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# NEWSLETTER



**OFFSHORE PHASE**

## **IODP Expedition 386:** Japan Trench Paleoseismology

**Two depth records**  
in scientific ocean research

IODP Expedition 377: Arctic Ocean Palaeoceanography (ArcOP)  
IODP 2050 Science Framework  
ECORD Awards

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The International Ocean Discovery Program (**IODP**) - [www.iodp.org](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**) - [www.ecord.org](http://www.ecord.org) - 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 (*see back page*).

IODP is funded by the US National Science Foundation (NSF), Japan's Ministry of Education, Culture, Sports, Science, and Technology (MEXT); ECORD; the Australian-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).

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**Thanks to all authors who contributed to this issue.**

**Cover:** *R/V Kaimei* operating as a drillship for Expedition 386: Japan Trench Paleoseismology. Credits: JAMSTEC



Gilbert Camoin



Nadine Hallmann



Mike Webb




Bernard Westerop

While writing these words, the world is still facing an unprecedented health crisis related to the COVID-19 disease outbreak. Since last year, this crisis has affected the progress of our programme due to the postponement or cancellation of expeditions, workshops, conferences and educational activities due to new governmental guidance, and institutional restrictions on international travels. IODP and ECORD meetings have however been successfully held remotely, which has allowed for important work to continue (e.g., ECORD's planning for an Arctic expedition). It is still too early to evaluate the overall impact of this crisis on future activities of the programme, including the implementation of expeditions. Nevertheless, in these uncertain times, we do hope that you and your loved ones will stay safe and healthy.

The ECORD science community is in very good shape, especially through its leading role in the submission of drilling proposals, its massive and sustained participation to IODP expeditions, and its pivotal role in the publication and promotion of cutting-edge results related to the successive ocean drilling programmes. The ECORD science community has been also actively involved in the development of the 2050

Science Framework that will be the foundation of a post-2023 programme.

Over the last months, ECORD has developed concrete operational plans for the next mission-specific platform (MSP) expeditions that will be implemented in 2021 and 2022 and started to plan actions designed to shape the future of scientific ocean drilling beyond 2023.

 Before the start of the health crisis, two former ECORD members, Israel and Iceland, expressed interest in joining the current 15 ECORD members in supporting ECORD's unique distributed research infrastructure that connects research facilities at multiple sites across Europe and Canada. In addition, ECORD has maintained regular exchanges with countries that are interested in potentially joining ECORD for the first time: Greece, Croatia and Russia.

*continued* →

## Outgoing ECORD members



### Dave Smith

*ESO Operations Manager*

(since late 1986)

In October 2020, we said goodbye to our colleague Dave Smith, who retired from the BGS and the role of ESO Operations Manager. Dave worked for the BGS for 34 years in marine operations, and for the last 18 years he first supported then eventually led our MSP operations. We wish Dave all the best in his retirement.

Dave was awarded with the ECORD Award in 2020 ([read more on page 9](#) »)



### Carol Cotterill

*Expedition Project Manager*

*ESO Outreach Manager*

(since late 2008)

In November 2020, we also said goodbye to our colleague Carol Cotterill, who is leaving the BGS to take up a new position with the IODP U.S. Science Support Program (USSSP).

Carol worked for the BGS for nearly 15 years, with 12 years contributing to ECORD in various ways, from Expedition Project Manager on multiple MSP expeditions, to ESO Outreach Manager and part of the ESO Management Team. We wish Carol the best of luck with her new role at USSSP.

## Relocation of ECORD members



### Erwan Le Ber

*ESO-EPC team*

(since late 2015)

In October 2020 and after 5 years with us, Erwan Le Ber left the Leicester team and joined our consortium partner, the University of Montpellier. However, he is in a very similar role and remains part of the ESO-EPC team. Since his move, we have continued working with him on a regular basis.



With regret we need to let you know that due to a non-signing of the ECORD 2019-2023 MoU and receipt of no financial contributions to ECORD from Spain since 2017, the right of scientists with Spanish institutional affiliations to apply for ECORD berths to sail on IODP expeditions is suspended with immediate effect and until this situation is resolved. All invitations to sail issued to scientists with Spanish institutional affiliations prior to this announcement will be honored. However, scientists in other ECORD countries should be aware that from this point forward invitations to sail may be withdrawn if they successfully apply for an ECORD berth and then move to Spain. This is a challenging situation and ECORD is actively working together with Spanish colleagues to address these problems. ECORD wishes Spain to be part of the current scientific ocean drilling

programme and hopes that these membership issues can be resolved during discussions at the next ECORD Council-ESSAC meeting, to be held in Granada, Spain, on 20 and 21 October 2021.

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Chair of the ECORD Facility Board

## Mission-specific platform expeditions

The delivery of a world-class portfolio of MSP expeditions has been ECORD's primary objective since 2004 and, since 2013, ECORD became one of the three IODP Platform Providers, along with the NSF and JAMSTEC.



April-June 2021

### IODP Expedition 386: Japan Trench Paleoseismology

The next planned MSP is IODP Expedition 386: Japan Trench Paleoseismology (Co-chief Scientists: M. Strasser, ECORD-Austria and K. Ikehara, Japan) will be implemented offshore in April-June 2021 and be first IODP expedition since the start of the pandemic in early 2020. It aims at reconstructing the Late Pleistocene-Holocene history of giant earthquakes, which are major geological events with catastrophic societal consequences. This expedition will be jointly implemented by a strong collaboration between the ECORD Science Operator (ESO) and the Institute for Marine-Earth Exploration and Engineering (MarE3) within the Japan Agency for Marine-Earth Science and Technology (JAMSTEC). This direct collaboration between two IODP platform providers and the provision of in-kind contributions (IKC) by JAMSTEC (e.g., reduced day rate) may serve as a model for the implementation of future IODP expeditions, especially MSP expeditions. The offshore phase of this MSP expedition will be conducted on the JAMSTEC R/V *Kaimei*, while the Onshore Science Party will be held in Autumn 2021 on board *Chikyu* docked in Shimizu, as an alternative to the Bremen Core Repository (*see ESO News* »).



Scheduled for 2022

### IODP Expedition 377: Central Arctic Paleoceanography (ArcOP)

At its 2019 Autumn meeting, the ECORD Council followed the ECORD Facility Board (EFB) recommendations and approved the scheduling of IODP Expedition 377: Central Arctic Paleoceanography (ArcOP; Co-chief Scientists: R. Stein, ECORD-Germany and K. St. John, USA) in late summer 2021. However, following the assessment by ESO of the submitted commercial bids, it came to light that the estimated operational costs were significantly over budget and ECORD could not proceed with ArcOP in 2021. A close collaboration between ECORD and the Swedish Polar Research Secretariat (SPRS) over the last months identified an affordable implementation option for this expedition in August and September 2022 (*see ESO News* »). ECORD Council agreed at its meeting in late 2021 to implement this option and warmly thanked the SPRS for its commitment and its efficiency in working with ECORD to develop this option. Following actions from ESO and the ECORD Managing Agency (EMA), IKCs from the SPRS and the Federal Institute for Geosciences and Natural Resources (BGR) in Hannover, Germany, were secured. ArcOP, which has been considered by the EFB as a first-priority expedition for ECORD, aims at reconstructing the long-term Cenozoic climate history of the central Arctic Ocean at high resolution, with a special focus on the Neogene and the Pleistocene.

More info <https://www.ecord.org/expeditions/msp/2013-2023/>

## ECORD partnership: *JOIDES Resolution* and *Chikyu* expeditions

ECORD's participation to expeditions implemented by the *JOIDES Resolution* (JR) and *Chikyu* is based on MoUs with our partners.

The MoU linking ECORD and JAMSTEC involves the two partners for the whole duration of IODP. However, no *Chikyu* expedition is scheduled so far and the *Chikyu* IODP Board (CIB) has stated that no new *Chikyu* riser projects can be scheduled for the current phase of IODP.

The MoU between ECORD and the US National Science Foundation (NSF) for the second phase of IODP that has been signed in late 2019 brought several changes affecting ECORD's participation to JR expeditions. The number of ECORD scientists on each JR expedition has been lowered to seven and the Co-chief Scientists, as well as sailing education or outreach officers, are now counted towards quotas.

After implementing IODP Expedition 385: Guaymas Basin Tectonics and Biosphere from 16 September to 16 November 2019, the JR has implemented partly IODP Expedition 378: South Pacific Paleogene (initially scheduled in late 2018) from 3 January to 6 February 2020. Since the derrick could not support deployment of drill strings in excess of 2 km, only the first site of the expedition could be implemented (the redrill of DSDP Site 277). The other sites, like 'orphan' sites from previous expeditions (e.g., IODP Expedition 374: Ross Sea West Antarctic Ice Sheet History) will be kept at the *JOIDES Resolution* Facility Board (JRFB) for further consideration, but this will necessarily impact the JR expedition scheduling before the end of the current programme.

There have been some further dramatic developments regarding JR expedition scheduling after IODP Expedition 378, with the postponements of IODP Expedition 387: Amazon Continental Margin due to a dry dock period to undergo repairs of the vessel's thrusters and of IODP Expedition 388: Equatorial Atlantic Gateway and IODP Expedition 394: Rio Grande Cone Methane and Carbon Cycling due to a lack of permission to drill in Brazilian waters. IODP Expedition 395: Reykjanes Mantle Convection and Climate that was scheduled from 26 June to 26 August 2020 has been eventually postponed due to the global health situation. This expedition has been now been rescheduled from 6 June to 6 August 2021 and, together with IODP Expedition 396: Mid-Norwegian Continental Margin Magmatism (6 August - 6 October 2021), should precede the implementation of four expeditions in the Southern Atlantic from December 2021 to August 2022 ([see map and table on page 7](#) »).

At its last meeting, the JRFB has considered that the number of proposals with the JRFB and at the SEP that would use the *JOIDES Resolution* are more than sufficient to schedule through the end of 2024.

As a consequence, the **JRFB has decided to no longer request any new proposals/pre-proposals that would address the current Science Plan**, with the exception of proposals reviewed by the SEP in 2020 that were deactivated, but encouraged to re-apply ([see Letter from the JRFB Chair](#) »).

The JRFB will consider soon the scheduling of JR expeditions in the Northern Atlantic and neighboring seas in 2022 and beyond.



Sediment sampling by tip-cut syringe onboard *R/V Kaimoi*, Exp. 386, April 2021. Credits: ECORD/IODP/JAMSTEC

## ECORD beyond 2023

ECORD is actively involved in the planning of an international ocean drilling programme to be developed beyond 2023.

Scientific Ocean Drilling will soon enter a transitional phase from the 2013-2023 Science Plan to the [2050 Science Framework](#), which represents a new and innovative approach for conducting science using offshore drilling platforms.

**The 2050 Science Framework** (<https://www.iodp.org/2050-science-framework>), will be the foundation of a future programme.

The second development stage of a post-2023 programme will require that current and new platform providers confirm participation and work on a sustainable implementation model. The challenges are huge, as the post-2023 programme will be more expensive and different scenarios need to be worked out. There are still uncertainties regarding the availability of platforms to conduct scientific drilling related to the 2050 Science Framework.

**The finalization of a business framework for the new programme should be completed in a year from now at most.**

Like the other IODP members, ECORD has started to discuss its intentions for a post-2023 programme both internally and with its partners through bi-lateral meetings. They are based on the legacy of its achievements, success and innovations, and to its commitments to the 'philosophy' and 'legacy' of the successive scientific ocean drilling programmes.

Since a **prominent role for MSPs** is anticipated to achieve the goals of the 2050 Science Framework, various initiatives have been taken to support development of MSP proposals, either as stand-alone projects or as part of land-to-sea transects that integrate marine and continental coring in collaboration with the International Continental Scientific Drilling Program (ICDP).

Following a dedicated workshop organized by UK-IODP on 9-11 February 2021 (*see box on page 22 »*), ECORD has initiated a specific call for workshop proposals in the frame of the MagellanPlus Workshop Series Programme (<https://www.ecord.org/science/magellanplus/>). This call aims at generating MSP drilling proposals with scientific themes aligned with the Strategic Objectives defined in the 2050 Science Framework (*read more on page 10 »*).

ECORD intends to play a prominent role in a post-2023 programme.

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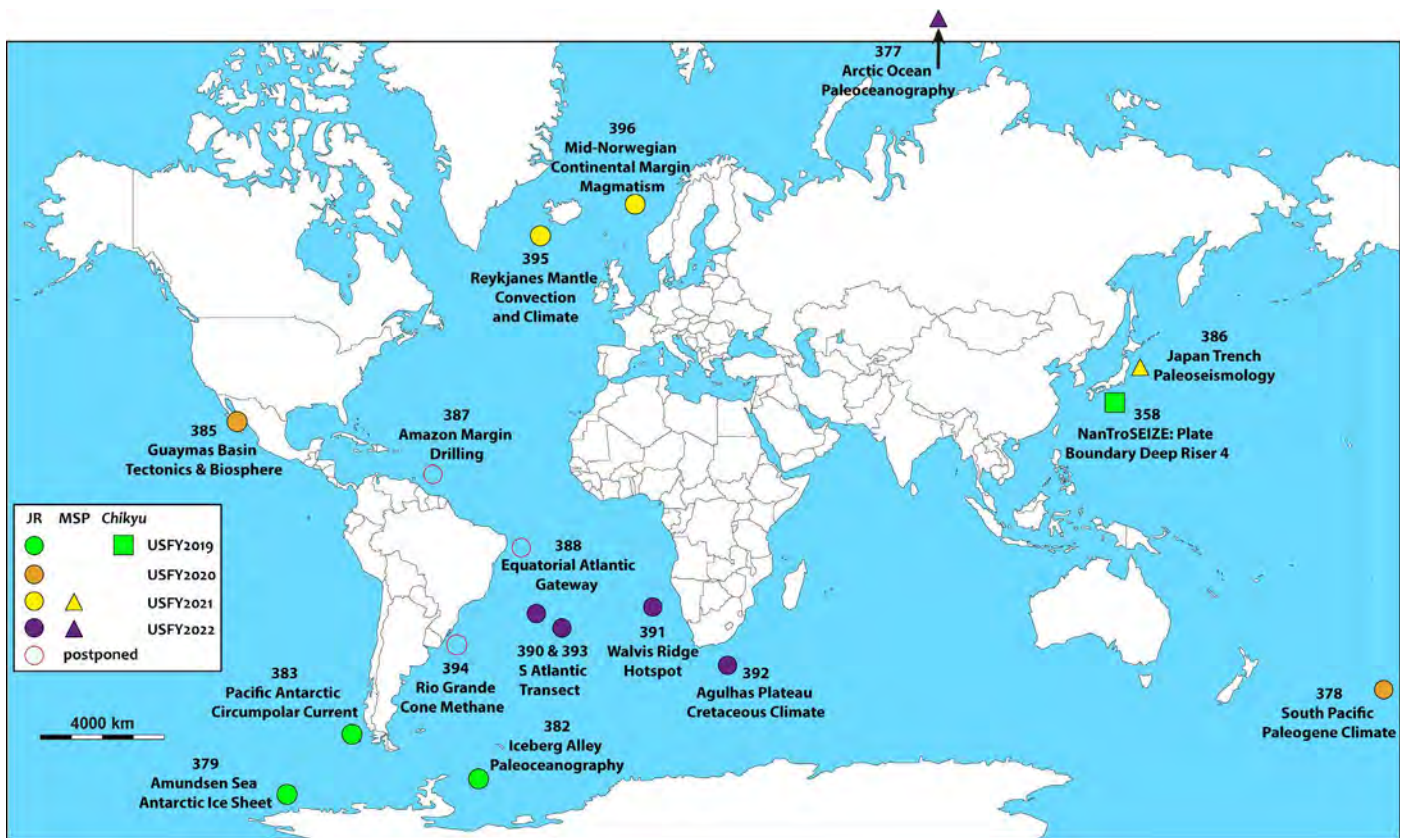
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View from onboard R/V Kaimei during IODP Expedition 386.  
Credit: N. Okutsu, ECORD/IODP/JAMSTEC

## IODP Expeditions 2021-2022



Expedition Name	#	Dates	Ports	Operator
<b>Japan Trench Paleoseismology</b>	<b>386</b>	<b>Apr 13-Jun 1, 2021</b>	<b>Yokosuka / Yokosuka</b>	<b>ESO</b>
Reykjanes Mantle Convection and Climate	395	June 6-Aug 6, 2021	Reykjavik / Reykjavik	JRSO
Mid-Norwegian Continental Margin Magmatism	396	Aug 6-Oct 6, 2021	Reykjavik/Kristiansand	JRSO
Walvis Ridge Hotspot	391	Dec 6, 2021-Feb 5, 2022	Cape Town / Cape Town	JRSO
Agulhas Plateau Cretaceous Climate	392	Feb 5-Apr 7, 2022	Cape Town / Cape Town	JRSO
South Atlantic Transect #1	390	Apr 7-Jun 7, 2022	Cape Town / Montevideo	JRSO
South Atlantic Transect #2	393	Jun 7-Aug 7, 2022	Montevideo / Montevideo	JRSO
<b>Arctic Ocean Paleooceanography</b>	<b>377</b>	<b>Aug-Sep 2022</b>	<b>TBD</b>	<b>ESO</b>
Amazon Continental Margin	387	postponed	TBD	JRSO
Equatorial Atlantic Gateway	388	postponed	TBD	JRSO
Rio Grande Cone Methane and Carbon Cycling	394	postponed	TBD	JRSO

## ECORD Awards in recognition of outstanding contribution to ECORD



**05 October 2019**

### **Werner E. Piller**

received the **4<sup>th</sup> ECORD Award**

on the occasion of the Werner E. Piller Festive Colloquium

I was convinced that Ocean Drilling is an eminent part of Natural Sciences and to get involved I attended the APLACON Conference 2001 in Lisbon when the reorganization and internationalization of ODP into the Integrated Ocean Drilling Program (IODP) was discussed. For the draft paper of this conference I was a member of the writing team on shallow water carbonates.

I worked hard to get Austria involved in ocean drilling and in 2004 I succeeded when Austria became a member of ECORD.

From 2004 to 2019 I acted continuously as Austrian ESSAC Delegate.

From 2015 to 2019 I was an ECORD representative in the IODP Science Evaluation Panel (SEP) and was selected as ESSAC liaison within SEP and reported to ESSAC and ECORD.

I was involved in establishing the ESF Magellan Research Networking Programme (2006 – 2010) and became a member of the steering committee of the ECORD MagellanPlus Workshop Series Programme since 2013.

For the upcoming period I think that ECORD will play an even more important role in scientific ocean drilling and hope that it can expand its Mission Specific Platform projects.

While co-organizing the PROCEED workshop in Vienna in April 2019, I was able to listen to enthusiastic and highly dedicated, mostly young, scientists. Their innovative ideas and strong personalities clearly testified that scientific drilling will successfully be continued. After the new 2050 Science Framework has been finished and distributed this very positive feeling was even more augmented and I am convinced that the new programme will provide fundamental insight into system Earth from a very broad perspective.

*In between these two milestones, a completely unexpected incident happened on 5<sup>th</sup> October, 2019: during a festive colloquium organized by the University of Graz and the Institute of Earth Sciences on the occasion my new status of Professor emeritus I received a video message by Gilbert Camoin that I have been awarded with the 4<sup>th</sup> ECORD Award. This was, of course, a great personal honor for what I am deeply grateful. But it also reminded me how much I gained scientifically but just as well I benefitted personally from my dear colleagues in the various IODP/ECORD panels I was allowed to be involved. This was a major incision in my career and I will follow the new development in scientific drilling and will stay involved in several projects for the next years.*



## ECORD Awards in recognition of outstanding contribution to ECORD



**01 October 2020**

### **Dave Smith**

received the **5<sup>th</sup> ECORD Award**

on the occasion of the ECORD Council-ESSAC Meeting #8

I was appointed Head of BGS Marine Operations and IODP ESO Operations Manager in 2007. My 39 year career spans operations

worldwide in addition to developing innovative engineering developments for industry and academia including being part of all ESO MSP Expeditions to date (except ACEX).

IODP expeditions encompass the symbiotic relationship between science that constantly pushes the boundaries of what is possible, and engineering, often creating developments to meet these demands. The unique diversity of MSPs (no MSP is the same) is exciting and challenging. As an engineer, I am proud to continue the IODP legacy for the development of techniques and equipment to meet these demands.

Delivering MSPs, working from concept to implementation is hugely satisfying. Completing an MSP successfully and

in budget, is always the goal. Being part of a dedicated multinational ESO Operations Team, working together to grow, develop and deliver MSPs under pressure with all the fun, laughter and tears that comes with expeditions, is something I am immensely proud and will always remember.

Going forward, innovation in all aspects of ECORD/MSPs are required to continue the huge success of MSPs, whilst facing the twin challenges of reduced funding and increasing operational costs.

