



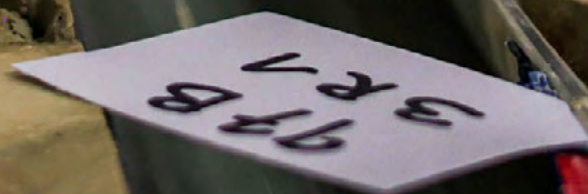
European Consortium for
Ocean Research Drilling

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NEWSLETTER



International
Ocean
Drilling
Programme



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The International Ocean Discovery Program (**IODP**) - 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 - 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; and the Korea Institute of Geoscience and Mineral Resources (KIGAM).

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Cover photo: Cores splitted during the Onshore Science Party for IODP Expedition 389, Bremen Core Repository, MARUM.
Credits: M. Parker, ECORD/IODP.



Gilbert Camoin



Annalisa Iadanza



Nadine Hallmann

Ending the International Ocean Discovery Program

The International Ocean Discovery Program has now entered its last year as it will end on 30 September 2024 instead of 30 September 2023 as initially planned. This additional year has therefore needed the extension of all Memoranda of Understanding (MoU) and contracts concerning ECORD and its partners.



An addendum to the 2019-2023 ECORD MoU has been signed by all ECORD members between October 2023 and March 2024. In parallel, the ECORD Council has also decided two years ago to extend the current terms of the different ECORD entities and their Chairs/Directors through 2025: the ECORD Managing Agency (hosted by the Centre National de la Recherche Scientifique – CNRS), the ECORD Science Operator (hosted by the British Geological Survey – BGS - in Edinburgh), the ECORD Science Support and Advisory Committee (hosted by the National Institute of Oceanography and Experimental Geophysics – OGS - in Trieste) and the Bremen Core Repository (hosted by the MARUM at the University of Bremen). The ECORD Council observed that the current ECORD entities are fit for purpose and are working very well. No significant changes in the management and functioning of these entities are currently requested.

The signature of the 2024 addendum to the 2019-2023 ECORD MoU was necessary to consider the extension of the MoUs between ECORD and its partners, NSF and JAMSTEC, to allow ECORD scientists to participate to expeditions implemented by the *JOIDES Resolution* (JR) and *Chikyu*. In 2024, ECORD will provide half of its regular annual contribution to NSF (3.5 M\$) and 1 M\$ to JAMSTEC. Over the last months, ECORD has negotiated an MoU with NSF for the period from 1 October 2023 to

30 September 2029 regarding the storage and archiving of NSF-owned cores recovered from previous ocean drilling programmes at the IODP Bremen Core Repository (BCR) at MARUM, University of Bremen in Germany. These cores will continue to be stored, archived, and sampled at the BCR at no cost to NSF and remain available for scholarly studies, e.g. investigations on legacy material (cores and data), sampling, and education, to all global scientists following guidelines approved by the *JOIDES Resolution* Facility Board. It is the intention of all current IODP members to preserve the core distribution amongst the three repositories (BCR, Gulf Coast Repository and Kochi Core Center) and to maintain the continuity of core and data legacies to better serve the needs of the global science community.

The 2024 ECORD budget is with 15.6 M\$ the lowest one in the past 15 years due to decreased contributions from several members, especially France and Norway. The launch of IODP³ on 1 January 2025, in which ECORD will play a pivotal role, will require the full mobilization of the ECORD funding agencies to ensure a sufficient cash flow in the new programme.

The ECORD Council has decided to fund the activities of the new IODP³ Science Office (IODP³-SO), which will be based at the University of Plymouth, UK, with Antony Morris (University of Plymouth, UK) and Nobu Eguchi (JAMSTEC/MarE3, Japan) as Joint Directors of the new IODP³-SO for the first five years of IODP³ (2025–2029). This is the first IODP³ entity to be funded and to start its activities and protocols on 1 May 2024, before the launch of the programme on 1 January 2025 (*see page 8*).

IODP³ logo

The outreach teams of ECORD and JAMSTEC/MarE3 decided on the final version of the logo for IODP³ (cubed).

The author of the logo design is **Jež Everest** (ESO BGS)



International
Ocean
Drilling
Programme

IODP expeditions in FY2024

The three IODP platform providers initially planned to operate simultaneously in 2024 for the last year of the current programme. Unfortunately, the IODP MSP Expedition 406: New England Shelf Hydrogeology (Co-chief Scientists: Brandon Dugan, USA and Karen Johannesson, USA) has been postponed due to a lack of a suitable coring system/platform for summer 2024 (see below).

Mission-specific platform expeditions

IODP Expedition 389 Hawaiian Drowned Reefs



The Onshore Science Party of IODP MSP Expedition 389: Hawaiian Drowned Reefs (Co-chief Scientists: Jody Webster, ANZIC and Christina Ravelo, USA) has been held in February 2024. This expedition aims at generating a record of sea-level change and associated climate variability during several controversial and poorly understood periods over the last 500 kyrs (see page 18).

IODP Expedition 406 New England Shelf Hydrogeology

The ECORD Facility Board has decided to re-schedule the implementation of Proposal 637: New England Shelf Hydrogeology in 2025. The current Science Party will be preserved, despite the implementation of the expedition during the first year of the International Ocean Drilling Programme (IODP³). ESO has re-issued a tender call for this expedition. Following a proposition from EMA, NSF has accepted to co-fund this expedition, which will then be organized as an IODP³-NSF 'hybrid' expedition. The Science Party membership will be adapted to this new funding scenario. The objectives of this expedition are to determine the origin and volume of offshore freshwater in the subsurface of the New England Shelf that will lead to a better understanding of this hydrogeological phenomenon worldwide (see page 21).

JOIDES Resolution and Chikyu expeditions

Three expeditions will have been implemented by the *JOIDES Resolution* (JR) in the last year of the current programme:

IODP Expedition 401 Mediterranean-Atlantic Gateway Exchange

IODP Expedition 401: Mediterranean-Atlantic Gateway Exchange (Co-chief Scientists: Rachel Flecker, ECORD-UK and Emmanuelle Ducassou, ECORD-France) is the first Land-to-Sea Transect (L2S) implemented by IODP and aims at investigating Miocene Mediterranean-Atlantic Gateway Exchange (IMMAGE) to recover a complete record of Atlantic-Mediterranean exchange from its Late Miocene inception to its current configuration.

IODP Expedition 402 Tyrrhenian Continent-Ocean Exchange

IODP Expedition 402: Tyrrhenian Continent-Ocean Exchange (Co-chief Scientists: Nevio Zittellini, ECORD-Italy and Alberto Malinverno, USA) aims at testing continent-ocean transition (COT) formation models by drilling.

IODP Expedition 403 Eastern Fram Strait Paleoarchive

IODP Expedition 403: Eastern Fram Strait Paleoarchive (Co-chief Scientists: Renata Giulia Lucchi, ECORD-Italy and Kristen St John, USA) has the objective to investigate the area around Svalbard, which is very sensitive to climatic variability and can be considered as a "sentinel of climate change."

Proposals supporting these expeditions were led by ECORD scientists.

IODP Expedition 404

Arctic-Atlantic Gateway Paleoclimate

IODP Expedition 404: Arctic-Atlantic Gateway Paleoclimate supported by proposal 979 (Principal Investigator: Wolfram Geissler, ECORD-Germany), which was initially scheduled in September and October 2024, has been cancelled due to the demobilization of the JR. EMA has initiated discussions with NSF regarding a potential re-scheduling of this expedition with substantial additional ECORD funding, but for a variety of reasons along with several other internal considerations at JRSO and TAMU, adding Expedition 404 back to the schedule at this late date was not feasible.

Expedition 405

Japan Trench Tsunamiogenesis – JTRACK

Chikyu will implement IODP Expedition 405: Japan Trench Tsunamiogenesis – JTRACK, which will be the last expedition of the International Ocean Discovery Program, from 12 September to 7 December 2024 (Co-chief Scientists: Suishi Kodara, Japan, Marianne Conin, ECORD-France, Christine Regalla, USA, Patrick Fulton, USA, Kohtaro Ujiie, Japan and Jamie Kirkpatrick, ECORD-Canada). This expedition aims at exploring what controls shallow slip during great earthquakes and will be focused on drilling into the Japan Trench subduction zone. The second transect of this expedition will access the fault zone in the region of large, shallow slip observed during the 2011 Tohoku-oki earthquake.

Forward look

Over the last months, all ECORD entities have been heavily involved in the planning of the International Ocean Drilling Programme (IODP³). The documents that will support both the MoU/Agreement between ECORD and JAMSTEC and the organization of the whole programme and its partnership have been finalized after a retreat of the IODP³ Planning Group in September 2023 and several virtual meetings until

February 2024. These documents have been sent to the CNRS and JAMSTEC legal departments who will start soon to draft the MoU/Agreement between ECORD and JAMSTEC. The section 'The International Ocean Drilling Programme: IODP³' provides an overview of the status of this programme that will start on 1 January 2025, immediately after the end of the International Ocean Discovery Program.

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Director of the ECORD Managing Agency

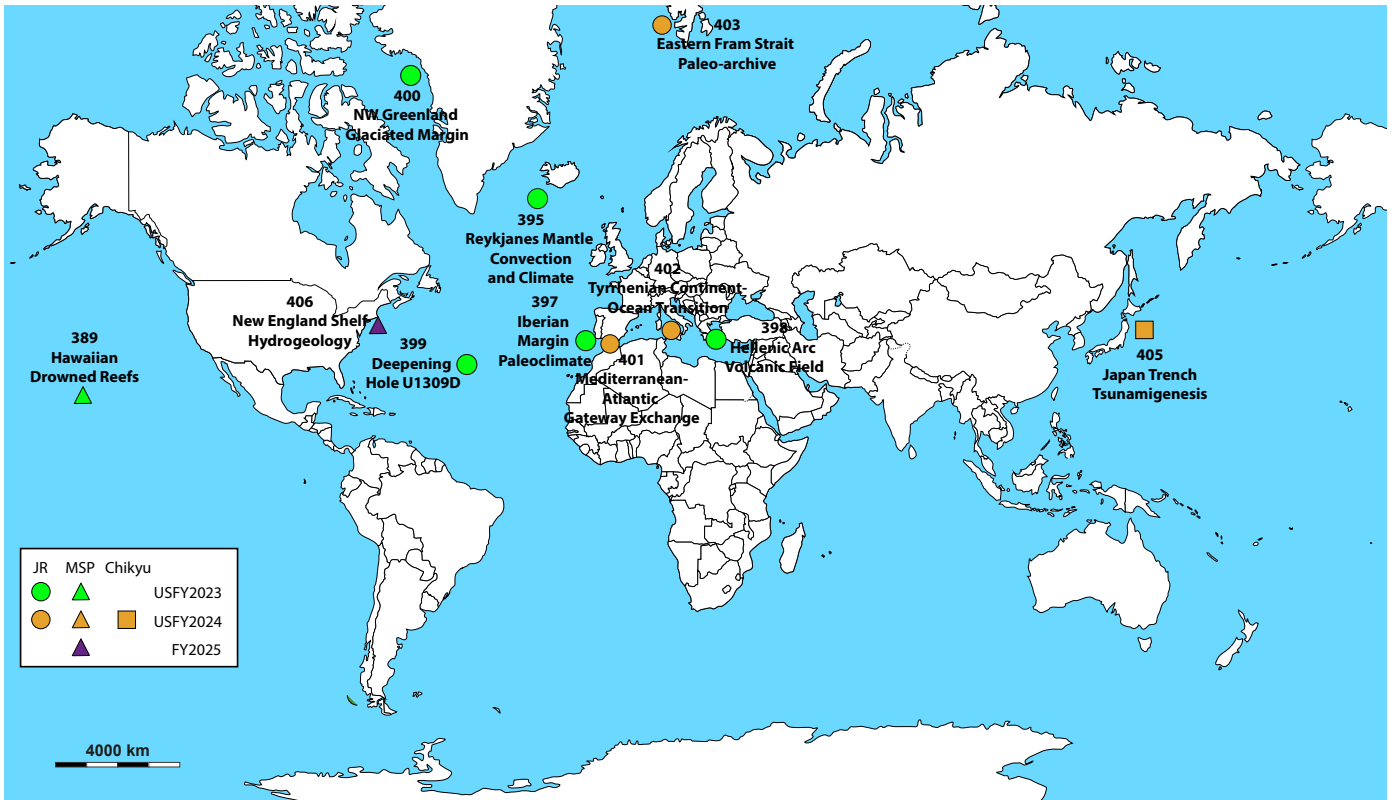
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More info: <https://www.ecord.org>

IODP expeditions 2023-2025



Expedition Name	#	Dates	Ports	Operator
Iberian Margin Paleoclimate	397	Oct. 11 – Dec. 11, 2022	Lisbon / Tarragona	JRSO
Hellenic Arc Volcanic Field	398	Dec. 11, 2022 – Feb. 10, 2023	Tarragona / Heraklion	JRSO
Building Blocks of Life, Atlantis Massif	399	April 12 – June 12, 2023	Ponta Delgada / Ponta Delgada	JRSO
Reykjanes Mantle Convection and Climate	395	June 12 – Aug. 12, 2023	Ponta Delgada / Reykjavik	JRSO
NW Greenland Glaciated Margin	400	Aug. 12 – Oct. 12, 2023	Reykjavik / Reykjavik	JRSO
Hawaiian Drowned Reefs	389	Aug. 31 – Oct. 31, 2023	Barbers Point Harbor, Hawaii	ESO
Mediterranean-Atlantic Gateway Exchange	401	Dec. 10, 2023 – Feb. 9, 2024	Amsterdam / Napoli	JRSO
Tyrrhenian Continent-Ocean Transition	402	Feb. 9 – Apr. 8, 2024	Napoli / Napoli	JRSO
Eastern Fram Strait Paleo-archive	403	June 4 – Aug. 2, 2024	Reykjavik / Reykjavik	JRSO
Japan Trench Tsunamigenesis	405	Sept. 12 - Dec. 7, 2024	Shimizu / Shimizu	MarE3
New England Shelf Hydrogeology	406	TBD 2025	TBD	ESO

Outgoing ECORD staff

Alex Wülbers

Curation & Logistics
MARUM,
University of Bremen

(retired Feb 2024)



Alex Wülbers has retired and left the Bremen Core Repository group at MARUM - Center for Marine Environmental Sciences at the University of Bremen by the end of February. With Walter Hale he was one of two staff members at the time of the BCR's founding by Gerold Wefer in 1994.

Alex was responsible for Curation and Logistics since the opening of the Bremen Core Repository in July 1994, and with his dedication and good humor he has done extraordinary contributions to a very pleasant atmosphere in the core repository's sampling laboratory as well as during expeditions. He was involved in all ten ECORD

MSP expeditions. We thank him for so many years of hard work and contribution to the ocean drilling programmes, very successful collaborations and wish him all the best on his retirement.

Photo credit: M. Parker, ECORD/IODP.

Simon Draper

EPC Project Manager,
University of Leicester

(retired Jan 2024)



Simon Draper, Project Manager, based at the University of Leicester, retired on the 10 January 2024 after 14 years of working within the European Petrophysics Consortium, supporting colleagues at Montpellier and Aachen, and working with our ECORD Science Operator partners at the British Geological Survey and Bremen Core Repository at MARUM.

During his time working with IODP, Simon made a huge contribution to the work of the EPC, joining in January 2010, just ahead of mobilisation for IODP Expedition 325: Great Barrier Reef Environmental Changes. Simon has been integral to supporting the staff providing scientific and technical support for downhole logging and core

petrophysics in a further six ECORD mission-specific platform expeditions. Simon supported colleagues from Leicester, Montpellier and Aachen who participated as Logging Scientists on JR expeditions and on *Chikyu* operations as part of the International Scientific Logging Consortium. Simon was a key team member delivering the four in-person Petrophysics Summer Schools 2016-2019 and the online versions in 2021 and 2022 as it became the Downhole Logging for IODP Science Summer School.

Simon was a member of the ECORD Science Operator management team and represented ESO EPC at the ECORD Facility Board from 2018. IODP is not a 9-5 endeavour and Simon has been incredibly dedicated to his role in the European Petrophysics Consortium. It is difficult to imagine the project without his efficient support and advice.

Incoming ECORD staff

Oliver Blaszczyk

Bioinformatician
MARUM,
University of Bremen

(started Jan 2023)



Oliver T. Blaszczyk has joined the Bremen Core Repository group at MARUM – Center for Marine Environmental Sciences, University of Bremen. After an early phase of working for Computer and IT services companies, he studied biology at the University of Bremen. Oliver received a Bachelor in Biology, and successfully completed a Training as an IT specialist for system integration at the ZARM (Center of Applied Space Technology and Microgravity), University of Bremen. Oliver enjoys working at the interface between science, technology and IT.

Nina Rohlfs

Curation & Logistics
MARUM,
University of Bremen

(started Oct 2023)



Nina Rohlfs has joined the Bremen Core Repository group at MARUM – Center for Marine Environmental Sciences, University of Bremen. Nina got her Bachelor in Geosciences at the University of Bremen and gained a lot of experience as a student assistant in the BCR for several years. In this phase she also was part of the ESO Bremen team during the Onshore Science Parties for IODP Exp. 357, Exp. 364 and Exp. 381. She obtained a master's degree in marine geosciences and subsequently worked for various projects as a technician and scientist, deepening her detailed knowledge of sample processing, microscopy, laboratory and work at sea, and namely data management. She particularly appreciates the variation of tasks - including ship

expeditions - and the focused, productive atmosphere in the core repository laboratories, as well as the frequent interaction with visiting scientists from all over the world.

Photo credit: M. Parker, ECORD/IODP.

The International Ocean Drilling Programme:



Gilbert Camoin



Nobu Eguchi



Principles of the International Ocean Drilling Programme - IODP³

The end of the International Ocean Discovery Program on 30 September 2024 will mark major changes in the organization of international activities related to scientific ocean drilling.

After decades of unified international programmes, from DSDP to the current IODP, post-2024 scientific ocean drilling initiatives will see a transition from a single international programme operated by independent platform providers to independent ocean drilling programmes.

