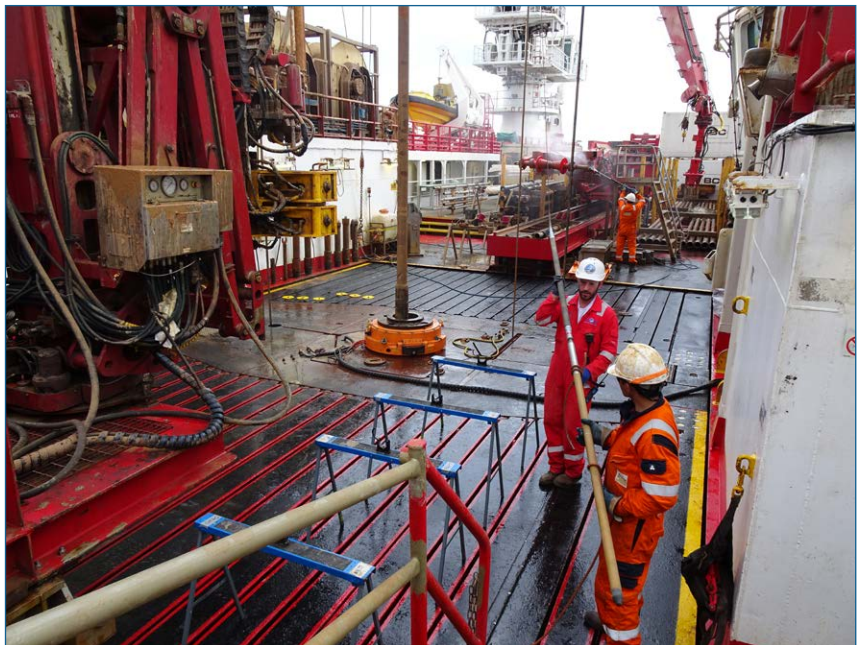
- First, the fault and rift evolution (including fault growth, strain localisation, and rift propagation) and deformation rates will be examined. The spatial scales and relative timing can already be determined using the offshore seismic data, and dating of the new cores will better constrain the timing, provide temporal correlation to the onshore data, and the ability to quantify strain rates.
- Second, the new expedition data will define lithologies, depositional systems and paleoenvironment (including catchment paleoclimate), basin paleobathymetry, and relative sea level. By integrating this data with seismic data, onshore stratigraphy, and catchment data, the relative roles and feedbacks between tectonics, climate, and eustasy in sediment flux and basin evolution can be investigated.

The *Fugro Synergy* (*above*) departed Corinth on 22 October and transited to the first site M0078, with coring commencing early the following day. During the expedition, ESO staff provided operation and drilling contract management, scientific coring oversight, science, database and outreach support, with downhole

logging services being subcontracted to the University of Montpellier, a European Petrophysics Consortium (EPC) partner.

Coring progress was good for most of the expedition. Slow penetration at depth at the first and second sites led to the decision to terminate these holes before the proposed total depth was reached, conserving time for subsequent holes and allowing the expedition to remain on schedule. Coring at the third site progressed very well, and despite coring 55 m past the proposed total depth (the predicted depth of the basement seismic reflector), basement was not reached. The expedition ended in Corinth on 18 December, after a total of **58 days at sea** and collecting almost **1,645 m of core** (*table and photo below*).

Various modes of coring were utilised - Fugro Piston Corer (note this is not the same as the IODP piston corer), Fugro Corer (push and percussive modes), and rotary coring - to maximise the coring rate and efficiency in the highly variable lithologies. When the lithology



Petrophysics Staff Scientist Erwan Le Ber being assisted by a Fugro engineer to deploy super-slimline logging tools (D. Smith, ECORD/IODP).



Expedition 381 cores being prepared for refrigerated storage onboard Fugro Synergy (D. Smith, ECORD/IODP).

allowed, coring was briefly paused to take *in-situ* temperature measurements from the formation at the base of the hole.

Supers slimline downhole logging services were contracted from the University of Montpellier (*above*). *In-situ* data were acquired, despite some significant technical and geological challenges, from portions of Holes M0079A and M0080A. Datasets acquired include gamma ray, resistivity, magnetic susceptibility and sonic. The logged intervals provide an important dataset, intermediate in scale to the recovered cores and the corresponding seismic data.

The **OSP took place from 31 January to 28 February** at the IODP Bremen Core Repository and the MARUM, University of Bremen, Germany, with further analytical laboratories accessed through the Department of Geosciences, University of Bremen, Germany (*photos page 8*).

Preliminary observations of the core revealed thinly bedded and laminated mud with thin interbeds of fine sand including organic matter. Lithologies and micropalaeontological assemblages were highly variable, indicating a complex palaeoenvironmental history with multiple changes between

Expedition 381 coring summary.

Hole	M0078A	M0078B	M0079A	M0080A	Total
No of cores recovered	176	15	163	146	500
Drilled length (m)	610.43	55.85	704.90	534.10	1905.28
Recovered length (m)	533.99	52.17	610.80	447.83	1644.79
Recovery (%)	87	93	87	84	86
Final depth (mbsf)	610.43	55.85	704.90	534.10	
Proposed hole depth (mbsf)	750.00	N/A	750.00	479.00	



Onshore Science Party of Expedition 381: left, Co-chief Scientists Donna Shillington and Lisa McNeill examine the cores; top centre, Holger Kuhlmann and Alex Wülbbers take samples, top bottom, detail of sampling a core, right, Mary Ford measures structures within the cores (all photos Volker Diekamp, ECORD/IODP).

marine and lacustrine conditions in the Gulf of Corinth. Discrete and distinctive sandy turbidite layers were identified, which the Science Party suspect were deposited during lowstand periods when the gulf was isolated from the marine environment. The deeper part of the section drilled at Site M0079 shows more complexity and heterogeneity than the equivalent section sampled at Site M0078, which may be a consequence of the expansion and completeness of the section at M0079. At Site M0080, intervals of marine and non-marine deposition were identified, including gravels, pebbly muds/sands, siltstone, and at the base of the hole, coarse conglomerate was recovered. Microfossils were observed in some of the deepest cores, some of which will be able to provide important age constraints on the oldest sediments recovered.

The ECORD Facility Board has given approval to postpone publication of the Expedition 381 Preliminary Report from 25

April until later in summer 2018, to make way for two high impact Science Party papers on the high resolution environmental record in the active Corinth Rift, and the preservation of that record in sediment pore waters. The IODP Proceedings volume for this expedition will be published in March 2019.

Other ESO news

In October 2017, the moratorium ended for **Expedition 364 Chicxulub K-Pg Impact Crater** and all shipboard data were made publicly available through the PANGAEA portal, with the IODP Proceedings published online on 30 December (<http://publications.iodp.org/proceedings/364/364title.html>). .

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>

Expedition 381 in numbers



- 9 days mobilisation
- 9 days mobilisation-related transit
- 12 hours expedition transit
- 58 days at sea
- 4 holes
- 1644.79 m of core (86% recovery)
- 704.9 mbsf total depth
- 3.4 km of wireline downhole logs
- 365 - 862 m water depth
- 29 days Onshore Science Party
- 12,133 samples taken

ECORD Outreach & Education

News and Activities

Since November 2017, the ECORD Outreach & Education Task Force (E-OETF) has promoted ECORD and IODP at AGU 2017 in collaboration with ICDP, produced various resources, and supported educational activities. Following the recommendations of the ECORD Council, the E-OETF took actions at its spring meeting 2018 to start outreach activities addressing stakeholders, funding agencies and the general public. The spring meeting was hosted by Ulrike Prange (MARUM, University of Bremen) at MARUM, Bremen, (right), on 28 February-1 March. We are happy to welcome Antony Morris as the new ESSAC Chair. We thank Jan Behrmann, ESSAC Outgoing Chair, for his involvement in education and outreach activities.

Activities

For the second year a joint booth presenting "ICDP and IODP Scientific Drilling Programs" was organised at **AGU 2017** (23-28 December) in New Orleans, US, in collaboration with colleagues from the USSSP and CDEX/JAMSTEC and ICDP.