*It is a great pleasure to be a recipient of the 'ECORD Award' and recognised for my contribution to IODP, MSPs and delivering frontier science. However, MSP success is not down to one individual but is a Team effort in every sense and thus I must acknowledge this award to all who contribute to these successes, the ESO Team, EMA, ECORD and the wider scientific community.*



**29 October 2020**

### **Roz Coggon**

received the **6<sup>th</sup> ECORD Award**

on the occasion of the ECORD Council Meeting #9

Rosalind Coggon is a Royal Society University Research Fellow in the School of Ocean and Earth Science at the University

of Southampton. Her research focuses on the role of fluids in the formation and evolution of the ocean crust, with a particular emphasis on quantifying the thermally driven chemical exchanges between the aging ocean crust and the overlying oceans and the consequences of hydrothermal fluid-rock interaction for the properties of ocean crust and sea water over time. Dr Coggon is Co-Lead Editor of the recently published 2050 Science Framework: Exploring Earth by Scientific Ocean Drilling, which will guide future scientific ocean drilling beyond 2023.

Read about Roz Coggon in the [UK IODP Newsletter 2020 Issue 7](#) »

*Ever since joining my first drilling expedition (Leg 206) as a PhD student, I have found being a member of the scientific ocean drilling community extremely rewarding – providing opportunities to not only expand the scope of my scientific research, but also receive mentoring from and collaborate with many international colleagues. The fact that IODP encourages ECRs to take a leading role in all aspects of the programme – from leading research groups on the ship, to writing drilling proposals, and convening workshops and meetings – is another great strength of the programme. Over the last 2 years I really enjoyed the opportunity to work with Anthony Koppers and a large group of ocean drilling scientist to develop the 2050 Framework and help shape the future of scientific ocean drilling. I am thrilled to receive an ECORD award in recognition of this effort. Working with experts in different fields I gained a new appreciation for the importance of all that scientific ocean drilling has contributed and will continue to contribute, beyond my own research field. I look forward to the ambitious ideas in the Framework coming to fruition over the next three decades!*



# 2050 Science Framework

## Exploring Earth by Scientific Ocean Drilling – The 2050 Science Framework



Roz Coggon



Antony Morris

Over the last 50 years scientific ocean drilling has fundamentally transformed our understanding of Earth. It provided proof for plate tectonic theory, key observations on the formation and subduction of the great tectonic plates, developed the science of paleoceanography-climatology, and probed the limits and origins of life.

2020 saw the beginning of a new era of scientific ocean drilling with the publication of the community-inspired and driven *Exploring the Earth by Scientific Ocean Drilling: 2050 Science Framework*.

**2050 Science Framework** will guide scientific ocean drilling over the next 30 years with the overarching goal of understanding the interconnected processes that characterize the complex Earth system and shape our planet's future.

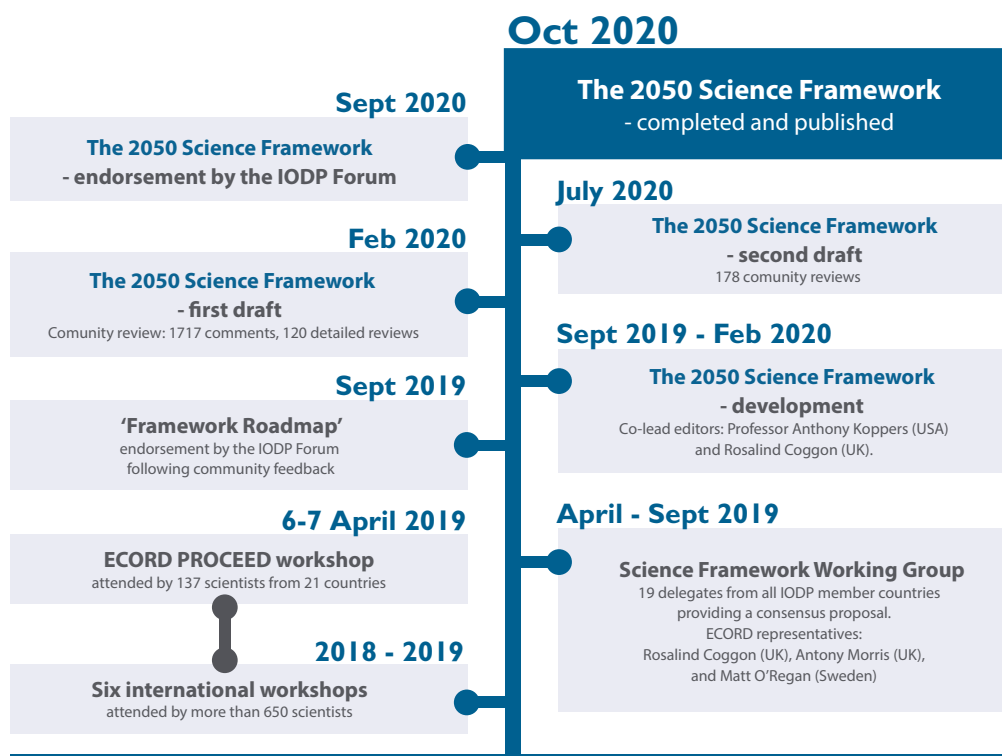


The 2050 Science Framework builds on the many successes from 50 years of scientific ocean drilling – but represents a radical departure from previous 10-year science plans that have previously guided scientific ocean drilling, with its focus on multidisciplinary research and its longer timeframe that enables multi-decadal planning for complex projects. It captures the

exciting research frontiers that future scientific ocean drilling should pursue in seven Strategic Objectives that focus on understanding the interconnections within the Earth system and five Flagship Initiatives that integrate these objectives into long-term drilling endeavors that address key issues facing society.

[Download 2050 Science Framework »](#)

### Planning, writing and final publication



### Key facts about the development of the 2050 Science Framework

The publication of the 2050 Science Framework marks the culmination of an intense planning and writing effort by the international scientific drilling community. The development of the 2050 Science Framework began with six international workshops in 2018-2019 attended by more than 650 scientists, including the ECORD PROCEED workshop held in Vienna, Austria (6-7 April 2019) that was attended by 137 scientists from 21 countries. A Science Framework Working Group, comprising 19 delegates representing all IODP member countries and consortia were tasked with providing a consensus proposal for a new science framework in support of future Scientific Ocean Drilling Beyond 2023, based on the outcomes of these six planning

workshops. ECORD was represented in this group by Rosalind Coggon (UK), Antony Morris (UK), and Matt O'Regan (Sweden). The resultant 'Framework Roadmap' was endorsed by the IODP Forum in September 2019, following community feedback. The 2050 Science Framework was subsequently developed by an international team of researchers headed by co-lead editors Anthony Koppers (USA) and Rosalind Coggon. The writing process included circulation of two drafts online for community review in February and July 2020.

The first draft received a phenomenal 1717 comments in an accompanying online survey as well as 120 detailed reviews, with a further 178 community reviews of the second draft. Following endorsement by the IODP Forum in September 2020, the full Framework was published online at [iodp.org](http://iodp.org) in October 2020, along with two shorter versions – a 12-page summary and a 2-page pamphlet for more general audiences.

**2050 Science Framework: to inspire and support strong cross-discipline collaboration**

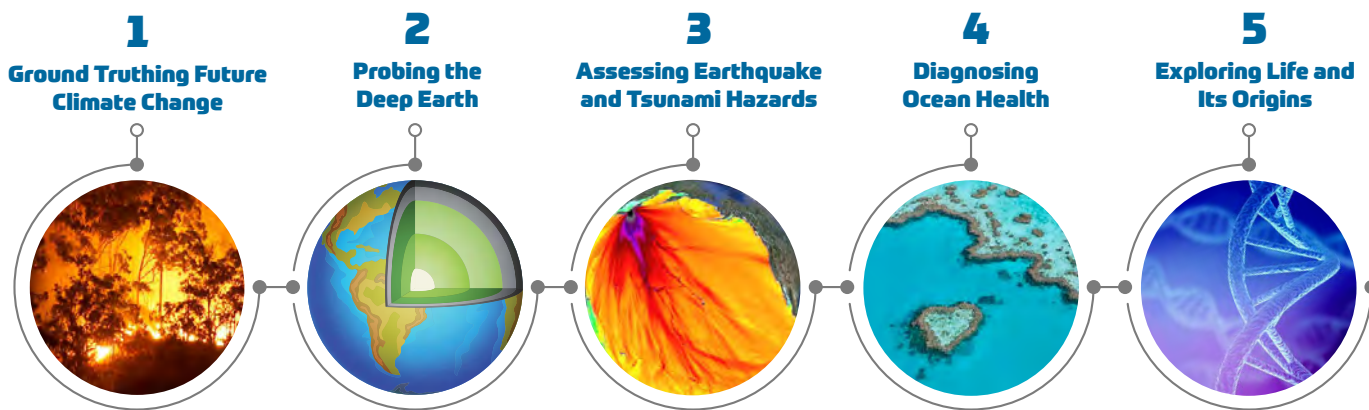
The 2050 Science Framework has been designed to inspire and support strong cross-discipline collaboration and promote dissemination of results to a broad audience. The seven 'Strategic Objectives' - broad, multi-disciplinary areas of scientific inquiry that cut across the traditional themes of previous scientific ocean drilling efforts - are open-ended to encourage innovation and evolution of scientific ideas.

The five 'Flagship Initiatives' combine goals from multiple Strategic Objectives in long-term research efforts that will require the community to develop strategies and technologies to implement multiple coordinated expeditions, taking advantage of the 25-year timeframe of the 2050 Science Framework.

The Strategic Objectives and Flagship Initiatives are supported by four Enabling Elements – key facets of scientific ocean drilling that facilitate our research activities, enhance our scientific outputs, and maximize their impact. These elements include strengthened collaborations with allied programs such as continental drilling programs and space agencies, effective strategies to communicate results to the public, and the generation of new opportunities through novel technology and data approaches. Because the Science Framework covers a longer term than its predecessors, it will be a living online document to encourage and enable the evolution of research objectives. All expeditions will continue to come from bottom-up, proposal driven science.



**FLAGSHIP INITIATIVES**



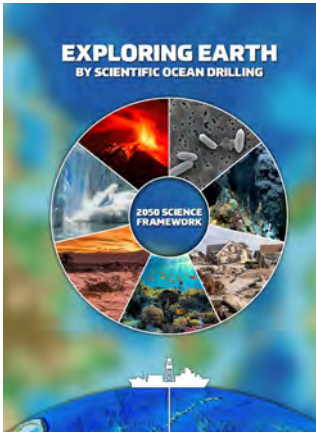
**2050 Science Framework**



<https://iodp.org/2050-science-framework>

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<b>Julie Prytulak</b>	<b>UK</b>	<b>Durham University</b>
Beth Orcutt	USA	Bigelow Laboratory for Ocean Sciences
Liz Screaton	USA	University of Florida
Kristen St. John	USA	James Madison University
Zhen Sun South	China	China Sea Institute of Oceanology
Yohey Suzuki	Japan	University of Tokyo
Jun Tian	China	Tongji University
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Scientific Drilling Program (ICDP),  
Stockholm University, Sweden

*The editors are very grateful to the community for engaging enthusiastically with the writing and reviewing of the 2050 Science Framework, much of which happened 'remotely' under the restrictions of the coronavirus pandemic, despite the extra workload and challenges they faced as a result of the pandemic. The outcome of this extensive peer review process and the high level of community input and involvement is an exciting new outlook for three decades of future scientific ocean drilling.*

## 2050 Science Framework



<https://iodp.org/2050-science-framework>

### Mission

The 2050 Science Framework for Scientific Ocean Drilling guides multidisciplinary subseafloor research into the interconnected processes that characterize the complex Earth system and shape our planet's future.

### Vision

To be globally recognized as the authoritative source of information about ocean and Earth system history and its links to society.

## Letter from the IODP Forum Chair

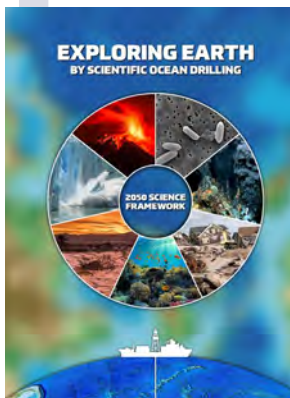


Dick Kroon

The International Ocean Discovery Program (IODP), like many programs, has spent the past year adjusting to the ramifications of the global pandemic with schedule and meeting adjustments.



IODP and the International Continental Scientific Drilling Program (ICDP) also recently revised the submission procedures for Land-2-Sea Proposals, which replaces Amphibious Drilling Proposals. **Land-2-Sea Proposals** would be implemented by both programs and must require scientific drilling at both onshore and offshore sites to accomplish their scientific goals. Land-2-Sea proposals are specifically mentioned in the 2050 Science Framework as a separate bullet under the enabling elements of the 2050 Science Framework. I expect ECORD to play a prominent role in making Land-2-Sea Proposals successful in the future program. ECORD is uniquely positioned to do so as it has built considerable experience of drilling in shallow waters, often unexplored areas, along the continental margins.



Planning for a post-2023 scientific ocean drilling program, however, continues in full force with the **release of the 2050 Science Framework** (<https://iodp.org/2050-science-framework/>) this past October. Prepared by the international community, the document focuses on the many ways in which scientific ocean drilling will increase our understanding of the fundamental connections among Earth system components. Thank you to Rosalind

Coggon for co-leading this important undertaking and to all the ECORD scientists who contributed their valuable time writing and providing input to the document.

The ECORD community can continue participating in planning for a post-2023 scientific ocean drilling program by submitting responses to the open request for information (RFI), which asks about where you would like to propose drilling expeditions in a future program. I highly encourage you to submit an RFI response today by filling out the simple form in the IODP Proposal Database System. **We need your input and participation to secure a future program.**

Read more about proposal types, the current call for proposals, and the open RFI at: <https://iodp.org/proposals/call-for-proposals>.

I am confident that ECORD is uniquely positioned through its MSP program to make strong scientific contributions to the remainder of the current and post-2023 scientific ocean drilling programs.

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**Dick Kroon** - [dick.kroon@ed.ac.uk](mailto:dick.kroon@ed.ac.uk)  
IODP FORUM Chair  
Regius Professor of Geology  
University of Edinburgh, UK



I would like to highlight ECORD's efforts in organizing a series of workshops focused on **MSP drilling proposals** (<https://www.ecord.org/science/magellanplus/>). The workshops are key to prepare for excellent drilling proposals addressing strategic and flagship proposals post-2023. It shows that ECORD aims to contribute to important goals of the 2050 Science Framework through a mission-specific platforms (MSP) program post-2023.





Gabriele Uenzelmann-Neben

## ECORD Facility Board News



At the end of 2020 EFB member Gilles Lericolais (F) rotated off the board after a period of serving the board as a member, as the chair and then as the vice-chair. The EFB thanks him for his valuable services and commitments during his EFB term. The new member, who has joined the EFB, is Michele Rebesco (I), and the EFB welcomes him warmly to the board.



As the result of an excellent and intense collaboration, ESO and the Swedish partners with the help of the CNRS signed the contracts to implement **Expedition 377: Arctic Ocean Paleooceanography (ArcOP)** in Summer 2022. The preparations for the expedition are about to begin ([read more on page 18 »](#)).

**Expedition 386: Japan Trench Paleoseismology**, initially to take place in April-June 2020, had to be postponed as a result of the COVID-19 pandemic. Preparations are now proceeding well via a close collaboration of ESO with MarE3/JAMSTEC to carry out the expedition in April-June 2021. However, here the pandemic also puts down its mark in reducing the number of participants on-board. The remaining participants will work extra hard to complete all tasks needed to ensure a success of the expedition ([read more on page 17 »](#)).

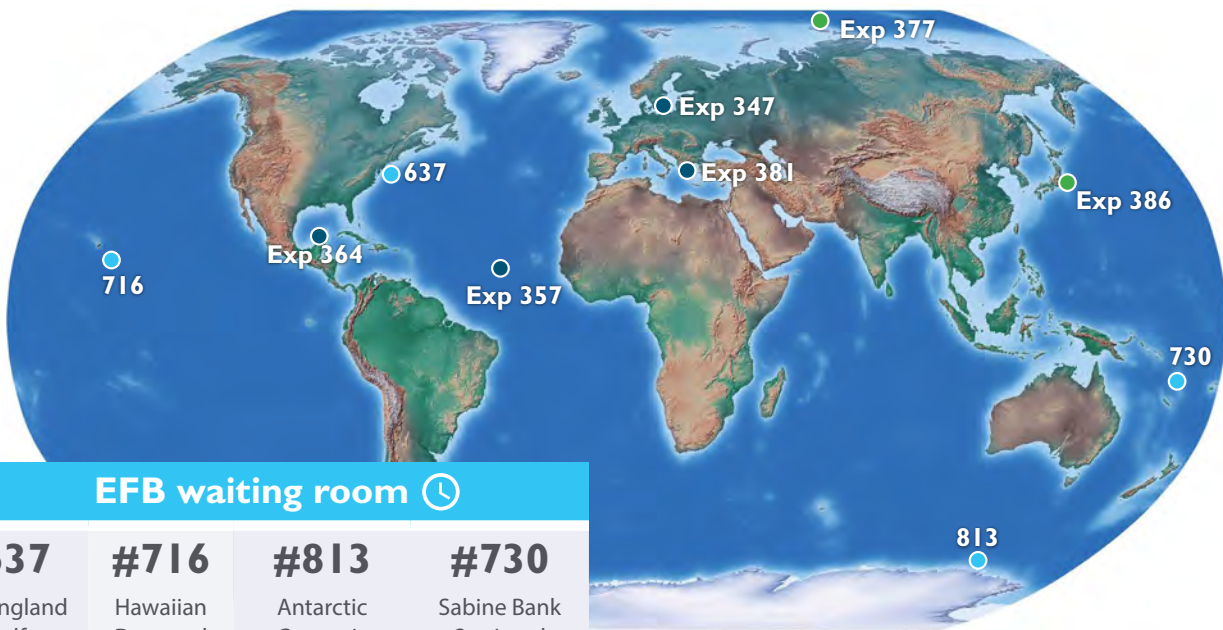


The flow of newly submitted MSP proposals is still very low. The discussion of how to increase the rate of MPS proposals is ongoing. Furthermore, the discussion on how to reposition ECORD and the MSP concept within the new Scientific Framework has commenced.

Gabriele Uenzelmann-Neben  
[gabriele.uenzelmann-neben@awi.de](mailto:gabriele.uenzelmann-neben@awi.de)  
 Chair of the ECORD Facility Board

## MSP 2020-2022 operational plan

2013 - 2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>347</b> Baltic Sea Paleoenvironment	<b>357</b> Atlantis Massif Serpentinization and Life	<b>364</b> Chicxulub K-Pg Impact Crater	<b>381</b> Corinth Active Rift Development	No expedition	ECORD renewal	No expedition	<b>386</b> Japan Trench Paleoseismology	<b>377</b> Arctic Ocean Paleooceanography
Drillship <i>Greatship Maya</i>	RRS <i>James Cook</i> & Seabed drills ( <i>MeBo</i> & <i>RD2</i> )	Liftboat <i>Myrtle</i>	Drillship <i>Fugro Synergy</i>				<i>Kaimei</i> & <i>Chikyu</i>	<i>Dina Polaris Oden</i> & <i>Victor Chernomyrdin</i>



### EFB waiting room ⌚

<b>#637</b> New England Shelf Hydrogeology	<b>#716</b> Hawaiian Drowned Reefs	<b>#813</b> Antarctic Cenozoic Paleoclimate	<b>#730</b> Sabine Bank Sea Level
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● Completed MSP expeditions    ● Scheduled MSP expeditions  
 ● MSP proposals in the EFB waiting room



David McInroy



Sarah Davies



Ursula Röhl



Jez Everest

In the previous ECORD Newsletter (#33 Nov 2019), we reported on the latest planning for Expedition 386: Japan Trench Paleoseismology and Expedition 377: Arctic Ocean Paleoceanography.

Joint planning for Expedition 386: Japan Trench Paleoseismology has progressed well with MarE3, and ESO staff participated in a JAMSTEC giant piston coring trial cruise on board the R/V *Kaimei* in the Japan Trench in February 2020. A 40 m GPC was successfully taken for the first time using the *Kaimei* systems. ESO staff were able to observe the coring, core handling procedures, review H&S arrangements, and review the procedures for moving cores around the deck and lab areas.

Our scoping and feasibility studies for Expedition 377: Arctic Ocean Paleoceanography were concluding in parallel, and we initiated steps to procure the vessels, drilling and ice management services.

In March 2020, the COVID-19 outbreak accelerated in Europe, resulting in national lockdown measures affecting all ESO partner institutes. Our staff were able to mostly work from home, a

situation that persisted for the rest of 2020 and has continued into early 2021. We were able to continue our management and future expedition planning work while away from our offices, however implementation of an expedition was impossible under the conditions and restrictions imposed by the global pandemic in April 2020. We were forced to postpone Expedition 386: Japan Trench Paleoseismology, however, regular planning meetings continued and the expedition has been re-scheduled for 2021 (*see next page* »).

Fortunately, we were able to continue with our preparations for Expedition 377: Arctic Ocean Paleoceanography (*see page 18* »).



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ESO Science Manager

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ESO Curation and Laboratory Manager

Jez Everest - [djsm@hgs.ac.uk](mailto:djsm@hgs.ac.uk)  
ESO Operations Manager

## General ESO News

■ **Participation at the ESO General Workshop (virtual)**, 17 – 18 March 2020. This is the annual ESO workshop for all ESO staff from all partner institutions where we discuss past and future expeditions, and how we might change and improve our systems and approaches. The workshop was held virtually due to COVID-19 travel restrictions.