ECORD and Japan, who have advocated for the continuation of a single international programme, intend to continue providing scientific ocean drilling opportunities post-2024 to the international scientific community, based on their well-established infrastructures, competitiveness in the international research landscape and maximum scientific return from investment.



Through a two-year long process of exchange of views and ambitions, ECORD and Japan agreed to build a joint scientific ocean drilling programme: the International Ocean Drilling Programme - IODP³ (IODP-cubed).

IODP³ will consist of an international scientific collaboration addressing important questions in Earth, Ocean, Environmental and Life sciences described in the 2050 Science Framework, based on the study of rock and/or sediment cores, borehole imaging, in-situ observatory data, and related geophysical imaging obtained from the seafloor.

IODP³ will adopt a transparent, open, flexible, and international modus operandi, programme-wide standard policies and guidelines, sustainable management, and publicly accessible knowledge-based resources. IODP³ will adopt the 2050 Science Framework Enduring Principles.

Objectives and organization of the International Ocean Drilling Programme - IODP³

IODP³ investigations will be based on research proposals that address the objectives of the 2050 Science Framework, or other outstanding new research ideas.

IODP³ will implement and fund:

- Offshore expeditions following an expanded Mission Specific Platform (MSP) concept.
- Scientific Projects using Ocean Drilling ARchives (SPARCs) that are international and multidisciplinary projects that have objectives originating from or that are based on ocean drilling archives.

Drilling and SPARC proposals will be submitted with a bottom-up process to the IODP³ Science Office by teams of proponents belonging to the international research community.

The primary responsibility of the Science Evaluation Panel (SEP) is to evaluate all proposals submitted to IODP³ in a fair, open, and transparent manner, in terms of both scientific excellence and completeness and quality of the site characterization data packages. The SEP will be composed of top international experts selected through competitive calls.

The Safety and Environment Advisory (SEA) Group will be an advisory body to the MSP-FB, SEP and IODP³ Operators and will provide independent advice regarding potential safety and environmental issues associated with the general and specific geological settings of proposed IODP³ drill sites.

The SEP and the SEA Group will be logistically supported by the IODP³ Science Office and serve all the platforms employed by the programme. IODP³ drilling expeditions and SPARCs

will be scheduled by the MSP Facility Board based on their scientific merit and operational constraints within the limits of the available resources.

The IODP³ Executive Board (ExB) will be the IODP³ entity responsible for assuring effective decision-making and overseeing the programme.

The Magellan³ Workshops will be designed to support scientists from IODP³ and ICDP members in developing new and innovative scientific drilling proposals and SPARCS that meet the ambitions of the 2050 Science Framework and/or the ICDP Science Plan 2020-2030 by funding or co-funding workshop proposals and travel grants.

IODP³ will include two task forces:

1. **the Vision Task Force** will be in charge of developing a long-term scientific and funding strategy, and
2. **the Communication Task Force** will be in charge of programme-wide communication activities.

MSP expeditions

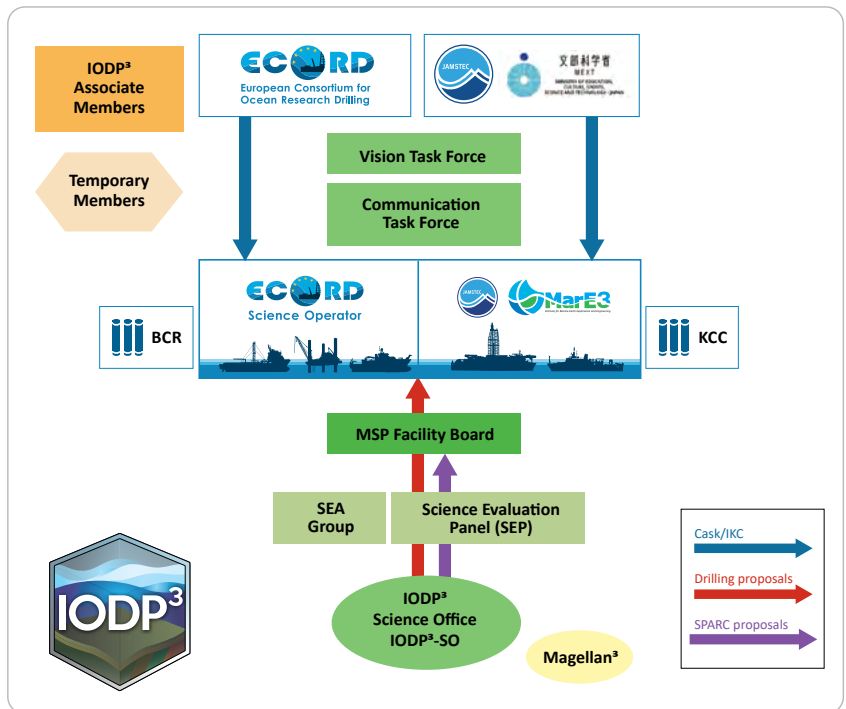
IODP³ drilling expeditions will be implemented by the MSP Operators, ESO and/or JAMSTEC-MarE3, following the MSP concept. This concept will be an expanded Mission Specific Platform (MSP) concept by diversifying drilling and coring technologies - riserless and riser drilling, giant piston coring - and applying them to all drilling environments, as determined by scientific priorities, operational efficiency, and better value for money. *D/V Chikyu* and *R/V Kaimei* are identified as MSP facilities that are crucial facilities for the successful implementation of the 2050 Science Framework.

Land-to-Sea Transects (L2S), requiring scientific drilling at both onshore and offshore sites or at shallow marine sites to be implemented jointly with the International Scientific Continental Drilling Program (ICDP) are one of prime objectives for IODP³.

The duration of IODP³ expeditions will be flexible and be determined by scientific requirements and available funds. IODP³ drilling expeditions will be scheduled by the MSP Facility Board based on their scientific merit and operational constraints within the limits of the available resources.

IODP³ expeditions are intended to have no significant environmental impact, and they are carried out in conformance with the highest accepted levels of environmental sensitivity.

IODP³ expeditions will be undertaken by international teams of scientists - Science Party - selected by the MSP Operator(s) and Co-chief Scientists, based on recommendations made by Program Member Offices (PMOs). Staffing decisions



will consider, as far as possible, the goal of achieving the maximum diversity of gender, career stage, nationality, disciplinary, cultural in science parties.

The size of expedition Science Parties will be flexible and be determined by scientific requirements.

IODP³ will include the services provided by the current IODP core repositories in Bremen (BCR) and Kochi (KCC).

IODP³ will provide open access to all expedition samples and data once the expedition Science Party members have had the opportunity to complete the initial studies within the established moratorium period, typically one year. After the expiration of the moratorium period, the programme will make samples, cores, and data available to any scientist, in accordance with the IODP³ Samples, Data and Obligations Policy following the FAIR data principles.

Scientific Projects using Ocean Drilling ARCHives (SPARCs)

The IODP³ "Scientific Projects using Ocean Drilling Archives" (SPARCs) provide a mechanism for the international scientific ocean drilling community to propose new large-scale projects that may address any aspect of the '2050 Science Framework' and involving interdisciplinary collaborations.

SPARCs will have objectives that maximise the return on the legacy assets (i.e. cores, samples, and data from current and past scientific ocean drilling programmes) without new drilling or other operations at sea.

SPARCs will address globally significant processes/problems and use innovative, creative, and multidisciplinary approaches that could include, for example, the production

of large new datasets from samples, integration of data across multiple expeditions and/or multiple boreholes, and/or the application of new methods or technologies (e.g., AI, “big data” approaches) that were not available when the legacy assets were collected. The scientific ambition of SPARC projects should far exceed that of standard requests for samples or data as they are intended to provide a new avenue to facilitate collaboration at scales larger than conventional single or multi-proponent sample requests. In parallel, standard requests for samples and data may be submitted at any time.

Each SPARC will have a funded duration of three years and will receive €300,000 for its implementation. SPARC proposals should have a maximum of five co-proponents. All co-proponents of a funded SPARC will automatically become Science Party members (with two selected as Co-Chief Scientists), but the remaining Science Party members will be selected following an open call for applications. The overall size of the final Science Party for a SPARC is flexible and can be adapted to project needs but will normally consist of a minimum of 15 scientists, with no fixed upper limit.

IODP³ Partnership

Core Members

As Platform Providers, ECORD and Japan will be the IODP³ Core Members.

Associate Members and Temporary Members

International governmental and non-governmental entities not regularly providing scientific ocean drilling platform(s) to IODP³ can become Associate Members by making annual cash contributions to IODP³ (on the order of 1 M€) or as Temporary Members by providing cash and/or project-based in-kind contributions (IKC) (with a minimum of 0.5 M€) to access IODP³ expedition(s). ANZIC and India already sent letters of interest to become IODP³ Associate Members.

IKC and/or cash contributions from any IODP³ member or non-member country/institution are potentially acceptable to fund offshore expeditions. IKCs may include essential scientific or operational services that the IODP³ would normally pay for, fully/partly funded drilling platforms, support vessels, hazard site survey (if required), permitting assistance, onshore facilities near drill sites (if required), ice management, and remote logistical assistance etc.

IODP³ will set up an overarching Scientific Drilling Forum as a venue for exchanging ideas, views and information between all international research programmes that employ scientific drilling to explore Earth and planetary processes.

Forward look

Based on the well-established operation of the ECORD and JAMSTEC infrastructures, their successful implementation, their competitiveness in the international research landscape and maximum return from investment, a bright future is promised to the international communities and ECORD and Japan in their intentions to play a prominent role in post-2024 scientific ocean drilling.



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Harue Masuda – J-DESC
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Tomo Morishita – J-DESC
Tony Morris – ESSAC
Sanny Saito – J-DESC
Ursula Röhl – ESO-BCR
Yuki Morono – J-DESC
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See “The International Ocean Drilling Programme (IODP³) is ready to be launched“:
<https://www.ecord.org/ecord-headlines-24/>



Core description during the Onshore Science Party of IODP Expedition 389, Bremen Core Repository, MARUM, Germany. Credits: M. Parker, ECORD/IODP.

Introducing the IODP³ Science Office

Appointed IODP³ Science Office Directors:

Antony Morris (UK) and **Nobu Eguchi** (Japan)

Location of the IODP³ Science Office:

University of Plymouth, UK



Antony Morris
(University of Plymouth, UK)



Nobu Eguchi
(JAMSTEC/MarE3, Japan)



The International Ocean Drilling Programme (IODP³) will begin in January 2025, succeeding the current International Ocean Discovery Program that ends in 2024. IODP³ will be led jointly by ECORD and JAMSTEC as Core Members and involve collaboration and partnership with other non-platform-providing ocean drilling research entities or consortia as Associate and Temporary Members.

On 18 September 2023, ECORD and Japan opened a call for expressions of interest from senior scientists based in IODP³ Core Member nations to lead and host the new IODP³ Science Office (IODP³-SO).

An external committee thoroughly evaluated the applications received and recommended the appointment of **Professor Antony Morris** (University of Plymouth, UK) and **Dr Nobu Eguchi** (JAMSTEC/MarE3, Japan) as joint Directors of the new Science Office for the five first years of IODP³ (2025–2029). It will be based at the University of Plymouth.

The IODP³-SO will begin its activities in May 2024 to provide a start-up period for establishing IT systems, workflows, and protocols prior to the launch of IODP³ on 1 January 2025. During this period, the IODP³-SO will also interact with the

The IODP³-SO will:

- Implement a programme-wide application portal for all aspects of IODP³ activities including calls for expedition participation, panel and board membership, training events, scholarships, and grants.
- Develop and maintain a database management system for community-led drilling proposals and their evaluation, together with an associated site survey data bank, accessible to Science Evaluation Panel (SEP) members and other IODP³ entities.
- Develop and implement an online, open-access publication system for IODP³ expedition-related reports, including associated editorial and reviewing processes, and maintain an expedition-based bibliographic database.



The Portland Square Building on the University of Plymouth campus, home of the new IODP³ Science Office

current IODP Science Support Office to ensure a smooth transition between the two programmes. A review of the IODP³-SO will be conducted in the first quarter of 2029 by the IODP³ Executive Board to guide a decision to either re-compete or renew the contract for a second five-year period (2030–2034).

- Provide logistical support for the SEP, the Mission-Specific Platform Facility Board (MSP-FB), and the Scientific Drilling Forum.
- Gather and analyze data (statistics and metrics) aimed at monitoring and improving equality, diversity, and inclusion within IODP³, and propose measures to further facilitate an inclusive culture in scientific ocean drilling.
- Design and maintain the IODP³ website that will act as the primary source of programmatic information for the international scientific ocean drilling research community.

Joint vision of the IODP³-SO Directors

Here, our newly appointed IODP³-SO Directors outline their joint vision for delivery of some core aspects of this wide mandate within the new programme.

“We are honoured to have been selected to lead the IODP³-SO and to be given this opportunity to serve the scientific ocean drilling community in this new capacity. Our bid to host the office was inspired by our belief that the needs of the various IODP³ entities and the wider international scientific community would be best met by a Science Office co-led by ECORD and Japan and fully aware of the need for cultural competency in our activities.

We have a strong working relationship, developed through many years of close cooperation, and share a common vision for ensuring the success of the IODP³-SO. This involves finding cost-effective and novel solutions to deliver the IODP³-SO mandate, against a backdrop of rising costs and flat budgets in the scientific sector as a whole.

One of our first priorities is the development of a new “[Global Application Portal](#)” for IODP³ that will provide a single web interface for the scientific community to engage with the programme, and help to streamline its management and review processes. To achieve this, we will be working with a team at Maas Software Engineering B.V. (The Netherlands) to modify their Marine Facilities Planning (MFP) software to manage submission and evaluation processes for IODP³. The modular MFP web-based program was developed with support from NERC and NIOZ and can be custom-tailored for different needs. By leveraging these investments from research organizations in ECORD countries, we can benefit from a mature, cost-effective software solution, constructed by a team of expert developers. The system will use Azure (Microsoft’s cloud computing platform), ensuring secure and stable storage of data that is compliant with the EU’s GDPR laws.

Our own, dedicated IODP³-SO IT developers will be charged with designing and implementing a [new Site Survey Database](#) (SSDB) system. We are delighted that Prof. Christian Berndt (Head of the Research Unit in Marine Geophysics, GEOMAR, Kiel, Germany) has agreed to act as an independent

consultant during the development, implementation and testing of this new SSDB. Christian and his team have recently been reviewing seismic data handling protocols and systems for the research community. His involvement will help ensure that IODP³ benefits from the latest developments in this dynamic field, such as metadata standardization and application programming interfaces (APIs) for seismic data interchange.

Finally, the new IODP³-SO will also be responsible for [publications](#) resulting from expeditions and legacy asset projects (via the new SPARC scheme), consisting of equivalents of the familiar IODP Scientific Prospectuses, Preliminary Reports, Proceedings volumes, and Data Reports. This aspect of our mandate falls outside the traditional responsibilities of SO-equivalents in previous programmes and therefore requires a novel and radical new solution. We’re delighted, therefore, to be launching a new open-access journal with Copernicus Publications later this year. This will allow us to benefit from the expertise of the highly experienced Copernicus team of full-time professional publication specialists, requiring only minimal staffing within the IODP³-SO itself. The Copernicus business model is based solely on page charges (to be met from the IODP³-SO budget), making our publications very cost-effective as annual costs will be directly proportional to the quantity of output in each year. The services provided by Copernicus will also include typesetting and layout, image processing of figures, copy-editing, delivery of metadata to major databases and search engines, and e-archiving (ensuring the long-term security of outputs).

We look forward to establishing our new team over coming months and to working with our IODP³ friends and colleagues around the world as we enter this exciting and challenging period of change for the international scientific ocean drilling community.”

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ECORD, UK

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MarE3-JAMSTEC



International
Ocean
Drilling
Programme

Letter from the IODP Forum Chair



Henk Brinkhuis

Aloha ECORD & IODP community!

"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, ..."

Charles Dickens

This famous quote – from Charles Dickens' novel, *A Tale of Two Cities*, as I am sure many of you know – comes to (my) mind when contemplating the demise of IODP II, and the birth of IODP³, and perhaps, hopefully, more initiatives. At least it does to me, and I think likely many of you out there as well. Which scientific ocean drilling program or programs will the future hold? We surely had the best of times over the past decade or so, with the JR in full flow, and other platforms to top it all off. And, well, the 'worst of times' now associated with the demise of the 'Great Ship'. Or at least that is how it seems at this stage. And an indetermined future of the 'program of programs'...

Aspects of the transition into IODP³ and related issues were (and still are) very much on the agenda of the IODP Forum, also when we gathered late last year in Wollongong, Australia. Kindly hosted by our ANZIC colleagues (*see photo below and on the next page*), we e.g., dealt with 'the conclusion of IODP II', and had a day of presentations dealing with the status of the various developments concerning potential new program(s), positions of the various funding agencies, notably NSF, but also when, and if, the role of the JR really would come to an end. For consensus statements, please check <http://iodp.org>.

The IODP Forum meeting in Wollongong, Australia, October 2023.
Credits: H. Brinkhuis ECORD/IODP.



As mentioned last time, a new initiative at/of the FORUM taken last year (as the custodian of the IODP science plan) was a general check for (scientific and logistic) 'lessons learned' and remaining (scientific) challenges after IODP II and its science plan. This including potential (even far-field) linkage to the 'Framework 2050'; and of benefit to any new program(s) being drafted. A first outing was compiled by the collective 'Science Operators' – also to be found online at <http://iodp.org>. It was also noted that notably the (scientific) evaluation of expeditions, and potential role(s) of a 'forum' in the future, needs a broader approach, and further considerations, parallel to the shaping of new program(s) going forward. Such discussions will be convened along various paths, also through initiatives like USAC-FOCUS and the upcoming MEXT-ECORD meeting, and culminating in the (last?) FORUM meeting in Japan, fall 2024.