Regarding **Expedition 381 Corinth Active Rift Development**, outreach activities have been carried out by Carol Cotterill, ESO Outreach Manager, and Ulrike Prange, ESO Media Relations (page 10). A number of lively videos have been posted on the ECORD YouTube channel <https://www.youtube.com/user/ECORDESO>. A media event took place in MARUM during the Onshore Science Party of the expedition - <http://www.ecord.org/outreach/press-releases/>

ECORD sponsored a workshop for teachers, the **ECORD School of Rock (SOR) 2017**, organised by Michèle Darriau, (Education Officer on Expedition 359 Maldives Monsoon), in Brussels, to address French teachers based in North European countries (page 13). Agnès Pointu sailed as Education Officer onboard the *JOIDES Resolution* on Expedition 374 Ross Sea Ice Sheet History and provided many entries on her own blog <https://expedition374rosssea.wordpress.com/>. ECORD issued a **call for an Outreach Officer to sail on Expedition 379 Amundsen Sea W Antarctic Ice Sheet History** (Co-chief Scientists K. Gohl, ECORD-Germany and J. Wellner, USA) and applications will be assessed by ESSAC and the E-OETF to provide a nomination by the end of March.



The E-OETF met in Bremen: from left to right, Gilbert Camoin and Nadine Hallmann (EMA), Carol Cotterill (ESO), Antony Morris (ESSAC), Patricia Maruélol (EMA), Hanno Kinkel (ESSAC) and Ulrike Prange (ESO) (photo Ulrike Prange).

Resources

ECORD/IODP information materials (Annual Report 2017, Newsletter, flyers,) were distributed to the ECORD community and participants of the ECORD SOR 2017. New resources arising from **Expedition 364 Chicxulub K-Pg Impact Crater** are in preparation. A comprehensive set of cores has been selected by the Co-chief Scientists Joanna Morgan and Sean Gulick to create new core replicas. In February a series of replicas was ordered to Paula Weiss, who will manufacture these new core replicas. Some

of them will be added to the ECORD outreach materials for displays at public exhibition - <http://www.ecord.org/resources/core-replicas/>. The E-OETF is now working to produce a new video and a new brochure to promote ECORD to stakeholders, funding agencies and the general public.

ECORD online

During the Onshore Science Party of Expedition 381 (31 January-28 February), the **ECORD website** had 1797 users with a peak of visits on 13 February when the media event was distributed. The top five countries using the website are the USA, UK, Germany, France and Italy. A significant proportion of users continue to access the website via our social media channels, and to increase our visibility, the ECORD, ESO and ESSAC accounts will be merged into a single "**ECORD-IODP**" **twitter and facebook access** after EGU (April 2018). The blog of Expedition 381 - <https://esoexp381corinthactiveriftdevelopment.wordpress.com/> was continuously fed during Expedition 381 with 29 blogs being posted.

Upcoming events / activities

ECORD/IODP exhibition booth will be organised at **EGU 2018** - 8-13 April, Vienna, Austria, in conjunction with IODP-ICDP sessions (page 15). Exhibit booths will be organised at ISC 2018 in Québec and AGU 2018 (Washington, DC).

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



EGU 2018
8-13 April, Vienna, Austria

EOS18 - ECORD IODP Outreach: Past, Present and Future

Thu 12 April, Posters 13:30-15:00, Hall X1



Carol Cotterill

Both the offshore and onshore phases of an expedition are accompanied by Outreach, but what happens from the outreach side when you "take one boat...?"

ESO have two outreach staff and between us we manage all aspects of pre-, during and post-expedition outreach madness! This ranges from designing the logo and pre-cruise information flyer (with assistance from our colleagues in EMA), to setting up media events (*below left*), arranging ship visits for the media (*below right*), filming, interviewing and preparing educational



Ulrike Prange

materials and activities for future use amongst other things. We are working on expanding the range of our outreach, and so we have been collecting a lot of video, stills and verbal footage from Expedition 381 to add to our extensive archive of thousands of photos and video from all eight expeditions. This will help us with development of educational materials and touring outreach displays in the future.....watch this space for updates on that!

Carol Cotterill, ESO Outreach Manager - cjcott@bgs.ac.uk - and Ulrike Prange, ESO Media Relations - uprange@marum.de

What happens when you take an outreach team and one boat is:



1 dedicated website for informative and fun blogs

70 countries following the blogs

29 blogs on the website

2,121 followers came from social media outlets

21,416 views with November being the best month with over 8,800 views - Apparently Mondays are the best day to post with 20% of all views, and 3pm is the most popular time to log in and read a blog - a blog and a coffee break maybe?

15 video shorts released on the ESOECORD You Tube channel

25 interviews with scientists, ESO staff and student helpers

1 dedicated logo design

2 Press releases sent to over **400 news outlets** internationally

2 Media events - one pre-cruise with a tour of the vessel, and one during the onshore science party.



Völker Diekamp, ECORD, IODP



Carol Cotterill, ECORD, IODP

Blog of Expedition 381

<https://esoexp381corinthactiveriftdevelopment.wordpress.com/>

You Tube ECORDESO channel

In Search of Earth's Secrets: A Pop-Up Science Encounter

Sharon Katz-Cooper*

In February, the U.S. Science Support Program - in collaboration with IODP, Consortium for Ocean Leadership, Rutgers University, University of Hawaii, and a variety of libraries and youth-serving organisations - launched the traveling exhibit, **In Search of Earth's Secrets: A Pop-Up Science Encounter**. Independently funded by the U.S. National Science Foundation, Earth's Secrets aims to bring the exciting cutting edge science of the ocean drilling programmes, and Earth science in general, to communities nationwide. Its goals include especially bringing science and scientists to those traditionally underserved and with less access to world-class science resources throughout the U.S.

Earth's Secrets consists of a 45-foot (13.7 m) inflatable replica of the drillship *JOIDES Resolution (JR)* (right), inside of which a video wall presentation tells some of scientific ocean drilling's greatest stories of discovery (below). This video was produced by the team at Netherlands-based ScienceMedia. In addition to the inflatable *JR*, the exhibit includes six interactive kiosks, each focusing on a science or engineering topic addressed by the drilling programme - including sub-seafloor microbiology, microfossils as Earth's history storytellers, drilling technology, earthquakes and tsunamis, extinction of the dinosaurs, and more. In addition, a 30 by 15-foot (9 x 4.5 m) floor map of the ocean floor (below right) invites visitors to step into the ocean and explore its many unique and surprising features.

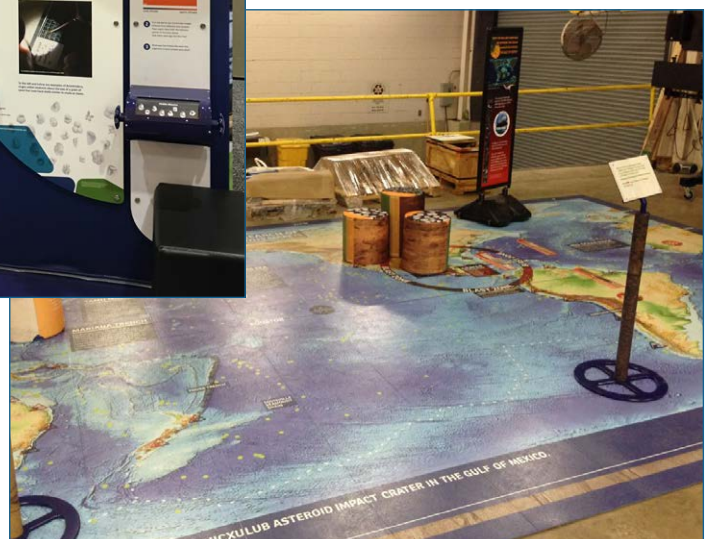
The exhibit is set to visit three communities in 2018: Martinsville, VA, New Brunswick, NJ, and Queens, NY. During each visit, programme staff first work with Girl Scouts and other youth-serving organisations to train them on the content and operation of the exhibit. Later, during public events, these young people serve as docents and facilitators



The inflatable drillship presented at the JOIDES Resolution Science Operator at TAMU.

for the exhibit. In between larger public events at museums and outdoor spaces, the kiosks "live" at libraries and other venues where they are available for deeper exploration by visitors.

While the 2018 sites are set, the project is requesting applications for new communities to serve as hosts for the project in 2019, 2020 and 2021. Information, schedule and more can be found at www.insearchofearthsecrets.com. For more information, feel free to contact Sharon Cooper at scooper@ldeo.columbia.edu.