■ **Preparations for the ECORD Summer School: Downhole logging for IODP Science**, 4 – 10 July 2020. Over 50 applications from 22 countries (by institution) and 24 nationalities were received and for the first time researchers from Brazil, Canada and the ANZIC countries applied to attend. In March 2020, ESO-EPC staff took the decision to cancel the summer school due to the ongoing COVID-19 situation. The successful applicants were informed of the situation, and will be offered a place when the event is held again.

■ **Preparations for ECORD Summer Schools hosted by MARUM/IODP BCR**. Due to the ongoing COVID-19 situation, ESO-MARUM staff took the decision in March 2020 to cancel the ECORD Training Course 2020, 20 – 24 April 2020 (70 applications from 14 countries were received). Similarly, in April the ECORD Summer School on “Sea level, climate variability, and coral reefs”, originally planned for September 2020 was also cancelled. The successful applicants for the ECORD Training Course were informed of the situation, and were offered a place when this course will be held again. However, it has become clear that it is also not practicable to aim for a physical meeting in the spring and summer of 2021. This is due the nature of the “virtual ship experience”, where there are advantages and peculiarities of the hands-on exercises, personal interactions between course colleagues and lecturers, and plenty of time for discussions at the course site. This approach has proven to be very successful

previously, and we determined that virtual courses or schools would not be feasible or effective. Similarly, we decided in February 2021 to postpone the ECORD Summer School 2021 on “Sea level, climate variability, and coral reefs” to 2022.

■ **Refurbishment of ESO Containerised Laboratories**. We have replaced or upgraded our suite of containerised laboratories to meet new standards and regulations provided by the American Bureau of Shipping and enforced by the US Coast Guard. The changes improve safety, reliability, science operation and comfort. Throughout 2020 we liaised with suppliers on container specifications, interiors and connections. All the containers have now been delivered to ESO partner institutes ready for the next expedition.

■ **Participation at the UK IODP MSP Proposal Workshop**, 9 – 11 February 2021. Staff from the ESO partners gave presentations at, and took part in, a UK IODP online workshop held from 9 to 11 February, to help scientists to develop IODP MSP proposals. The presentations covering all aspects of the operations can be viewed at <https://www.ukiodp.org/msp-proposal-workshop-2021>, and provide a wealth of useful information for those researchers considering a mission specific expedition.

■ **ESO staff changes – Retirement of Dave Smith**. (*see pages 3 and 9* »)

■ **ESO staff changes – Departure of Carol Cotterill**. (*see page 3* »)

■ **ESO staff changes – Relocation of Erwan Le Ber**. (*see page 3* »)





This expedition is using Giant Piston Coring (GPC) to test and develop submarine paleoseismology in the Japan Trench at multiple locations. Eighteen primary sites in water depths between 7250 and 8030 m are proposed for Giant Piston Coring to 40 mbsf.

Planning for the expedition was paused in early 2020 as the COVID-19 pandemic closed international borders, altered schedules, and caused misery for thousands around the globe. The decision was made on the 18 March to postpone the expedition for a year in the hope that the pandemic situation might have improved by the spring of 2021.

This decision was anticipated to impact on the Science Party and unfortunately two members confirmed they would not be able to attend in 2021 due to other commitments. A new call was issued in October and three new members were invited to join the expedition on the 25 November.

The ESO Management team, in discussion with colleagues from MarE3 in Japan, kept developments in the pandemic under scrutiny throughout 2020. On 3 December, ESO informed the Science Party that a decision to sail, or not, would be made on 15 February 2021. The timing of this decision would leave enough time for full preparations to be made, should the expedition continue as planned.

Co-chief Scientists:	<b>Michael Strasser</b> <b>Ken Ikehara</b>
Offshore dates:	<b>13 April - 1 June 2021</b> on board <i>R/V Kaimei</i> from/to Yokosuka
Onshore Science Party dates:	<b>14 October - 13 November, 2021</b> on board <i>D/V Chikyu</i> docked in Shimizu

The first two months of 2021 saw continued high numbers of coronavirus cases around the world and most borders remained closed to international travellers. The ESO team and most of the science party also faced travel restrictions from their home institutions. The future for Expedition 386 was looking bleak until ESO and MarE3 produced a new plan. In this plan, the offshore phase on *R/V Kaimei* will be carried out by operator staff and Science Party members already based in Japan with onshore support from ESO before and during the cruise. Full international Science Party and operator attendance is planned for the Onshore Science Party onboard *D/V Chikyu* still scheduled for autumn 2021.

Since the decision to proceed in February, planning for this new option has continued apace. Currently the *R/V Kaimei* is due to sail from Yokosuka on 13 April 2021, to return on 1 June. Depending on the global COVID-19 situation, it is hoped that the Onshore Science Party will run from October to November 2021 and be located aboard the *D/V Chikyu* docked in Shimizu.



Expedition 386 - Scientific Prospectus:

[http://publications.iodp.org/scientific\\_prospectus/386/](http://publications.iodp.org/scientific_prospectus/386/)

Expedition 386 webpage: <https://www.ecord.org/expedition386/>

## IODP Expedition 386 two new depth records in Scientific Ocean Research

- the deepest water site ever drilled at the water depth of **8023 m**
- the deepest sub-sea level sample at **8060.74 mbsl** (meters below sea level)



Operations on *R/V Kaimei* on 14 June 2021 when the depth records were broken during the IODP Expedition 386. Credit: T. Kanamatsu, ECORD/IODP/JAMSTEC

## Expedition 377: Arctic Ocean Paleoceanography (ArcOP)



The overall goal of this expedition is to recover of a complete stratigraphic sedimentary record on the southern Lomonosov Ridge to study the continuous, long-term Cenozoic climate history of the central Arctic Ocean. Higher-resolution studies of Arctic climate change in the Pleistocene and Neogene will be possible because the chosen location experienced sedimentation rates two to four times higher than successions sampled at *Expedition 302 (ACEX)* sites.

We presented our latest scoping for this expedition to the ECORD Council at its meeting in November 2019 and the decision was taken to implement the expedition in late summer 2021. On 11 December 2019, ESO issued a revised Prior Information Notice (PIN) on the Electronic Daily of the OJEU, followed by a full Call for Tenders which was published in February 2020. After the Call for Tenders closed in May 2020, ESO assessed the commercial bids for major expedition services. The proposed technical solutions were excellent, however the proposed costs were significantly over the maximum budget approved by ECORD Council.

In June 2020, the ECORD Council and Facility Board agreed to remove Expedition 377 from the MSP expedition schedule. However, ECORD, ESO and the Swedish Polar Research Secretariat (SPRS) then explored alternative technical approaches that might allow the expedition to be implemented in 2022 or 2023.

Expedition 377 webpage: <https://www.ecord.org/expedition377/>



Co-chief Scientists:	<b>Ruediger Stein</b> <b>Kristen St. John</b>
Offshore dates:	<b>Aug - Sep 2022</b> on board <i>Dina Polaris</i> , ports to be confirmed
Onshore Science Party dates:	to be confirmed
All dates are provisional	

In the final quarter of 2020, a series of meetings and discussions between ECORD, ESO, SPRS and potential suppliers of ice management, vessel and drilling services culminated in an offer from SPRS to ECORD to provide vessel and ice management services for the expedition. At the December 2020 ECORD Council meeting, ESO provided a fresh review and risk assessment of the new technical offer for the expedition fleet. The decision was taken to proceed with the expedition in Aug-Sep 2022. We are now moving forward with detailed planning with the expedition partners and Co-chief Scientists, and a new Call for Scientists has been issued in March 2021 (<https://www.ecord.org/open-calls-for-scientists-iodp-expedition-377/>).

The drillship *Dina Polaris* will be used during Exp. 377: ArcOP in 2022.  
Credit: Geoquip



*Dina Polaris.* Credit: Geoquip



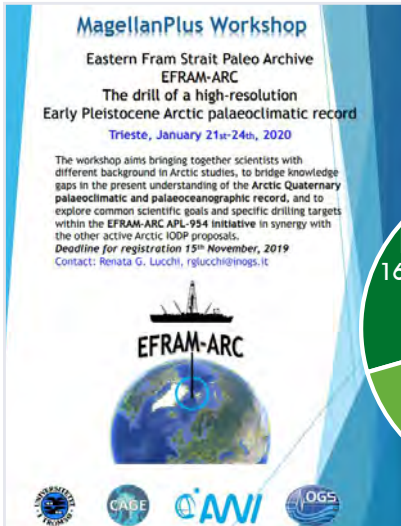


Nadine Hallmann

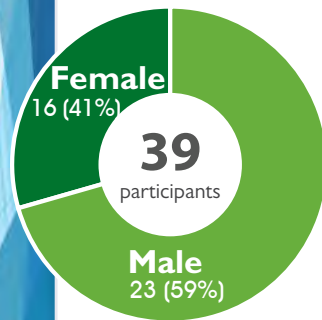


Lucas Lourens

## MagellanPlus: **EFRAM-ARC Workshop** (21-24 January 2020, Trieste, Italy)



### Eastern Fram Strait Paleo Archive: The drill of a high-resolution Early Pleistocene Arctic palaeoclimatic record



The workshop brought together scientists with different background in Arctic studies, to bridge knowledge gaps in the present understanding of the Arctic Quaternary palaeoclimatic and palaeoceanographic record, and to explore common scientific goals and specific drilling targets within the EFRAM-ARC APL-954 initiative in synergy with the other active Arctic IODP proposals.

EFRAM-ARC MagellanPlus workshop was initially designed to implement and strengthen the synergies of APL-954 EFRAM-ARC, submitted on 1 April 2019, with other IODP Full proposal submitted to study the Arctic around the Fram Strait. In particular, APL-954 was complementary and synergic with:

- Full proposal 934: Arctic Atlantic Gateway Climate (AAG-DRILL), focused on the timing of the opening of the Fram Strait having drill sited located on the western side of the Fram Strait. The results from the two proposals can be combined for a better comprehension of the mechanisms regulating the northern component of the global thermohaline circulation and the onset of glaciations.
- Full-proposal 915: Fjord sediment archives: assessing the recent (post LGM) millennial to sub-decadal scale variability of marine and continental climates in the northeastern North Atlantic (FANA), focused on the reconstruction of the recent depositional history recorded in the fjord sequences. The two proposals could collaborate to generate a comprehensive climate-related depositional model of high latitudes with major climatic changes recorded on the slope, (EFRAM-ARC proposal) and a very-high resolution record of last glacial termination and present interglacial recorded in the fjord sequences (FANA proposal).

■ Full-proposal 935: Pleistocene evolution of Arctic gas hydrates and fluid flow systems (PATH), for which EFRAM-ARC drill site can provide a stratigraphic framework for core-to-core correlation through the seismic record.

■ Full Proposal 708: Central Arctic Paleooceanography (ArcOP), for which EFRAM-ARC drill site can represent a foothold, through the seismic record, to link stratigraphic units from the Central Arctic to a standard isotope/magnetic stratigraphic record.

Following SEP recommendations (July 2019), EFRAM-ARC MagellanPlus workshop was converted in a planification meeting to discuss common, synergic objectives of the former Arctic proposals in order to develop a systematic strategy to combine research targets and related drill sites in a coherently integrated proposal. For this reason, the workshop hosted the PIs of the above IODP proposals as well as the PIs of other Arctic or sub-Arctic proposals (i.e. Full 909-CENICE, and Full 962) that participated remotely to the discussion in order to explore possible synergies for a future overall comprehension of the pan-Arctic system.

The workshop successfully identified two main synergic research lines that will be developed as Full proposals to be submitted by 1 April 2020.

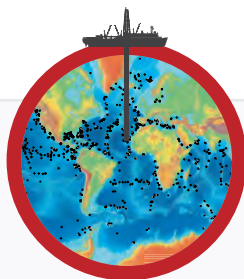
EFRAM-ARC MagellanPlus workshop hosted 39 scientists (three remotely connected) proceeding from nine Nations (including USA and Korea), that represented 21 Research Institutes and Universities, covering a wide range of expertise. The workshop working group particularly benefitted by the presence of a consistent group of early-career scientists that actively participated to the scientific discussion and the definition of the new proposals working hypothesis and objectives.



#### EFRAM-ARC conveners:

- Renata G. Lucchi (OGS; CAGE-UiT)
- Michele Rebesco (OGS)
- Riccardo Geletti (OGS)
- Jan S. Laberg (UiT)
- Jens Gruetzner (AWI)





## Upcoming MagellanPlus Workshops

### REGULAR WORKSHOPS

**BlackGate: Black Sea – Mediterranean Gateway Exchange** (22-24 September 2021, Frankfurt/Main, Germany)

Contacts: Wout Krijgsman ([w.krijgsman@uu.nl](mailto:w.krijgsman@uu.nl)); Iuliana Vasiliev-Popa ([Iuliana.vasiliev-popa@senckenberg.de](mailto:Iuliana.vasiliev-popa@senckenberg.de)); Anouk Beniest ([a.beniest@vu.nl](mailto:a.beniest@vu.nl))

**TIMOR: Tracing Monsoon, Ocean currents and diagenetic carbon Redistribution**

(31 March-2 April 2022, Vienna, Austria)

Contact: Uwe Balthasar ([uwe.balthasar@plymouth.ac.uk](mailto:uwe.balthasar@plymouth.ac.uk))

**IO:DIP – Indian Ocean: Delving Into the Past** (9-12 April 2022, Graz, Austria)

The life cycle of a microplate at a convergent margin. More info: <http://indian-ocean.uni-graz.at>

**COSNICA Workshop** (spring 2022, Graz, Austria)

The life cycle of a microplate at a convergent margin. More info: <http://indian-ocean.uni-graz.at>

**SCYLLA Workshop** (spring 2022, Bologna, Italy)

Serpentinite diapirs in the Calabrian subduction system return lower plate mantle from Earth's oldest ocean.

Contacts: Luca Gasperini ([luca.gasperini@ismar.cnr.it](mailto:luca.gasperini@ismar.cnr.it)) and Alina Polonia ([alina.polonia@ismar.cnr.it](mailto:alina.polonia@ismar.cnr.it))

**Belize Barrier Reef Workshop** (2022, Frankfurt/Main, Germany)

IODP-drilling off of the Belize Barrier Reef (Central America) to reconstruct postglacial environmental changes.

Contacts: Eberhard Gischler ([gischler@em.uni-frankfurt.de](mailto:gischler@em.uni-frankfurt.de)); Stefano Fabbri ([stefano.fabbri@geo.unibe.ch](mailto:stefano.fabbri@geo.unibe.ch)); Flavio Anselmetti ([Flavio.anselmetti@geo.unibe.ch](mailto:Flavio.anselmetti@geo.unibe.ch))

### EXPLORATORY WORKSHOPS

**Investigating the Oceanic Life Cycle of Tectonic Plates with Mission-Specific Scientific Drilling** (1-2 April 2022, Vienna, Austria)

Contact: Michelle Harris ([michelle.harris@plymouth.ac.uk](mailto:michelle.harris@plymouth.ac.uk))

**Mission-specific platform approaches to assessing natural hazards that impact society** (8-10 July 2022, Lisbon, Portugal)

Contact: Hugh Daigle ([daigle@austin.utexas.edu](mailto:daigle@austin.utexas.edu))

**More info:** <https://www.ecord.org/science/magellanplus/>

# UK IODP MSP Proposal Workshop 2021



Jude Coggon Damon Teagle



UK IODP hosted its first online workshop, on the topic of proposal development for IODP Mission Specific Platforms (MSPs) in early 2021. Fifty-two delegates from 10 countries (Brazil, China, Finland, France, Germany, Italy, Netherlands, Spain, UK, USA) joined the workshop, with early-career researchers making up 54% of the registrants and 48% of delegates coming from non-UK institutions.

## Workshop Primer session (virtual) 26 January 2021

On 26 January a Workshop Primer session was convened by ESO Science Manager David McInroy. The programme of presentations from ESO staff was designed to provide delegates with a good understanding of the capabilities of MSPs, state-of-the-art drilling technologies available on these platforms, downhole logging and petrophysics facilities and curation protocols for both offshore and onshore science parties. It was rounded off with a talk from Rob Larter (British Antarctic Survey) on the new RRS Sir David Attenborough and its potential for deployment as an MSP along with different sea-bed rock drills.

## Main Workshop (virtual) 9 - 11 February 2021

The Main Workshop took place from 9–11 February and was chaired by UK IODP Programme Advisory Group (PAG) Chair Damon Teagle. IODP experts gave a series of talks covering the IODP proposal process, specialist talks on Microbiology and Paleomagnetism and a selection of

case studies of inspiring MSP expeditions. The talks were interspersed with group activities focussed on developing a drilling proposal based on a compelling science question.

The mentors and specialists were impressed by the high standard of diverse science questions posed, engagement with the training exercise and great spirit of collaboration demonstrated by all involved. The digital format of the workshop, using Zoom meetings and breakout rooms, was a new experience for most involved and required some adjustment, but overall was well received by participants and mentors. It was great to have the opportunity to get together and collaborate in this way despite the challenges of the pandemic, childcare, online teaching and more.

## Workshop recordings - online access

The four Primer presentations and 12 Workshop presentations were recorded and can be found on: UK IODP website

<https://www.ukiodp.org/msp-proposal-workshop-2021>

UK IODP YouTube channel

<https://youtube.com/playlist?list=PLz4RUzqZJYWJY9eChSSubyxM5o65NFNbl>

[https://youtube.com/playlist?list=PLz4RUzqZJYWJRbW0g\\_aqDaJELo2zbxNwL](https://youtube.com/playlist?list=PLz4RUzqZJYWJRbW0g_aqDaJELo2zbxNwL)

Closed captions are available on all recordings.

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**Damon Teagle** - [Damon.Teagle@southampton.ac.uk](mailto:Damon.Teagle@southampton.ac.uk)  
Chair of the NERC UK-IODP Programme Advisory Group  
University of Southampton, UK

## Feedback from attendees and mentors of the UK IODP MSP Proposal Workshop 2021

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*“The diversity of speakers, participants and ideas was really refreshing. IODP really seems like a supportive and welcoming environment.”*

**Isobel Yeo**, (Delegate)

National Oceanography Centre Southampton

*“I found it a really valuable and informative exercise, both in developing and broadening our project ideas as a group, and in learning more widely about the application and drilling process.”*

**Sebastian Watt**, (Delegate)

University of Birmingham

*“I had some real light-bulb moments! And the way in which all the mentors and subject experts were whole-heartedly supportive was really fantastic.”*

**Uwe Balthasar**, (Delegate)

University of Plymouth

*“One thing that I really enjoyed was that due to taking this online, we could work truly international in the IODP spirit, which could probably not happen if you do such a workshop in person, so home office has its advantages.”*

**Katharina Hochmuth**, (Specialist and Delegate)

University of Leicester/ESO

*“I was incredibly impressed by how the teams pulled together to develop a proposal idea over such a short period of time – it was inspiring and gives us confidence there will be many great ideas for drilling in future from an enthusiastic community.”*

**Lisa McNeill**, (Specialist/Mentor)

University of Southampton

## Course Convenors

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Damon Teagle	University of Southampton, Chair of the UK IODP Programme Advisory Group (PAG)
Dave McInroy	British Geological Survey & ECORD Science Operator, PAG member
Roz Coggon	University of Southampton, Co-Lead Editor of 2050 Science Framework, PAG member
Lisa McNeill	University of Southampton, Chair of IODP Science Evaluation Panel, PAG member
Tony Morris	University of Plymouth, ESSAC Chair, PAG member
Kate Littler	University of Exeter, ESSAC member, PAG member
Uisdean Nicholson	Heriot-Watt University, IODP Science Evaluation Panel member, PAG member
Sasha Turchyn	University of Cambridge, ECORD Facilities Board member, PAG member
Jude Coggon	University of Southampton, UK IODP Knowledge Exchange Coordinator, PAG member

## Presenters

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Gilbert Camoin	CEREGE & EMA, France
Roz Coggon	University of Southampton, UK
Patrizia Geprägs	MARUM & ESO, Germany
Katharina Hochmuth	University of Leicester & ESO, UK
Rob Larter	British Antarctic Survey, UK
Erwan Le Ber	University of Montpellier & ESO, France
Dave McInroy	British Geological Survey & ESO, UK
Lisa McNeill	University of Southampton, UK
Jo Morgan	Imperial College London, UK
Tony Morris	University of Plymouth, UK
Uisdean Nicholson	Heriot-Watt University, UK
Heiko Palike	MARUM, Germany
Michi Strasser	University of Innsbruck, Austria
Jason Sylvan	Texas A&M University, USA
Damon Teagle	University of Southampton, UK

## Group Mentors

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Steve Bohaty	University of Southampton, UK
Roz Coggon	University of Southampton, UK
Tom Dunkley Jones	University of Birmingham, UK
Lisa McNeill	University of Southampton, UK
Tony Morris	University of Plymouth, UK
Heiko Palike	MARUM, Germany

## ‘Rotating’ IODP Specialist Mentors

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Site survey	Uisdean Nicholson/Lisa McNeill
Wireline Logging/Physical Properties	Katharina Hochmuth/Erwan Le Ber/Dave McInroy
Drilling platforms	Dave McInroy
Environment and pollution	Damon Teagle
Paleomagnetism	Tony Morris
Microbiology	Jason Sylvan
Geochemistry	Damon Teagle/Roz Coggon

## Letter from the *JOIDES Resolution* Facility Board



Clive R. Neal

5 January 2021

Dear IODP Community,

Happy, safe, and productive 2021 to all of you and here's hoping for a much better year relative to 2020! I am hopeful that, at some point in 2021, we can get back to normal operations of the *JOIDES Resolution*. Though the JRSO has made monumental efforts to keep the ship productive during 2020 through much-needed ship repairs and improvements, Expedition 384 (Engineering Testing), and preparation work for Expeditions 390/393, IODP expeditions could not be implemented after the early conclusion of Expedition 378 last February. This resulted in some hard decisions for the JRFB, such that we held the **first ever out-of-sequence meeting on 23 November 2020** and developed a number of critical consensus statements.