Meanwhile, I do note that the ether is buzzing with intense, mostly positive discussions among all partners about the immediate, and long-term future of scientific ocean drilling. Which is hopeful. Among the various communities, spirits remain high to, in one (or more) form(s) or another, build on the ultra-successful international cooperation of the past decades. This, combined with a strong sense of urgency, and acknowledged global need for high impact scientific ocean drilling should form a solid basis for continued operations. But, as Yoda said, 'impossible to see, the future is'. So be a part of it. Make it so.

Mahalo!

Henk Brinkhuis - henk.brinkhuis@nioz.nl
IODP Forum Chair
Utrecht University
Ocean Systems Research Department, Royal NIOZ, NL



The IODP Forum meeting in Wollongong, Australia, October 2023.
Top photo: from left: Ron Hackney, Hanno Kinkel, Henk Brinkhuis.
Credits: H. Brinkhuis, ECORD/IODP.

JOIDES Resolution at the dock in Amsterdam (after drydock) ready for departure of IODP Expedition 401 in early December 2023.
Credits: H. Brinkhuis, ECORD/IODP.



Splitting cores waiting for sampling. Onshore Science Party of IODP Expedition 389, Bremen Core Repository, MARUM, Germany. Credits: M. Parker, ECORD/IODP.





Alexandra V. Turchyn

ECORD Facility Board News

Scheduling of MSP expeditions

The ECORD Facility Board met in Edinburgh, Scotland, in September 2023, where we discussed the range of MSP proposals both at the EFB, requesting transfer from the JRFB, and those at SEP that are designed to be drilled using MSPs. We also had the post cruise meeting for Expedition 386: Japan Trench Paleoseismology. There were two separate emergency meetings in December, 2023, and January 2024, when we needed to consider what science could be implemented in 2024 when Expedition 406: New England Shelf Hydrogeology was cancelled. After considering a range of different possibilities, it was decided unanimously to reschedule Expedition 406 with a more flexible time window for implementation at the start of IODP³.

Plans continue for the transition to the new programme and we wait with anticipation the start of IODP³. Immediately prior to the upcoming Workshop on IODP³ and drilling opportunities we have the first meeting of the interim MSP Facility Board in Kobe, Japan. The next meeting of the EFB, which will be joint with the CIB, will be in September 2024.

Alexandra V. Turchyn
avt25@cam.ac.uk
 Chair of the ECORD Facility Board



MSP 2013-2025 operational plan

2013 - 2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
347 Baltic Sea Paleoenvironment	357 Atlantis Massif Serpentinization and Life	364 Chicxulub K-Pg Impact Crater	381 Corinth Active Rift Development	No expedition	ECORD renewal	No expedition	386 Japan Trench Paleoseismology	No expedition	389 Hawaiian Drowned Reefs	No expedition	406 New England Shelf Hydrogeology
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>MMA Valour</i> & Seabed drill (<i>Benthic PRODS</i>)		<i>TBD</i>



EFB waiting room ⌚

#813 Antarctic Cenozoic Paleoclimate	#708 Arctic Ocean Paleoceanography	#730 Sabine Bank Sea Level
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- Completed MSP expeditions
- Postponed MSP expeditions
- MSP proposals in the EFB waiting room
- Scheduled MSP expeditions



David McInroy



Sarah Davies



Ursula Röhl

Implementation of MSP expeditions

IODP Expedition 389: Hawaiian Drowned Reefs



The overall goal of this expedition is to core a series of twelve fossil coral reefs surrounding the island of Hawaii, that formed as the reef communities successively grew and were drowned by rising sea-levels and/or the near constant subsidence of the crust around the ever-growing volcanic archipelago of Hawaii. Hawaii hosts a unique succession of expanded reef sequences,

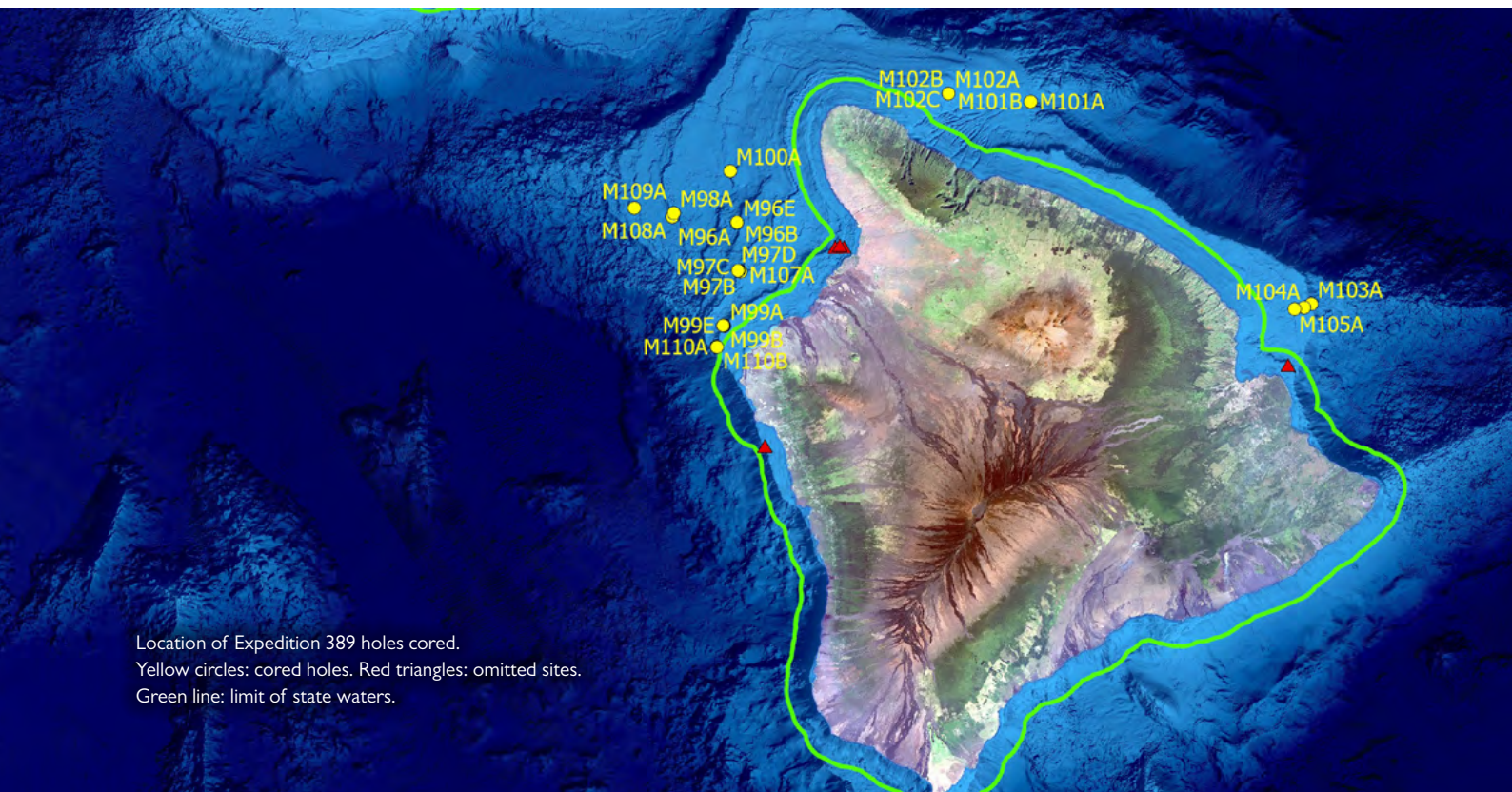
key for the recovery of high-resolution climate and reef response records, due to its location away from the influence of any of the large Quaternary ice-sheets or strong boundary ocean currents that can mask the sea-level and paleoclimate signals. The information contained in these natural fossil reef archives will help scientists reconstruct sea-level change at a much higher resolution than previously possible at a stable far-field site. It will also enable them to investigate the links between global sea-level change and global climate change, and therefore the mechanisms that control abrupt climate change.

In summer 2023, ESO contracted Benthic (Acteon Data and Robotics) to supply their 5th generation Portable Remotely

Co-chief Scientists:	Jody Webster Christina Ravelo
Offshore dates:	31 Aug – 31 Oct 2023
Onshore Science Party dates:	6 – 26 Feb 2024, MARUM, Germany
Vessel:	MMA Valour
Port:	from/to Honolulu, Hawaii

Operated Drill (PROD5) system, carried on the multipurpose vessel MMA Valour. PROD5 is a self-contained, remotely operated seabed drilling and geotechnical testing system, capable of operating in water depths up to 3000 m and investigating subsea bed depths in excess of 130 m. PROD takes rock and stiff sediment cores using proprietary thin kerf rotary diamond core barrels and other specialised coring bits as required. For softer sediments, cores are taken using a hydraulically-tethered piston core (HTPC).

First mobilisation for the expedition took place in Singapore between 24 and 31 July, attended by various ESO team members from all partners. The main tasks were to install



Location of Expedition 389 holes cored.
Yellow circles: cored holes. Red triangles: omitted sites.
Green line: limit of state waters.

the ESO laboratory containers on the vessel, check and test the equipment, and make the necessary cable runs. Second mobilisation took place in Kapolei, near Honolulu, between 23 and 31 August, attended by various ESO team members. The main tasks were to finalise the expedition set up, conduct final equipment testing, finalise the IT network, make final detailed plans with the Benthic drilling team and ship crew, and introduce the Science Party to the vessel. ESO staff also deployed the new database system mDIS (mobile Drilling Information System) on this expedition.

The expedition set sail on 31 August; please consult the daily and weekly reports (<https://www.ecord.org/expedition389/expedition-389-reports/>) for information on expedition progress, and also the expedition blog (with ESO staff contributions) for further background explanations (<https://expedition389.wordpress.com/>).

A mid-expedition port call took place between 27 and 29 September to refuel and resupply, and the opportunity was taken to ship the first consignment of cores back to the UK

for X-ray CT scanning at the BGS Core Scanning Facility near Nottingham. Additionally, 19 samples were shipped to Science Party member laboratories for 'quick turnaround' geochronological C¹⁴ (three samples) and U/Th (16 samples) analyses.

On 13 October, the Hawaii Board of Land and Natural Resources denied permission to enter state waters for the purpose of scientific coring. The expedition therefore focused on sites in federal waters beyond the three nautical mile limit (see map on previous page).

After 63 days at sea, the offshore phase of the expedition ended on 2 November at Kapolei, near Honolulu, followed by a 4-day demobilisation when ESO staff dismantled and packed away the cores and equipment.

The expedition recovered a total of 426 m of core from 35 holes across 15 sites, with an average recovery of 66%. See table on next page (page 20) for a summary of the holes completed.

Completion of the Onshore Science Party of IODP Expedition 389: Hawai'ian Drowned Reefs



The Onshore Science Party (OSP) took place from 6 to 26 February 2024 at the IODP Bremen Core Repository, MARUM – Center for Marine Environmental Sciences, University of Bremen, Germany, with further analytical laboratories accessed through the Department of Geosciences at the University of Bremen. At this occasion the 31 invited Science Party members from 12 different countries met for the first time. During the icebreaker event on the evening before OSP's start it was pretty obvious that there was a lot of excitement and eagerness in the air on what the total of 426 meters of cores, collected from 35 holes at 15 sites off the coast of Hawai'i's Big Island last year, would contain. One of the most one-off and novel aspects the Expedition 389 was the collection of extremely old corals - spanning the last half million years.

The Science Party together with the ESO team worked in two overlapping shifts between 7:30 in the morning until 22:30 at night to maximize the core flow for all the laboratories and to ensure the ambitious target of processing at least

22 m of core a day. The 21 days of the onshore phase of the expedition presented an excellent opportunity for detailed description, meeting of all Science Party members, further development of joint research endeavors, and sampling for post-expedition research.

During the OSP, the cores were opened, analyzed, sampled and described in detail. IODP standard measurements were made, and samples were not only taken for individual post-expedition research projects, but also for acquiring the programme's legacy data. Hyperspectral core scanning was applied for the first time, the equipment and data were provided by a company, TheiaX.

By the end of the OSP, it was clear that the team had succeeded in obtaining a high-resolution continuous record of environmental data from shallow-water corals for the first time. Towards the end of the OSP media was invited to follow the core flow and interview the science party members.

Expedition 389 webpage: <https://www.ecord.org/expedition389/>

Table: Summary of IODP Expedition 389 holes completed.

Note: hole depth includes intervals deliberately washed (no coring attempted).

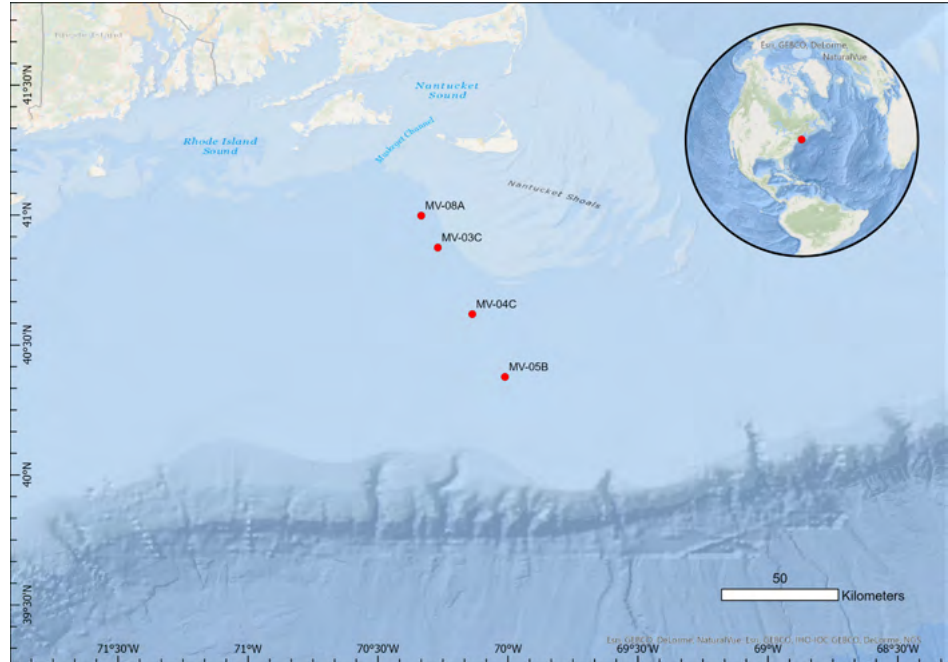
Hole	Proposal site	Latitude	Longitude	Water depth (m)	Hole depth (mbsf)	Core recovery (m)
M96A	KAW-06A	20.036387812	-156.065719885	740.8	1.78	1.62
M96B	KAW-06A	20.036439220	-156.065665198	739.1	0.99	0
M96C	KAW-06A	20.036422841	-156.065688377	739.9	1.74	0.45
M96D	KAW-06A	20.036843135	-156.065609619	736.8	7.4	2.24
M96E	KAW-06A	20.036979547	-156.065609012	738.2	6.7	0
M96F	KAW-06A	20.036959730	-156.065595741	738.2	12.24	4.76
M97A	KAW-04B	19.942136760	-156.062852945	414.2	35.05	26.42
M97B	KAW-04B	19.942109002	-156.062875988	414.6	59.35	23.17
M97C	KAW-04B	19.942525350	-156.063654893	417.6	36.16	28.04
M97D	KAW-04B	19.942699113	-156.063477191	424	23.69	19.22
M98A	MAH-01A	20.055425001	-156.189734849	1100.1	19.1	8.42
M99A	KAW-02C	19.834423008	-156.091288166	131.9	6.44	4.29
M99B	KAW-02C	19.834341762	-156.091198980	131.9	6.4	4.35
M99C	KAW-02C	19.834347933	-156.091260576	131.9	38.31	25.5
M99D	KAW-02C	19.834410742	-156.091323987	131.7	27.71	0
M99E	KAW-02C	19.835240049	-156.092440724	144.6	31.62	18
M99F	KAW-02C	19.835338020	-156.092303752	145.6	13.45	6.75
M99G	KAW-02C	19.835295112	-156.092467393	146.3	68.62	18.93
M100A	KAW-07A	20.137606420	-156.079107446	998	12.43	9.73
M101A	KOH-02A	20.273677052	-155.489902562	931.9	18.09	12.34
M101B	KOH-02A	20.273832303	-155.489799011	932	45.15	26.44
M102A	KOH-01A	20.289982490	-155.650867689	412.8	25.14	11.08
M102B	KOH-01A	20.289949127	-155.650948175	415.4	4.7	0
M102C	KOH-01A	20.289871227	-155.651008790	415.9	73.44	42.32
M103A	HIL-05A	19.877010150	-154.939609090	404.5	45.61	14.31
M104A	HIL-04A	19.870310570	-154.953999946	347	46.39	42.99
M105A	HIL-03A	19.867493518	-154.972719106	339.5	26.08	7.63
M106A	KAL-01A	18.856679311	-155.688330269	148.6	7.43	1.47
M106B	KAL-01A	18.856771819	-155.688264967	147.9	16.14	2.98
M107A	KAW-04C	19.940184832	-156.058177883	403.8	13.44	12.72
M108A	MAH-02B	20.048363606	-156.192745340	1178.4	1.97	1.95
M108B	MAH-02B	20.048345511	-156.192126985	1177.2	30.7	16.35
M109A	MAH-04A	20.065169109	-156.266938099	1241.8	4.62	4.21
M110A	KAW-03C	19.793231357	-156.105784391	156.9	18.7	14.18
M110B	KAW-03C	19.792508400	-156.104755849	144.8	17.22	12.9
				Total	804	425.76

This expedition aims to core into the Atlantic continental shelf offshore New England, USA, to explore current and past states of fluid composition, pressure, and temperature in continental shelf environments. This location is a remarkable example of where the distribution of freshwater within the continental shelf sediments is far out of equilibrium with modern sea level, with low salinity groundwater in shallow Pliocene-Pleistocene sand aquifers over 100 km from shore. Freshwater-saltwater boundaries are abrupt, indicating the disequilibrium nature of such systems. This expedition will help to better constrain rates, directions, and mechanisms of groundwater flow and chemical fluxes in continental shelf systems, and will test process-based models for shelf freshwater off New England and other systems around the world.

Following a market consultation exercise in September 2023, a Request for Proposals was issued by ESO in October and November.