* U.S. Science Support Program - scooper@ldeo.columbia.edu

An ECORD Education Outreach officer onboard Expedition 367

Alessia Cicconi*

When I first hopped onto the *JOIDES Resolution (JR)*, the ship was docked for maintenance in Cape Town, South Africa. The occasion was a training course for teachers, the School of Rock 2016, organised by IODP. The ship was empty, the labs were not working, the silence filled everywhere. It felt like the sleeping kingdom of Sleeping Beauty, ready to be awakened. But still it was for me love at first sight. I dreamed of sailing on her when the *JR* was fully operational. As the fairy tales teach, dreams sometimes become true and...here we go! I was selected as Education and Outreach Officer for Expedition 367 in the South China Sea departing from Hong Kong.

The main goal of the Expedition was to drill through the sediments and to the basement rocks in order to understand the opening process of the South China Sea. My main goal was to disseminate to a wider public what was going on onboard the *JR* (right).

Being an Outreach and Education Officer is one of the most significant experiences that I have had as a science teacher both in professional development and human adventure. It meant, not only learning A LOT about science but also being immersed in the process of DOING SCIENCE. Having the opportunity to work alongside the researchers from different countries while discussing different scientific hypotheses has been priceless. I learnt that there are many ways of being a geologist: structural, chemist, palaeomagnetist, palaeontologist, sedimentologist and so on. Each one put his/her knowledge and competence together as pieces building the answers to the scientific questions the expedition is addressing and to make progress in science. Through my outreach activity, via a blog and social media (facebook, twitter), I tried to highlight this aspect of the scientific research: a discovery is always the result of teamwork. As a science teacher, I understood how much work and how many people exist beyond the lines of the textbooks I use in my classroom, and I realised how much is still unknown, especially about deep-sea exploration.

"The big excitement of doing science", this is what I tried to disseminate through social media but especially with the video connections from the ship-to-schools (table right). I did about 100 videos, thanks to the participation of the scientists in meeting students and explaining their work to them. One thing that make me proud is that for the first time many schools and teachers from Italy had the chance to be connected with the drillship. The Italian palaeontologist onboard, Claudia Lupi took part in every connection with Italian schools and together we "met" about 1500 Italian students. Claudia and I have started a long lasting collaboration: we are in the process of organising an ECORD School of Rock in Italy for Italian science teachers and we published a little article on the outreach we achieved



onboard. In my opinion, connecting teachers with scientists is one of the greatest values of this programme. I call this relationship a mutualistic symbiosis: teachers gain professional development and new enthusiasm for teaching science, whilst researchers learn how disseminate their research to a wider public.

After the expedition, I participated in different conferences and workshops where I presented my experience. I also created a three-minute video, for a contest organised by the Italian Geological Society, which explains (in Italian) the great value for a teacher of being involved in a scientific expedition - <https://www.sgi-ontherocks.it/266n118/a-lezione-di-geologia-a-bordo-di-una-nave.html>.

Moreover, an enthusiastic teacher is also a great resource for students and I just wanted to finish with one of the incredible comments we received from teachers and students after the video connections. "I really loved to see the *JR* and what it does. In my opinion, this ship will help the world in many ways. After meeting you I want to become a scientist" - Matteo, 9 years old.

VIDEO-BROADCASTS FROM THE JR		
COUNTRY	N° of Video-Broadcast	N° of involved Students
ITALY	40	≈1500
CHINA	30	≈3400
USA	24	≈700
FRANCE	3	≈70
GERMANY	2	≈800
SPAIN	1	≈120
ARGENTINA	1	≈300

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ECORD School of Rock 2017

"To explore, study and understand the planet Earth with IODP Expeditions 359, 360 and 362"

Michèle Darrieu*

The third ECORD School of Rock (SOR) took place on 29 and 30 November and 1 December 2017 in the French high school Jean Monnet in Brussels (*right*), where the organiser Michèle Darrieu is a biology and earth science teacher. This workshop addressed a group of about 20 biology and earthscience teachers from French high schools based in London (UK), Brussels, Dublin (Ireland), Luxembourg, Stockholm (Sweden), Paris and Quimper.

The programme of the ECORD SOR was built on the success of the previous SORs in France and Portugal, and also on the last three IODP expeditions in which French Education Officers (EO) have participated:

- Expedition 359 Maldives Monsoon and Sea Level, 2015 - EO Michèle Darrieu,
- Expedition 360 SW Indian Ridge Lower Crust and Moho, 2015-2016 - EO Marion Burgio, Lycée Jean Barthou, Pau, France.
- Expedition 362 Sumatra Seismogenic Zone, 2016 - EO Agnès Pointu, Lycée De Broglie, Marly-le-Roy, France.

These IODP expeditions were ideally correlated with the French high school's curriculum:

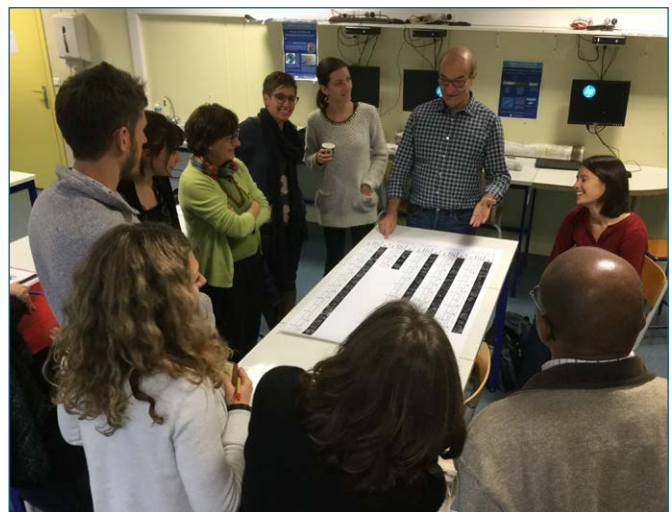
- Past climates and understanding of changing climate,
- Earth's structure and current tectonic model,
- Evolution and weathering of the mountain chains.

We also benefited from the experience of Jean-Luc Bérenguer (France) and Helder Pereira (Portugal), pioneers of the ECORD SOR, who also sailed as an EO on Expeditions 345 Hess Deep and 339 Mediterranean Outflow respectively.

The format of the workshop was organised with morning lectures and afternoon hands-on activities. Invited speakers were scientists who had taken part in IODP expeditions and they gave lectures about:

- Geodynamics of the South China Sea (Anne Briais, France)
- Palaeomagnetic methods and fundamental crustal processes (Antony Morris, UK)
- Geochemical and isotopic tools to explore connections between oceans, sediments and climate system. Himalayan erosion and Bengal-Nicobar submarine fan (Hugo Pouderoux, France);
- Petrophysics and downhole logging and the Earth structure (Johanna Lofi, France)

During the afternoon, scientists and EOs led laboratory sessions to groups of teachers on how to find and work with IODP data (*above right*) and test practical hands-on activities they could continue in the classrooms.



(photos Michèle Darrieu)

We planned to connect with the drillship *Fugro Synergy* during Expedition 381 Corinth Active Rift Development, but unfortunately, due to the bad weather conditions, it was not possible to conduct a ship-to-shore video. However, Jeremy Everest (Expedition Program Manager trainee) kindly provided us with a very interesting video about the scientific objectives of the expedition and a short visit of the drillship both presented by Donna Shillington, one of the Co-chief Scientists.

During the last day of the workshop, Elisabeth Prat, biology and earth science teacher in Quimper (France), gave a presentation on the US SOR 2016 held onboard the *JOIDES Resolution* when the vessel was alongside in Cape Town (South Africa).

The workshop finished with the presentation of the working group IODP-Education Nationale - this group is composed of teachers and representatives of the French Ministry of Education - and educational resources with discussions on how to keep in touch and share IODP resources and our experiences with the students.

* Science Teacher at the Lycée Français de Bruxelles, Belgium - michele.darrieu@lyceefrançais.be



Antony Morris

The ESSAC Office migrated to the University of Plymouth (UK) at the start of 2018, following the appointment of Antony Morris as ESSAC Chair. The e-mail address of the new office is essac@plymouth.ac.uk and all correspondence (including applications to sail) should be directed to this address until the end of 2019. The office move was accompanied by an open competition and interview process to appoint the new ESSAC Science Coordinator, resulting in the appointment of Hanno Kinkel for a further two years in this role.