I am writing to provide some explanation about the meeting results and inform you of the path we have taken to ensure we move into 2021 and beyond with a firm foundation from which to grow the next era of scientific ocean drilling.

I want to highlight two results of this meeting now to ensure you are aware:

- **We will not be requesting new proposals for the JR** that address the current science plan for the 1 April 2021 deadline;
- **We will be requesting community input from 1 February 2021** on implementation of the Science Framework via a Request for Information (RFI).

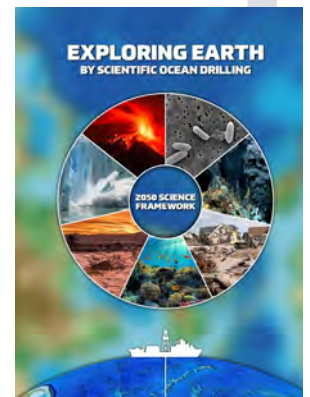
Not being able to implement IODP expeditions for much of 2020 and 2021 means that the number of JR proposals currently at SEP and the JRFB are more than enough to schedule through the end of the program and into 2024 (for context, see 2019 JRFB meeting *Consensus Statement 3*). Therefore, we have decided **not to request new proposals for the JR that address the current science plan for the 1 April 2021 deadline** (see November 2020 JRFB meeting *Consensus Statement 3*). Exceptions to this are the new Land-2-Sea proposals, as well as those proposals reviewed by the SEP in 2020 that were deactivated but where the proponents were encouraged to re-submit. Revisions to proposals already in the system and Ancillary Project Letters will be also be accepted. Unfortunately, we

are not yet in a position to accept proposals that address the new 2050 Science Framework (more details on this are below).

A significant positive highlight in future planning was the IODP Forum endorsement of the new 2050 Science Framework (SF). Again, we owe a huge debt of gratitude to Anthony Koppers, Roz Coggon, and their team for completing the SF in such a short time AND during a pandemic! The innovative SF is very different from the current Science Plan and, as became evident during the Forum meeting, implementation will be challenging because that innovation must now be matched in its implementation. Therefore, the JRFB has established a Working Group (WG) to consider requirements and review processes for proposals that would use an anticipated U.S. global ranging, non-riser drilling platform to address the SF (see *Consensus Statement 2*). The WG has been asked to focus on innovative ways for requesting, formulating, and reviewing proposals to address the SF and specifics can be found in the *November 2020 JRFB meeting minutes*.

I have asked JRFB member Ken Miller to chair this WG, which is comprised of Cara Burberry, Gail Christeson (SEP co-chair), Sean Gulick, Susan Humphris, Lisa McNeill (SEP co-chair), Dick Norris, and Brandi Reese. I want to thank everyone listed here for agreeing to serve on this very important WG. Ex-officio members are the Forum and JRFB Chairs, as well as representatives from the CIB, EFB, NSF, SSO and JRSO. The initial meeting of the WG was held (virtually, of course!) on 17 December 2020, resulting in a set of *consensus statements and actions*. The WG report is due at the 2021 JRFB meeting, currently scheduled to be held in-person in La Jolla, California, 23-25 June 2021. At that time, specific criteria for new proposals addressing the SF should be available and we should be in a position to define when those new proposals will be accepted.

The JRFB will also issue a **“Request For Information” (RFI)**, see <https://www.ecord.org/jrfb-chairs-letter-on-future-proposals-and-rfi/>, see next page) to the international community to provide input for preparing to transition from the IODP Science Plan to the 2050 Science





Framework. Responses will focus on new proposal ideas and will be collected through a web-based form that should take no more than 10 minutes to complete.

**Responding to the RFI is critical** for the JRFB WG, NSF (in terms of what a new U.S. drilling platform will look like), the JRFB and other facility boards/platform providers (to aid in SF implementation, and the IODP Forum as it oversees SF implementation).

See *Consensus Statement 4*. The SSO will begin collecting RFI responses on 1 February 2021. While results will be used to inform the JRFB WG and their June 2021 report, the data are vital for several other important issues, so there is no hard deadline for submitting results. Details will be sent via a future email, and I ask you to please submit responses to the best of your ability. Your input is vital and needed, noting this is an initial step in information gathering.

As you can see from the new *schedule plan*, the JR is in a period of tie up in Cape Town until early February. (There have been some fantastic pictures of Table Mountain coming from the *@TheJR Twitter feed!!*) After this tie up period, the ship will complete the re-entry installations for Expeditions 390/393, then move on to Expedition 395E. Expedition 395E was originally intended to prepare Hole U1309D for re-entry so that proposal P937 could

be scheduled at the 2021 JRFB meeting. However, some planned tests that were not completed during Expedition 384 will also be conducted during this now-hybrid expedition 395E. *Consensus Statement 1* addresses some issues that have arisen regarding sampling, equipment tests, and the creation of a Sample Allocation Committee for Expedition 395E (see my *September 2020 letter* for details on scheduling changes).

In closing, I want to state that while 2020 was immensely challenging for scientific ocean drilling, I am optimistic for the future. We belong to a vibrant and innovative international community, as demonstrated by the SF. We must continue to be innovative in the implementation of the SF.

Again, I wish you all a happy, safe, and productive 2021!

Sincerely yours,  
Clive R. Neal



Clive R. Neal - [neal.1@nd.edu](mailto:neal.1@nd.edu)  
*Chair of the JOIDES Resolution Facility Board*

### Respond to RFI (Request For Information):

[Through Google Form »](#)

[Through Proposal Database System \(PDB\) »](#)



JOIDES Resolution in the Admunsen Sea during IODP Expedition 379 (photo credits P. Christie, IODP)



Antony Morris



Hanno Kinkel

## ECORD Grants and Scholarships 2020

### ECORD Research Grants 2020



The ESSAC Office announced a call for ECORD Research Grants with a deadline of 31 January 2020.

The ECORD Research Grants scheme supports outstanding early career scientists by awarding merit-based awards for research directed towards the scientific objectives of previous DSDP / ODP / IODP expeditions, using existing core materials and/or data. The aim is to foster participation of early career scientists in ocean drilling research and to encourage them to develop their own projects and collaborate with other research groups outside of their home institutions.

With the COVID pandemic ending all international travel and meeting activities in 2020, the ESSAC delegates decided to raise the budget of the ECORD Research Grants, allowing a total of 13 grants to be awarded (see below). As possibilities for international networking, a key component of the ECORD Research grants, are still very limited or even impossible, the deadlines for completing these grants has been extended and/or the associated mobility plans modified, to allow all Grant holders to make use their funding in the best possible way.

#### ECORD Research Grant Award 2020

Name	Country	Project	Host Institution
Odysseas Archontikis	UK	Coccolithophore Speciation and Adaptation in the Quaternary Oceans (ODP Leg 165, IODP Expeditions 306 & 361)	Oxford University
Valentina Brombin	ITA	Sr-Nd and C isotopic characterisation of basalts from the “very fast”-spreading (10- to 12-Ma) ridges of the Eastern Equatorial Pacific Ocean (ODP Leg 203)	University of Ferrara
Liyenne Cavalheiro	ITA	Provision of paleohydrological data to reconstruct Early Cretaceous climate evolution off Eastern Antarctica (ODP Leg 113)	Universita' degli Studi di Milano
Maxime King	UK	Plio-Pleistocene changes in seafloor morphology and sedimentary processes on the eastern Ross Sea continental slope, Antarctica (IODP Expedition 374)	Plymouth University
Nicola Kirby	UK	Orbital forcing of early Eocene hyperthermal events: A new benthic foraminiferal record from the Indian Ocean (IODP Expedition 369)	University of Birmingham
Rebecca Kühn	GER	Sediment fabrics in the Hikurangi accretionary margin (IODP Expedition 375)	University of Halle
Tereza Kunkelova	UK	Plio-Pleistocene Summer monsoon variability in the Western Arabian Sea traced by modern grain size distribution un-mixing methods (ODP Leg 117)	University of Southampton
Roland Neofitu	IRE	Southern Ocean iceberg armadas during the mid-Miocene climatic transition: A multi-proxy provenance study (ODP Leg 113)	University College Dublin
Elisabetta Olivo	ITA	Whales Deep Basin-Houtz and Hayes Banks system (Southeastern Ross Sea, Antarctica): A geological record of Pleistocene ice sheet dynamics (IODP Expedition 374)	OGS Trieste
Deborah Tangunan	ESP	Pliocene adaptation of coccolithophores to long-term CO2 variability at the Agulhas Plateau (IODP Expedition 361)	Universidad de Salamanca
Ze Tao	UK	Constraining late Miocene deep-water temperatures and ice volume at IODP Site U1338 (IODP Expedition 320/321)	University College London
Victoria Taylor	UK	Reconstructing late Eocene bottom-water temperatures with clumped isotope thermometry (IODP Expeditions 320 & 342)	University of Southampton
Allyson Viganò	ITA	Are calcareous phytoplankton affected by the onset of the Antarctica ice-sheet at the Eocene-Oligocene transition? (ODP Legs 121 & 198, IODP Expedition 371)	University of Padova

## **ECORD Research Grants 2021** for Early-Career Scientists

# **CALL FOR APPLICATIONS**

The European Consortium for Ocean Research Drilling (ECORD) is sponsoring **merit-based awards** for **outstanding young scientists** to conduct innovative research related to the International Ocean Discovery Program. The research may be directed toward the objectives of completed DSDP/ODP/IODP expeditions. The research should utilise available core material and/or data from DSDP/ODP/IODP expeditions. The ECORD Research Grants will cover travel and lab expenses or other approved costs related to the study.

Studies should be conducted in a laboratory/institution other than the applicant's home institution, and involve mobility (coronavirus restrictions permitting) to promote new collaborations and/ or the acquisition of new scientific expertise. Grant budgets must not exceed 3000 €. Applicants should be enrolled in either a PhD programme or hold a post-doctoral research position at an institution within an ECORD country. Eligible post-doctoral scientists will have completed their PhD within the last 6 years.

Applications should take the form of a mini-proposal, detailing the aims of the study and relevance to IODP, the availability of material and/or data to be worked on, the project partnership and estimated costs. Applications can be strengthened by including the benefits of the proposed study to current work and why the proposed institution is the most appropriate place to carry out the planned study. Please also include a brief statement on contingency plans for how your research will proceed if travel to your host institution becomes impossible due to COVID-19 restrictions.

*A final report, including details of the final expenditure, must be completed within 12 months of the grant being awarded.*

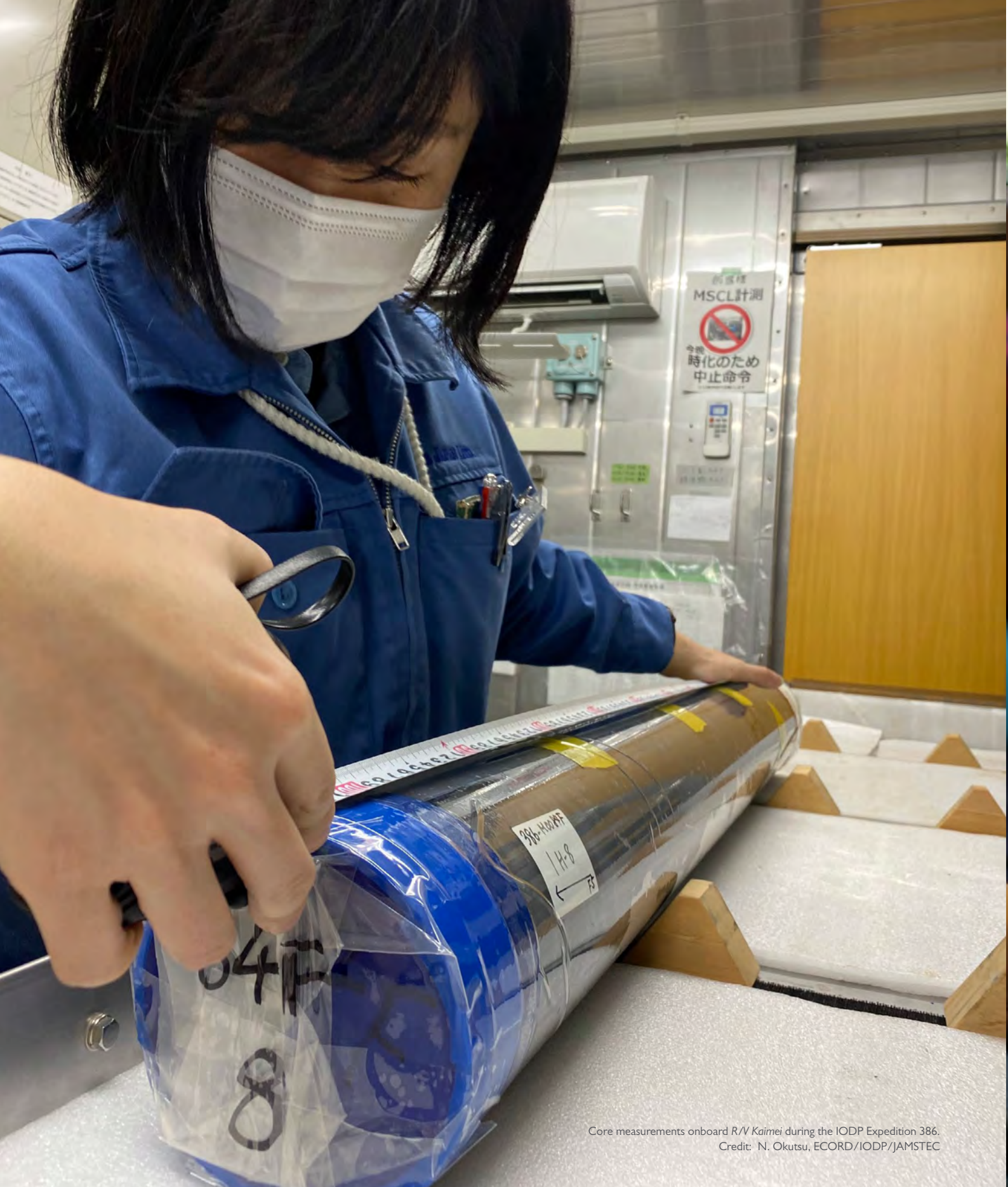
Please email the following documents to the ESSAC Office ([essac@plymouth.ac.uk](mailto:essac@plymouth.ac.uk)):

1. your application, including a **detailed mini-proposal** (max. 5 pages) with a detailed budget plan
2. a **letter of support** from the host institution
3. a **CV**
4. a **letter of support** from the main supervisor (PhD students) or home institution (post-doctoral researchers)

Applications will be evaluated according to the following criteria: (1) Mini-proposal (40%) + Budget plan (10%); (2) CV (30%); and (3) Letters of Support (20%).

Please download and use the templates for the CV and Letter of Support from the ECORD website:  
<http://www.ecord.org/education/research-grant/>

<http://www.ecord.org/education/research-grant/>



Core measurements onboard R/V Kaimei during the IODP Expedition 386.  
Credit: N. Okutsu, ECORD/IODP/JAMSTEC

Antony Morris - *ESSAC Chair*

Hanno Kinkel - *ESSAC Science Coordinator*

[essac@plymouth.ac.uk](mailto:essac@plymouth.ac.uk)

<http://www.ecord.org/education/research-grant/>  
<https://www.ecord.org/education/scholarship/>

Open call to host an  
**ECORD Summer School in 2022**  
at your institution

# CALL FOR APPLICATIONS

The European Consortium for Ocean Research Drilling (ECORD) calls for applications to host an ECORD Summer School for graduate students and early-career scientists at your institution in 2022.

Proposals should relate to the research themes described in the International Ocean Discovery Program (IODP) Science Plan (<http://www.iodp.org/science-plan-for-2013-2023>):

- Climate and Ocean Change
- Earth Connections
- Biosphere Frontiers
- Earth in Motion

Although we look forward to supporting events involving in-person participation, we also welcome proposals that enable virtual participation with the potential to be accessible to more diverse audiences and those who are unable to travel.

Interested institutions are requested to send a proposal outlining the concept, research topics, structure, location and budget plan of the proposed Summer School (max. 20 pages). Awards of up to € 10,000 will be considered to (co-) sponsor the organisational costs of these events. Advice and support can be obtained from the ESSAC Office.

**To apply, please send your full proposal as a PDF to [essac@plymouth.ac.uk](mailto:essac@plymouth.ac.uk) with the subject line "Host ECORD Summer School 2022" by the closing date of 31 August 2021.**

After consideration by the ECORD Science Support and Advisory Committee (ESSAC), awards will be announced in early October 2021 to provide selected organisers with sufficient time to prepare for scheduling of their summer schools in 2022.

ECORD will also provide 10 to 15 ECORD Scholarships to support students wishing to attend the Summer Schools and a call to apply to this scheme will be announced in early 2022.

<https://www.ecord.org/education/summer-schools/>

Photo: Students during 2019 Petrophysics Summer School 2019 at the University of Leicester, Leicester, UK.  
(photo E. Le Ber, ECORD/IODP).



## EOTF News and activities



Malgo Bednarz



David McInroy



Ulrike Prange



Hanno Kinkel



Nadine Hallmann



Jez Everest

In March 2020, just after the EOTF members returned from the ECORD Outreach Task Force meeting #17 in Plymouth, UK, the rapid COVID-19 outbreak led to national lockdowns in most European countries affecting universities, museums and research institutions. For over a year now the EOTF members have been working mostly from home, and this situation continues in 2021. Throughout this difficult pandemic time all meetings and conferences, as well as exhibitions, where the EOTF usually promotes ECORD mission and activities, have been either cancelled or rescheduled. The persisting global health crisis resulted in meetings, conferences and even exhibitions being organized and attended virtually. Many institutions and organizations were not entirely ready to start their digital presence in a space where virtual meetings or exhibitions required pre-existing digital infrastructure for virtual booths. This led to the cancellation of the EGU 2020, and in a limited offer from the AGU 2020, which resulted in the decision of the EOTF not to participate in the latter meeting.

In early 2021, the EOTF was actively preparing for a virtual EGU 2021 (19-30 April 2021) where we a joint ECORD-ICDP virtual booth was presented (*see page 38 »*).

EOTF staff used the pandemic time to develop new ideas and materials for the future, as well as to explore new ways of promoting ECORD. This was also the time when the EOTF managed to conduct major technical updates on the hosting platform for the ECORD website.

### Updated ECORD logo

**ECORD updated its logo in the middle of 2019.**

Download raster and vector versions from:

<https://www.ecord.org/resources/logos-and-maps/>



Current version



## Projects

### Permanent/long-term exhibitions

The EOTF initiated planning for permanent exhibitions in museums around Europe. This idea includes fabrication and donation (or long-term loan up to a year) of materials for museums/research institutions that have been contacted by ECORD (see below) and for the ones that will be contacted by EOTF staff in the future.

#### Exhibit in the Natural History Museum Vienna



The EOTF initiated a discussion with the Natural History Museum (NHM) Vienna about the possibility to promote scientific drilling on the occasion of the newly planned, long-term (>10 years) exhibit at the NHM Vienna. The NHM Vienna exhibit will concentrate on geology with the focus on climate and major changes in the atmosphere and biosphere.

The EOTF invited the ICDP outreach team for this initiative and joint planning for participation in the permanent exhibition at the NHM Vienna is in place. This joint ECORD-ICDP project will deliver a section in the exhibit where scientific drilling will be promoted and explained. ECORD and ICDP will donate materials to the NHM Vienna. This exhibition is planned to be realized within 2021 or at the beginning of 2022.

It is planned that representatives of ECORD and ICDP will give talks on the opening day of the exhibition.

The discussion on this project started in late 2020 but was put on hold owing the uncertainties related to funding and difficulties corresponding to the global health crisis. Planning was recently restarted and ECORD will donate multiple materials that are being considered for production in the coming months. The EOTF organized fabrication of core replicas and other models for the expedition (*see pages 34 and 35 »*).

A detailed plan in cooperation with the exhibition architects from the NHM Vienna is planned to be delivered in the coming months.



## Travelling exhibition

In 2019, the EOTF and ICDP started discussions about a Travelling Exhibition at the EOTF meeting in Dublin and an EOTF-ICDP meeting with the management of the Natural History Museum Vienna. This joint ICDP-ECORD project aims at building an exhibition about scientific drilling that would be

possible to be mounted in any given museum for an extended period of time (circa six months). However, planning for this project was cancelled following the decision of ICDP not to fund this project in its originally planned form.