In early December the call closed with no bids submitted. Early feedback from suppliers indicated a lack of availability of platforms in the advertised time window (May-August 2024). The expedition was cancelled for 2024, and has been rescheduled by the ECORD Facility Board for spring-summer 2025.

Co-chief Scientists:	Brandon Dugan Karen Johannesson
Offshore dates:	Rescheduled: Spring-summer 2025, TBC



Map with potential drill sites of IODP Expedition 406.
Credit: ECORD/IODP

Expedition 406 webpage: <https://www.ecord.org/expedition406/>

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Nadine Hallmann



Lucas Lourens



MagellanPlus: MANTLE-L2S

(3-6 July 2023, Plymouth, UK)

Accessing the Circum-Iberian mantle archive of Wilson Cycle processes through Land-to-Sea drilling (MANTLE-L2S)

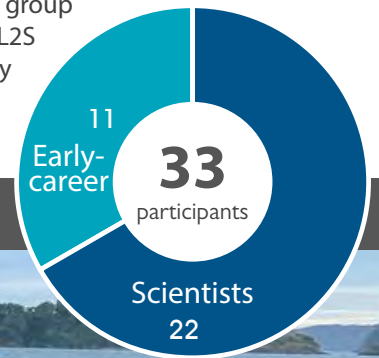


Our MagellanPlus workshop, “Accessing the Circum-Iberian mantle archive of Wilson Cycle processes through Land-to-Sea drilling”, also known as MANTLE-L2S, was held at the University of Plymouth on 3-6 July 2023. The primary goal of MANTLE-L2S was to bring together a diverse group of researchers, who could develop Mission-Specific Platform-based scientific drilling proposals to investigate mantle rocks and their interactions with Earth systems and cycles during the Wilson cycle.

Regional focus of MANTLE-L2S was directed towards the circum-Iberian system and similar Atlantic-type settings, where shallow occurrences of mantle rocks offer exceptional opportunities to target various stages of the Wilson cycle.

Recognising ECORD’s need for a compelling and diverse range of drilling proposals to implement during the post-2024 phase of scientific ocean drilling, MANTLE-L2S had a particular emphasis on the application of Mission-Specific Platform (MSP) technologies and land-to-sea (L2S) drilling programmes. From a longer-term perspective, MANTLE-L2S hoped to create a diverse consortium, comprising early career and senior researchers with a broad spectrum of skills, which will aim to address multiple Strategic Objectives of the 2050 Science Framework through applications of MSP drilling.

MANTLE-L2S was born out of the previous MagellanPlus workshop held at Plymouth, in April 2022, “Investigating the Oceanic Life Cycle of Tectonic Plates with Mission-Specific Scientific Drilling”. At that workshop, one of three focus groups identified the investigation of mantle rocks at different stages of the Wilson Cycle as a key target to for addressing Strategic Objective 2 (Oceanic Life Cycle of Tectonic Plates) of the 2050 Science Framework with MSP-based scientific drilling. From that focus group formed the MANTLE-L2S committee, comprising Andy Parsons (lead proponent



Participants of the MagellanPlus Workshop: MANTLE-L2S. Credit: ECORD/IODP



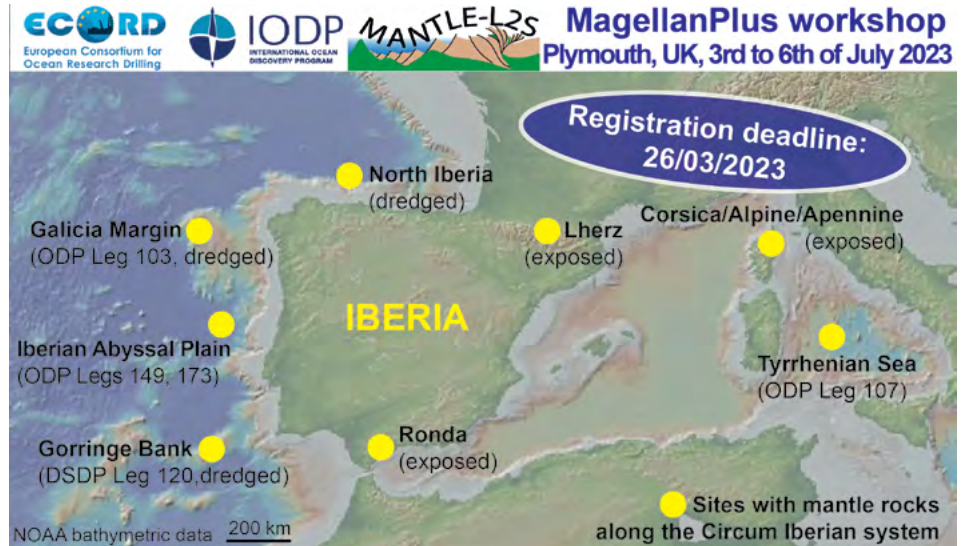
– University of Plymouth), Julien Collot (Geological Survey of New Caledonia), Marguerite Godard (CNRS Géosciences Montpellier), James Hepworth (University of Plymouth), Gael Lymer (Royal Belgian Institute of Natural Sciences), Gianreto Manatschal (ITES, University of Strasbourg), Antony Morris (University of Plymouth), Esther Schwarzenbach (Université de Fribourg), and Arianna Secchiari (Università degli Studi di Milano Statale).

MANTLE-L2S was attended in-person by 28 guests, with an addition five attendees taking part online. The group included guests from nine different countries and 20 different institutes, including 11 attendees who classified themselves as early career researchers (ECR). The workshop took place over three and a half days, including an evening icebreaker event on 3rd July, followed by two days of technical presentations from invited speakers alongside group discussions and breakout groupwork. The final day of the workshop involved focused groupwork aimed at the delivery of one or more proposal plans for new IODP MSP pre-proposals.

To help us meet our aim of creating new MSP proposals, we sought out a range of invited presentations, which covered all possible scientific and technical components of a successful MSP-based proposal. Our selection of invited speakers therefore ensured that our workshop was attended by leading experts from all relevant disciplines:

- Geoffroy Mohn, CY Cergy Paris – The circum-Iberian system and the Wilson cycle
- Margot Godard, Géosciences Montpellier – Onshore peridotite massifs
- Peter Kelemen, Lamont – Continental drilling, OmanDP
- Esther Schwarzenbach, Fribourg (CH) – Serpentinisation, fluid flow and element cycles
- Chiara Boschi, IGG-CNR, Pisa – Hydrothermal alteration and CO₂ storage
- Susan Lang, Woods Hole – Biogenic activity associated with serpentinization
- Lisa McNeill, Southampton – Examples of legacy drilling, borehole monitoring

As well as seeking a diverse range of scientific expertise, we also wanted to ensure that our workshop included guests with a detailed technical knowledge of scientific drilling including MSP-based technologies and borehole



measurements and monitoring. We were therefore very fortunate to have ECORP Science Operator (ESO) representatives Hannah Grant (BGS), Marisa Rydzy (Leicester), and Luzie Schnieders (Bremen) attend our meeting, presenting technical talks on MSP applications, and being on hand to help our discussions of potential MSP targets. Talks were spaced out across the mornings and mid-day of the first two days with plenty of time for breakout groups to get together to consider what regions and topics they were interested in and to identify targets suitable for addressing those problems via MSP applications. Each evening involved food and refreshments for the whole group, allowing all attendees to naturally continue their scientific discussions, or to simply relax and take a break!

Thanks to the hard work and contributions of all attendees, MANTLE-L2S has achieved its central aim of creating a proposal plan for a new MSP-based IODP pre-proposal. Whilst a number of potential targets were discussed, there was an overwhelming consensus that the Goringe Bank serpentinite seamount, offshore SW Portugal, should be the target for our pre-proposal. This seamount first exhumed during opening of the Atlantic but is currently in a state of compression. It is located in a region of complex and societally important seismic activity and has also be interpreted as a site of subduction initiation. As such Goringe bank offers a unique opportunity to investigate mantle rocks in the middle part of the Wilson cycle during which, passive margins transform to active margins. Work is currently underway to write up the plans developed during MANTLE-L2S into MSP pre-proposal.

The MANTLE-L2S committee are grateful for the funding provided by the ECORP MagellanPlus Programme, for the dedicated assistance provided by Katie Rhodes and the events team at the University of Plymouth, and for the participation of all workshop attendees who contributed to the workshop success.

Andy Parsons (ECR) – *University of Plymouth*, Julien Collot – *Geological Survey of New Caledonia*, Marguerite Godard - *CNRS Géosciences Montpellier*, James Hepworth (ECR) – *University of Plymouth*, Gael Lymer (ECR) – *iCRAG, University College Dublin*, Gianreto Manatschal – *ITES, University of Strasbourg*, Antony Morris – *University of Plymouth*, Esther Schwarzenbach – *Freie Universität Berlin*, Arianna Secchiari (ECR) – *Università di Parma*

MagellanPlus: Sunda Shelf

(9–11 October 2023, Heriot-Watt University, Edinburgh, UK)

Drilling the SE-Asian Sunda Shelf

The Sunda Shelf in Southeast Asia has long been identified as a strategic and high-quality target region for scientific drilling using MSP techniques. Two strong proposals have been developed in the past (IODP 1005 and IODP 1007) providing an opportunity to build synergies and develop conceptual ideas for a land-to-sea perspective for the Sunda Shelf region within the framework of the new IODP³.

A 2.5-day workshop followed by a half day training session, led by and designed for Early Career Researchers (ECRs), was held from 9-11 October 2023 at the Lyell Centre at Heriot-Watt University in Edinburgh, UK. With 66 participants, split equally between on campus and online, from Europe the USA, and Asia the workshop was truly international with a strong representation of 26 ECRs.

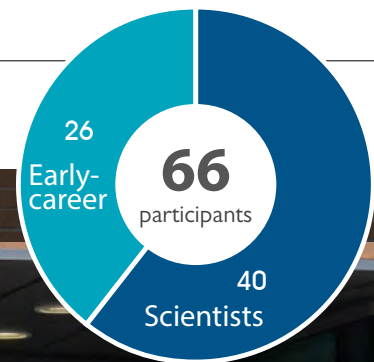
The workshop was organised around two main topics: the advancement of IODP 1005 and the development of new conceptual ideas for a land-to-sea drilling perspective. Representatives of the ICDP research community joined the workshop and supported a vibrant discussion about Land-to-Sea perspective. The first day covered overview presentation, with contributions from both the IODP and ICDP community. These presentations and initial discussions were taken to the 2nd day breakout groups where participants rotated between

both sessions. This strategy developed deep discussion and excellent outcomes. The final morning session was used to create synergies, allocate work tasks and agree on timelines for action.

Moving forward, IODP China invited for a sister workshop in Shanghai on 8-9 November 2023, focussing the discussion on IODP 1007 with a participation of 45 experts mainly from SE Asian countries. Wagner and Hanebuth represented the Edinburgh team at this workshop. The enthusiasm from the workshop continues, with active writing teams supporting the revision of IODP 1005 and intense communication between ICDP and IODP communities about new joined goals. As a follow on to the Edinburgh workshop, Wagner plans to hold two 1-day discussion meetings in March 2024, jointly invited by colleagues from GRID in Bandung, Indonesia, and the Nanyang Technological University in Singapore. We all anticipated that these national meetings will further catalyse the development of a full scale scientific drilling initiative for the wider Sunda Shelf region.

For further information on the Edinburgh workshop see our life blog at https://youtu.be/s8sKuS43o_8.

Tom Wagner, Lyell Center, Heriot-Watt University, et al.; t.wagner@hw.ac.uk



Participants of the MagellanPlus Workshop: Sunda Shelf. Credit: ECORD/IODP



Upcoming MagellanPlus Workshops

21st Century Drilling Workshop (8-12 April 2024, Bremen, Germany)
Building Capacity in the Digital Domain on scientific ocean drilling legacy material.
Contact: Anna Joy Drury (a.j.drury@ucl.ac.uk)

Inner Hebrides Drilling Workshop (14-16 July 2024, London, UK)
Drilling the Tonian to Cryogenian boundary in the Inner Hebrides, Scotland.
Contacts: Graham Shields (g.shields@ucl.ac.uk) and Elias Rugen (elias.rugen.21@ucl.ac.uk)

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

ECORD/ICDP MagellanPlus Workshop Series Programme CALL FOR PROPOSALS

The ECORD/ICDP MagellanPlus Workshop Series Programme aims **to foster the development of new IODP³/ICDP drilling projects**, and invites scientists from ECORD/ICDP member countries to propose workshops for the elaboration of compelling drilling proposals.

The International Ocean Drilling Programme (IODP³), inspired by the 2050 Science Framework (www.iodp.org/2050-science-framework), will start on January 1st, 2025 immediately after the conclusion of the current IODP. IODP³ offshore drilling and coring expeditions will be implemented by the IODP³ operators following an expanded **Mission-Specific Platform (MSP)** concept that will be applied to all drilling environments, as determined by scientific priorities, operational efficiency and better value for money.

MagellanPlus welcomes proposals for workshops aimed at generating **MSP drilling proposals**, either as **stand-alone projects** or as part of **land-to-sea transects** that integrate marine and continental coring. Scientific themes must be aligned with the **Strategic Objectives** defined in the **2050 Science Framework**, i.e.:

- Earth's Climate System;
- Feedbacks in the Earth System;
- Tipping Points in Earth's History;
- Global Cycles of Energy and Matter;
- Natural Hazards Impacting Society;
- The Oceanic Life Cycle of Tectonic Plates;
- Habitability and Life on Earth (e.g., deep biosphere).

Workshops may be either focused on specific scientific ideas and targets or be designed to explore a range of potential ideas related to the Strategic Objectives listed above.

The submission of MSP drilling proposals that consider the possibility of in-kind contributions is encouraged.

MagellanPlus workshops are normally expected to take place in ECORD/ICDP member countries, but exceptions can be made when justified. Workshops that combine virtual and face-to-face sessions, in order to both reduce our carbon footprint and allow for wider participation in workshops, can be considered.

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

ECORD/ICDP MagellanPlus Workshop Series Programme **CALL FOR PROPOSALS**

The ECORD/ICDP MagellanPlus Workshop Series Programme aims **to foster the development of new IODP³/ICDP drilling projects**, and invites scientists from ECORD/ICDP member countries to propose workshops for the elaboration of compelling drilling proposals.

The contribution of the MagellanPlus Workshop Series will not exceed 15,000 € per workshop. Proponents are encouraged to seek co-funding from other sources. Workshops will be held no later than 12 months after approval by the MagellanPlus Science Steering Committee.

Proposals must include:

- 1) a short summary (max. 500 characters) stating the purpose of the proposed workshop and its expected impact;
- 2) a full description (max. 2 pages) of the proposed workshop outlining the goals, rationale, expected outcome, involvement of early-career researchers, number of participants and location;
- 3) a workshop programme;
- 4) a list of keynote speakers;
- 5) a flyer of the workshop;
- 6) a full budget for the workshop;
- 7) a CV (max. 1 page) plus a list of international, peer-reviewed publications for the last five years, of main applicant.

Proposals must be submitted by email as a single, combined pdf document to magellan.plus@uu.nl and to ema@cerege.fr

The deadline for applications is **15 May 2024**

For further information, please contact MagellanPlus via magellan.plus@uu.nl

ECORD remains committed to a vigorous policy of broad participation and inclusion, and to providing a safe, productive, and welcoming environment for all programme participants and staff.

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



Angelo Camerlenghi



Hanno Kinkel

ECORD Educational activities

Summer schools and ECORD training courses 2024

In 2024, ECORD will support three Summer-Schools in Urbino (Italy), Leicester (UK), and Bremen (Germany) (*see next page*). While the summer schools in Urbino (Paleoclimatology) and Leicester (Petrophysics) continue with their established thematic programs, the ECORD Summer School in Bremen, provides a different theme every year, with **'From Ridges to Flanks to Margins** - lithosphere dynamics and connections to global environmental change' as the topic of this year's summer school.

As usual, ECORD will provide a number of merit-based scholarships to a number of applicants, the call is currently

open and scholarship awardees will be announced at the ESSAC spring meeting (end of May). *Read how to apply for an ECORD scholarship on page 30.*

Unfortunately, the ECORD Training Course "Shipboard Simulation Experience"- usually held in early spring, this year had to be cancelled this year as the Bremen Core Repository was extremely busy with the Onshore Science Party of IODP Expedition 389, and other sample parties. We hope to continue with this course in 2025.

ECORD Summer Schools 2024

ECORD Scholarships available

Apply to attend!



Deadline for scholarship applications:

14 April 2024



The ECORD Scholarships

are open to young scientists based in ECORD countries.

ECORD will sponsor **10 to 15 Scholarships** contributing to costs of registration, travel, subsistence and/or accommodation at the Schools.