This year is a critical time for ECORD as the majority of our nations seek renewal of their financial contributions to the programme, and since the transfer of the ESSAC Office to Plymouth we have been working to rationalise the ESSAC databases to provide information on national participation across all ECORD activities to assist renewal efforts.

Five IODP expeditions were completed in 2017, all using the JOIDES Resolution (JR). As part of ECORD's mission-specific platform (MSP) programme, **IODP Expedition 381 Corinth Active Rift Development** successfully completed its offshore phase in December 2017, and its onshore phase at the Bremen Core Repository on 28 February 2018 (*pages 6-8*). In 2017, a total of **53 scientists, including three Co-chief Scientists from ECORD member countries** participated in IODP expeditions. Seven of these scientists were chosen following special calls for

ESSAC News



Hanno Kinkel

participation. So far this year, the *JR* has completed Expedition 374 Ross Sea West Antarctic Ice Sheet History, with an ECORD Co-chief Scientist (Laura De Santis, Italy) and nine other ECORD members in the shipboard Science Party. The *Chikyu* has completed **Expedition 380 NanTroSEIZE Frontal Thrust Long-Term Borehole Monitoring System** on 28 February 2018 with two ECORD members in the shipboard Science Party (*page 21*).

The selection of ECORD scientists to participate in upcoming expeditions by the *JOIDES Resolution*, the *Chikyu* and MSPs during 2018 (*table below*) has been completed or is ongoing. Applicants for these IODP expeditions have greatly benefited from information provided by online, interactive "webinars", which have become an integral part of the application process for all IODP expeditions.

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>.

The development of drilling proposals within IODP is overseen by the Science Evaluation Panel (SEP) that meets twice a year

IODP Expedition Drilling Schedule

Expedition	Exp #	Drillship	Dates	Co-chief Scientists
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 Paleoceanography	377	MSP	<i>cancelled</i>	R. Stein - K. St John
South Pacific Paleogene Climate	378	JR	14 Oct - 14 Dec 2018	D. Thomas - U. Röhl
NanTroSEIZE Plate Boundary Deep Riser 4	358	Chikyu	7 Oct 2018 - 21 March 2019	<i>tbd</i>
Amundsen Sea West Antarctic Ice Sheet History	379	JR	18 Jan - 20 March 2019	K. Gohl - J. Wellner
Iceberg Alley Paleoceanography & S Falkland Slope Drift	382	JR	20 March - 20 May 2019	M. Weber - M. Raymo
Dynamics of Pacific Antarctic Circumpolar Current (DYNAPACC)	383	JR	20 May - 20 July 2019	F. Lamy - G. Winckler
Panama Basin Crustal Architecture (504B) & Eng. Testing	384	JR	20 July - 19 Sept. 2019	<i>tbd</i>
Guaymas Basin Tectonics and Biosphere	385	JR	19 Sept. - 19 Nov. 2019	A. Teske - <i>tbd</i>
Antarctic Cenozoic Paleoclimate	373	MSP	winter 2019-20 or 2020-21	C. Escutia - T. Williams
Gulf of Mexico Methane Hydrate	386	JR	21 Jan. - 22 March 2020	<i>tbd</i>

JR: JOIDES Resolution, MSP: mission-specific platform, LTBMS: long-term borehole monitoring system
ECORD Co-chief Scientists are marked in blue.

<http://www.iodp.org/expeditions/expeditions-schedule>

to review proposals, encourage and monitor their progress and eventually identify the strongest proposals to pass to the facility boards for scheduling. ECORD has **nine members in the SEP Science sub-group** and **five members in the SEP Site sub-group of the Science Evaluation** (tables page 16). With the *JOIDES Resolution* continuing its global circumnavigation (page 4), there is a pressing need for the community to consider developing new proposals for drilling in the Atlantic Ocean, to maximise the benefit of having the *JOIDES Resolution* in this region in the early 2020's. The progress of proposals through the evaluation system in recent years has been streamlined and optimised, so this is an ideal opportunity for ECORD scientists to lead new expeditions and potentially have them scheduled before the ship returns to the Pacific and to other regions on its global journey.

The **2017-2018 ECORD Distinguished Lecturer Programme** covering the major themes defined in the IODP Science Plan continues to be delivered to enthusiastic audiences by the current group of four outstanding lecturers. In total, **26 lectures** have either been given or are planned in this phase, and further information is available at <http://www.ecord.org/education/dlp/>. There will shortly be a call for applications/nominations for the next group of ECORD Distinguished Lecturers to cover the period 2018/2019.

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

- The **Petrophysics Summer School**, Leicester, UK, 2-7 July 2017 - <http://www2.le.ac.uk/departments/geology/research/gbrg/projects/iodp/summerschool17>.
- The **Urbino Summer School in Paleoclimatology on Past Global Change Reconstruction and Modelling Techniques**, University of Urbino, Italy, 13 to 28 July 2017 - <http://www.urbinossp.it>

- The **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 provided **ECORD Scholarships** to young scientists to attend these summer schools, with **14 awards** made in 2017. The deadline for the 2018 round of awards will be announced shortly - <http://www.ecord.org/education/scholarship/>

The ESSAC office issued a call for applications for **ECORD Research Grants**, to support outstanding young scientists in IODP-related research, with a deadline of 30 January 2018. 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/>

Other ESSAC activities include the **EGU 2018** General Assembly in Vienna, Austria (8 - 13 April 2018), where a session entitled "Achievements and Perspectives in Scientific Ocean and Continental Drilling (Session SSP1.2)" 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.

Antony Morris, ESSAC Chair, and Hanno Kinkel, ESSAC Science Coordinator - essac@plymouth.ac.uk

<http://www.ecord.org/science/get-involved/>

<http://www.ecord.org/education/>

ECORD-IODP sessions at 2018 conferences



EGU 2018
8-13 April, Vienna, Austria

US4 - Fifty years of International Ocean Drilling
Wed 11 April, 8:30-12:00, Room E1

TM3. - ICDP-IODP Townhall Meeting
Wed 11 April, 1900-20:00, Room K2

SSP1.2. - Achievements and perspectives in scientific ocean and continental drilling
Thu 12 April, 8:30-10:00, room 0:31 & posters 17:30-19:00, Hall X1

EOS18 - ECORD IODP Outreach: Past, Present and Future

Thu 12 April, posters 13:30-15:00, Hall X1



ISC 2018
13-17 August 2018, Québec, Canada

7.2 - Exploring the Earth through scientific drilling: contributions from IODP and ICDP
<http://www.isc2018.org/sessions>

ECORD Representatives in IODP advisory panels

Science Evaluation Panel (SEP)					
Science sub-group			Site sub-group		
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Henrich Villinger	Germany	vill@uni-bremen.de			
Environmental Protection and Safety Panel (EPSP)					
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Philippe Lapointe	France	philippe.lapointe@total.com	Dieter Strack	Germany	ddhstrack@aol.com

<http://www.iodp.org/program-organization/science-evaluation-panel>

<http://www.iodp.org/program-organization/environmental-protection-and-safety-panel>

ESSAC Delegates and Alternates

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

Calendar of Workshops and Conferences

<p>2018</p> <p>7-8 April MagellanPlus Workshop Fjord Sediment Archives Vienna, Austria www.ecord.org/science/magellanplus/</p> <p>8 - 13 April EGU 2018 Vienna, Austria www.egu.eu</p> <p>20 - 24 May JpGU 2018 Chiba, Japan www.jpгу.org/meeting_e2018/</p> <p>29-30 May MagellanPlus Workshop: N Atlantic Igneous Province Kiel, Germany www.ecord.org/science/magellanplus/</p> <p>3 - 8 June AOGS 2018</p>	<p>Honolulu, Hawaii, USA www.asiaoceania.org/society/index.asp</p> <p>4 - 5 June MagellanPlus Workshop Arctic Gas Hydrates Tromsø, Norway www.ecord.org/science/magellanplus/</p> <p>11 - 17 August Goldschmidt 2018 Boston, MA, USA goldschmidt.info/2018/</p> <p>13 - 18 August ISC 2018 Québec, QC, Canada www.isc2018.org/</p> <p><i>mid September</i> MagellanPlus Workshop Greeland Ice Sheet Evolution Vienna, Austria www.ecord.org/science/magellanplus/</p> <p>14 - 18 October AGCC 2018</p>	<p>Adelaide, Australia www.agcc.org.au/</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> <p>2019</p> <p>7 - 12 April EGU 2019 Vienna, Austria www.egu.eu</p> <p><i>January</i> MagellanPlus Workshop New Caledonia Peridotite ADP Montpellier, France www.ecord.org/science/magellanplus</p>	<p>18 July - 2 August AOGS 2019 Singapore www.asiaoceania.org/society/index.asp</p> <p>9 - 13 December AGU 2019 San Francisco, CA, USA meetings.agu.org</p> <p>2020</p> <p>2-8 March IGC #36 Delhi, India 36igc.org/</p> <p>3-8 May EGU 2020 Vienna, Austria www.egu2020.eu/</p> <p>5-10 July ICRS 2020 Bremen http://www.icrs2020.de/</p>
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Calendar of ECORD & IODP Meetings