## ECORD Puffersphere

ECORD Puffersphere is now completed and the project entered the stage of testing by the EOTF.

ECORD Puffersphere presents ECORD and its MSP concept on an interactive spherical display, which will be in the future loaned to museums and aquariums across Europe and displayed at meetings and conferences. This interactive display is targeted at the general public. The scientific content focuses on an introduction to the four IODP science themes, IODP/ ECORD drilling vessels, selected IODP/ ECORD expeditions covering all of the IODP themes and the three IODP core repositories (see previous issue of *ECORD Newsletter*). It also illustrates and/or animates selected scientific data of ocean acidity, sea-level rise, draining the oceans and tectonic plates. It also illustrates and/or animates selected scientific data on ocean acidity, sea-level rise, draining the oceans and tectonic plates.

The content of the sphere can be updated by the Pufferfish developers based on ECORD request or by the EOTF members



Dave McInroy (ESO/EOTF) testing Puffersphere. Photo credits: ECORD/IODP

themselves, depending on the update difficulty. The EOTF is working on planning for future travels of the sphere and the logistics related to shipping and insurance.

In late 2020, the EOTF was discussing the on-line version of the ECORD sphere (the Wake app) that was proposed by the Pufferfish developers. This part of the project is currently on hold until the physical sphere is in its full operation for exhibitions in Europe.

More info about the Puffersphere display: <https://pufferfishdisplays.com/displays/>



# Outreach activities related to MSP Expeditions

## Outreach for Expedition 386: Japan Trench Paleoseismology

Planning for the expedition and the related outreach activities was paused in early 2020 as international borders were closed due to the COVID-19 pandemic. By that time, the EOTF worked together with MarE3/ JAMSTEC and the Co-

chief Scientists on the pre-expedition flyer that was printed in early 2020. In March 2020, the expedition was postponed and most of the outreach actions were put on hold. The outreach efforts for this expedition restarted in February 2021 when the decision on the implementation of this expedition in April 2021 was announced.



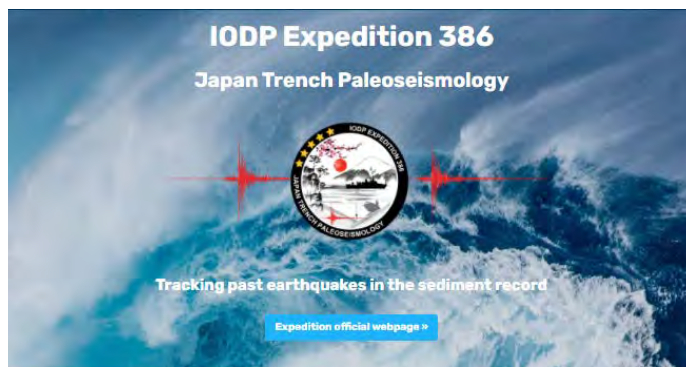
Since February 2021, the EOTF worked together with the outreach team from MarE3/JAMSTEC on a press release, a Japanese version of the pre-expedition flyer and an expedition blog.

A campaign promoting Exp. 386 in the social media started right after the press release with an official announcement of the implementation of the expedition published on 11 March 2021 – the tenth anniversary of the Tohoku Earthquake. Since ESO is not physically participating in the offshore stage of this expedition, MarE3/JAMSTEC and the EOTF work closely together in order to coordinate the outreach actions from R/V *Kaimei*.

The EOTF created an expedition blog and posted several introductory posts to familiarize its audience with the goals of the expedition ([link](#)). New blog posts are frequently added to the blog.

### Important events during offshore stage:

- 13 April 2021: Live streaming of R/V *Kaimei* leaving the port of Yokosuka to start the offshore stage
- 21 April 2021: World record - GPC coring onboard R/V *Kaimei* JAMSTEC retrieved the deepest seabed core ever recovered at IODP Site M0081 in 8016 m water depth. Congratulations!
- 27 April 2021: Ship to shore live video call during the ECORD/IODP-ICDP Town Hall Meeting at vEGU21 (see below)
- Japan Broadcasting Corporation (NHK) is making a science documentary about earthquakes and will add scenes from Exp. 386., along with interviews with onboard scientists
- Michael Strasser (Co-chief Scientist) gave an interview for Terra Mater Magazine of Red Bull Media Publishing based in Vienna, Austria (to be published in the coming weeks)
- Michael Strasser (Co-chief Scientist) gave a short presentation on 7 May 2021 during a live video message to Japanese universities' students



Exp. 386 blog posts

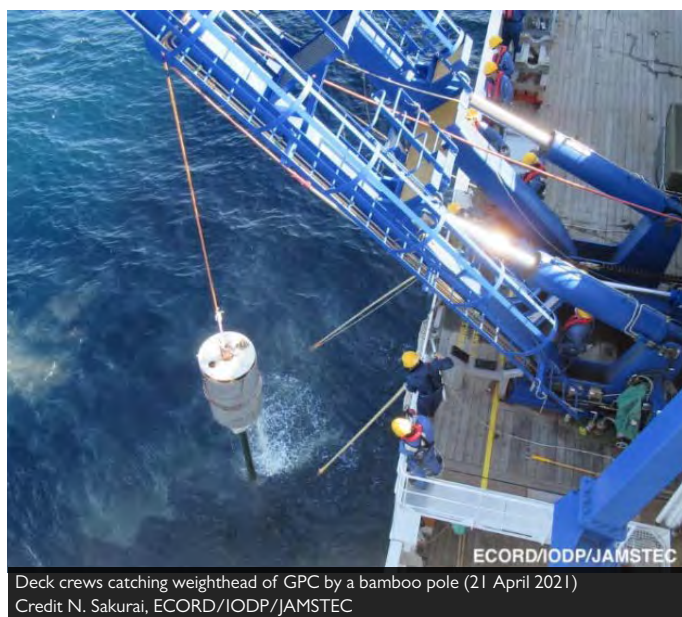
### LATEST POSTS

**Sample processing on research vessel Kaimei during Exp.386**  
It's been a week since we left port and we have successfully completed the 20m and 40m Giant Piston Core (GPC) and sample processing is going well.  
[Read more](#) —  
By [ECORD](#) 29th Apr 2021

**Life with seasickness**  
It has been about 2 weeks since the expedition have started and we got wonderful cores collected from deep sea of 8,000 m water depth. At the same time, it is the days that I have been struggling with the seasickness!  
[Read more](#) —  
By [ECORD](#) 24th Apr 2021

**Livestreaming of R/V Kaimei departure for Exp. 386: 13 April, 2:30 am CET**  
On 13 April 2021 the research vessel R/V Kaimei will leave JAMSTEC quayside in the port of Yokosuka on IODP Expedition 386: Japan Trench Paleoseismology. This expedition is a cooperative effort by both the...  
[Read more](#) —  
By [ECORD](#) 7th Apr 2021

**Introducing Kaimei - the drillship of the Expedition 386**  
Kaimei is a multi-purpose research vessel with Giant Piston Corer and three labs onboard. It is 100.5 m long, 20.5 m width, and 5,747 gross tons. A maximum of 38 scientists and technical support persons can stay onboard.  
[Read more](#) —  
By [ECORD](#) 7th Apr 2021



Expedition 386 blog: <https://expedition386.wordpress.com/>

Expedition 386 webpage: <https://www.ecord.org/expedition386/>

Expedition 386 daily and weekly ship reports: <https://www.ecord.org/expedition386/expedition-386-reports/>



## Outreach for Expedition 377: Arctic Ocean Paleoceanography (ArcOP)

Planning for outreach actions for Exp. 377 restarted in early 2021 after the announcement of the implementation of this expedition following the collaboration with the Swedish Polar Research Secretariat (SPRS) and AMS (Arctic Marine Solutions). A Press Release has been published in five languages on 17 February 2021 and was followed by a successful social media campaign promoting this challenging MSP expedition. Since the beginning of 2021, EOTF members and Co-chief Scientists meet frequently with representatives from SPRS and AMS in order to further promote the expedition and to plan for future actions, especially considering the offshore stage.

- **Webinar** about Exp. 377 was held on 30 March 2021 and the recording is available on the ECORD YouTube channel: <https://www.youtube.com/watch?v=-WkjOwdu6Zs>
- **Questions & Answers** document was published to familiarize the audience with Exp. 377 ([link to pdf](#)).
- **Official expedition blog** was created. Introductory post will be posted on the blog to familiarize our audience with the goals of the expedition long before the offshore phase starts. <https://expedition377arcop.wordpress.com/>

### Documentary about Expedition 377 and ECORD

In early 2021, following the long-planned initiative for a documentary about the ArcOP expedition, the EOTF started communication with experienced filming companies/producers in order to find the best approach for completing this project and plan ahead for the dissemination of the documentary to the global audience. The documentary aims to promote both – the science of ArcOP and IODP/ECORD mission globally. The process of selecting the producer is planned to be finished in the first half of 2021, which will leave enough time for the selected company to plan their actions for offshore and onshore stages and later dissemination of the documentary.

### Onboard Outreach Officer for Exp. 377

The EOTF is working on selecting a Science Communication Specialist for the post of Onboard Outreach Officer who will be responsible for ECORD outreach actions and activities during the onboard and onshore stages of the expedition. A call was released on 28 April 2021 (<https://www.ecord.org/call-for-science-communication-specialists-arcop/>).

Expedition 377 blog: <https://expedition377arcop.wordpress.com/>  
Expedition 377 webpage: <https://www.ecord.org/expedition377/>



The drillship *Dina Polaris* will be used during Exp. 377: ArcOP in 2022.  
Credit: Geotop

## Resources

### Core replicas

Seven replicas of ODP and IODP drilled cores are available for classroom activities and display at temporary exhibitions and conferences in Europe and Canada.

Read more about how core replicas were used on [page 39](#) ».

### New core replicas

#### Expedition 364: Chicxulub K-Pg Impact Crater

Transitional unit

(364-M0077A-040R-1)

A new core replica from Exp. 364 is now available for loans. The replica of core drilled in the transitional unit (postimpact resurgence, settling, seiches, and tsunami) was donated to EMA by ESO/BGS. A poster for this core replica was produced.



#### Expedition 310: Tahiti Sea Level

Coral boundstone with microbialites

(310-M0024A-10R-1)

A new core replica from Exp. 310 has been fabricated to replace the former core replica that was lost by a courier during international shipment in 2020. The new core replica is now complemented by realistic models of corals that have been identified in the cores from Exp. 310 (see next page). A poster for this core replica was produced.

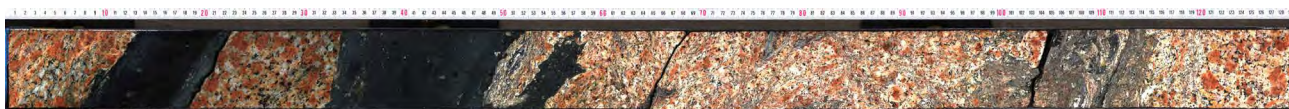


### Planned core replicas

#### Expedition 364: Chicxulub K-Pg Impact Crater

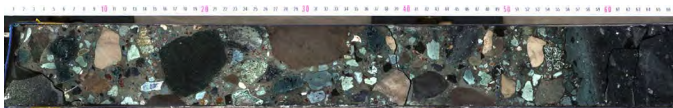
Suevite: polymict breccia and impact melt-rock

(364-M0077A-081R-2)



Brittle and ductile deformation in granite

(364-M0077A-265R-2)



#### ODP Leg 171B: Blake Nose Paleocyanographic Transect

Two new K-Pg core replicas will be fabricated in the coming months. The K-Pg core replica is the most popular, therefore the EOTF made the decision to have two replicas for loans and one for a planned permanent exhibition ([see page 30](#) »).



## How to loan a core replica?

To order a loan, contact Malgo Bednarz ([bednarz@cerege.fr](mailto:bednarz@cerege.fr)) with inquiry about the availability of any particular core replica.

ECORD shares the core replicas on a temporary basis to scientists and teachers under the conditions described in the loan document, with special attention to core replica preservation and treatment (core replica may not be visually or physically altered in any way). Core replicas are loaned free of charge with the ordering university/research institution covering the shipment of core replicas back to EMA.

More info: <https://www.ecord.org/resources/core-replicas>

## Models for exhibitions

Four realistic (1:1 scale) models of two species of corals were fabricated. These models will compliment the new core replica from Expedition 310: Tahiti Sea Level (see previous page). Two of the models are considered to be donated to the NHM Vienna for the permanent exhibit (see page 30 »).



The EOTF is planning on producing other models, including a 3D model of a seafloor drill and a 3D model of an MSP vessel (e.g., *L/B Myrtle*).

Realistic models of specimens of corals identified in cores from Exp. 310. Left: *Porites lobata*; right: *Pocillopora eydouxi*. Produced by Kamyk.pl.

## Brochures and flyers

Production and publication of the ECORD Newsletter in 2020 (April and November issues) as well as the ECORD Annual Report 2020 were cancelled following multiple postponements of IODP expeditions, cancellations and postponements of international and national meetings, conferences and workshops due to the COVID-19 global health crisis.

Printing of any materials that were created short before, or during the pandemic was cancelled, with the exception of the pre-expedition flyer for Exp. 386. These materials are offered in their digital format, ready for download from the ECORD website.

The following brochures were created (illustration below):

- Brochure for stakeholders (1)
- A pre-expedition flyer for Exp 386: English and Japanese (2)
- A pre-expedition flyer for Exp 377: English (3)
- ECORD generic interactive poster (4)



1



2



3



4

Download ECORD brochures and flyers: <https://www.ecord.org/resources/brochures/>

## Goodies

New ECORD goodies were produced and are waiting to be distributed at conferences/events when the global health situation improves and travel restrictions will be lifted. Occasionally some goodies are sent to our partners and ECORD members.

The EOTF keeps working on new ideas for ECORD goodies and exhibition resources.



## Video and multimedia resources

- **ECORD video:** “ECORD explained in 4 minutes” was completed in early 2020 (video by Alex Ingle, voice by Prof. Iain Stewart) – [match the ECORD video](#) »



- **ECORD Puffersphere project** (completed, [see page 31](#) »)



## ECORD online

The EOTF keeps working on the active presence of ECORD in the Internet through social media (Facebook, Twitter, Instagram and Youtube – see back page) and through ECORD website improvements and additional applications.



## Hosting, server-side maintenance and website management

### ■ Upgrade of scripting language on the hosting server

2020 brought a need for an upgrade of the scripting language for the ECORD website and applications that are based on the server. The upgrade took two working days and was necessary for security of the ECORD website.

### ■ Website update

ECORD website update was completed following the above upgrade. This allowed for installation of additional plugins that are more efficient in the distribution of mass-mail.

### ■ Dedicated ECORD e-mail addresses

A dedicated e-mail address for every member country was created. The e-mails sent to a [country]@ecord.org e-mail address are automatically redirected to the current ESSAC delegate and the national IODP office of the country. The e-mail addresses under ecord.org domain name work as a general, single point of contact with any member country, making contact with ECORD representatives intuitive. This also ensures the reception of ECORD as a multinational, recognized organization with an established network of 15 countries that are closely cooperating.

## ECORD at conferences, events and meetings

### EOTF meetings

#### **EOTF #17 Spring meeting** (10-12 March 2020, Plymouth, UK)

The EOTF meeting #17 was held at the University of Plymouth and included visits to the *National Marine Aquarium* and *Eden Project* in order to meet the outreach teams and establish a possible cooperation. A full day was dedicated for the outreach related to Exp. 377 and involved the presence of the ArcOP Co-chief Scientists.

#### **EOTF #18 Fall meeting** (29 Sept 2020, virtual)

The EOTF Fall meeting #18 was a half-day meeting held virtually. As every year, our outreach colleagues from USSSP and MarE3/JAMSTEC were invited to participate in the Fall meeting to join discussions with ECORD and ICDP teams. During this meeting the decision was made that the outreach teams from IODP and ICDP will not proceed with the organization of a virtual booth at the (virtual) AGU 2020 because of the cost-benefit ratio that did not address our expectations.

#### **EOTF #19 Spring meeting** (24 Feb 2021, virtual)

The EOTF Spring meeting #19 was a half-day meeting held virtually. During this meeting ECORD and ICDP teams agreed to organize a virtual booth at the (virtual) EGU 2021 and started to plan its shape and content. The planning for vEGU2021 continued through the following weeks and resulted in a solid plan for the virtual booth including set of webinars and a bespoke virtual space built on the ECORD website especially for the vEGU2021 (*see page 38 »*).

#### **EOTF #20 Fall meeting** (22 Oct 2021, Granada, Spain/virtual)

The meeting is planned to take place in Granada and we hope that the travel restrictions will be lifted by that time.

### 50<sup>th</sup> Anniversary of the University of Bremen (June-Dec 2021)

#### **Touch exhibit focusing on international networks**

Networking, cooperation and interdisciplinarity are key for international research - this is especially the case for the ocean drilling programmes. On the occasion of the 50<sup>th</sup> anniversary of the University of Bremen an outreach project focuses on selected international networks within University of Bremen's high profile area 'Marine, Polar and Climate Research' by displaying them in a touch exhibit. IODP and ECORD will also appear on an interactive world map. The IODP Bremen Core Repository archives drill cores and samples from more than 50 years of ocean drilling in the Atlantic, Mediterranean, Black and Baltic Seas and the Arctic Ocean - and the international research community uses this treasure like extensive books containing extraordinary detailed information in a library. At the same time, the University of Bremen is a partner in the implementation of ECORD's Mission Specific Platform expeditions within IODP. The execution of such expeditions often require international partners working hand in hand. This applies to both infrastructure and research. IODP Expedition 370: Limit of the Deep Biosphere off Muroto will be also shown as an example, researchers from a total of eight member countries, including Japan and the University of Bremen took part.

The exhibit will be on display in the anniversary year at events of the University of Bremen and potentially could also be shown in museums in the future. The exhibit will be handled by the public relations group at MARUM – Center for Marine Environmental Sciences.

## EGU 2021 (19-30 April 2021, virtual)

Because of the ongoing global health crisis, the EGU 2021 was virtual (similar to the EGU 2020).

### Virtual exhibition booth at vEGU21

A virtual exhibition booth presenting IODP/ECORD and ICDP under a “Scientific Drilling” banner was co-organised in collaboration with our colleagues from the ICDP outreach team.

To extend the possibilities of the virtual booth offered by the native EGU management tool, a bespoke virtual booth was constructed on the ECORD website. This allowed for sharing the up to date information and providing easy access to the content that the outreach teams of ECORD and ICDP prepared for the EGU 2021 and which was not possible to be achieved through the vEGU21 native virtual booth.

<https://www.ecord.org/vegu21-welcome-to-the-iodp-ecord-icdp-virtual-booth/>

### Webinars at vEGU21

ECORD and ICDP organized five webinars during the vEGU21. The webinars were freely accessible to the public owing no requirement for EGU registration for the participants of the webinars. Each webinar was well attended, and presentations from the webinars can be downloaded from the virtual booth created on the ECORD website ([link](#)).

#### 1. IODP and ICDP new science plans, Land-2-Sea proposals

by Roz Coggon (University of Southampton), Thomas Wiersberg (ICDP), Lucas Lourens (ECORD)

#### 2. Exploring IODP Data

by Hanno Kinkel (ESSAC), Ulla Röhl (ESO/BCR)

#### 3. ICDP running and upcoming projects

by Uli Harms (ICDP)

#### 4. IODP Expedition 377 ArcOP

by Dave McInroy (ESO), Jez Everest (ESO), Rüdiger Stein (Co-chief Scientist), Kristen St. John (Co-chief Scientist). Co-conveners: Gilbert Camoin (ECORD Managing Agency), Katarina Gardfeldt (Swedish Polar Research Secretariat), Åke Rohlen (Arctic Marine Solutions)

#### 5. Students, scientists, stakeholder: how to get involved in IODP and ICDP?

by Hanno Kinkel (ESSAC), Thomas Wiersberg (ICDP)

### Scientific session on Scientific Drilling at vEGU21

A scientific session on Scientific Drilling was held on 27 April 2021: Achievements and perspectives in scientific ocean and continental drilling (SSP1.2, [link](#))

### ECORD/IODP - ICDP Town Hall meeting (27 Apr 2021)

The EGU 2021 ICDP-ECORD/IODP Town Hall meeting was held virtually on a Zoom and later on GATHER for the informal part of the meeting. Four presentations were given at the beginning of the Town Hall meeting, including ECORD News by Gilbert Camoin (Director of the ECORD Managing Agency) and Michi Strasser (Co-chief Scientist of IODP Exp. 386) who held a live ship-to-shore video call with the JAMSTEC team being at this time onboard R/V *Kaimei*.



### Scientific Drilling IODP ICDP

Two major international research programmes, the International Ocean Discovery Program (IODP) with its European part ECORD (European Consortium for Ocean Research Drilling) and the International Continental Scientific Drilling Program (ICDP) bring major advances to understand geodynamic processes, geological hazards, ongoing and future climate change and sustainable georesources by scientific drilling in oceans and on land.



Webinar 1 (22 Apr)



Webinar 2 (23 Apr)



Webinar 3 (26 Apr)



Webinar 4 (27 Apr)



Webinar 5 (28 Apr)



## Televised lecture on Norwegian history (28 February 2021)

### Public Aarebrot lecture

Kikki Kleiven (Marine geologist and associate professor at the University of Bergen and ESSAC representative for Norway) was selected to give this 200-minute-long lecture which was streamed live on national TV.