Leicester, UK

Bremen, Germany

Urbino, Italy

ECORD Summer Schools 2024



ECORD Summer School

 **Downhole Logging for IODP Science**
University of Leicester, UK

Deadline
for summer
school applications:
**25 March
2024**



27 Jul - 2 Aug

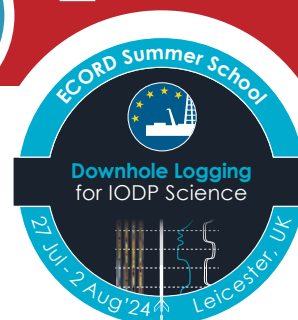
27 July - 2 August 2024

Deadline to apply for a scholarship: 14 April 2024

Deadline for application to the Summer School: 25 March 2024

For more information please visit:

<https://le.ac.uk/iodp/summer-schools/current>



ECORD and NESSC Summer School

 **(Past) Climates and the Earth System**
Urbino, Italy

Deadline
for summer
school applications:
**25 March
2024**



9 - 25 Jul

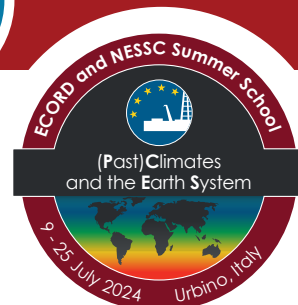
9 - 25 July 2024

Deadline to apply for a scholarship: 14 April 2024

Deadline for early-registration to the Summer School: 25 March 2024

For more information please visit:

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



Bremen ECORD Summer School

 **From Ridges to Flanks to Margins-litho-
sphere dynamics and connections to global
environmental change**
MARUM, University of Bremen, Germany

Deadline
for summer
school applications:
**31 May
2024**



2 - 13 Sept

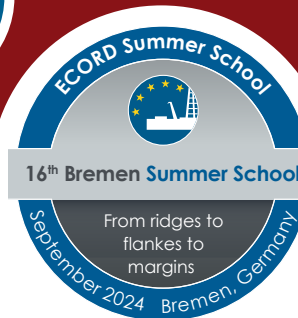
2 - 13 September 2024

Deadline to apply for a scholarship: 14 April 2024

Deadline for early-registration to the Summer School: 31 May 2024

For more information please visit

www.marum.de/Ausbildung-Karriere/ECORD-training/ECORD-Summer-Schools.html



www.ecord.org/education/scholarship

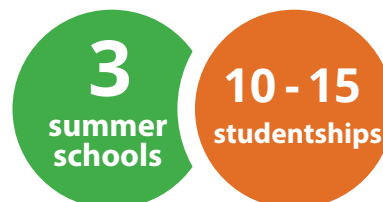
The ECORD Scholarships 2024



The European Consortium for Ocean Research Drilling (ECORD) will sponsor 10 to 15 Scholarships to allow outstanding young scientists to attend one of the three ECORD Summer Schools in:

- ④ Urbino (Italy),
- ④ Bremen (Germany) or
- ④ Leicester (UK).

The Scholarships will contribute to costs of registration, travel, subsistence and/or accommodation at the Schools.



The ECORD Scholarships are open to young scientists based in ECORD countries

<http://www.ecord.org/about-ecord/about-us/>

Preference will be given to PhD students or early career post-doctoral research scientists. The review of the applications will be made by ESSAC, the ECORD Science Committee, and the decisions will be communicated by the end of May 2024.

The deadline to apply for an ECORD Scholarship is 14 April 2024.

Austria
Canada
Denmark
Finland
France
Germany
Ireland
Italy
Netherlands
Norway
Portugal
Spain
Sweden
Switzerland
United Kingdom

How to apply

Applications should be sent to the ESSAC Office (essac@ogs.it) and should include:

- ④ a detailed Letter of Interest (max. two pages),
- ④ a CV and a Letter of Support from one supervisor.

No other attachments will be accepted.

Please download the application form from our website:

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

The most important document of the package is the Letter of Interest, which should outline the motivation for your application and summarise how attendance at the summer school will be beneficial for your future scientific career. Application for an ECORD Scholarship is independent of the application and registration process to an ECORD Summer School. **Please be aware that application and registration for the ECORD Summer Schools must be made directly through the respective Summer School organisers (see contact links below), not through the ESSAC Office.**

For further information or questions, please contact the ESSAC Office:

ECORD Science Support & Advisory Committee

Hanno Kinkel (ESSAC Science Coordinator)
Istituto Nazionale di Oceanografia e di Geofisica
Sperimentale - OGS
via Beirut n. 2
34151 Trieste - Italy

Email: essac@ogs.it

Web Page: www.ecord.org



ECORD School of Rock 2024

Understand the Planet through ocean exploration (Naples, Italy, 9 - 11 February 2024)

Forty science teachers from all over Italy participated in the ECORD School of Rock (SOR) on 9 -11 February 2024, in Naples, Italy. Through lectures alternating with practical activities the participants have discovered the scientific drilling tools of the International Ocean Discovery Program for unravelling the Earth secrets.

The ECORD School of Rock is a workshop designed by scientists and outreach & education officers who have sailed onboard IODP/ODP expeditions to share their at-sea experience with teachers of their home country and to introduce educational resources which can be used in the classroom. The teachers thus experienced an immersive research experience: "With scientists as scientists".

"School of Rock" was financed by the Italian Commission CNR ECORD-IODP ICDP and was organized by the Department of Earth and Environmental Sciences of the University of Pavia and the Department of Earth, Environmental and Resources Sciences and from the Museum Center of Natural and Physical Sciences of the University of Naples Federico II. The scientific committee was composed by Claudia Lupi and Alessia Cicconi (Pavia) and Mariano Parente (Naples). The school has benefited from the patronage of the Italian Geological Society (SGI), of the National Geology Project (PLS -Geology) and of the National Association of Natural Science Teachers (ANISN).

The teachers carried out practical activities of description and sampling of sediment cores, preparation of samples for the analysis of foraminifera and calcareous nannofossil content, calculation of the expansion rate of the oceans as well as participating in seminars on the history of IODP, drilling techniques and differences between continental and oceanic crust. The seminar lessons took place in the splendid settings of the Royal Mineralogical Museum and the Paleontological Museum, while the practical activities were held in the laboratories of the Department of Earth, Environment and Resources Sciences at the University of Naples Federico II. During the workshop, participants were given the unique opportunity to visit the *JOIDES Resolution* with a guided tour by experts and to meet the scientists who will take part in the upcoming *JOIDES Resolution* expeditions.

Read more on page 44, and:
<https://www.ecord.org/ecord-school-of-rock-2024-naples-italy/>

Claudia Lupi
Department of Earth and Environmental Sciences
University of Pavia

Ester Piegari
Department of Earth, Environmental and Resources Sciences
University of Naples Federico II



Starting pack for the participants of the ECORD School of Rock.



Participation in the ECORD School of Rock.



Discussions during the ECORD School of Rock.

ECORD Distinguished Lecturer Programme 2024

In 2024, ECORD will return with the Distinguished Lecturer Programme and has nominated **six outstanding lecturers** to provide an overview of a wide range of scientific ocean drilling science (see below and on the next page).



The ECORD Distinguished Lecturer Programme (DLP) is designed to bring the exciting scientific discoveries of IODP to the geosciences community in ECORD and non-ECORD countries. Distinguished Lecturers will give lectures in each of the four main thematic areas of the *IODP Science Plan 2013-2023*.

Climate &
Ocean Change



Cédric M. John
Queen Mary University London, UK



Sverre Planke
University of Oslo, Norway

Biosphere
Frontiers

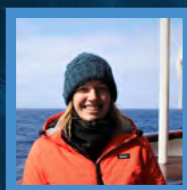


Laura De Santis
OGS Trieste, Italy

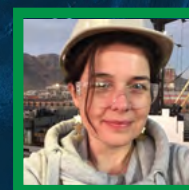


Thomas Westerhold
MARUM University Bremen Germany

Earth
Connections



Jenny A. Gales
University of Plymouth, UK



Rosalind M. Coggon
University of Southampton, UK

Earth
in Motion



DLP Speakers 2024

ECORD Distinguished Lecturer Programme webpage: <https://www.ecord.org/education/dlp/>

Cédric M. John

Queen Mary University London, UK

Drilling Down the Data: A Deep Learning Dive into IODP Cores

The International Ocean Discovery Program (IODP) stands as a testament to human curiosity, having amassed a diverse collection of drilling cores which provide a window into geological processes. Core data is pivotal for understanding our planet's past, present, and future. Despite this richness, extracting meaningful insights from core description poses significant challenges due to the inherent complexity and variability of the data, the amount of existing material, and the subjectivity of the interpreter.

Focusing largely (but not exclusively) on carbonate rocks, characterized by their heterogeneity at all observational scales, I will discuss how my research group and I have pioneered the application of deep learning computer vision to geological core interpretation. This technology transcends the traditional, tedious manual interpretations of cores, offering a rapid, and often more accurate, alternative for delineating depositional environments and sequence stratigraphy. Convolutional neural networks (CNNs) form the backbone of our approach, enabling us to process core data with unprecedented efficiency. I will show that these sophisticated models, when correctly trained and fed with substantial datasets, serve as invaluable tools for geologists, outpacing conventional methods in speed without compromising on precision.

Our early work was centred on transfer learning, an AI approach that adapts pre-existing models to new data. I will show that this remains one of the best way to train classification algorithms for geological dataset. But we also worked on generative algorithms that fill gaps in our sampling of core imagery: for instance, we use Generative Adversarial Networks (GANs) to transform the resistivity images from formation micro scanners into representations mirroring actual core photographs, thus enhancing the interpretability for geologists irrespective of their background in downhole tools.

We tackle the often-limiting factor of dataset size in two ways. First, we recourse to generative AI to oversample our training set. Second, we also explore semi-supervised learning techniques. I will demonstrate that we successfully train models on core deformation images from IODP with minimal labelled data, achieving accuracy on par with, if not exceeding, that of transfer learning models. The arc of my talk will thus chart the course of deep learning's evolution from a mere auxiliary tool to a pivotal force in geological sciences. Results from my research group and the broader research community indicate a promising future where deep learning not only streamlines the interpretation process but also provides robust, systematic insights that could revolutionize our understanding of geological data.

Laura De Santis

National Institute of Oceanography and Applied Geophysics OGS Trieste, Italy

Ice sheet and ocean interaction, paleoclimate and paleoceanographic record during past glacials and interglacials

The West and East Antarctic ice sheets are the largest and oldest on Earth. Their fluctuations since the early Oligocene, triggered by orbital and greenhouse gas induced climate variations influenced global sea level and ocean circulation until the Northern Hemisphere ice sheets developed in the Pliocene. Thereafter, the volume of the Antarctic ice sheets changed little compared to the Arctic ice sheets younger "sisters", which are much more sensitive to climate variability in the cooler and drier low-CO₂ Quaternary world.

The sparse IODP sites from the continental margin suggest that some marinebased sectors of the Antarctic ice sheet likely retreated during the warmest Plio- Pleistocene interglacials, possibly under the influence of ocean warming and rising sea levels.

Observations that shed light on the maximum extent and retreat of the ice sheet over the continental shelf in the past, together with paleo environmental proxies are crucial for reconstructing changes in ice sheet volume and ice dynamics during glacial and interglacial periods. Estimates of ice sheet

extent and environmental conditions in the past can be obtained by identifying the transition from subglacial to near-ice sediments, which coincides with the so-called "ice grounding zone", i.e. the point at which the ice sheet detaches from its bedrock, begins to float and generally expands into ice shelves. These paleo-ice sheet reconstructions are then used to predict the rate and mechanism of the response of modern ice sheets to climate warming and the resulting global sea level rise.

This talk will present examples of sediments from the grounding zone of the ice sheet recovered during IODP Expedition 374 and previous drilling projects in Antarctica. The correlation of sedimentary units with seismic profiles via the borehole logs allows the acoustic facies of these deposits to be characterised, which can be mapped spatially around the drilling sites and elsewhere in the area. This information is combined with paleoenvironmental and water depth information obtained from the sediments to reconstruct paleobathymetric maps that provide a fundamental basis for estimating the volume of the ice sheet and ice flow pathways as well as ice and ocean interaction in the past.

Thomas Westerhold

MARUM University Bremen, Germany

The starring role of Scientific Ocean Drilling to discover the changing states of Earth's Climate during the past 66 million years

Average global temperatures are rising due to anthropogenic emission of greenhouse gases. What will be the consequences? Has this happened before in Earth history? Did other climate states in the past exist with greenhouse gas concentrations like today or even higher? And if so, what was the main climate response to it? Those are just a few of the pressing questions we would like to know more about for our future. Sediment deposits at the bottom of the ocean are some of the only continuous archives recording changes in Earth's climate for the last ~100 million years. Ocean floor sediments are prime target for scientific ocean drilling giving access to material to reconstruct past environmental and climatic conditions essential for understanding earth system processes.

In this lecture I will take the audience on a journey following the motivation and milestones reconstructing Earth's global climate variability throughout the Cenozoic, the last 66 million

years. Insight will be given to the key role of scientific ocean drilling and the international collaborative efforts associated with to enable the assembly of Earth fever curve of the past. Because resolving Earth's climate response to astronomical forcing is essential to understand past climate dynamics and the processes involved, the lecture in particular will focus on the development of the Cenozoic Global Reference benthic foraminifer carbon and oxygen Isotope Dataset, the CENOGRID. The curve is a major product of the IODP Science Plan Illuminating earth's past, present, and future. For the first time the record statistically disentangled four climate states of the Cenozoic: Hothouse, Warmhouse, Coolhouse, Icehouse. Depending on greenhouse gas concentrations and polar ice sheet volume Earth's climate showed a distinctive response, or fingerprint, to astronomical forcing during each of the climate states. We now know more accurately when it was warmer or colder and we also have a better understanding of the underlying dynamics behind past climate changes.

Sverre Planke

University of Oslo, Norway

Drilling volcanic rifted margins to understand large igneous provinces and associated global warming

Continental breakup is a rare, but fundamental Earth event driven by massive internal forces. The splitting of Europe from Greenland some 56 million years ago was likely triggered by hot material rising from the deep mantle, forming a large igneous province. The breakup magmatism was associated with a global warming and extinction event, the Paleocene-Eocene Thermal Maximum (PETM).

IODP Expedition 396 successfully drilled 20 holes on the mid-Norwegian continental margin to better understand continental breakup processes and to test the hypothesis that associated voluminous magmatism triggered the PETM. Hole locations were carefully selected on conventional and high-resolution 3D seismic data. In total, > 4 km of sediments and volcanic rocks were drilled, recovering 2 km of core. The expedition recovered the first sub-basalt rocks on the Norwegian margin, documenting the presence of granite and inter-basalt sandstones on the Kolga High. We also cored three different seaward dipping reflectors (SDR) facies units on the Vøring Margin, representing basaltic

lava flows emplaced in sub-aerial, coastal, and deep marine environments, respectively. An Outer High named Eldhø, was sampled at the termination of the Inner SDR and recovered spectacular pillow basalt units. The PETM interval was cored at the ten Modgunn Arch and Mimir High holes. The Modgunn holes drilled into the upper part of a hydrothermal vent complex. High-resolution palynology and isotope geochemistry document that the hydrothermal venting took place near the start of the PETM, supporting the hypothesis that the global warming event was triggered by shallow-water eruption of greenhouse gases formed by heating of organic-rich sediments intruded by magmatic sills.

In conclusion, scientific drilling has provided essential data to document how the Earth's internal processes have influenced the environment and life in deep time. To understand the environmental changes in the future, it is critical to keep on drilling the ocean basins to test new hypotheses and to discover our geological past.

Jenny A. Gales

University of Plymouth, UK

Deciphering Antarctic continental slope processes: new insights through ocean drilling

Antarctica's continental slopes hold invaluable insights for understanding past climate, ice-sheet dynamics, ocean circulation, erosional and depositional processes, and submarine geohazards over millennial timescales. Antarctica has been the recent focus for International Ocean Discovery Program (IODP) Expeditions 374, 379 and 382, recovering hundreds of meters of continental slope records. This lecture presents some of the multidisciplinary results from these recent expeditions arising from Antarctic continental slope records, particularly focusing on submarine geohazards. Antarctica's continental margins constitute an unknown geohazard risk, such as submarine landslide-generated tsunamis that pose threats to Southern Hemisphere populations and infrastructure. A major submarine landslide complex was drilled during IODP Expedition 374 on the eastern Ross Sea slope, identifying submarine landslide preconditioning factors and failure mechanisms. These recurrent submarine landslides were likely triggered by seismicity associated with glacioisostatic readjustment,

leading to failure within preconditioned, climatically controlled weak layers and highlights risk of future slope failure across the region. We show multidisciplinary datasets that constrain the signature of down and along-slope processes and examine factors driving their timing, frequency, and impact. Deciphering these processes offers immense potential in understanding historical ocean circulation shifts, for example, when climates resembled 'worst-case' future climatic scenarios which could help understand anticipated changes in ice retreat and subsequent sea-level rise. These processes are also becoming increasingly important economically as international interest in subsea internet cable connections to Antarctica grows. We discuss the implications of these findings in relation to Neogene and Quaternary West Antarctic Ice Sheet expansions to the shelf edge and finally discuss forthcoming research directions and opportunities.

Rosalind M. Coggon

University of Southampton, UK

The IODP South Atlantic transect: Low-temperature Ridge Flank Contributions to Global Biogeochemical Cycles and Archives of Changing Global Conditions

Throughout its life the ocean crust is a key boundary between Earth's interior and the oceans/atmosphere. Hydrothermal circulation of seawater-derived fluids through the cooling and aging crust results in chemical exchange between Earth's interior and oceans and atmosphere, playing an important role in long-term biogeochemical cycles.

Hydrothermally altered ocean crust provides a time-integrated record of its geochemical exchange with seawater. Just as cooling crust preserves a signal of Earth's magnetic field and hence a record of plate tectonics, cores recovered by scientific ocean drilling have revealed that hydrothermal minerals that form from seawater derived fluids across the ridge flank record the evolving chemistry of the overlying oceans – itself an integrator of a range of Earth processes. This led to a dramatic shift in appreciation of studies of hydrothermally altered ocean crust, as they enable us to both reconstruct past ocean chemistry and decipher the Earth processes responsible for variations in these records. I will present an overview of how scientific ocean drilling experiments across ridge flanks contribute to our understanding of the processes that control ridge flank

hydrothermal exchanges, the role these exchanges play in global geochemical cycles, and the extent to which they record and respond to wider changes in the Earth system.

The South Atlantic Transect (IODP Expeditions 390C/395E/390/393) was designed to recover the upper crust and overlying sediments across the western flank of the slow-spreading Mid-Atlantic Ridge to investigate hydrothermal aging and microbiological evolution of the ocean crust, and the paleoceanographic evolution of the overlying South Atlantic. This lecture will include an overview of this multidisciplinary drilling campaign, with a particular focus on how the recovered crustal cores have revealed that the extent and duration of ridge flank hydrothermal carbonate precipitation are influenced by crustal architecture, which is strongly influenced by spreading rate. Consequently, ridge flank hydrothermal contributions to the long-term planetary carbon cycle depend on the global length of slow-, intermediate-, and fast-spreading ridges and the age distribution of the ridge flanks, which have varied significantly throughout the Phanerozoic.

Letter from the *JOIDES Resolution* Facility Board Chair



Larry Krissek

March 2024

Dear IODP Community!