<p>JOIDES Resolution Facility Board 15-16 May 2018 Alexandria, VA, USA</p> <p>ESSAC 28-29 May 2018 Toulouse, France</p> <p>ECORD Council -Spring 19 June 2018 Berlin, Germany</p>	<p>SEP 26-28 June 2018 Potsdam, Germany</p> <p>IODP Forum September 2018 Goa, India</p> <p>EPSP September 2018 College Station, TX, USA</p>	<p>Operational Review Committee Exp 381 6 November 2018 Den Haag, The Netherlands</p> <p>ESSAC-ECORD Council #6 6-8 November 2018 Den Haag, The Netherlands</p> <p>ECORD Facility Board 21-22 March 2019 Bremen, Germany</p>
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<http://www.ecord.org/about-ecord/events-calendar/>

Reports of MagellanPlus Workshop Series

Carbon Cycling at the Ultraslow Arctic Spreading Ridge System - 6-8 September 2017, Bergen, Norway

Convenors: Steffen Leth Jørgensen, Wolfgang Bach, Beth Orcutt, Desiree Roerdink and Eoghan Reeves

The MagellanPlus workshop "Carbon Cycling at the Ultraslow Arctic Spreading Ridge System" was hosted by the K.G. Jebsen Centre for Deep Sea Research on 6-8 September 2017 at the University of Bergen, Norway.

The aim of the workshop was to lay the cornerstones for a future full **IODP drilling proposal to the southern Knipovich ridge (SKR)** by framing scientific objectives, selecting drill sites and exposing potential risks related to deep drilling of the North Atlantic Spreading Ridge System. In order to achieve this, the workshop brought together scientists from five different countries, and from multiple disciplines, ranging from geophysics to petrology to biogeochemistry and microbiology, many of which had extensive knowledge and experience in planning and leading previous IODP drilling expeditions.

The following four main topics were discussed:

- Identify scientific objectives and questions;
- Identify/select potential drill sites to achieve the objectives;
- Identify missing site-survey data;
- Identify potential risks.

Below is a summary of the conclusions.

Objectives

Primary

The sedimented, and presumably active core complexes at the SKR, provides optimal drilling conditions for succeeding in retrieving ultramafic rocks. The prospect of gaining access to potential active serpentinisation processes with minimal risk makes this the overarching science objective. It will address a number of first order questions related to serpentinization and its relevance for the carbon cycle and the deep biosphere.

Secondary

The secondary objectives include, but are not restricted to:

- "Zero-age" drilling opportunities;
- Sediment comparison between east and west;
- Timing and evolution of rotation and volcanic activity;
- Crustal architecture in the rift valley.



Participants of the workshop examine the Ægir 6000 ROV during a guided tour of the Norwegian Ocean Observation Laboratory facility at the University of Bergen.

Potential targets sites

It was agreed that the most relevant drill sites were to be found on, or in close proximity to, an approximate 75 km long transect crossing the SKR approximately 5 km north of the active hydrothermal field Loki's Castle at the end of the axial volcanic ridge. On this line **four targets** were selected (1) a sediment pond directly on a likely core complex located west of ridge, (2) sediment pond closer to western ridge, (3) rift valley - with great potential for "zero-age" crustal drilling and (4) sediments on the eastern ridge.

Risk assessment

With the currently available site-survey data there is no indication of potential risk associated with *JOIDES Resolution*-type drilling at the proposed drill sites.

It was suggested that enough site-survey data was available for a pre-proposal but that additional site-survey data are likely to be required before a full proposal can be submitted *e.g.* additional heat flux and OBS data. A tentative plan was made for how to obtain such data.

Contact: Steffen Leth Jørgensen - steffen.jorgensen@uib.no

Full reports of MagellanPlus workshops are posted on:
<http://www.ecord.org/science/magellanplus/>

Volcanic, tectonic and hydrothermal processes in an island-arc caldera environment. Development of an IODP Drilling Proposal at Santorini-Kolumbo Marine Volcanic System - 21-23 November 2017, Athens, Greece

Convenors: Tim Druitt, Paraskevi Nomikou, Dimitris Papanikolaou and Christian Hübscher

A MagellanPlus workshop was held on 21-23 November in Athens, Greece, to begin preparation for a proposal to drill at Santorini-Kolumbo volcanic field on the Hellenic island arc. The workshop was attended by **30 researchers, including eight early-career scientists**, and was successful in bringing together a team of marine and onland geologists and geophysicists in preparing the first stages of proposal development and identifying potential drilling sites. A pre-proposal will be submitted to IODP in April of 2018.

The meeting proved to be extremely efficient and productive, with the following main deliverables.

- The development of a cross-disciplinary dynamic between all participants, many of whom did not know each other before.
- The sharing of knowledge and expertise between onland volcanologists, marine geologists and geophysicists, and scientists with prior experience of IODP missions.
- Full involvement of a number of experienced and highly motivated early-career scientists.
- A list of possible participants from the US and Japan to be approached for integration into the (at present mainly European) team at pre-proposal stage.
- The selection of six sites most appropriate for addressing the science questions and with suitably detailed seismic and bathymetric coverage.
- Initial lists of core-analysis techniques to be explored.
- An agreement to focus the project on the relationship between volcanism and tectonics, as this was seen as the most innovative strategy addressing a particularly big question in earth sciences.
- Following a long discussion, an agreement to omit a previously favoured drill site in Kolumbo crater. This site, originally envisaged as an exploration of a hot, active hydrothermal system, was seen to pose a number of technical issues that would significantly complicate, or even threaten, the proposal.



Santorini-Kolumbo MagellanPlus workshop: Field excursion to the Soussaki volcanic field, west of Athens

Moreover insufficient geophysical site-characterisation data are available for this site which, it was concluded, should form the basis for a separate drilling proposal at a later date.

- A realisation that existing seismic coverage of the anticipated sites was generally of very high quality. Funding applications will be made, however, in early 2018 to make additional seismic surveys at one site where existing seismic coverage or quality are deemed insufficient.
- A decision to submit a **pre-proposal to IODP in the spring of 2018**, with (if possible) a **full proposal in October 2018**, the aim being to possibly try and benefit from the presence of the *JOIDES Resolution* in the North Atlantic region in 2022.
- Plentiful notes and a draft working document full of modifications and ideas. The working document was very significantly improved by the input of all participants, and will be used as a basis for the pre-proposal.

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

Calls for MagellanPlus Workshop Proposals 2019

Deadline: 15 January 2019

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

IODP-Italy Workshop: Scientific Drilling in the Mediterranean Sea - 15-16 January 2018, Rome (Italy)

Convenors: Andrea Argnani, Angelo Camerlenghi, Fabio Florindo, Annalisa Iadanza, Marco Sacchi and Nevio Zitellini

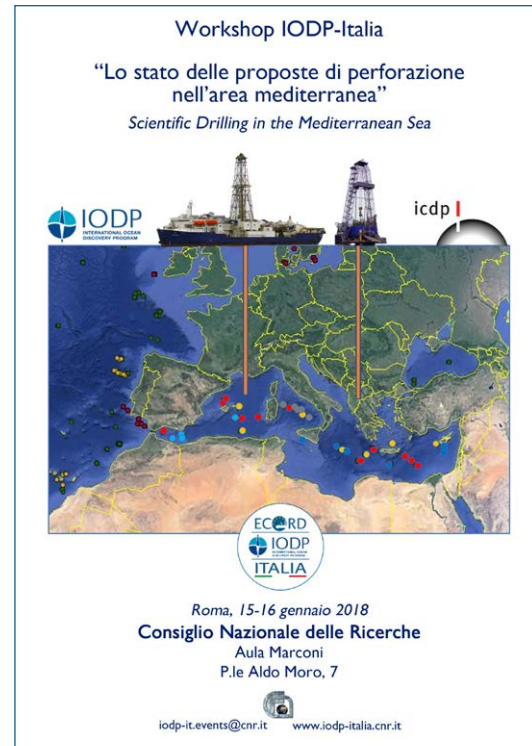
After almost 15 years since the last general convention, a national IODP workshop titled "Scientific Drilling in the Mediterranean Sea" was held on 15-16 January 2018 under the patronage of IODP-Italy Committee and CNR Department of Earth System Science and Environmental Technologies at the CNR Headquarters in Rome, Italy (*below*).