### 4.5 billion years of climate in 200 minutes

With the theme “4.5 billion years of climate in 200 minutes” the focus was from Earth’s formation to the current global warming. A part of this national lecture was about the K/Pg event showcasing the **two core replicas** on loan from ECORD:

The Cretaceous-Paleogene mass extinction boundary core from ODP Leg 171B and the Chixulub impact crater core from IODP Expedition 364. Also, in several separate national TV programs, radio and newspaper interviews the ECORD cores and the IODP were showcased and discussed.

After the live event, over 12 000 people have seen the lecture on YouTube and Vimeo. Thus a good (and FUN!) national boost for IODP and ECORD! [Read more on page 50 »](#)

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Helga (Kikki) F. Kleiven - [kikki@uib.no](mailto:kikki@uib.no)  
ESSAC Delegate

Watch video (in Norwegian): <https://vimeo.com/500041852>

Read more about the event: <https://www.uib.no/en/sampol/71361/professor-frank-aarebrot-honored-rector-tv-lecture>



Kikki Kleiven showing the K-Pg core replica loaned from ECORD during the lecture at the University of Bergen, Norway.  
Credit: A. Magugliani/UIB

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## Calendar of meetings, workshops and conferences in 2021

<b>2021</b>		
19-30 April <b>EGU 2021</b> Virtual		13-14 July <b>Chikyu IODP Board</b> Virtual
26 April and 6 May <b>IODP Forum</b> Virtual		22 October <b>ECORD Outreach TF Meeting #20</b> Granada, Spain
5-7 May <b>MagellanPlus Workshop: Mechanisms of rifting of large continental blocks</b> Helsinki, Finland		23-25 June <b>JR Facility Board</b> La Jolla, CA, USA and virtual
2 and 9 June <b>ECORD Council Spring Meeting #7</b> Virtual		18 October <b>ESSAC Fall Meeting #17</b> Granada, Spain
14 and 18 June <b>ESSAC Spring Meeting #16</b> Virtual		27-30 July <b>SEP</b> La Jolla, CA, USA
		29-30 September <b>ECORD Facility Board Meeting #10</b> Trieste, Italy
		13-17 December <b>AGU 2021</b> New Orleans, LA, USA
		

Check for updates: <https://www.ecord.org/calendar/>



## Scientific Drilling

Volume 29 | April 2021



New volume of Scientific Drilling was published in April 2021.

**Scientific Drilling** (SD) is an open-access ICDP and IODP multidisciplinary journal focused on bringing the latest science and news from the scientific drilling and related programmes to the geosciences community.

Scientific Drilling delivers peer-reviewed science reports from recently completed and ongoing international scientific drilling projects. The journal also includes reports on engineering developments, technical developments, workshops, progress reports, and news & updates from the community.



<https://sd.copernicus.org> »



<https://sd.copernicus.org/articles/sd-volume29.pdf> »





Last day on R/V Kaimei during IODP Expedition 386.  
Credit: K. Ikehara, ECORD/IODP/JAMSTEC



Thomas Wiersberg

## ICDP and continental drilling in challenging times

In response to the COVID-19 pandemic, many activities had to proceed differently than originally planned. The purely virtual 2020 EGU General Assembly (4-8 May) included the session “Achievements and perspectives in scientific ocean and continental drilling”, jointly organized by IODP and ICDP. Twenty-five papers on new findings from drilling in the marine and terrestrial realms were presented and lively discussed online by more than 180 participants. For the virtual 2021 EGU General Assembly, we received 36 contributions which will be presented on 27 April, 13:30-17:00.

On 7 December, ICDP held a joint virtual **Town Hall meeting during the 2020 AGU Fall Meeting** together with CSDCO (Continental Scientific Drilling Coordination Office, Minneapolis, USA) that was attended by 75 participants. Marco Bohnhoff (ICDP Executive Director) and Anders Noren (Director CSDCO) provided updates on

news and recent developments from both programs, Roz Coggon introduced the new IODP Science Plan and ICDP-PI Steve Hesselbo reported about a drilling project in UK (JET). The presentations were followed by a Q&A round and the opportunity to meet in virtual breakout groups for specific discussion.

News and Views LacCore/CSDCO	Anders Noren
News and Views ICDP	Marco Bohnhoff
New IODP Science Plan	Roz Coggon
JET - Drilling at Prees, UK	Steve Hesselbo
Q&A	All

## New ICDP Science Plan

The new ICDP Science Plan 2020-2030 was released on 1 October 2020. The Science Plan runs under the headline ‘Billions of years of Earth Evolution’, informs about the program structure of ICDP and outlines the four scientific key themes for continental scientific drilling in the coming decade: Geodynamic Processes, Geohazards, Georesources, and Environmental Change. In this framework future ICDP projects will focus on the evolution of planet Earth, past climates, the effects of large impacts and mass extinctions, the formation and wise utilization of our most significant resources, and in-situ monitoring of volcanoes and fault zones. The linkage to wider societal challenges will include climate action, mitigation of natural hazards, affordable clean energy, sustainable cities and communities and clean water and sanitation.

The Science Plan was developed in close cooperation with IODP. Jointly with IODP, the ICDP now also aims at fostering the successful cooperation by implementing new Land-to-Sea Drilling projects that require combined onshore and offshore – amphibious – scientific drilling to tackle the key scientific themes. The ICDP community is invited to discover the new ICDP Science Plan in its breadth, to start brainstorming about new drilling initiatives and to spread the word on ICDP in all science networks. [Download the Science Plan here](#) and [watch an introductory video](#).



[Watch ICDP introductory video »](#)

[Download ICDP Science Plan 2020-2030 »](#)

## ICDP projects

Despite the COVID-19 pandemic, two ICDP projects have been successfully drilled in the last 12 months: COSC-2 and JET.



### Collisional Orogeny in the Scandinavian Caledonides (COSC-2): Drilling the main Caledonian décollement and into the basement of the Fennoscandian Shield

The Collisional Orogeny in the Scandinavian Caledonides (COSC) scientific drilling project drilled two sites to investigate mountain building processes at mid to lower crustal levels in a deeply eroded Paleozoic collisional orogen of Himalayan dimensions by means of two boreholes in Jämtland, Sweden. The COSC-2 site was drilled May-August 2020 to define the character and age of deformation of greenschist facies thrust-sheets, the main Caledonian décollement and the Precambrian basement that underlie the nappes drilled in COSC-1. After four months, the drilling at the COSC-2 site was successfully concluded on 12 August 2020, comprising a main borehole (COSC-2A) that reached down to 2,276 m depth and a short hole (COSC-2B) cored to 116 m to cover the top interval of COSC-2A. The core recovery rate was close to 100%. An extensive set of downhole logging data was acquired directly after drilling by the ICDP-OSG in cooperation with a team of Lund University. The main borehole is open (uncased) below the 100 m surface casing, providing ideal conditions for borehole experiments.



COSC-2A drilling in Jämtland, Sweden. Photo: Henning Lorenz

The geology of COSC-2A held some lithological surprises: below 775 m depth, COSC-2 sampled an imbricated section of quartzites, diverse conglomerates and tuffs down to the depth of a linear seismic reflection that was originally interpreted as the décollement, but in contrast seems to correlate with the top of a thick section of porphyry.



### Jurassic Earth system and Timescale (JET)

The major goal of the ICDP JET project is to produce a new global standard for the Early Jurassic Epoch, a time of extreme environmental change. JET will integrate Astrochronology, Chemostratigraphy, Biostratigraphy, and Magnetostratigraphy and, combined with existing data from the old Mochras core, will become the international standard for these crucial 25 million years of Earth history. The site (Prees) was drilled in the Cheshire Basin (Shropshire, England) from October to December 2020. Drilling at Prees reached a total depth of 656 m and recovered 114 cores of very good to excellent quality and recovery rate. The team reached the project's goal by drilling through the complete Jurassic sequences and well into the Upper Triassic lacustrine red beds (Brooks Mill Mudstone) and, thus, achieved the primary objectives with regard to the Jurassic – Triassic boundary strata. Despite pandemic restrictions it was possible to assemble a core team of on-site scientists from Exeter,

A biostratigraphically significant (and magnificent) ammonite at the ICDP drilling JET drillsite in Prees.. Ammonites provide one of the most finely resolved biostratigraphic schemes in the Phanerozoic. Photo: Amy Elson/JET.



Leeds and Southampton universities, and the British Geological Survey. Core logging and scanning was conducted at the National Core Repository and Core Scanning Facility (CSF) in Keyworth, Nottingham, and will continue with detailed work in 2021.

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Section 4.2: Geomechanics and Scientific Drilling

More information about ICDP: <https://www.icdp-online.org>



# News from ECORD member countries



## Canada

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The Canadian Consortium for Ocean Drilling (CCOD) is pleased to announce that funding for Canada's continuing membership in ECORD has been secured to the end of 2022.

The funding is the result of a new partnership between the CCOD and Ocean Networks Canada ([www.oceannetworks.ca](http://www.oceannetworks.ca)), a Major Science Infrastructure funded by the Canada Foundation for Innovation.

Canada's membership in ECORD continues to be coordinated by the CCOD, which includes representation from the Government of Canada and ten universities from across the country. More information on this partnership can be found at [www.iodpcanada.ca](http://www.iodpcanada.ca).



John William Jamieson - [jjamieson@mun.ca](mailto:jjamieson@mun.ca)  
Chair of the Canadian Consortium for Ocean Drilling



## Finland

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The Finnish IODP community is looking forward to the MagellanPlus Workshop "Mechanisms of rifting of large continental blocks – Baltic Sea case study" to be held in Helsinki-Espoo 3-4 December 2021. More information will be available soon.

Joonas Virtasalo has been invited to join the Expedition 386: Japan Trench Paleoseismology.

**Raisa Alatarvas** has started her PhD project at the University of Oulu, using materials from the **Expedition 347: Baltic Sea Paleoenvironment**. Participants of the Expedition 347, Outi Hyttinen and Aarno Kotilainen, have continued publishing results from the expedition.

Joonas Virtasalo - [joonas.virtasalo@gtk.fi](mailto:joonas.virtasalo@gtk.fi)  
ESSAC Alternate



## Germany

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As everywhere else, in 2020 the work of our coordination office was strongly influenced by the worldwide pandemic. Our annual joint IODP/ICDP colloquium, usually taking place in March, was initially postponed and then had to be ultimately cancelled. As there is still no possibility of holding a face-to-face event for more than 200 participants in spring 2021, we decided to replace the three-day colloquium with a one-day online event in order to update the German IODP and ICDP communities about latest activities within both programs. A reduced scientific program offers the opportunity of sharing results via selected talks. The colloquium took place on 16 March 2021.

Furthermore, we would like to welcome **André Bornemann** as the new coordinator for IODP Germany. André Bornemann is well known within the community and will bring in a lot of experience, which he gained during his work as scientific coordinator. The whole team wants to thank **Jochen Erbacher** very much for his great work and the countless hours he invested into the program!

Lisa M. Egger - [iodp@bgr.de](mailto:iodp@bgr.de)  
IODP Germany coordination office



The IODP research community in Austria proudly congratulates **Prof. em. Werner Piller** from the University of Graz for having been awarded with the **4<sup>th</sup> ECORD Award** for his outstanding contribution to ECORD and IODP (*see page 8 »*). In particular also for Austria, Werner has been a great driving force

to motivate and foster the young generation scientists in our landlocked country to get involved, participate and contribute in IODP expeditions and science. By now there is a rather small, but continuously growing, and highly active IODP community representing several academic and research institutions across the country, and covering diverse research foci relevant for addressing many on the strategic objectives and flagship initiatives of the new 2050 Science Framework of Scientific Ocean Drilling, in the development of which Austria was involved together with 23 other countries.

In 2020, three Austrian scientists (**Arianna Del Gaudio**, PhD student in Micropaleontology, University of Graz; **Gerald Auer**, who moved back from Japan to Austria to take a tenure-track Professorship in Paleontology and Stratigraphy at the University of Graz, and **Michael Strasser** from the University of Innsbruck as lead proponent of IODP Proposal 866) were scheduled to sail on IODP Expeditions 391 (Walvis Ridge Hotspot), 387 (Amazon Margin) and 386 (Japan Trench Paleoseismology), respectively. Furthermore, **Werner Piller** (Univ. Graz) and **Dominik Jaeger** (Univ. Innsbruck) were considered as shore-based participants of IODP Expedition 387. Unfortunately, all 2020 expeditions with



Austrian participations had to be postponed given the special pandemic circumstances in this year. IODP Expeditions 386 and 387 are now scheduled for 2021 and Austrian participants look very much forward to being involved in and contributing to these upcoming expeditions.

As for **IODP Expedition 386**, in particular, Michi Strasser is co-leading, as first-ever Austrian co-chief scientist, this upcoming mission-specific platform Expedition jointly implemented by ECORD and JAMSTEC to study sedimentary event-deposits and submarine paleoseismology in the 7-8 km deep hadal trench of the Japan Trench plate boundary system.

Unfortunately, also the 2020 scheduled MagellanPlus Workshop COSNICA (The life cycle of a microplate at a convergent margin) hosted and co-organized by Walter Kurz at the University of Graz, had to be postponed. We hope that this workshop could be held in September 2021. A specific date, however, is still pending. A second MagellanPlus Workshop (IO:DIP - Indian Ocean: Delving into the Past) hosted at the University of Graz is scheduled for 19-22 September 2021. Austrian scientists further remain actively involved as proponents in IODP proposals (885 – Ulleung Basin Gas Hydrates; 945-Add3 - Paleocceanography of the Brazilian Equatorial Margin (PBEM); 981Pre-Tracing Tasman Leakage through the Cenozoic) and efforts to develop new proposals in the near future (e.g. resulting from COSNICA and IO:DIP Workshop). Also, throughout 2020 Austrian Scientists continued publishing exciting results on data and samples collected during previous ocean drilling expeditions.

We are happy and acknowledge that the Austrian Academy of Sciences (ÖAW) secured and confirmed continued ECORD membership until the end of the current program in 2023.

The Austrian IODP community is now invited to prepare community input for the next negotiation phases in early 2022 between the ÖAW and the federal ministry for education, science and research, for continued membership in the post-2023 scientific ocean drilling program. Thus, and beyond above-mentioned involvements in IODP expeditions, proposal developments, and post-cruise science projects, preparing for the next phase in scientific ocean drilling is our key objective for the coming year.

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ECORD Council Delegate



The French IODP community has taken advantage of the special context imposed by the sanitary situation to valorize former drilling expeditions. To encourage our colleagues to transform a dramatic situation into a unique opportunity to exhume old treasures from the core repositories, the IODP-France office launched a “special pandemic” call that met a great success. Several projects were funded and a wealth of publications is expected. Early-career scientists were the most reactive to respond and this initiative has even motivated their application to forthcoming expeditions.

### Transforming pandemic situation into a unique opportunity

IODP-France office encouraged scientists to valorize former drilling expeditions using data from IODP core repositories.

Here are a few examples of researches that likely would not have been conducted in a different context.

**1. Laetitia Guibourdenche (IPG, Paris)** investigated “The isotopic geochemistry of messinian evaporites in the deep Mediterranean basins”, where the biogeochemical conditions associated to the formation of the Mediterranean Salt Giant are still poorly constrained, because more than 90% of these deposits are located in the deep basins. The study of samples from **DSDP Legs XIII and XLII-A** and from **ODP Leg 107** led to the discovery of sulfide minerals co-precipitated with deep-basin gypsum. Their multiple-sulfur isotopic signature testifies to the presence of an active sulfur biogeochemical cycle during the formation of these sulfated minerals.

**2. Maël Allard (Géosciences Montpellier)** worked on “Plastic deformation of plagioclase in a gabbro pluton at a slow-spreading ridge”. This study focused on documenting and quantifying, as a function of strain intensity, plastic deformation of plagioclase in gabbros accreted at the ultra-slow spreading Southwest Indian Ridge (**IODP Expedition 360**). Petrographic observations and microtextural analyses of plagioclase through EBSD method in gabbros have interestingly revealed overall weak to moderate crystallographic preferred orientations, further decreasing

in ultramylonites. The detailed analysis of crystallographic misorientations has revealed the activation of at least five slip systems that attest for an early onset of crystal plasticity in the deep oceanic crust at near-solidus conditions and its sustainability over exhumation in a core complex setting.

**3. Florent Hodel (Chrono-Environnement, Besançon and GET, Toulouse)** performed a “Reconstruction of past continental denudation rates and climate using strontium-Lithium-chromium isotopes of oceanic sediments (REPLIES)” that has focused on paleoceanographic, climate and continental weathering evolutions during the initiation of the modern ice-house climate, the Eocene cooling and the Oligocene glaciation that ensued at 33.7 Ma. This project consists in a joint study of the biocarbonate (foraminifera, coccoliths) and of the clay fractions of oceanic sediments made available by several past **DSDP, ODP and IODP expeditions (Legs XXIX, 105, 113, 159, 207; Expeditions 320, 342)** and one to come (**Expedition 387: Amazon Margin**). The salient results concern the Eocene- Oligocene global climate and paleoceanography, including a better dating of the Drake gateway opening and Antarctic Circumpolar current onset from 31 Ma to 26 Ma (ODP Leg 113 and IODP Exp. 320). These results question the presumed link between the Oligocene glaciation onset and the Antarctic Circumpolar Current establishment<sup>1</sup> & <sup>2</sup>. The Tasmanian gateway opening (Leg XXIX) has also been actively studied as well as the impact of the Oligocene glaciation on the North Pole, which is still highly debated today (ODP Leg 105 and IODP Exp. 342<sup>3</sup>). REPLIES also yielded promising results concerning the tracing of the continental weathering associated to the Eocene-Oligocene cooling. The Li, Sr isotopes results for clays and foraminifera from the ODP leg 159 (Ivory Coast margin) coupled with clay mineralogy evolutions, testify of a continental contribution in the neritic domain, which will allow to finely constrain the West African alteration rate evolutions along the Eocene-Oligocene cooling<sup>2</sup> & <sup>3</sup>.



Florent Hodel. Credit: IODP-France Office

#### References:

1. R. Grespan, F. Hodel, M. De Rafélis, G. Déra, C. Lezin, E. Nardin, D. Chardon, D. Rouby, V. Chavagnac. Drake gateway opening recorded by global 87Sr/86Sr, Mg/Ca and REE signals of foraminifers. *Goldschmidt 2019*, Barcelona, Spain.
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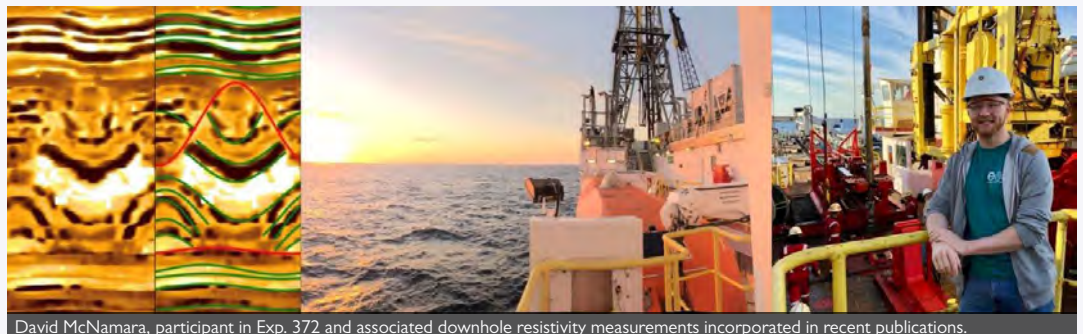
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Weimu Xu, recently invited to participate in IODP Expedition 396.



David McNamara, participant in Exp. 372 and associated downhole resistivity measurements incorporated in recent publications.

The Irish community is excited that **Weimu Xu**, an assistant professor at University College Dublin & iCRAG (Irish Center for Research in Applied Geosciences), has been invited to sail on **Expedition 396: Mid-Norwegian Continental Margin Magmatism**. Weimu is a paleoclimatologist with a keen interest in the interactions and mechanistic processes that drive evolution of the Earth's climate and environment. Her post-cruise research will apply paleobotanical and geochemical tools and analysis, with the aim to constrain North Atlantic Igneous Province (NAIP) volcanic activity and associated carbon degassing and changing atmospheric  $pCO_2$ , and potential links to climatic warming, enhanced hydrological cycling and changing global weathering rates.

Previous participants (**David McNamara & Aggeliki Georgiopoulou**), in conjunction with their graduate students, continue to analyse and publish data associated with **Expedition 372: Creeping Gas Hydrate Slides and Hikurangi LWD**. In the last two years, this has generated four journal papers and multiple conference submissions. Both graduate students (Effat Behboudi [UCD]; Ben Couvin [UCD]) recently presented their work at the 64<sup>th</sup> Irish Geological Research Meeting.

Posters highlighting the ECORD & IODP opportunities to Irish scientists were included in the GSI's 'Geoscience 2020' conference, to promote engagement from the wider community.