Much has happened – or continues in various stages of development – since my letter to you in March 2023, so I write now to summarize those efforts as we look toward a future beyond the end of IODP. I will begin by describing activities by the JRFB and its affiliates over the past year, as well as those planned by the JRFB through the end of IODP. For completeness, I then will take this opportunity to describe recent and ongoing activities by the US Science Support Program (USSSP), the US National Science Foundation (NSF), and the U.S. National Academies’ Decadal Survey of Ocean Sciences, all of which will impact future U.S. efforts in scientific ocean drilling.

As a reminder, the minutes, consensus statements, and action items from the May 2023 JRFB meeting, as well as the other IODP documents mentioned in this letter, are available at www.iodp.org. Two major agenda items at the May 2023 JRFB meeting focused on steps needed to transition to the future of scientific ocean drilling:

1. the fate of drilling proposals currently residing at the JRFB, and
2. the recommendations of the JRFB’s Working Group on “virtual expeditions,” now known as Ocean Drilling Legacy Asset Projects (LEAPs).

The first of these items was addressed successfully by collaboration between the JRFB, the EFB, the CIB, and the Science Support Office, which worked together to develop and implement a **process to move proposals from the JRFB to the EFB during IODP**. This process is described in the latest version of the IODP Proposal Submission Guidelines. Lead proponents of proposals at the JRFB have been informed of the steps needed for this transfer (thereby completing Action Item 2 of the 2023 JRFB meeting), and several already have begun this process. We anticipate that others will begin this process in time for the 1 April deadline for drilling proposals, which will allow those transfer requests to be evaluated at the June SEP meeting. Any proposals at the JRFB that are not transferred to the EFB before the end of IODP will have to follow yet-to-be-defined submission processes to be considered for future drilling programs (e.g., IODP³ or a potential new U.S. program).

At its May 2023 meeting, the JRFB also discussed the almost-finalized report of its Working Group on “virtual expeditions” (i.e., the JRFB WG-VE). As a reminder, this Working Group had members from all IODP PMOs, so that the Working Group’s recommendations intentionally were developed to be usable across all present and future drilling programs. The JRFB indicated its strong support for the newly named **Legacy Asset Projects (LEAPs)**, while also providing constructive feedback on several aspects of the report. The final version of the Working Group’s LEAPs report subsequently was approved by the JRFB, and is available at www.iodp.org (thereby completing Action Item 1 of the 2023 JRFB meeting). Based on its enthusiasm for the LEAPs concept, the JRFB recommended that a LEAPs pilot program be conducted during the remainder of IODP, using the existing SSO for proposal management and the existing SEP for proposal evaluation. LEAPs proposal guidelines were needed to implement this pilot program, so those were written during summer 2023 by a small group (Angelo Camerlenghi, Charna Meth, Angela Slagle, and myself, with review and input from the IODP core repository curators and the SEP co-chairs). The JRFB approved the LEAPs proposal guidelines in late summer 2023, which allowed the approved guidelines to be posted on www.iodp.org and a call for LEAPs proposals to open on 1 September. This call had a deadline of 1 November, so that submissions could be reviewed at the January 2024 SEP meeting. To support the international community in developing LEAPs proposals, three informational webinars were held during September and October, with a total of nearly 100 attendees representing all IODP partners and several non-IODP countries.

Response to this inaugural call for LEAPs proposals was excellent; the proposals submitted had diverse objectives, a broad range of proponents, and a diversity of legacy assets to be used. Five pre-proposals were submitted, with 38 unique proponents representing all IODP partners and one non-IODP country. These five submissions addressed five of the seven Strategic Objectives and three of the five Flagship Initiatives in the 2050 Science Framework. Two of the projects proposed to use existing cores, two proposed using downhole logging data, and three

proposed using other existing datasets. The overall strength of these submissions is underscored by the fact that SEP recommended three for development into full proposals, while providing very constructive reviews for the other two. A call for LEAPs proposals has been included with the most recent call for drilling proposals, with a deadline of 1 April. Those proposals will be reviewed at the SEP meeting in June.

In my opinion, the strong response to the first call for LEAPs proposals clearly demonstrates two points:

1. the community's interest in maintaining explicit connections to scientific ocean drilling while using legacy assets during and beyond IODP; and
2. the inclusive nature of, and reasonable expectations for, LEAPs as developed by the JRFB's Working Group.

I thank the community for its enthusiastic response to the first call for LEAPs proposals; I also thank SEP and its cochairs (Kathie Marsaglia and Tim Reston) for their thoughtful reviews of the LEAP proposals and for their helpful comments on the LEAP review process itself. I look forward to an equally strong response to the present call for proposals.

Two other activities by the JRFB in the last year also are worth noting, both in response to Action Items from the 2023 JRFB meeting. First, an advisory group organized by Karen Stocks and Charna Meth at the SSO (and co-chaired by Brandon Dugan and Tim Reston) has considered issues associated with the fate of site characterization data presently in SSDB, since SSDB will disappear with the end of IODP. This group produced a report with recommendations for first priority and second priority actions; that report was approved by the JRFB, and SSO staff presently are implementing its first priority recommendations. Second, based on the usual 3-year rotation pattern for science members of the JRFB, Ken Miller (Rutgers University) rotated off and Steve Hovan (Indiana University of Pennsylvania) joined the JRFB. We thank Ken for his exemplary service to the JRFB (as well as for his long tenure of service to scientific ocean drilling in a variety of roles), and welcome Steve to the JRFB.

Looking ahead, the JRFB will hold its 2024 meeting in Honolulu in May, with an option for virtual participation. While the agenda for that meeting is still being developed, I anticipate that much of our time will be spent talking about the future, and how the present JRFB can assist in the transition to that future. For example, will the JRFB continue beyond the end of IODP? If so, in what form and with what responsibilities? How will LEAPs be reviewed and managed after IODP, and how can the various legacy asset programs be coordinated? I look forward to discussions on these topics – and others – that work

toward continuing the robust scientific progress and the international collaboration that have been hallmarks of scientific ocean drilling.

For completeness, I want to be sure you are aware of three other activities that are underway in the U.S. and will influence future U.S. efforts in scientific ocean drilling. First is the series of FOCUS workshops (“Future Ocean Drilling in the United States”) being conducted by the U.S. Science Support Program (see <https://usoceandiscovery.org/focus/>). The main objectives of FOCUS are:

1. to identify scientific priorities of the U.S. community that are achievable in the next 5-7 years with the subseafloor sampling options that are expected to be available, and
2. to identify ways for the U.S. community to advance the case for a future, state-of-the-art, globally ranging U.S.-operated drilling vessel.

The FOCUS process is based on a series of virtual workshops, which presently are underway, followed by an in-person workshop in late spring 2024. These workshops will result in a report to NSF about the near-term priorities of the U.S. community.

The second effort is NSF's ongoing steps toward defining the framework within which future U.S. ocean drilling science will take place. In August, NSF circulated a **Dear Colleague Letter** (see <https://www.nsf.gov/pubs/2023/nsf23138/nsf23138.jsp>) soliciting expressions of interest from eligible U.S. organizations to provide a Coordinating Office for scientific ocean drilling activities (i.e., SODCO). This Dear Colleague Letter identified the following as essential capabilities of the SODCO:

1. determining the type and availability of drilling services available for NSF-funded scientific projects that require ocean drilling;
2. encouraging innovation in scientific ocean drilling technologies and methods, and development of new drilling designs;
3. managing drilling activities for the U.S. scientific community, including potential collaborations with international partners; and
4. providing guidance to U.S. principal investigators to meet core curation responsibilities.

NSF is now using the responses to this Dear Colleague Letter to help guide the development of an official solicitation for SODCO proposals; we expect that solicitation to be released in the near future.

The third effort is the ongoing **“2025-2035 Decadal Survey of Ocean Sciences for the National Science Foundation”**, conducted by a committee convened

by the U.S. National Academies of Science, Engineering and Medicine (see <https://www.nationalacademies.org/our-work/2025-2035-decadal-survey-of-ocean-sciences-for-the-national-science-foundation>).

This Decadal Survey will advise NSF's Division of Ocean Sciences on forward-looking approaches to guide investments in research, infrastructure, and workforce development across the broad landscape of ocean sciences. As a result, the Decadal Survey's recommendations will establish the overall context within which future U.S. scientific ocean drilling activities will take place. The Decadal Survey's final report is expected late in 2024, but the committee will produce an interim report specifically focused on the

resources and infrastructure available to address high priority research questions requiring scientific ocean drilling. That interim report is expected in the near future.

As is true for much of our community, the JRFB continues to seek innovative ways to address a changing landscape of scientific ocean drilling, and to develop effective mechanisms for transitioning to that future. As these efforts proceed, feel free to contact me with questions or comments about the JRFB and its activities.

Stay safe and healthy, and I look forward to meeting you soon.

Larry Krissek - krissek.1@osu.edu
JOIDES Resolution Facility Board Chair
Ohio State University, USA



An aerial view of the JOIDES Resolution in the Aegean Sea during IODP Expedition 398. Credit: T. Ronge, IODP JRSO.



Core sampling during the Onshore Science Party of IODP Expedition 389,
Bremen Core Repository, MARUM, Germany.
Credits: M. Parker, ECORD/IODP.



EOTF News and Activities



Malgo Bednarz



Ulrike Prange



David McInroy



Hanno Kinkel



Nadine Hallmann

The EOTF has continued to work on establishing cooperation with various museums and science centres for the purpose of promoting scientific drilling and ECORD at permanent, long-, and short-term exhibitions (see below). Besides core replicas and audio-visual materials, one of the elements that the EOTF offers to support short-term exhibitions is the ECORD Sphere, which has already travelled throughout Europe (see page 46).

For the last several months outreach activities focused on the onshore phase of IODP Expedition 389: Hawaiian Drowned Reefs. The Onshore Science Party took place on 6-26 February 2024 at the Bremen Core Repository at MARUM, Germany, where the science party gathered again to examine the

cores recovered during the last year's offshore phase of the Expedition 389. Marley Parker, the Offshore Outreach Officer, also joined the team of scientists in Bremen and worked with the EOTF to promote and document the OSP.

Outreach actions planned for IODP Expedition 406: New England Shelf Hydrogeology were put on hold after the news that the expedition was rescheduled for 2025.

As every spring the EOTF team will be present at the EGU 2024 in Vienna, where ECORD and ICDP will have their joint booth under the common banner of Scientific Drilling. The start of the IODP³ planned for January of 2025 will be discussed during the Townhall Meeting on 16 April at the Natural History Museum in Vienna.

ECORD in museums and exhibitions

The EOTF has been working towards ECORD's presence at permanent and short-term exhibitions in museums all around Europe. This includes fabrication and donation (or long-term loans) of materials for museums and research institutions as well as loans of the ECORD Sphere for dedicated exhibitions.

Since 2022, ECORD is proud to have its presence at two permanent exhibitions, including one that was officially opened in February 2023: 1) at the Cosquer Méditerranée

museum in Marseille, France in 2022, and 2) at the NHM Vienna in Austria in 2023. A third permanent exhibit with ECORD presence at yet another high-ranking museum is planned to be officially opened this summer at the German Maritime Museum (DSM). The EOTF has been actively working on providing suitable materials to its partners at the DSM in Germany, with whom it has an excellent record of cooperation regarding one short-term exhibit in the past.

ECORD at German Maritime Museum (DSM): "Ship Realms - The Ocean and Us"

Permanent exhibition to be opened in July 2024

<https://www.dsm.museum/en/museum/exhibitions/ship-realms-the-ocean-and-us>



The EOTF has been working with the museum on a permanent exhibition focused on laboratory settings since 2022. For the new

exhibition ECORD agreed to provide a core replica from IODP Expedition 310: Tahiti Sea Level, a 3D coral model,

and information related to the Expedition 310. Additionally, an interview with the expedition Co-chief Scientist Gilbert Camoin was filmed in October 2023 at MARUM, and will be set as an audio-visual element of the permanent exhibition to accompany the materials provided by ECORD. The opening of the exhibition at the DSM is planned in Summer 2024.



The new permanent exhibition "Ship Realms - The Ocean and Us" at German Maritime Museum (DSM) / Leibniz Institute for Maritime History in Bremerhaven will have a specific focus on marine research. One of the interactive exhibits will feature IODP Expedition 310: Tahiti Sea-Level Change. It will show scientific findings on the effects of the meltwater pulse 1A had on the coralline growth thousands of years ago. One of the drill cores of that expedition will be made "readable" to a broad museum audience by scanning it with a screen that can enlarge the core to a microscopic level and convey all information from microbialite to the change from *Pocillopora* to *Porites*. It shows how sensitive corals are to environmental change and also how important are the drill cores of coralline sediments as a historic data storage waiting for us to be deciphered. The exhibition at the German Maritime Museum will be opened on 17 July in Bremerhaven.

Dr. Pablo v. Frankenberg, Curating Consulting for DSM

ECORD at the Algarve Living Science Center:

Expedition 401 | Salty secrets of the Mediterranean: a story to be revealed

Temporary exhibition, December 2023 - February 2024, Faro, Portugal

Taking advantage of Expedition 401's proximity to the Algarve coast, Centro Ciência Viva do Algarve (CCVALg) proposed to ECORD the creation of a temporary exhibition centered on the ECORD Sphere and the Expedition 401: Mediterranean-Atlantic Gateway Exchange. Upon ECORD's approval of the loan for the ECORD Sphere, CCVALg's team embarked on developing and co-creating the exhibition in collaboration with ECORD outreach team, Portuguese ECORD representatives, the US Science Support Program, ICDP correspondents, and Co-chief Scientists.

The exhibition opened on 19 December 2023, featuring five activity tables surrounding the ECORD Sphere, two projected presentations, and a tablet with real-time connection to ECORD's social media. The activities were designed to document and explain various aspects and processes involved in ECORD programs. Beginning with a 50 cm long simplified paper model of the *JOIDES Resolution*, which was also available in smaller sizes for children to paint and assemble, visitors were introduced to the complexities of underground geology through a plasticine 3D model. A core replica, created with high-resolution pictures, was displayed alongside wet and dry deep-sea sediment from the Gulf of Cadiz, showcasing the studied material. Visitors then explored microfossils within sediment samples through a jar filled with ping-pong balls and 3D-printed microfossils, accompanied by a digital microscope observing true foraminifera microfossils and a poster presenting different types of microfossils. Additionally, a FlyPI microscope demonstrated the formation of salt crystals from evaporating saline waters, complemented by a piece of rocksalt from a local salt mine and a 3D-printed elevation model.



Throughout the exhibition, visitors engaged with a wall presentation summarizing the purpose and objectives of Expedition 401, co-designed with Master students from the University of Algarve, and viewed a small animation on the TV screen presenting the Portuguese translation of the children's book "Uncovering Earth's Secrets."

By February 5, 2024, when the ECORD Sphere was relocated to Italy, the temporary exhibition had attracted 1435 visitors, with around 30 participating in two online ship tours. Subsequently, until the end of February, an additional 1150 visitors experienced the transformed exhibition "Expedition 401," featuring artistic representations of diatoms made from recycled plastic bottles, created by a local artist that also engaged visitors to make their own diatoms.

Photogallery: <https://www.ecord.org/resources/gallery/ecord-at-exhibitions/ecord-at-algarve-living-science-center/>

Cristina Veiga-Pires - cvpires@ualg.pt
ECORD Alternate delegate
Executive director of Centro Ciência Viva do Algarve

Panoramic view at the temporary exhibition at the Algarve Living Science Center, Faro, Portugal. Credits: Algarve Living Science Center



ECORD at the Museum of Palaeontology, University of Naples Federico II

Short-term exhibition, February - April 2024, Naples, Italy

On the occasion of the *JOIDES Resolution* being at the port of Naples, Italy, just before the start of the Expedition 402, IODP Italy and the EOTF team worked together towards presenting ECORD and its mission during a temporary exhibition in Naples. The exhibition started on the 9 February in the Museum of Palaeontology, University of Naples Federico II and continued till early April. The EOTF arranged for the ECORD Sphere to be displayed at the exhibition, along with two core replicas and a 3D coral model. The exhibition at the museum was an important place to be visited by the participants of the ECORD School of Rock that took place between 9 and 11 February. Read more about the ECORD School of Rock in Naples on page [31](#) and [44](#).