The two-day workshop was dedicated to the past, present and future of scientific drilling in the Mediterranean area, with a specific focus on active and future drilling proposals that intend to take the opportunity of a possible entry of the *JOIDES Resolution* into the Mediterranean Sea towards 2022-2023.

Over **100 participants** from various national academic and research institutions attended the event, with **34 speakers** including researchers from the IODP-Italy community (CNR, OGS, INGV, CoNISMa-Universities, ENEA), delegates of the Ministry of Education, University and Research (MIUR), and of the Ministry of Economic Development (MISE), and representatives from the Industry (Eni S.p.a.).



The workshop provided an opportunity to share new ideas among Italian scientists, and aimed to promote the submission of drilling proposals, stimulate the scientific debate on Mediterranean geology, and foster the Italian participation in IODP and ICDP. During the first day, participants were introduced to existing opportunities of getting involved in IODP and ICDP activities. Thematic sessions were devoted to IODP and ICDP active drilling proposals in the Mediterranean and to major achievements and outcomes from Mediterranean expeditions of previous drilling programmes.



During the second day, a live broadcast connection was established with Expedition 374 Co-Chief Laura De Santis (OGS), who explained the main objectives of the expedition and announced the beginning of coring activities onboard the *JOIDES Resolution* in the Ross Sea. The first results from the recent MSP Expedition 381, the MagellanPlus Workshop Series Programme, and the plan for hosting the 2018 edition of the ECORD School of Rock in Pavia were presented as well. Scientific sessions also included presentations of new ideas for drilling proposals in the Mediterranean area and a poster session dedicated to early-career researchers involved in IODP and ICDP activities.

A round-table discussion for the development of an effective coordination between IODP-ICDP programmes at national level closed the workshop agenda.

Abstracts and presentations available online at <http://www.iodp-italia.cnr.it/index.php/it/eventi/eventi-iodp-italia/ws-iodp-italia-15-16-gennaio-2018-programma-e-abstract>

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News from the *D/V Chikyu*

Nobu Eguchi*

ICDP Oman Drilling Project: Core description on *D/V Chikyu*

Oman ophiolite is the largest, best-exposed, section of oceanic lithosphere in the world. During Phase I of the ICDP Oman Drilling Project from December 2016 to March 2017, about 1,500 m of this exposed oceanic lithosphere was cored, from sheeted dikes to gabbro to mantle. It sounds odd to hear of ICDP using *D/V Chikyu*, but it was a great opportunity for the *Chikyu* laboratory to host 71 onboard scientists from 14 countries for 62 days last summer for description and measurements of those core samples whilst alongside at the dock in Shimizu (*right*). Laboratory work included X-ray CT scanning, core imaging, core description, XRF, ICP-MS, XRF core scanner, XRD, physical property, paleomagnetism, etc. Science party members stayed on board at least one month (some stayed the entire period), working 24/7. A total of ca. **40,000 working, 81,088 analyses, 319 thin sections, and 26,874 veins** were described for a total data volume of 15 TB. This was a great opportunity for both ICDP scientists and *D/V Chikyu*/CDEX to collaborate; we are now planning to hold another campaign for Phase 2 cores (*page 22*) in the summer of 2018.



(IODP/JAMSTEC)

IODP Expedition 380 NanTroSEIZE Frontal Thrust Long-Term Borehole Monitoring System & Core-Log-Seismic-Integration at Sea Program

This expedition's target was to deploy a **Long-Term-Borehole-Monitoring-System (LTBMS)** along the **NanTroSEIZE transect at Site C0006**, which was originally logged and sampled during IODP Expeditions 314 & 316. Co-chief Scientists Keir Becker and Masa Kinoshita with CDEX Expedition Program Manager Sean Toczko, led six onboard scientists from ECORD, USA, and Japan. The expedition began on 12 January 2018 and was scheduled for 40 days; however, environmental conditions (Kuroshio current in meander mode) and technological developments by Operations Superintendent (OSI) Tomo Saruhashi allowed completion within only 27 days. The successful installation of the **LTBMS in a 495 m deep hole was finished on 7 February 2018**.

In conjunction with LTBMS installation, CDEX conducted a **Core-Log-Seismic-Integration at Sea Program (CLSI@Sea)** during Expedition 380. This workshop was conceived by Dr. Gaku Kimura, developed by the NanTroSEIZE Project Coordination Team (PCT), and managed by Lena Maeda (CDEX), and focused on extended investigations of the role of the Nankai Frontal Prism in past tsunamigenic earthquakes and slow slip, using well logging data and cores (total of 2,402 archive and working halves) collected during IODP Expeditions 314, 316, 322 and 333 for NanTroSEIZE project. Students and early-career scientists (14) from ECORD, USA, and Japan were joined by four onboard mentors and three shore-based support



CLSI@Sea Mentor Dr Michi Strasser discussing sediment characteristics in selected Site C0006 & C0007 core sections for the programme and expedition scientists. Drs. G. Motohashi, J. Edgington, T. Maison, B. Gao, C. Regalla, K. Suyehiro and B. Senyener (IODP/JAMSTEC).

scientists. Mentors presented several lectures and assisted with research plans and sample requests (*above*). As a result, nine sample requests were submitted and approved; in total **519 discrete samples** were collected during the workshop. The workshop participants are currently working on submitting scientific papers for publication based on original research with these samples as well as on the workshop reports.

http://www.jamstec.go.jp/chikyu/e/nantroseize/expedition_380.html



ICDP Oman Drilling Project



Scientific Drilling in the Samail Ophiolite Sultanate of Oman: Phase 2

Judith Ann Coggon¹, Ronald Conze², Tanja Hörner², Jürg Matter¹

OmanDP is an international drilling programme that samples the Samail Ophiolite in the Sultanate of Oman. The Samail ophiolite is the largest and most well-characterised sub-aerial exposure of oceanic crust and upper mantle in the world. OmanDP has sampled the ophiolite from the upper to the lower crustal sequence, across the crust-mantle boundary, through altered peridotites to the basal thrust. These unique and valuable samples will be used to address a broad range of unresolved scientific questions related to the formation, hydrothermal alteration and weathering of oceanic crust and upper mantle as well as the role of the biosphere in these processes.

The **ICDP OmanDP** is a collaboration of international scientists from different disciplines of geoscience led by Principal Investigators Peter Kelemen (LDEO), Juerg Matter and Damon Teagle (both U Southampton). The drilling project is divided into three operational phases. The first drilling phase started in December 2016 and ended in March 2017 (*see ECORD Newsletter #28 - <http://www.ecord.org/resources/ecord-newsletter/>*). The hard-rock cores were described in detail during a shipboard science party onboard the IODP research and drilling vessel *Chikyu*, from July to September 2017 (*page 21*). The second phase of drilling started in November 2017. Now, the project has almost reached the end of the second phase, with coring completed on 28 February and a final rotary borehole still to be completed. The OmanDP scientists and drilling team can look back on a hugely successful operation, with a total of 3200 m

In Phase 2 a total of **nine new boreholes** were drilled. Five of these boreholes were fully cored using wireline diamond coring (HQ in diameter) to depths of 300 and 400 m, depending on the target. The first two cored holes are located in Wadi Zeeb



and sample the crust-mantle transition, from lowermost gabbros, through dunite into harzburgite. The remaining three cored wells are located near Batin, in Wadi Lawayni where the primary geological target is active serpentinization of mantle harzburgite and dunite (*above*). Four rotary drilling holes (6 1/8" in diameter and each either 300 or 400 m depth) were drilled, two in Wadi Zeeb and two in Wadi Lawayni. Cuttings samples were described, photographed and sampled with a resolution of 1 m.