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ECORD Council Delegate

While the COVID-19 situation hampered travel and in-person meetings, the world of virtual meetings and presentations provided the opportunity to present IODP related results without having to spend money for travel. Thus, **Dulce Oliveira** from the Centro de Ciências do Mar (CCMAR) at the University of the Algarve was able to present the outcomes of her pollen study in the interglacial Marine Isotope Stage 13 (533 000 to 478 000 years ago) section of IODP Expedition 339: Mediterranean Outflow Site U1385 (SW Portuguese margin) to a wide range of audiences during 2020. She reported on her results, also published in the journal *Quaternary Science Reviews* in 2020, at the 2<sup>nd</sup> Palaeontological Virtual Congress in May, the UK IODP Annual Meeting in August, the "Climat et Impacts" conference, organized by the University of Paris-Saclay, Orsay (France), in November, and the annual CCMAR Symposium in December. Antje Voelker (IPMA) presented her results on the middle to early Pleistocene Mediterranean Outflow Water history at IODP Site U1387 (southern Portuguese margin) within the seminar series of the Department of Marine Geosciences, University of Haifa (Israel) in late November.



Memories of IODP Expedition 339: Mediterranean Outflow when Site U1385 and U1387 were drilled. The photo shows two of the Portuguese participants, Cristina Roque and Helder Perreira, at the core description table. Credits: J. A. Flores, Spain).

In June 2020, **Antje Voelker** became an ECORD representing member of the Science Evaluation Panel (SEP) – Science subpanel and has participated in three virtual SEP meetings so far.

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## Short report on IODP-Italy activities in 2020

In early 2020, before the outbreak of the pandemic, Italian scientists have been actively involved in IODP science activities: Isabella Raffi sailed onboard IODP Expedition 378: South Pacific Paleogene Climate as expert in nannofossil micropaleontology, Claudia Agnini took part in the post-cruise meeting of the IODP Expedition 371: Tasman Frontier Subduction Initiation and Paleogene Climate, and Renata Lucchi organized the EFRAM-ARC MagellanPlus Workshop in Trieste. In the following months, the new successful Italian applications to participate in ECORD/IODP have been temporarily suspended as a result of cancelled or postponed activities. As early-career scientists, Valentina Brombin (University of Ferrara), Liyenne Cavalheiro (University of Milan) and Elisabetta Olivo (OGS, Trieste) have been recipients of the ECORD Research Grants 2020.

### Italian representatives

**Angelo Camerlenghi** has been appointed ESSAC Chair for the two-year term 2022-2023.

In 2021 Angelo Camerlenghi will act as Vice-Chair, according to the MoU rotation scheme. **Paola Vannucchi** and **Silvia Ceramicola** are currently serving as ECORD-based members on IODP Science Evaluation Panel (Science Subgroup and Site subgroup, respectively). **Michele Rebesco** is a new member of the ECORD Facility Board since January 2021.

### Future Italian commitment to the Program

In July 2020, IODP-Italy submitted to the Ministry of University and Research (MUR) a “research infrastructure form” proposal in view of a multiyear term partnership commitment to ECORD, to be consolidated within the next 7-year term National Plan for Research Infrastructures (PNIR).

IODP-Italy: [www.iodp-italia.cnr.it](http://www.iodp-italia.cnr.it)

## 2021 – Current initiatives in the spotlight

### IODP-Italy Spring Webinar Series 2021 - International Scientific

#### IODP-Italy Spring Webinar Series 2021 International Scientific Drilling through IODP and ICDP

#### Drilling through IODP and ICDP

The CNR Advisory Committee “ECORD-IODP and ICDP” promotes a **Spring webinar series**, as a joint ocean and continental drilling live event to be conducted by qualified experts in scientific drilling. The initiative intends to favor a broad participation of the geoscience community and aims to bring high-level knowledge on outcomes and perspectives in scientific drilling, whilst making the audience also aware of the opportunities to get involved in IODP and ICDP. The event program, issued in early March, includes six webinars to be held on GoToWebinar on Friday mornings from 19 March to 11 June. Webinar leaflets, including registration details and background information on each single event, will be circulated in due time via mailing list [iodp-italia@cnr.it](mailto:iodp-italia@cnr.it) and will be updated on the website [www.iodp-italia.cnr.it](http://www.iodp-italia.cnr.it).

 [Download webinar flyer »](#)

#### IODP-Italy call for Postdoctoral Fellowships

On the legacy of December 2018 edition, the CNR and IODP-Italy have recently launched a new call for 2-year Postdoctoral Fellowships to conduct research on IODP data and samples. The accepted projects will be evaluated in the next months.

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ECORD Council Delegate  
(CNR) IODP-Italy Scientific Secretariat and the national IODP-Italia Committee

The Swiss scientific drilling community gathered in front of their screens on a gray and rainy Saturday morning November 2020 for the 18<sup>th</sup> edition of the [Swiss Geosciences Meeting 2020](#). Within our session: “Looking to the Future of Scientific Ocean Drilling from a Swiss Prospective”, we were curious and anxious to find out how this, first ever, online only session with pre-recorded talks and live online discussion would play out. Thanks to the exceptional combined efforts of **Pierre Dèzes**, Head of SCNAT Platform Geoscience, **Eric Reusser**, ETH-Zürich and his team our virtual session was a resounding success.

Six talks given by early-career scientists, posters and ensuing discussion covered all major ocean basins and millions of years, with topics spanning serpentinization of the Atlantis Massif, foraminifera in the Maldives to iceberg dynamics in the Southern Ocean. The presentations illustrated the global distribution, inter- and transdisciplinary nature of scientific ocean drilling, which continues to inspire Swiss geoscientists. A narrated poster

by SwissDrilling.ch introduced the Swiss community to the newly released “2050 Scientific Framework: Exploring Earth by Scientific Ocean Drilling”.

SwissDrilling congratulates **Anders McCarthy** for winning the prestigious Niggli award for young Swiss scientists. In parallel to his PhD on mineral growth in plutonic systems and links to volcanic activity, he joined IODP expedition 351 to the Izu Bonin arc, to work on subduction initiation, and on another IODP expedition 367 to study rifting and spreading in the South China sea. These cruises inspired his work to think about the problem of subduction initiation in the Alps.

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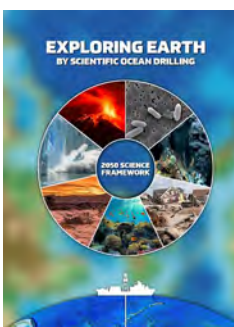


## UK IODP Annual Meeting 2020

Originally planned for April 2020, our in-person meeting at the Natural History Museum, London, had to be postponed and reconfigured into an online setting, so on the 27-28 August we welcomed ~220 registered participants to the virtual meeting, held on Zoom. The meeting was convened by Dr Rebecca Bell, Kirsty Edgar, Richard Herrington, Lisa McNeill, David McInroy and Jude Coggon. Keynote speakers Ake Fagereng (Cardiff University), Roz Coggon (University of Southampton) and Tina van de Flierdt (Imperial College) delivered fantastic presentations and the programme was completed with 12 further talks (including five from students and two from Early-Career Researchers (ECRs)) and 20 stimulating posters (eight of which were presented by students and eight from ECRs). We were presented with research from all five of the world's oceans, on samples from equator to polar regions, mantle to pelagic sediments, and from ridge to trench. Topics covered varied from tectonics and rifting to paleoclimate, mud volcanoes to meteorite impact craters, and origin of life to biome shifts in response to climate change.

In addition to the research presented, we learned more about the "Downhole Logging for IODP Science" ECORD Summer School, hosted annually at Leicester University, and the New IODP 2050 Science Framework. In the Friday afternoon session Steve Bohaty and Dave McInroy provided updates from the JR Facilities Board and the ECORD Science Operator, respectively, generating a lively Q&A session. We finished the meeting with a social session, dividing participants into randomly assigned "breakout groups" of six to seven people, giving an opportunity for networking and to meet new people.

The meeting was generously sponsored by the Marine Studies Group and the Geochemistry Group and representatives of each awarded prizes for the top student presentations. The feedback from the judges emphasised the high calibre of all student presentations and the great work that these scientists are producing.



## UK involvement in the New Science Framework

Rosalind Coggon, Royal Society University Research Fellow in the School of Ocean and Earth Science at the University of Southampton, was Co-Lead Editor of the new 2050 Science Framework: Exploring Earth by Scientific Ocean Drilling, published in October 2020. Other UK scientists

who contributed to this landmark document are: Antony Morris, University of Plymouth (Author, Reviewer); Damon Teagle, University of Southampton (Contributor); Lisa McNeill, University of Southampton (Reviewer); and Julie Prytulak, Durham University (Reviewer) ([read more on page 10 »](#)).

## VOLCORE Database Published



Contributor Scientific Data

BEHIND THE PAPER

## 150 Million years of large magnitude explosive volcanism.

The story of creating a history of explosive volcanism since the time dinosaurs walked the earth.

**Sue Mahony and Steve Sparks** of the University of Bristol published a global database of all visible tephra layers that have ever been sampled by ocean drilling.

Mahony, S.H., Barnard, N.H., Sparks, S.J., Rougier, J.C., 2020. VOLCORE, a global database of visible tephra layers sampled by ocean drilling. Scientific Data volume 7, Article number: 330.

The Scientific Data paper:

<https://www.nature.com/articles/s41597-020-00673-1>

 <https://rdcu.be/cjB3>

VOLCORE data:

<https://doi.pangaea.de/10.1594/PANGAEA.907331>

A blog post describing the story of the paper:

<https://researchdata.springernature.com/posts/150-million-years-of-large-magnitude-explosive-volcanism>



## UK IODP MSP Proposal Workshop

The three-day workshop was held online on 9-11 February 2021, after a Primer Session on 26 January. A report of the workshop can be found in this volume ([read more on page 22 »](#)).

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UK-ODP webpage: <https://nerc.ukri.org/research/funded/programmes/ukiodp/>

Since 2019 the University of Bergen in Norway has celebrated the late professor Frank Aarebrot with the public Aarebrot lecture. The purpose of the lecture is to honor the oral communication tradition for which the famous professor, commentator, democracy researcher and political scientist Frank Aarebrot was such an important and strong representative. Each year a professional who has excelled with special qualities as a lecturer in an oral storytelling style will be invited to give the lecture, regardless of professional background and national academic institution. This year **Kikki Kleiven** (Marine geologist and associate professor at University of Bergen and ESSAC rep. for Norway) was selected to give this 200-minute-long lecture which is streamed live on national TV.

[Read more on page 39 »](#)

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ESSAC Delegate



Kikki Kleiven during the 200-minutes long lecture showing two core replicas loaned from ECORD. Credit: A. Magugliani/UIB

Spanish scientists participated on a proposal writing workshop for proposal 953-Pre: Australian-Antarctic rift-drift transition and development of the Antarctic Circumpolar Current. The community continues their activities related to the proposals at the respective Facility Boards such as Proposal 537B: Costa Rica Seismogenesis Project Phase B; Proposal 633: Costa Rica Mud Mounds; Proposal 771: Iberian Margin Paleoclimate; Proposals 857 y 857B C: DREAM; Proposal 895: Mediterranean-Atlantic Gateway Exchange; APL 908: Costa Rica Megathrust Fluid-Pressure; and Proposal 813-Exp 373: Greenhouse to Icehouse Antarctic paleoclimate and ice history from George V Land and Adélie Land shelf sediments.

Participant of the Expedition 382: Iceberg Alley and Subantarctic Ice and Ocean Dynamics, **Marga García García**, continued her work to publish the expedition material.

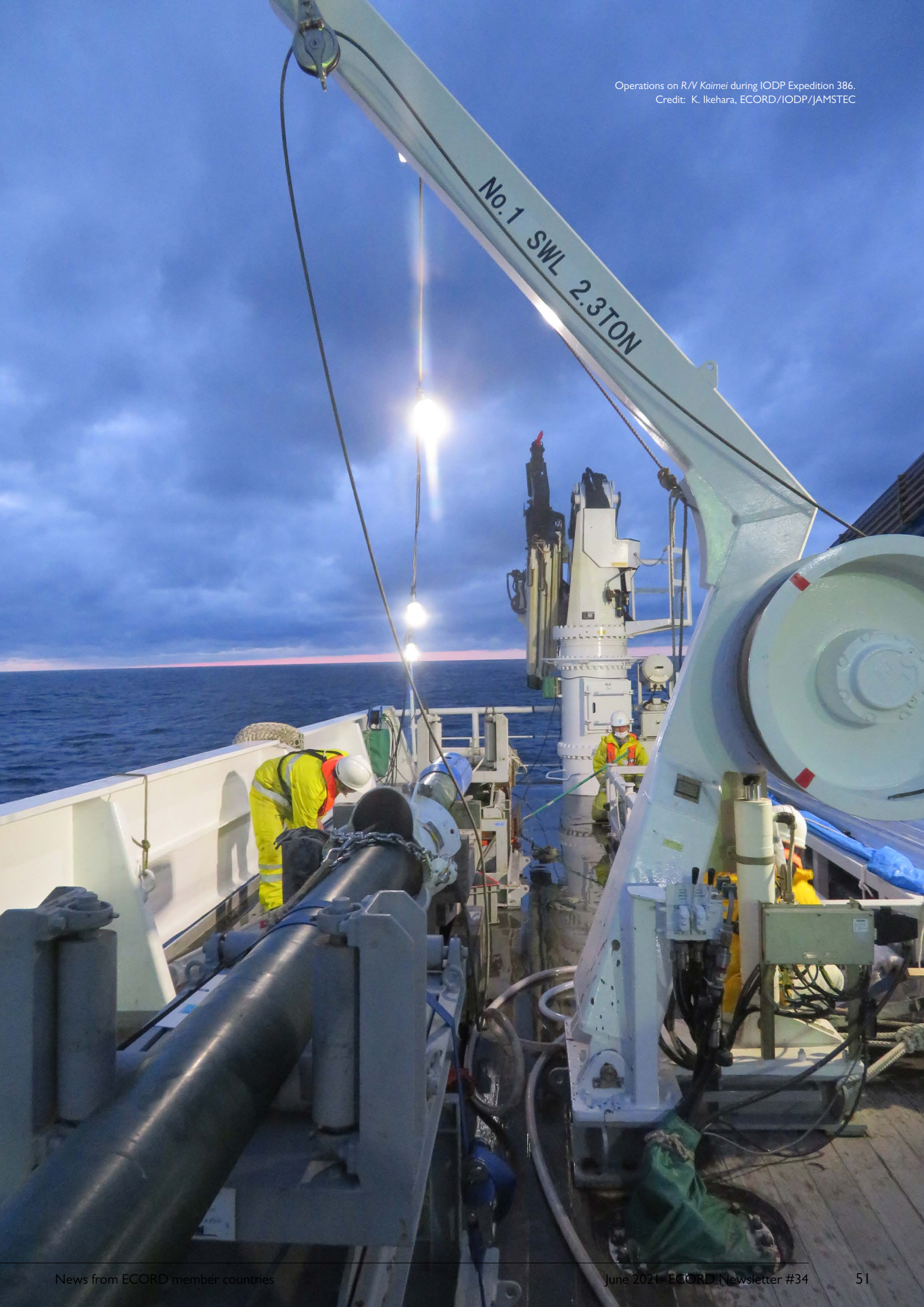
Due to COVID, the Spanish Geological Congress scheduled for summer 2020 was postponed to July 2021. During this meeting an IODP-ICDP Symposium is scheduled that has been coordinated by **Maria José Jurado**, **Blás Valero**, **Pilar Mata** and **Carlota Escutia**. This symposium provides the opportunity for the Spanish drilling community to interact and for scientists to learn about these two programs and their achievements.

**Carlota Escutia** received the 2020 SCAR (Scientific Committee on Antarctic Research) Medal for international Scientific Coordination among other things for successfully bringing the scientific ocean drilling and Antarctic communities together. A Paleoclimate Records from the Antarctic Margin and Southern Ocean (*PRAMSO*) Action Group has been created within SCAR as a forum to initiate, promote and coordinate scientific research drilling around the Antarctic margin and the Southern Ocean to obtain past records of ice sheet dynamics and ice sheet ocean interactions that are critical for improving the accuracy and precision of predictions of future changes in global and regional temperatures and sea level rise (<https://www.scar.org/science/pramso/home/>).



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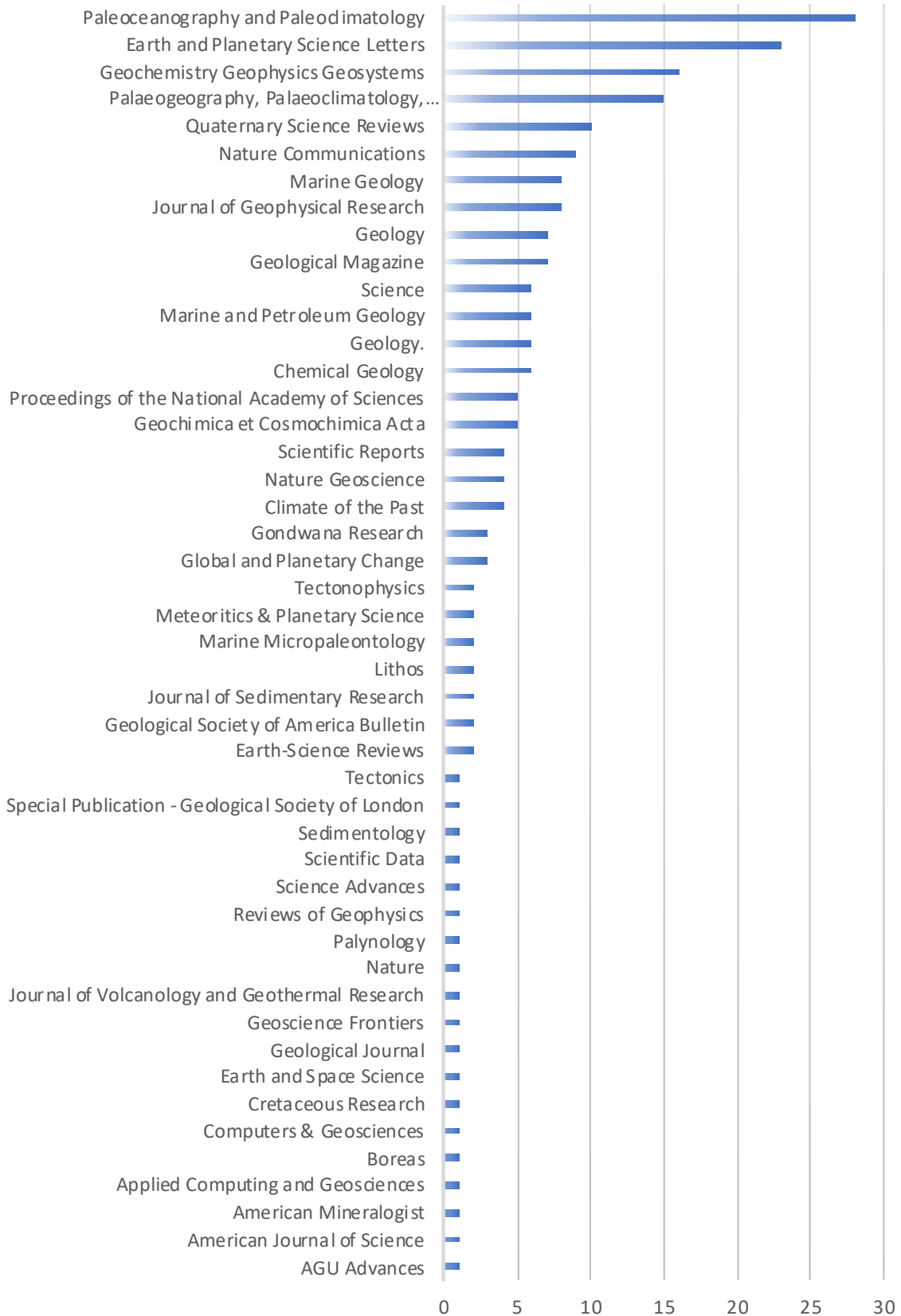
Carlota Escutia - [cescutia@ngr.es](mailto:cescutia@ngr.es)  
ESSAC Delegate





ECORD scientist have contributed to 219 publications that used materials and/or data from DSDP/ODP/IODP expeditions.