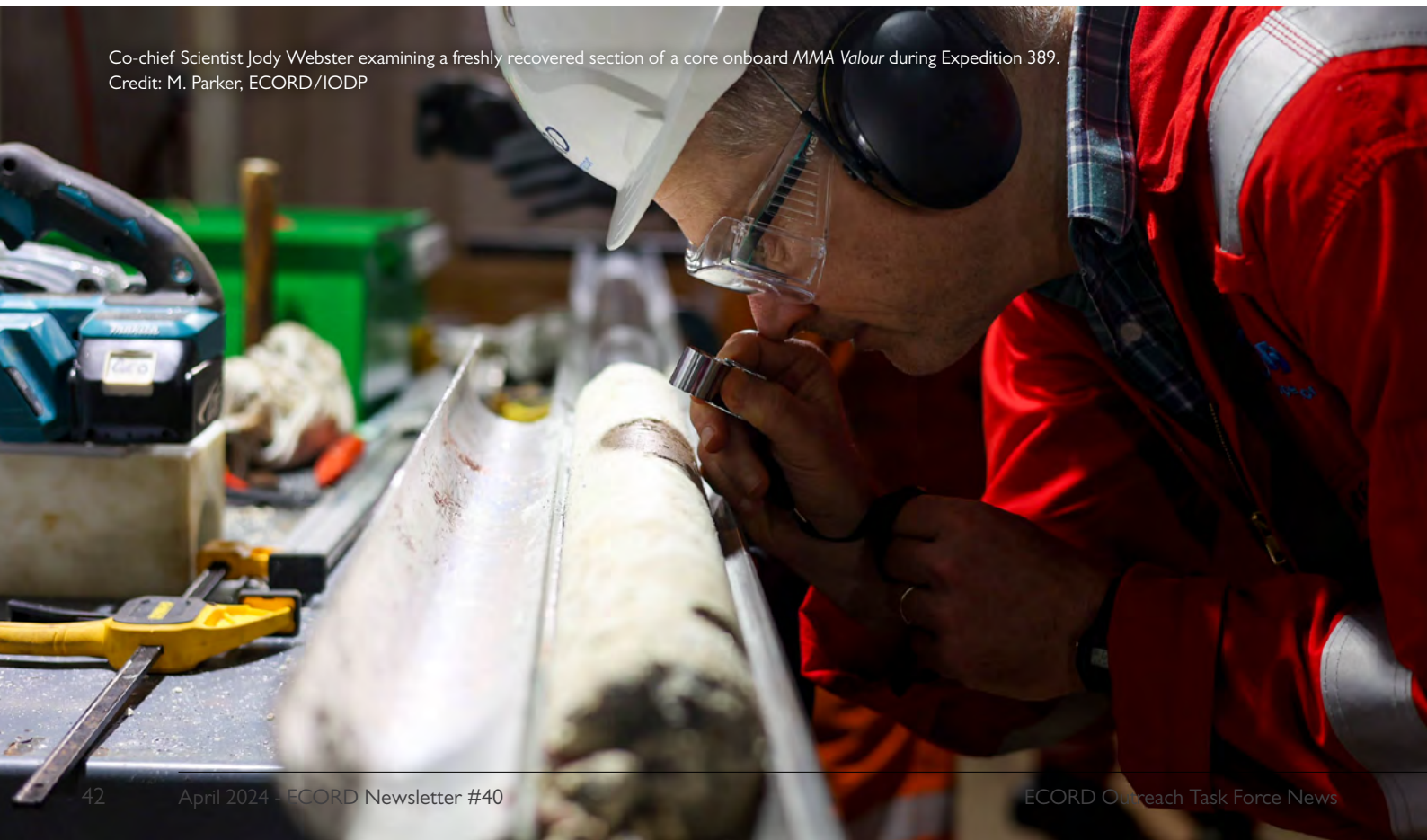
Core replicas and 3D coral model on display at the Museum of Palaeontology, University of Naples Federico II, during the ECORD School of Rock.

ECORD online

The EOTF keeps working on the active presence of ECORD in the Internet through social media (Facebook, X, Instagram and Youtube, Mastodon) and through ECORD website improvements and additional applications.



Co-chief Scientist Jody Webster examining a freshly recovered section of a core onboard *MMA Valour* during Expedition 389. Credit: M. Parker, ECORD/IODP



Outreach activities related to MSP Expeditions

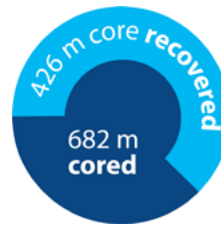
Outreach for Expedition 389: Hawaiian Drowned Reefs



Mission-Specific Platforms are special in more than one way: while only some of the scientists join the offshore phase, all of the participants meet for the first time in person at MARUM – Center for Marine Environmental Sciences at the University of Bremen. They were joined by Marley Parker, Onboard Outreach Officer

during the offshore phase (<https://www.ecord.org/start-of-the-onshore-science-party-of-iodp-expedition-389/>). Marley Parker conducted interviews and collected material for a film clip, documented the scientists' work in pictures and film footage. After the offshore phase in autumn 2023 the blog was reactivated as well as social media activities. All blog articles were accompanied by social media posts across the various ECORD channels (X, Instagram, Masstodon) in order to disseminate news about the science and more important – the people behind it (<https://expedition389.wordpress.com/>)

A news item and a press release (<https://www.ecord.org/iodp-expedition-389-first-high-resolution-fossil-coral-record-of-environmental-data-off-hawaii/>) were issued, and all communications departments of the expedition's



IODP Expedition 389

- 📍 15 sites
- 35 holes
- ||| 524 cores
- 📅 63 days offshore

participants were involved in order to share the news and preliminary findings widely. Towards the end of the onshore phase a media day was held at MARUM, showing – mostly regional – journalists around in the labs, introducing IODP and IODP's legacy with more than 185 kilometers of cores stored in Bremen, and showing fossil corals with illustrious names such as Beast and Godzilla. The personal contact and the interaction have sparked enthusiasm also towards a more general audience.

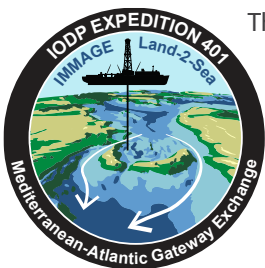
Science Party members are encouraged to further engage with different target audiences as well as media, supported by the EOTF, in order to disseminate the scientific objectives and first findings with societal relevance and their involvement in the expedition also after the onshore phase of the expedition.

Expedition 389 blog: <https://expedition389.wordpress.com/>
Expedition 386 webpage: <https://www.ecord.org/expedition386/>

Outreach for the IMMAGE Land-2-Sea Drilling Project

Investigating Miocene Mediterranean-Atlantic Gateway Exchange

Expedition 401: Mediterranean-Atlantic Gateway Exchange



The outreach actions for the Expedition 401 have been planned since early 2023 and included also plans for promotion of the continental phase of scientific drilling as part of the IMMAGE project. The EOTF team worked with the outreach team of the IMMAGE project at the University of Bristol, the USSSP and ICDP colleagues. Together with the Portuguese ESSAC delegates, our teams took part in preparation and launch of the temporary exhibition at the Algarve Living Science Center in Faro, Portugal (*see page 41*). Though the Expedition 401 successfully ended this February, the IMMAGE

project continues further and so do the outreach plans for its continental part. The Co-chief Scientist Rachel Flecker will be a guest speaker at the ECORD-ICDP Town Hall meeting that will take place on 16 April 2024 in Vienna, at the occasion of the EGU 2024 (*see page 49*). ECORD and ICDP join together in their efforts (including outreach actions) for the successful implementation of the IMMAGE project in the future, as it is the first Land-2-Sea project undertaken by scientific drilling.



Expedition 401 webpage: https://iodp.tamu.edu/scienceops/expeditions/mediterranean_atlantic_gateway_exchange.html
IMMAGE project website: <https://www.immageland2sea.ac.uk/>

Outreach for Expedition 402: Tyrrhenian Continent-Ocean Transition

On 11 February, the two Outreach Officers from Expedition 402: Tyrrhenian Continent-Ocean Transition, Tessa and Larkin were invited to visit the ECORD School of Rock that was being held in Naples between 9 and 11 February 2024. Local Science teachers had been invited to learn about the various educational materials at their disposal for engaging students in Earth Science. Tessa and Larkin walked through the various resources that can be found online at joidesresolution.org, and how to engage with the current Expedition through a virtual ship-to-shore. Over 30 teachers joined the meeting on 11 February and when Tessa and Larkin arrived, they were greeted by a round of applause from the very enthusiastic group (we felt very special)!

It became immediately obvious that the teachers really valued the fact that the ship-to-shores could be done in the language of their students due to the wonderful Italian scientists onboard Expedition 402 who were open to translating the tours. Though interested in the written resources online, the lack of Italian translations was a concern for the teachers. More than half of the broadcasts that were delivered on Expedition 402 were to teachers who were at the School of Rock, or who were a colleague of someone who attended the School of Rock meeting. It also seemed that

word of mouth was a powerful influence amongst teachers.

Many of the broadcasts to the Italian schools had multiple classes joining from one school, increasing the number of students viewing each ship-to-shore. Thanks to the high number of Italian scientists on board, language was not a barrier to providing the broadcasts and having the students tour the vessel and the labs. After many of the broadcasts, the teachers mentioned the excitement the students had to have seen the ship and to have seen so many Italian scientists on board. The classes posed lots of questions and students participated fully and enthusiastically on the calls, with some broadcasts going on for longer than originally anticipated.

This collaboration with the ECORD School of Rock was incredibly successful and we at USSSP would like to thank our ECORD colleagues for the opportunity to come and visit them prior to Expedition 402 sailing.

Carol Cotterill - ccotterill@ideo.columbia.edu
Education and Outreach, U.S. Science Support Program
Lamont-Doherty Earth Observatory

Outreach for Expedition 406: New England Shelf Hydrogeology

For 2024, the EOTF has focused on the preparations for extensive outreach materials for IODP Expedition 406. These included pre-expedition flyers, a logo, a communications plan and targeted campaigns tailored to the region and to involve local communities. After the cancellation of the expedition

for 2024 all outreach activities will be revisited when there is a new timeline. The same applies to contacts, we will resume our networking activities when there is a new date for the expedition.

Expedition 406 webpage: <https://www.ecord.org/expedition406/>

Participants of the ECORD School of Rock and the USSSP team at the University of Naples Federico II, Naples, Italy. Credits: USSSP.





Scientists looking at the unsplit cores at the beginning of the Onshore Science Party of IODP Expedition 389, Bremen Core Repository, MARUM, Germany. Credits: M. Parker, ECORD/IODP.

Resources

ECORD Sphere

The ECORD Sphere was shown in Vienna, Bremen and Berlin in 2023. The next stop for the ECORD Sphere was at the Science Center in Faro, Portugal, for an exhibition related to IODP Expedition 401 (December 2023 - February 2024, see page 41). In February 2024, the ECORD Sphere was displayed in Naples, Italy, on the occasion of the start of IODP Expedition 402 (when the JR was at the port of Naples) and the ECORD School of Rock (see page 31 and 44). In April 2024, the ECORD Sphere will be transported to Vienna for the EGU 2024 and then to the University of Utrecht, The Netherlands, to be displayed at the University Museum.

ECORD Sphere webpage:

<https://www.ecord.org/resources/ecord-sphere/>



The ECORD Sphere during the ECORD School of Rock in Naples, Italy.

Core replicas

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

The EOTF ordered the fabrication of several new core replicas, from among which, some were donated to museums and other found their home at the EPC (University of Leicester) as the ECORD hub for replica loans within the UK.

Core replicas webpage:

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

Models of corals

Two realistic 1:1 scale models of two species of corals are available for loans. These models accompany the core replica from IODP Expedition 310: Tahiti Sea Level (<https://www.ecord.org/resources/core-replicas/core-replica-tahiti-sea-level-iodp-expedition-310/>).

More: <https://www.ecord.org/resources/>

How to loan a core replica or a coral 3D model?

To order a loan, contact Malgo Bednarz at EMA (bednarz@cerege.fr) with inquiry about the availability of any of the core replicas or coral models.

ECORD shares these materials on a temporary basis with scientists and teachers under the conditions described in the loan document. The materials are loaned free of charge with the ordering university/research institution covering the shipment of core replicas back to EMA.



3D models of specimens of corals identified in cores from Expedition 310. Left: *Porites lobata*; right: *Pocillopora eydouxi*. Produced by Kamyk.pl.

ECORD Sphere

Touch and find out more...



● With the ECORD Sphere, you can interact and learn more about the how, where and why of **scientific ocean drilling**

● Explore the scientific themes of the current science plan and see where we drill to answer those challenges....

● Display scientific data on a changing ocean

● Explore our platforms....



... and our partners' drillships

ECORD at conferences, events and meetings

AGU 2023 (11-15 December 2023, San Francisco, USA)

AGU had returned to San Francisco after four years and the conference was well attended. As in previous years ECORD partnered with its colleagues from the USA, Japan and China at a joint conference exhibition booth to meet and discuss the latest news on scientific drilling. The joint booth under the banner of Scientific Drilling was located in the central part of the exhibition hall and gained large interest. Besides the well attended IODP Town Hall Meeting, where the future of IODP³ was laid out by Nobu Eguchi (MarE3/JAMSTEC), a large number of IODP-related sessions, including the Union session for the Asahiko Taira International Scientific Ocean Drilling Research Prize were held in the Moscone Center.



EGU 2024 (14-19 April 2024, Vienna, Austria)

The outreach teams of ECORD and ICDP will welcome visitors at a joint ECORD/IODP-ICDP booth under the common banner of Scientific Drilling.



We are awaiting visitors at our booth (numbers 48 and 49) in the Entrance Hall where the ECORD Sphere will also be set up. We are looking forward to meet with representatives of JAMSTEC/MarE3 who, together with the ECORD team, will be promoting scientific ocean drilling and the new International Ocean Drilling Programme - IODP³.

A joint ECORD-ICDP Town Hall Meeting will take place on 16 April 2024 at the Natural History Museum Vienna (see next page).

ECORD-ICDP Scientific Session “Achievements and perspectives in scientific ocean and continental drilling” at the EGU General Assembly 2024

The session has been accepted as ITS/SSP Session at the EGU General Assembly 2024 with one change in comparison to the last year: Harue Masuda has been replaced by Norikatsu Akizawa (University of Tokyo) in the team of co-conveners. In the session description, the importance of scientific results from the use of scientific drilling legacy samples and data has been emphasized.

The EGU 2024 team of co-conveners consists of: Angelo Camerlenghi, Thomas Wiersberg, Jorijntje Henderiks, Cindy Kunkel, and Norikatsu Akizawa.

<https://egu24.eu/>

View at the joint ECORD-ICDP booth at last year's EGU in Vienna, Austria. Credits: ECORD/IODP.





ECORD and ICDP invites you to the
ECORD-ICDP Townhall meeting

 **16 April 2024**




Meet ECORD/IODP and ICDP representatives and scientists for networking over refreshments

to discuss the launching of IODP³, the latest ICDP news, and the implementation of the first Land-2-Sea drilling project



Natural History Museum Vienna

Obere Kuppelhalle
 Maria-Theresien-Platz, 1010 Vienna, Austria

 Tube: U2, U3 (station Volkstheater)  Tram: 1, 2, 46, 49, 71, D
 Bus: 48A



18:00 arrival of guests
19:00 start of the event



Speakers:

- Gilbert Camoin**
 (Director of the ECORD Managing Agency) | Entering IODP³
- Marco Bohnhoff**
 (Director of ICDP) | ICDP - news, views, and rotating drill bits
- Rachel Flecker**
 (IODP Expedition 401 Co-chief Scientist) | Kicking off the IMMAGE Land-2-Sea drilling project with IODP Expedition 401: Mediterranean-Atlantic Gateway Exchange

JpGU 2024 (26-31 May 2024, Chiba, Japan)

JpGU (Japan Geoscience Union) is a large academic organization based on approximately 50 academic councils related to Earth and Planetary Science with about 10,000 members in Japan. JpGU holds annual meetings every May (see <https://www.jpгу.org/en/>), with a large number of parallel sessions, in a wide range of fields such as: Space and Planetary Sciences, Atmospheric and Hydrospheric Sciences, Human Geosciences, Solid Earth Sciences, Biogeosciences, Education & Outreach, Multidisciplinary, and Interdisciplinary. The 2023 JpGU annual meeting had 228 sessions with about 7900 participants (virtual and in-person). JpGU also includes participants from various backgrounds such as around 400 junior-high/high school students and educators.

JpGU also has an exhibitor booth area. Since 2016, the Japanese scientific drilling community, JAMSTEC, J-DESC, and Kochi University, typically have a Scientific Drilling booth. This booth promotes the latest updates from the ECORD/IODP/ICDP community, including D/V *Chikyu* and R/V *Kaimei* Expeditions. In 2022, JAMSTEC brought leaflets, posters, movies, and a 1/150 scale *Chikyu* ship model to the booth, and we welcomed over 600 visitors!



This year we will run a joint booth mainly promoting ECORD/IODP/ICDP, IODP³, and JTRACK with some booth swag (stickers, reusable eco-shopping bags, etc.). We look forward to seeing you there!

Natsumi Okutsu - okutsun@jamstec.go.jp
Education and Outreach
JAMSTEC



View at the joint JAMSTEC, J-DESC, and Kochi University booth at JpGU 2022, Japan. Credits: JAMSTEC





Taking a closer look at the cores during the Onshore Science Party of IODP Expedition 389, Bremen Core Repository, MARUM, Germany. Credits: M. Parker, ECORD/IODP.



2024		
14-15 March IODP ³ meeting: interim MSP-FB Japan	18-19 June SEP Helsinki, Finland	End of September ECORD Facility Board Meeting #13 Cambridge, UK
18-20 March ESSAC and J-DESC Workshop: Future of Scientific Ocean Drilling Nachikatsuura, Japan	9-25 July 19th ECORD Urbino Summer School in Paleoclimatology Urbino, Italy	End of September IODP ³ meeting: MSP-FB Cambridge, UK
8-12 April MagellanPlus Workshop: 21 st Century Drilling Bremen, Germany	14-16 July MagellanPlus Workshop: The Garvellachs London, UK	28 October ESSAC Fall Meeting #22 Oslo, Norway
14-19 April EGU 2024 Vienna, Austria	 27 July - 2 August 8th ECORD Summer School on Downhole Logging for IODP Science Leicester, UK	29-30 October ECORD Council-ESSAC Meeting #13 Oslo, Norway
8-9 May JR Facility Board Hawaii, USA	2-13 September 16th ECORD Bremen Summer School Bremen, Germany	1 November ECORD Outreach TF Meeting #26 Oslo, Norway
28-30 May ESSAC Spring Meeting #21 Espoo, Finland	3-4 September IODP Forum Shizuoka, Japan	9 -13 December AGU 2024 Washington, D.C., USA
18-19 June ECORD Council Spring Meeting #10 Virtual	5 September PMO Meeting Shizuoka, Japan	

[IODP meetings](#) | [ECORD meetings](#) | [IODP³ meetings](#) | [Conferences](#) | [ECORD Summer Schools and Training Course](#) | [Workshops and colloquia](#)

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

IODP Expeditions 2024

9 February - 8 April	Expedition 402 (JR): Tyrrhenian Continent-Ocean Transition
4 June - 2 August	Expedition 403 (JR): Eastern Fram Strait Paleo-archive
12 September - 7 December	Expedition 405 (<i>Chikyu</i>): Japan Trench Tsunamigenesis

SCIENTIFIC DRILLING

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Scientific Drilling: <https://www.scientific-drilling.net/>

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Scientific Drilling

Reports on Deep Earth Sampling and Monitoring

IODP³ International Ocean Drilling Programme

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The open-access ICDP and IODP journal • www.scientific-drilling.net



Thomas Wiersberg



Ursula Heidbach

The drill bit is currently rotating under the ICDP flag in North Italy (DIVE), South Africa (Bushveld), Brazil (TADP) and Antarctica (SWAIS-2C). We also expect to see drilling activities in China (Lake Nam Co) in the middle of the year.