On site, the 3-m long cores were measured, divided into sections (< 1 m long), curated, scanned, labelled, sketched and subject to preliminary description. In addition, thin section samples and samples for microbiological analyses were collected.

The Phase 2 onsite science team consists of scientists from disciplines as diverse as structural geology, petrology microbiology, and geochemistry. In addition, 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) were trained in core processing on site. The data management of the drilling operations, the curation 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 Operational Support Group.

The cores drilled in OmanDP Phase 2 will be described in detail during a core characterisation campaign that will take place onboard the IODP research and **drilling vessel *Chikyu***. OmanDP Core Description on the *Chikyu* is scheduled from 5 July to 5 September 2018 (*page 21*). The deadline for applications to participate in Phase 2 shipboard core description activities is **30 April 2018**. Those interested in participating are encouraged to apply via www.omandrilling.ac.uk/application-form.

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). The science party will be divided into two groups, each working for one month on the ship. We can accommodate up to 30 scientists per month. The first group will board the *Chikyu* (docked at Shimizu, near Tokyo) on 5 July and disembark on 5 August. The second group will embark at Shimizu on 5 August and disembark on 5 September.

In the third phase of OmanDP, hydrological borehole tests will be conducted in selected holes. This phase is scheduled to take place in winter 2018-2019.

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

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² Scientific Drilling, Operational Support Group ICDP, GFZ-Potsdam - conze@gfz-potsdam.de and thoerner@gfz-potsdam.de

News from ECORD Member Countries

The Netherlands

Francesca Sangiorgi (*right*) (Department of Earth Sciences, University of Utrecht) has joined IODP Expedition 374 Ross Sea to study the West Antarctic Ice Sheet History. Forty-five years after DSDP Leg 28 first drilled the Ross Sea on the *Glomar Challenger*, the *JOIDES Resolution* crossed the Pacific sector of Southern Ocean to drill sediments in the Central and Eastern Ross Sea with the goal of deciphering the Neogene and Quaternary history of the Western Antarctic Ice Sheet (WAIS). Francesca spent nine weeks at sea, with a group of 30 scientists (12 women and 18 men)

from 14 different nationalities. The expedition drilled five sites, two on the continental shelf and three along a slope-to-rise transect and recovered more than 1300 m sediments. Francesca sailed as palynologist, investigating the fossil remains of dinoflagellates (marine "microalgae"), pollen and spores, and other organic material that is preserved in the sediments, to reconstruct past marine and terrestrial climate and environments and to use them as biostratigraphic markers. Francesca spent most of her



Francesca Sangiorgi, centre, and colleagues during Expedition 374 (photo JRSO/IODP).

time in the micropalaeontology lab during the night shift and she fully enjoyed being part of this exciting adventure.

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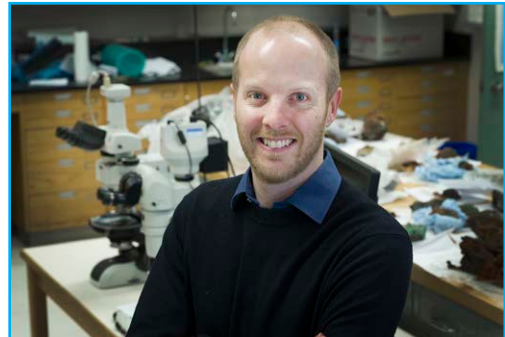
Canada

The **Canadian Consortium for Ocean Drilling (CCOD) Office** will be transferred from the University of British Columbia to Memorial University. John Jamieson (*right*) (Memorial University) will transition into the role of CCOD Chair, taking over from Dominique Weis (University of British Columbia). The CCOD wishes to thank Dominique for her years of dedicated service and leadership as Chair. John is an Assistant Professor and Canada Research Chair in Marine Geology, and will sail on the upcoming IODP Expedition 376 Brothers Arc Flux.

The CCOD will participate in a townhall meeting to engage Canadian marine geoscientists in all disciplines, including discussion

of options for continued participation in IODP. The meeting will take place at the upcoming Resources for Future Generations (RFG) Conference in June 2018 in Vancouver, Canada.

Canadian-based researchers and students remain very active in IODP. **Laura Bilenker** (University of British Columbia) presented work on Expedition 357 Serpentinization and Life samples at the American Geophysical Union (AGU) conference in which radiogenic and stable iron isotopes provide insights into the sources and paths of fluids and clasts at Atlantis Massif. This work is ongoing with Dominique Weis and James Scoates (University of British Columbia).



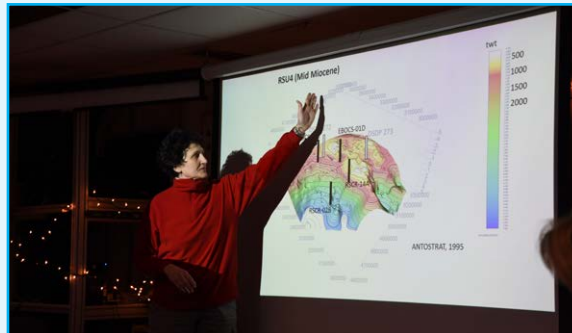
David R. Greenwood (Brandon University) is part of a team working to publish data from the Lomonosov Ridge, Expedition 302 Arctic Coring. The team is analysing the climate and terrestrial vegetation Eocene epoch record of the Arctic.

Kimberly Low, CCOD Scientific Coordinator (acting)
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<http://www.iodpcanada.ca>

Italy

IODP expeditions.

During Expedition 374 Ross Sea West Antarctic Ice Sheet History, Co-chief Scientist Laura De Santis (OGS) (*right*) published news on the ongoing drilling achievements and celebrated the 50th anniversary of scientific drilling and the 60th anniversary Scientific Committee on Antarctic Research (SCAR). Anna Cerchiari (Univ. of Modena-Reggio Emilia) took part in the first phase of the CLSI@Sea Program (Expedition 380 NanTroSEIZE Frontal Thrust LTBS) (*page 21*). Francesca Meneghini (Univ. of Pisa) is currently sailing on Expedition 375 Hikurangi Subduction Margin Observatory as



Laura De Santis (Expedition 374 Co-chief Scientist) presents the geological setting and scientific objectives of Site U1522. (Juliane Müller & IODP)

expert in sedimentology, while Ilaria Mazzini (CNR-IGAG) has been recently involved in the running analyses of core samples from Expedition 381 Corinth Active Rift Development, as expert in ostracods.

Workshops and Meetings. A national two-day workshop titled 'Scientific Drilling in the

Mediterranean Sea' was organised by IODP-Italia last January in Rome (*page 20*). IODP-Italia has recently hosted the ECORD Facility Board Meeting #6 at the Cultural Center Don Orione Artigianelli in Venice (6-7 March 2018) and organised a field trip to the Venice Lagoon. Alessio Sanfilippo and Riccardo Tribuzio (Univ. of Pavia)

will host in Sicily the post-cruise meeting for IODP Expedition 360 SW Indian Ridge Lower Crust and Moho.

Education and Outreach.

Three PhD students based in Italian universities will attend the ECORD Training Course in Bremen: Viviana Gamboa Sojo, Giulia Bosio, and Francesco Miniati. The 2018 edition of the ECORD School of Rock will be held in Italy at the University of Pavia next July.

Annalisa Iadanza, IODP-Italia Scientific Coordinator - annalisa.iadanza@iamc.cnr.it, iodp-italia@cnr.it, and Marco Sacchi, Council Delegate - marco.sacchi@iamc.cnr.it

Switzerland

We are pleased that a young scientist from a Swiss university has been invited to join an IODP expedition in 2018. **Blanca Ausin** (ETH Zurich) will participate in Expedition 378 South Pacific Paleogene Climate. She will sail on the *JOIDES Resolution* as an organic geochemist in October this year.

For the third time, **SwissDrilling.ch** had a successful booth (*above*) at the Swiss Geoscience Meeting on 18 November 2017 in Davos. Visitors to the booth were treated with a variety of information materials and



giveaways and could explore the homepage and follow video clips from past drilling expeditions on a monitor. Young researchers (MSc

and PhD students) visited the booth to obtain information about how to become involved in scientific drilling. Also delegates from organisations and industry showed interest in the Swiss participation in the international scientific drilling programmes.