## ECORD PUBLICATIONS BY JOURNAL



ECORD publications by journal (n = 219)

1. Bibi, M., M. Wagreeich, S. Iqbal, S. Gier, and I. U. Jan, 2020, Sedimentation and glaciations during the Pleistocene; palaeoclimate reconstruction in the Peshawar Basin, Pakistan. *Geological Journal*.
2. Pittarello, L., L. Ferrière, J.-G. Feignon, G. R. Osinski, and C. Koeberl, 2020, Preferred orientation distribution of shock-induced planar microstructures in quartz and feldspar. *Meteoritics & Planetary Science*.
3. Quandt, D., P. Mischeuz, W. Kurz, S. M. Bernasconi, D. Hippler, K. Krenn, and C. A. Hauzenberger, 2020a, Geochemistry and microtextures of vein calcites pervading the Izu-Bonin forearc and rear arc crust; new insights from IODP Expeditions 352 and 351. *Geochemistry Geophysics Geosystems*.
4. Li, K., L. Li, C. Aubaud, and K. Muehlenbachs, 2020, Efficient carbon recycling at the central-northern Lesser Antilles arc; implications to deep carbon recycling in global subduction zones. *Geophysical Research Letters*.
5. Simpson, S. L., G. R. Osinski, F. J. Longstaffe, M. Schmieder, and D. A. Kring, 2020, Hydrothermal alteration associated with the Chicxulub impact crater upper peak-ring breccias. *Earth and Planetary Science Letters*.
6. Tsang, M.-Y. et al., 2020, Hot fluids, burial metamorphism and thermal histories in the underthrust sediments at IODP 370 Site C0023, Nankai Accretionary Complex. *Marine and Petroleum Geology*.
7. Zorzi, C., J. Matthiessen, and A. de Vernal, 2020, Palynology, biostratigraphy, and paleoceanography of the Plio-Pleistocene at Ocean Drilling Program Site 887, Gulf of Alaska. *Palaeogeography*.
8. Detlef, H., S. M. Sosdian, S. Kender, C. H. Lear, and I. R. Hall, 2020, Multi-elemental composition of authigenic carbonates in benthic Foraminifera from the eastern Bering Sea continental margin (International Ocean Discovery Program Site U1343). *Geochimica et Cosmochimica Acta*.
9. Liu, J., A. Pellerin, G. Antler, S. Kasten, A. J. Findlay, I. Dohrmann, H. Røy, A. V. Turchyn, and B. B. Jorgensen, 2020, Early diagenesis of iron and sulfur in Bornholm Basin sediments. *Geochimica et Cosmochimica Acta*.
10. Casanova-Arenillas, S., F. J. Rodríguez-Tovar, and F. Martínez-Ruiz, 2020, Applied ichnology in sedimentary geology. *Computers & Geosciences*.
11. Collico, S., M. Arroyo, R. Urgeles, E. Gràcia, M. Devincenzi, and N. Pérez, 2020, Probabilistic mapping of earthquake-induced submarine landslide susceptibility in the South-West Iberian margin. *Marine Geology*.
12. Diz, P., A. Cobelo-García, I. Hernández-Almeida, H. Corbí, and S. M. Bernasconi, 2020, Persistent east Equatorial Pacific carbon storage at the middle Pleistocene transition. *Paleoceanography and Paleoclimatology*.
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14. Evangelinos, D. et al., 2020, Late Oligocene-Miocene proto-Antarctic Circumpolar Current dynamics off the Wilkes Land margin, East Antarctica. *Global and Planetary Change*.
15. González-Lanchas, A. et al., 2020, A new perspective of the Alboran Upwelling System reconstruction during the Marine Isotope Stage 11. *Quaternary Science Reviews*.
16. Jimenez-Espejo, F. J. et al., 2020, Late Pleistocene oceanographic and depositional variations along the Wilkes Land margin (East Antarctica) reconstructed with geochemical proxies in deep-sea sediments. *Global and Planetary Change*.
17. Reolid, J., C. Betzler, J. C. Braga, T. Lüdmann, A. Ling, and G. P. Eberli, 2020, Facies and geometry of drowning steps in a Miocene carbonate platform (Maldives). *Palaeogeography*.
18. Rivero-Cuesta, L., T. Westerhold, and L. Alegret, 2020, The Late Lutetian Thermal Maximum (middle Eocene); first record of deep-sea benthic foraminiferal response. *Palaeogeography*.
19. Rodríguez Tovar, F. J., C. M. Lowery, T. J. Bralower, S. P. S. Gulick, and H. L. Jones, 2020, Rapid macrobenthic diversification and stabilization after the end-Cretaceous mass extinction event. *Geology*.
20. Sierro, F. J. et al., 2020, Mediterranean Overflow Over the Last 250 kyr. *Paleoceanography and Paleoclimatology*.
21. Dutilleul, J., S. Bourlange, M. Conin, and Y. Géraud, 2020, Quantification of bound water content, interstitial porosity and fracture porosity in the sediments entering the north Sumatra subduction zone from cation exchange capacity and IODP Expedition 362 resistivity data. *Marine and Petroleum Geology*.
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24. Ferrando, C., K. J. Lynn, V. Basch, B. Ildefonse, and M. Godard, 2020, Retrieving timescales of oceanic crustal evolution at Oceanic Core Complexes. *Lithos*.
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- 27.** Lenard, S. J. P., J. Lavé, C. France-Lanord, G. Aumaître, D. L. Bourlès, and K. Keddadouche, 2020, Steady erosion rates in the Himalayas through late Cenozoic climatic changes. *Nature Geoscience*.
- 28.** Nirrengarten, M., G. Mohn, A. Schito, S. Corrado, L. Gutiérrez-García, S. A. Bowden, and F. Despinois, 2020, The thermal imprint of continental breakup during the formation of the South China Sea. *Earth and Planetary Science Letters*.
- 29.** Nirrengarten, M., G. Mohn, N. J. Kuszniir, F. Sapin, F. Despinois, M. Pubellier, S. P. Chang, H. C. Larsen, and J. C. Ringenbach, 2020, Extension modes and breakup processes of the southeast China-northwest Palawan conjugate rifted margins. *Marine and Petroleum Geology*.
- 30.** Roddaz, M., M. Nauton-Fourteu, R. V. Santos, E. L. Dantas, and G. Calves, 2020, Controls on the provenance of late Eocene to Quaternary Mozambique Channel shales (DSDP 25 Site 242). *Marine Geology*.
- 31.** Rousseau, D.-D. et al., 2020, Dansgaard-Oeschger-like events of the penultimate climate cycle; the loess point of view. *Climate of the Past*.
- 32.** Solaro, C., G. Boudon, A. Le Friant, H. Balcone-Boissard, L. Emmanuel, and M. Paterne, 2020, New insights into the recent eruptive and collapse history of Montagne Pelée (Lesser Antilles Arc) from offshore marine drilling site U1401A (IODP Expedition 340). *Journal of Volcanology and Geothermal Research*.
- 33.** Suc, J.-P., S. Fauquette, S.-M. Popescu, and C. Robin, 2020, Subtropical mangrove and evergreen forest reveal Paleogene terrestrial climate and physiography at the North Pole. *Palaeogeography*.
- 34.** Tribovillard, N., 2020, Arsenic in marine sediments; how robust a redox proxy?. *Palaeogeography*.
- 35.** Albers, E., W.-A. Kahl, L. Beyer, and W. Bach, 2020, Variant across-forearc compositions of slab-fluids recorded by serpentinites; implications on the mobilization of FMEs from an active subduction zone (Mariana Forearc). *Lithos*.
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- 37.** Bergmann, F., T. Schwenk, V. Spiess, and C. France-Lanord, 2020, Middle to late Pleistocene architecture and stratigraphy of the lower Bengal Fan; integrating multichannel seismic data and IODP Expedition 354 results. *Geochemistry Geophysics Geosystems*.
- 38.** Bretschneider, L. et al., 2020, Provenance and weathering of clays delivered to the Bay of Bengal during the middle Miocene. *Paleoceanography and Paleoclimatology*.
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- 42.** Dummann, W., S. Steinig, P. Hofmann, S. Flögel, A. H. Osborne, M. Frank, J. O. Herrle, L. Bretschneider, R. M. Sheward, and T. Wagner, 2020, The impact of early Cretaceous gateway evolution on ocean circulation and organic carbon burial in the emerging South Atlantic and Southern Ocean basins. *Earth and Planetary Science Letters*.
- 43.** Ebert, M., M. H. Poelchau, T. Kenkmann, and B. Schuster, 2020, Tracing shock-wave propagation in the Chicxulub Crater; implications for the formation of peak rings. *Geology*.
- 44.** Fontorbe, G., P. J. Frings, C. L. de la Rocha, K. R. Hendry, and D. J. Conley, 2020, Constraints on Earth System Functioning at the Paleocene-Eocene Thermal Maximum From the Marine Silicon Cycle. *Paleoceanography and Paleoclimatology*.
- 45.** Geilert, S., P. Grasse, K. Wallmann, V. Liebetrau, and C. D. Menzies, 2020, Serpentine alteration as source of high dissolved silicon and elevated  $\delta^{30}\text{Si}$  values to the marine Si cycle. *Nature Communications*.
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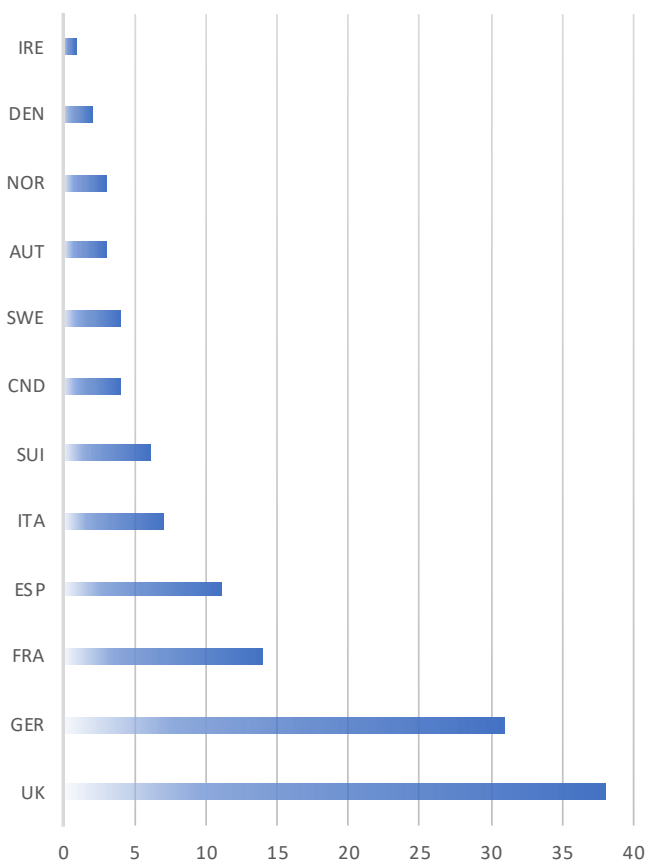
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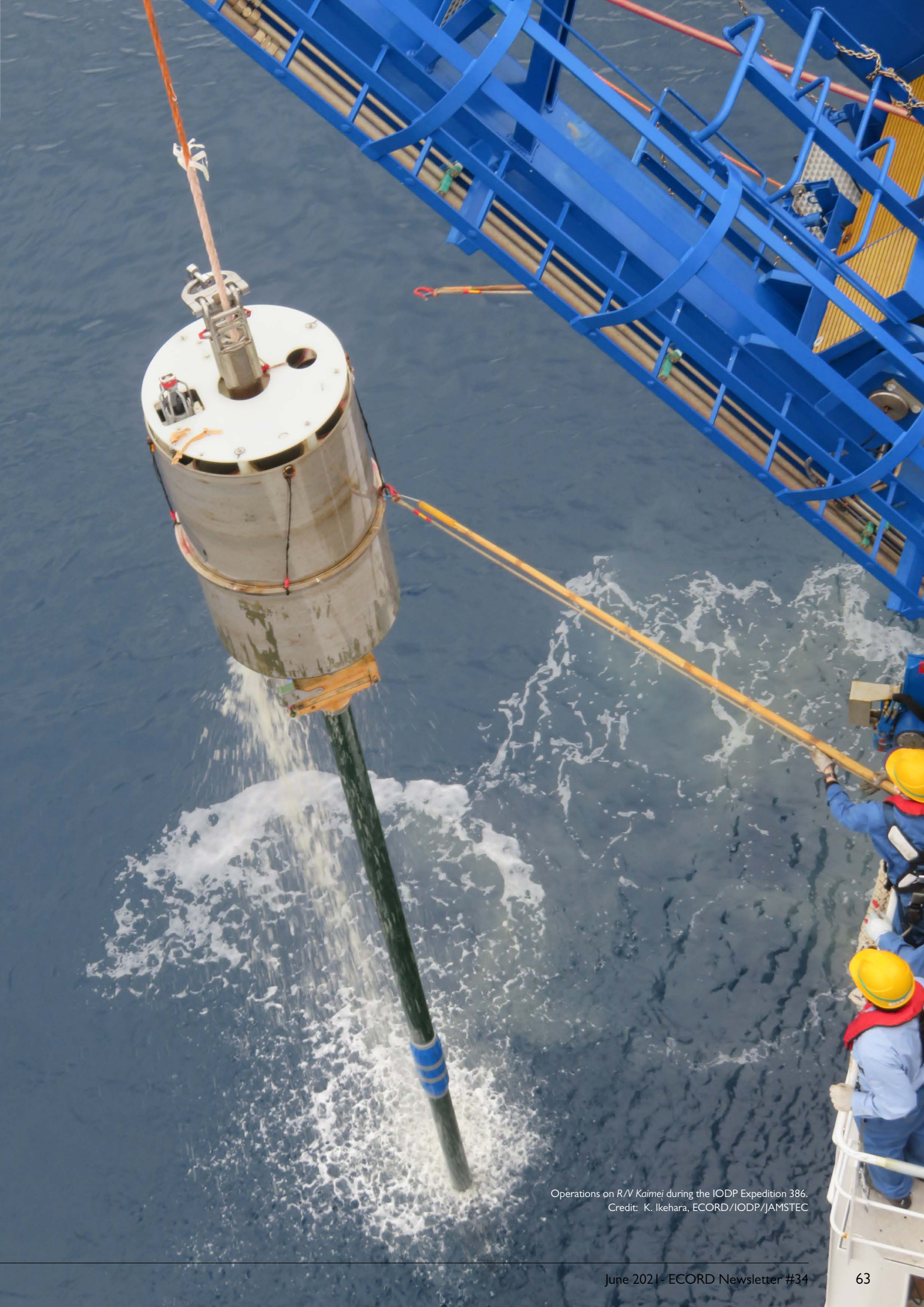
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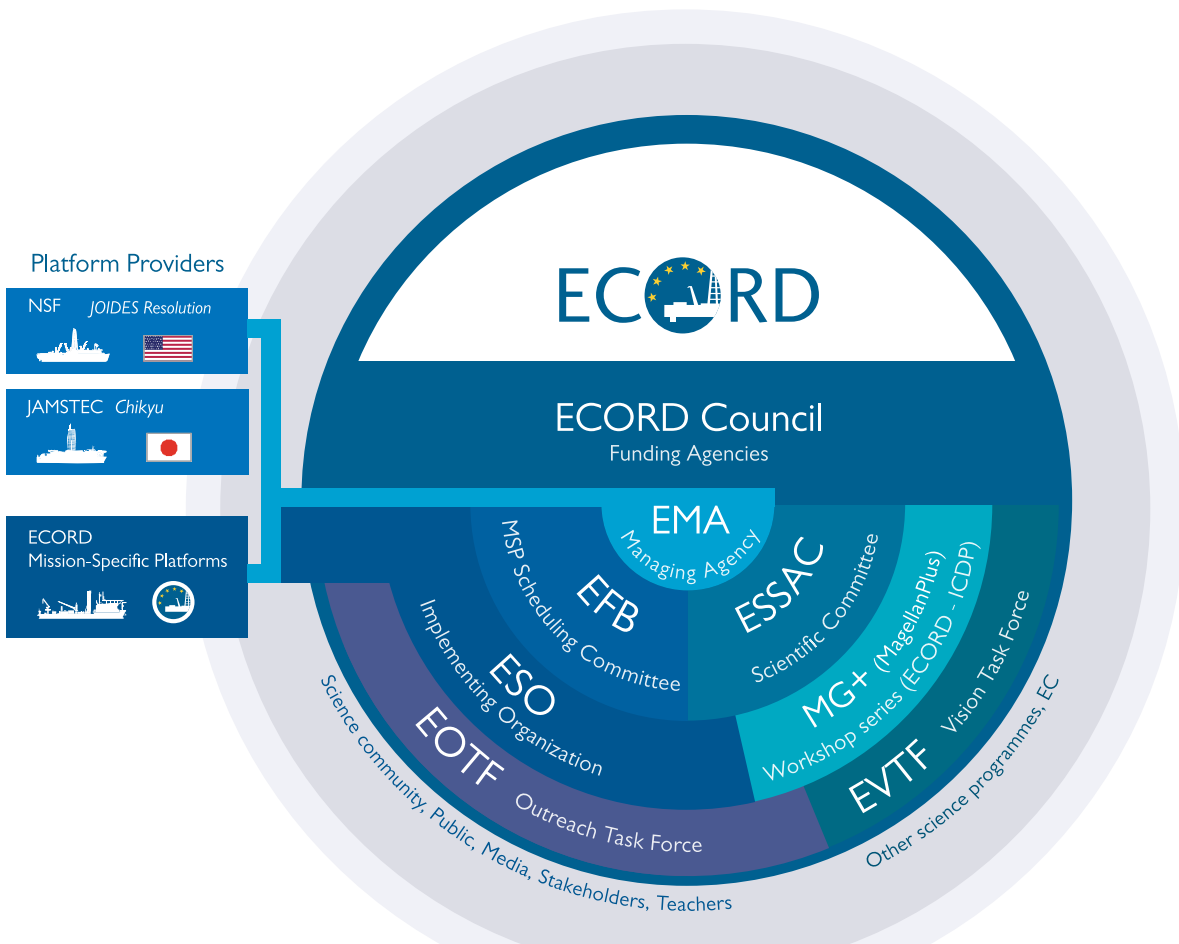


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<b>ACEX:</b> Arctic Coring Expedition	<b>IODP:</b> Integrated Ocean Drilling Program (2003-2013) & International Ocean Discovery Program (2013-2023)
<b>AGU:</b> American Geophysical Union	<b>JAMSTEC:</b> Japan Agency for Marine Earth Science and Technology
<b>AMS:</b> Arctic Marine Solutions	<b>J-DESC :</b> Japan Drilling Earth Science Consortium
<b>ANZIC:</b> Australian and New Zealand IODP Consortium	<b>JOIDES:</b> Joint Oceanographic Institutions for Deep Earth Sampling
<b>ArcOP:</b> Arctic Ocean Paleoceanography, IODP Expedition 377	<b>JR:</b> <i>JOIDES Resolution</i>
<b>BCR:</b> Bremen Core Repository	<b>JRFB:</b> JOIDES Resolution Facility Board
<b>BGR:</b> Bundesanstalt für Geowissenschaften und Rohstoffe - Federal Institute for Geosciences and Natural Resources	<b>JRSO:</b> JOIDES Resolution Science Operator
<b>BGS:</b> British Geological Survey	<b>MarE3:</b> Institute for Marine-Earth Exploration and Engineering
<b>CCOD:</b> Canadian Consortium for Ocean Drilling	<b>MARUM:</b> Zentrum für Marine Umweltwissenschaften der Universität Bremen - Center for Marine Environmental Sciences, University of Bremen
<b>CNR:</b> Consiglio Nazionale delle Ricerche – National Research Council, Italy	<b>mbsf:</b> metres below seafloor
<b>CNRS:</b> Centre National de la Recherche Scientifique - National Center for Scientific Research, France	<b>MCIN:</b> Ministry for Science and Innovation, Spain
<b>DAFSHE:</b> Danish Agency for Science and Higher Education	<b>MeBo:</b> Meeresboden-Bohrgerät - seafloor drill
<b>DFG:</b> Deutsche Forschungsgemeinschaft - German Research Foundation	<b>MEXT:</b> Ministry of Education, Culture, Sports, Science & Technology, Japan
<b>ECORD:</b> European Consortium for Ocean Research Drilling	<b>MINECO:</b> Ministerio de Economía y Competitividad - Ministry of Economy and Competitiveness
<b>EFB:</b> ECORD Facility Board	<b>MoU:</b> Memorandum of Understanding
<b>EGU:</b> European Geosciences Union	<b>MSP:</b> Mission-specific platform
<b>EMA:</b> ECORD Managing Agency	<b>NSF:</b> National Science Foundation, USA
<b>EPC:</b> European Petrophysics Consortium	<b>NWO:</b> Nederlandse Organisatie voor Wetenschappelijk Onderzoek - Netherlands Organisation for Scientific Research
<b>EPSP:</b> Environmental Protection and Safety Panel	<b>ÖAW:</b> Österreichische Akademie der Wissenschaften - Austrian Academy of Sciences
<b>ESO:</b> ECORD Science Operator	<b>OSP:</b> Onshore Science Party
<b>ESSAC:</b> ECORD Science Support and Advisory Committee	<b>OTF:</b> Outreach Task Force
<b>EVTF:</b> ECORD Vision Task Force	<b>PI:</b> Principal Investigator
<b>FB:</b> Facility Board	<b>PMO:</b> Program Member Office
<b>FCT:</b> Fundação para a Ciência e a Tecnologia - National Funding Agency for Science and Technology	<b>SEP:</b> Science Evaluation Panel
<b>FNS:</b> Fonds National Suisse de la Recherche Scientifique - Swiss National Science Foundation	<b>SPRS:</b> Swedish Polar Research Secretariat
<b>FY:</b> Fiscal Year	<b>UKRI:</b> UK Research and Innovation
<b>GPC:</b> Giant Piston Corer	<b>VR:</b> Vetenskapsrådet - Swedish Research Council
<b>GSI:</b> Geological Survey of Ireland	
<b>ICDP:</b> International Continental Scientific Drilling Program	
<b>IKC:</b> In-kind contribution	



Operations on R/V *Kaimei* during the IODP Expedition 386.  
Credit: K. Ikehara, ECORD/IODP/JAMSTEC




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