Mareike Trauerstein, SwissDrilling Coordination Office, and Gretchen Fröh-Green, Swiss ESSAC Delegate <http://www.swissdrilling.ch>

Ireland

The Irish geoscience community has regained interest in the IODP sphere reflected in the scientific participation in expeditions and related research projects. Over December and the New Year celebrations Irish geoscience was well represented in the IODP by the presence of both **David McNamara** and **Aggeliki Georgiopoulou** (*above right*) from the National University of Ireland, Galway and University College Dublin respectively.

While aboard the *JOIDES Resolution* during Expedition 372 Creeping Gas Hydrate Slides and Hikurangi LWD, David



McNamara was delighted to be able to collect downhole data that will help him characterise the stress field around the Hikurangi Subduction Margin and its link to the presence of slow slip earthquakes.

Aggeliki Georgiopoulou, whose research focuses on submarine landslide

initiation and flow processes, will now have access to an exceptional data that samples an entire submarine landslide deposit and the lithological sequence below it, data that are normally hard to obtain. They are grateful to the Geological Survey of Ireland for supporting their participation in

what was a scientifically, culturally, and personally rewarding research experience.

The **Geological Survey Ireland (GSI)** and the **Irish Centre for Research in Applied Geosciences (iCRAG)** funded by Science Foundation Ireland and co-funded by industry partners and the European Regional Development Fund, have launched the Environmental Geosciences Postgraduate Programme with a dedicated topic for funding IODP related projects.

Xavier Monteys, ESSAC Delegate - Xavier. Monteys@gsi.ie

France



We are pleased to announce that the IODP France office will take on the communication

of the French ICDP activities. In that perspective, **Pascal Philippot** (Geosciences Montpellier) has been recently named by the Institut National des Sciences de l'Univers head of ICDP-France. **Stéphanie Cuvén** will be the main contact for both IODP and ICDP communities and will ensure the scientific coordination of these two programmes in France.

The French educational network has benefited from the presence of **Agnès Pointu** (Lycée Louis de

Brogie in Marly-le-Roi). Agnès is just back from the Expedition 374 Ross Sea West Antarctic Ice Sheet History where she served as an Education Officer onboard the drillship *JOIDES Resolution* (*right*). Agnès produced an exceptional educational blog - <https://expedition374rosssea.wordpress.com> - that gives an insight into the latest knowledge on climate change. The many rewarding talks with the science party during the expedition were crucial for Agnès to produce new teaching materials. Her experience



Isabela de Sousa and Agnès Pointu (right) enjoy the sunshine (Juliane Müller & IODP).

is also a way to promote sustainable collaborations between the research and teaching communities.

Stéphanie Cuvén, IODP-France, and Georges Ceuleneer, ESSAC Delegate iodp-france@get.obs-mip.fr <http://www.iodp-france.org>

Sweden

At least ten members of the **Swedish ocean drilling** community (*right*) attended the Royal Swedish Academy of Sciences symposium on "The Ocean in a +2°C world - An analytical perspective", held in Stockholm on 22 February. This was an extremely well attended public event that provoked great discussion. Among the speakers two were from the IODP community (Paul Pearson, Cardiff University and Larry Mayer, University of New Hampshire), who elegantly demonstrated



From left to right, back to front: Thomas Andréén (Södertörns Högskola), Helena Filipsson (Lund University), Martin Jakobsson (Stockholm University), Helen Coxall (Stockholm University), Marcelo Ketzer (Linnaeus University, Kalmar); Falkje van Wirdum (Södertörns Högskola), Matt O'Regan (Stockholm University), Volker Brüchert (Stockholm University); Elinor Andréén (Södertörns Högskola, Stockholm) and Eve Arnold (Stockholm University) (Photo by Björn Eriksson).

the value of ocean cores in giving insight into the reality of warmer oceans.

In April, several of us will attend the EGU General Assembly 2018 (Vienna,

Austria) to present and discuss new IODP-related scientific findings.

Ian Snowball (Uppsala University) will participate in the MagellanPlus Workshop on Fjord Sediment Archives in the northeastern North Atlantic, which is scheduled as a pre-EGU event.

Jorijntje Henderiks, ESSAC Delegate - jorijntje.henderiks@geo.uu.se - and **Helen Coxall**, ESSAC Alternate - helen.coxall@geo.su.se <https://www.ssdp.se/>

Norway

IODP Expedition 374 sailed for the Ross Sea West Antarctic Ice Sheet History. This is the return of ocean drilling to the Ross Sea 45 years after the previous international expedition to this area, DSDP Leg 28. This time, a total of five sites were drilled, two on the outer shelf and three on the continental slope rise. Sediments from Pleistocene to Miocene were recovered, diamictites and mudstone on the shelf (including record recovery at one of the high-latitude shelf sites), various types of mudstone dominated the slope-rise succession



IODP 374 sedimentologists describing sediment cores: centre, Jan Sverre Laberg (Norway), left, Jeanine Ash (USA), and right, Shiv M. Singh (India) (JRSO/IODP).

- http://iodp.tamu.edu/scienceops/expeditions/ross_sea_ice_sheet_history.html

Having his background and training from studying the marine

sediments of the Northern Hemisphere ice sheets and the interbedded succession influenced by the ocean currents of the Nordic Seas, **Jan Sverre Laberg** (*above*) marine geologist from

the University of Tromsø - the Arctic University of Norway, sailed as a sedimentologist. His onboard tasks included core description and interpretation, establishing the lithostratigraphy for each site and prepare for post-cruise research which will include (1) studies of Miocene shelf diamictites, their origin and palaeoglaciological implications, and (2) Pliocene ocean current influenced sedimentation and gravity current - ice-rafted debris (IRD) interactions.

Kikki (Helga) Kleiven, ESSAC Delegate - kikki@uib.no

Portugal

Early-career scientist **Dulce Oliveira** (*right*), affiliated with the Marine Geology Division at the Instituto Português do Mar e da Atmosfera (IPMA) and the OC2 Group at the Centre of Marine Sciences at the University of the Algarve, received one of the four 2017 L'Oréal Portugal Medals of Honour for Women in Science, an initiative organised by L'Oréal Portugal in partnership with the Portuguese National Commission for UNESCO and FCT. Dulce's awarded project "Understanding abrupt hydroclimate shifts in vulnerable regions of the North Atlantic" will use samples from IODP Site U1385 on the SW Portuguese margin to reconstruct vegetation and climate changes with special focus on interglacial climate periods.



Dulce Oliveira in the Micropaleontology and Sedimentology Lab of IPMA. Photo courtesy of L'Oréal Portugal (2018)

Helder Pereira, high school teacher in Loule, remains highly active in IODP related outreach activities. He contributed to the ECORD SOR2017 (*page 13*) by training teachers in extracting foraminifer shells from soft marine sediments and observing them under a binocular microscope. During recent Expedition 374 to the Ross Sea,

Helder used two video conferences with the *JOIDES Resolution* to show his students how science works and what we can learn by studying marine climate archives. One of the classes was lucky to watch the arrival of a "core on deck" and its processing in the catwalk. They even saw a picture of the Science Party on the helideck celebrating the 50th anniversary

of scientific drilling. Helder will present some of his outreach activities in the session ECORD IODP Outreach: Past, Present and Future at the upcoming EGU conference in Vienna (*page 9*).

Antje Voelker, ESSAC Delegate - antje.voelker@ipma.pt

United Kingdom

This year UK-IODP is co-sponsoring **FORAMs 2018** - <http://forams2018.wp.st-andrews.ac.uk/> - the symposium for which will be held in Edinburgh, 17-22 June, followed by workshops at St Andrews, 23-24 June.

The **2017 UK-IODP Annual Science Meeting** was held on 3 November 2017, at the Royal Geographical Society. The day comprised a number of lectures, a poster session (*above right*), and an evening networking and drinks reception. The meeting was very well attended, with over 85 scientists in attendance. Keynote speakers included Dick Kroon (University of Edinburgh), Jane Francis (British



Antarctic Survey), Julie Prytulak (Imperial College London) and Joanna Morgan (Imperial College London). Students were encouraged to show their work with three of the best student posters awarded prizes (one £100 first place and two £50 runner ups). The prizes were in the form of book tokens, provided

by the poster presentation's sponsors, the Marine Studies Group - www.geolsoc.org.uk/marine.

Rachel Bertrum (Imperial College London) won first prize, with **Amy Jewell** (University of Southampton)

and **Nicola Kirby** (University of Southampton) winning the runner up prizes.

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