1. Drilling the Ivrea-Verbanò zone (DIVE)

<https://www.icdp-online.org/projects/by-continent/europe/dive-italy>

After successful drilling of the first DIVE (Drilling the Ivrea-Verbanò zone, see 1 on the map below) borehole last year, scientists have initiated drilling the second DIVE borehole at Megolo (Italy) in late 2023. By now, the borehole has reached 770 m depth with excellent core recovery. The Ivrea-Verbanò Zone provides a truly unique natural laboratory to fundamentally advance our understanding of the continental lower crust and the crust–mantle transition zone (the “Moho”). Research in the Ivrea-Verbanò Zone includes a combination of different geoscientific approaches applying scientific drilling.

2. Bushveld Complex Drilling Project (BVDP)

<https://www.icdp-online.org/projects/by-continent/africa/bvdp-south-africa>

The Bushveld Complex in South Africa constitutes a Large Igneous Province that poses questions about how such vast volumes of magma could be generated from the mantle. Its bimodal composition, with subequal proportions of mafic and felsic igneous rocks, provide an opportunity to study relationships between mantle and crustal sources of magmatism in detail. The complex also holds an enormous

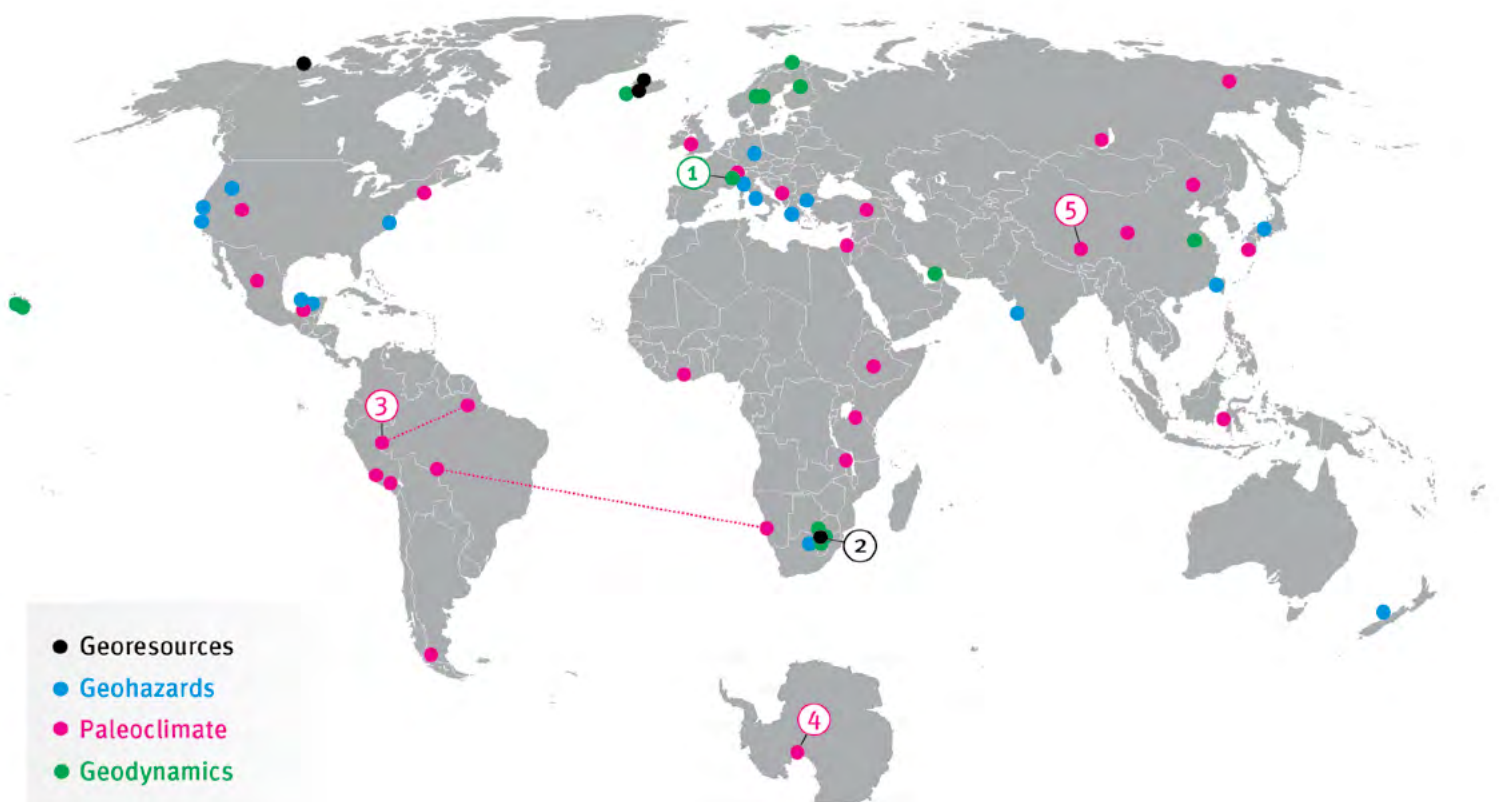
wealth of mineral resources including ores of strategic importance. The first phase of the Bushveld Complex Drilling Project (BVDP, see 2 on the map below) was launched at the University of the Free State in Bloemfontein in April 2021 with logging and description of a pre-existing 6-km-long drillcore section, provided by the company Impala Platinum Ltd as in-kind contribution. BVDP plans drilling approximately 3 km through the lower section of the intrusion and through the base of the intrusion in March 2024.

3. The Trans Amazon Drilling Project (TADP)

<https://www.icdp-online.org/projects/by-continent/the-americas/south-america/tadp-brazil>

The Trans Amazon Drilling Project (TADP, see 3 on the map below) has completed its first borehole in the Arce region in western Brazil at 920 m depth. Drilling will resume in mid 2024 to drill a complementary borehole in eastern Brazil. The overarching goals of TADP are to document the evolution of biodiversity of the Amazon forest across most of its entire reach throughout its entire history, and to determine how the evolution of the physical environment has shaped the generation, distribution, and preservation of neotropical biodiversity.

Location of ICDP drilling projects: 1. DIVE, 2. BVDP 3. TADP 4. SWAIS2C, 5. Nam Co. Credit: ICDP



4. Sensitivity of the West Antarctic Ice Sheet to 2 Degrees Celsius (SWAIS2C)

<https://www.icdp-online.org/projects/by-continent/polar-regions/antarctica/swais-2c-antarctica>

SWAIS2C (see 4 on the map on the previous page) aims to determine whether the West Antarctic Ice Sheet has advanced and retreated during the Holocene, and how ice sheets respond to a world that is 1.5°–2°C and >2°C warmer than pre-industrial times, and consequences of the response of the Antarctic Ice Sheet to this warming. On December 23rd, operations were halted due to technical challenges after ~80 m of drill string, including the heavy steel bottom hole assembly and many lengths of sea riser made of glass reinforced epoxy, had been deployed. Drilling will resume in the Arctic Summer 2024/25.

Also programwise, ICDP is in full swing. Preparation of the ICDP Membership of Australia is on track and we're looking forward to welcome Australia as new member of the ICDP family soon. By the annual ICDP proposal submission deadline on 15 January, eight Full Proposals, five Workshop Proposals and six Pre-Proposals, including one L2S Proposal were received. This high number of proposals demonstrates that the slight decline in the number of proposals submitted in 2022 and 2023 due to late effects of the pandemic has been overcome. The scientific review of the proposals by the ICDP Science Advisory Group (SAG) took place in mid March, and will be followed by final decisions in early June by the Executive Committee and the Assembly of Governors.

5. The Nam Co Drilling Project

<https://www.icdp-online.org/projects/by-continent/asia/namcore-china/>

Nam Co, one of the largest and deepest lakes on the Tibetan Plateau, is located in the modern monsoon regime and, due to its location, ideally suited for recording the temporal development of large-scale atmospheric circulation systems. Seismic data clearly show an infill of >700 m of well-layered, undisturbed sediments in the central part of the lake, spanning several glacial/interglacial cycles. Short piston-core sediment accumulation rates for the past 24 ka and seismostratigraphic investigations suggest a lake formation of >1 Ma. Drilling Lake Nam Co (see 5 on the map on the previous page) is foreseen for summer 2024.

The next ICDP Training Course will be held from May 12-17 at the Geocenter at the KTB in Germany. With a depth of 9101 m, of which the uppermost 6600 m are accessible, the KTB is still one of the deepest boreholes worldwide. 25 participants and 12 lecturers from a total of 15 countries have been invited for the training course. It will touch upon relevant aspects of continental scientific drilling, including drilling and coring techniques, sample types and sampling methods, data and sample management, downhole logging and testing, seismic monitoring, outreach, and project planning and management.

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



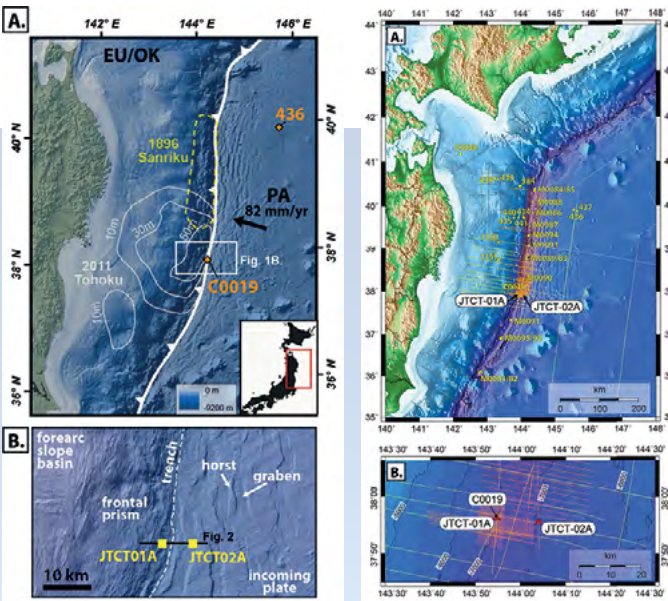
Last November, the IODP-France office organized the IODP-France days at the Institut de Physique du Globe de Paris. This major event brought together a hundred of colleagues from all over France. They presented to the community and to the representative of the CNRS-INSU the major results issued from their involvement in IODP Expeditions during the last decade. The quality of their investment in IODP was praised. It highlighted the fact that the data collected through the unique facilities offered by IODP were essential to “push back the frontiers of knowledge”, and hence to fulfil the objective put forward in the CNRS motto.

This event was also the opportunity to present to the French community the outline of IODP³ through presentations by Gilbert Camoin, for the structure and management of the future program, Angelo Camerlenghi and Michi Strasser, for the broad scientific orientations, and Dave McInroy for the diversity of technical solutions offered by the MSP concept to achieve these targets.

These exhilarating presentations, and the debate that followed, reassured the community: clearly, the upcoming end of the “JR era” will not dramatically impact our ability to respond to the major scientific challenges of the coming decades. Among the novelties announced, SPARC projects meet the full support of the French community already fully invested in the valorisation of the IODP heritage, thanks in part to the support of the IODP-France office.

Only slight shadow in the picture, the community wonders about the deep reasons for the decrease of the financial contribution of France to IODP these last few years at a time when ECORD, and therefore France which is in charge of its management, will share with Japan the leadership of the future programme.

Finishing on an optimistic note, the number of French co-leaders on IODP shipments has been growing strongly over the past two years. This brings us to collect the pre-cruise impressions of Marianne Conin, who was selected as a Co-chief Scientist on IODP Expedition 405: Tracking Tsunamigenic Slip Across the Japan Trench (JTRACK)



Sites to be drilled off Japan during the forthcoming IODP Expedition 405.

Pre-cruise impressions of **Marianne Conin**, Co-chief Scientist on IODP Expedition 405:

What are the tasks that keep you busy a few months before boarding?

About a year ago, I was asked to become one of the Co-chiefs of the IODP Expedition 405 aboard the *Chikyu*. The proposal had just been funded for a mission lasting almost four months, including coring, logging and the setting up of an observatory in the Tohoku fault zone destined to remain in place for several years. This expedition faces major technological challenges, as it involves drilling into an active fault zone and install an observatory in an area where the water depth approaches 7 km. It also involved getting a team of 50 scientists, separated in two time windows, to work all together in a common and long term effort. To prepare this expedition, the co-chiefs, expedition managers and technical teams meet approximately every two weeks by videoconference to review technical options and drilling tools, and to ensure that all technical and scientific specialties are on board to get the most exciting sciences out of this expedition.

What are your hopes for the results?

The aim of this mission is to understand the healing processes of a fault zone some ten years after it has hosted a magnitude 9. We'll be lucky enough to be able to compare



Marianne Conin
onboard *Chikyu* during
IODP Expedition 358

our data with that obtained by the IODP Expedition 343, which drilled in the same zone less than a year after the Mw9, Tohoku-oki earthquake. The study of the temporal evolution of an active fault zone and its host rock over the course of a seismic cycle is quite unique and exciting, and I hope that our data will enable us to better understand the processes underlying this evolution. This mission should also provide us with information on the role of sediments entering subduction in the seismo-tectonic behavior of this margin.

What's your general state of mind?

I'm both very excited about this expedition, which was conceived and built 12 years ago when we were completing the IODP Expedition 343, and I'm also aware of the tremendous amount of upstream work that such an expedition requires. The team around us is extremely competent, which helps us a lot as Co-chief.

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Danish ECORD activities have in particular focused on post-cruise work (analyses, reporting) following recently completed expeditions in the North Atlantic region; Expedition 396: Mid-Norwegian Margin Magmatism and Paleoclimate Implications, and Expedition 400: North West Greenland glaciated margin. A substantial contribution was made to the IODP Expedition 400 Preliminary Report which lays the foundation for the research projects starting after the sampling party held 18-22 March at MARUM in Bremen.

Danish scientists are involved in several active mission-specific proposals, including NORTHGREEN - Northeast Greenland glaciated margin, led by Lara Perez, GEUS, Denmark; and GLACE-NS - Late Cenozoic Glaciers, LANDscapes, CLimates, and ECOSYSTEMS of the North Sea - led by Andrew Newton, Queens University, northern Ireland.

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Finland is looking forward to hosting the ESSAC Spring meeting and SEP meeting in the Helsinki area in May and June, respectively. Outi Hyttinen and Aarno Kotilainen have continued working with materials from the Expedition 347 Baltic Sea Paleoenvironment. Joonas Virtasalo has continued to participate in the activities of Expedition 386 Japan Trench Paleoseismology. Christoph Beier is involved in 001-LEAP: Can

soft collision lead to plate tectonic reorganisation? Revisiting the Ontong Java Plateau collision paradox, and in preparing a pre-proposal for an MSP expedition to the Knipovich ridge with Italian, British and Norwegian colleagues.

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2024 is one of the most engaging years for the Italian geological community. The last two expeditions of the current IODP program to be implemented with the JR before its dismissal - Expedition 402 and 403 - will be led by two Italian Co-chief Scientists: N. Zitellini (CNR ISMAR) and R.G. Lucchi (OGS).

Many Italian experts have been involved in the IODP Expedition 402: Tyrrhenian Continent–Ocean Transition, recently completed. Together with the Co-chief N. Zitellini, two scientists sailed as Micropaleontologist/Nannofossils and Physical Properties specialists, respectively A. Di Stefano (University of Catania) and M.F. Loreto (CNR ISMAR). Two more shipboard scientists were also onboard as observers: A. Sanfilippo (University of Pavia) and P. Vannucchi (University of Florence). R. Tribuzio (University of Pavia), as a Metamorphic Petrologist specialist, and D. Insinga (CNR ISMAR), as an expert in Tephrochronology, will join the Science Party of the expedition as shore-based scientists. On the IODP-Italy website, a special page spotlights updated news, reports, press releases, social media and multimedia content of IODP Expedition 402 (<https://bit.ly/4c4d0y0>), which are also gathered in a Wakelet collection <https://wakelet.com/wake/L7aDqD0hS1hFnr1PsfQ9d>.

Taking advantage of the arrival of the JR at the port of Naples in early February, a new edition of the ECORD School of Rocks “Understand the Planet through ocean exploration” was organised at the University of Naples Federico II. During the workshop, participants were given the unique opportunity to visit the *JOIDES Resolution* with a guided tour by experts (see the article by C. Lupi and E. Piegari on page 31 <https://www.ecord.org/ecord-school-of-rock-2024-naples-italy/>).

On the national side, the IODP-Italy Postdoctoral Fellowships initiative for early career scientists “CNR IODP-Italy call for

projects on IODP scientific drilling themes” is now at its fourth edition (2023). Two projects have been awarded with a fellowship: “Exploring Deoxygenation Dynamics in a Warming Climate: Insights from Oxygen-Starved Conditions in the geological record” (A. M. Mancini, University “Politecnica delle Marche”) and “The origin and evolution of crustal magnetic signature at the Mid-Atlantic Ridge: The influence of prolonged low temperature interaction with seawater in slow- to intermediate spreading ridges” (C. Robustelli Test, University of Turin). The recipients will start their activities soon.



The JR entered the port of Naples at dawn on 9 February 2024, shining at the first light of the new day. Credits: A. Camerlenghi (OGS), ECORD/IODP.

Within the ITINERIS national project (Italian Integrated Environmental Research Infrastructures System, <https://itineris.cnr.it/>), the progress towards the creation of a thematic digital archive of ECORD/ICDP-related data from Italian legacy assets will be presented at the EGU General Assembly 2024 as a poster contribution in the session “Achievements and perspectives in scientific ocean and continental drilling”.

Science Party onboard IODP Expedition 402, led by N. Zitellini (CNR-ISMAR). Credits: R. K. Koorapati, ECORD/IODP



The National Plan for Research Infrastructures (PNIR), from where the funding for ECORD comes from, expires in 2027 and will be discussed for renewal in a couple of years. Given that, the description of the ECORD research infrastructure has been recently updated on the official portal of the Italian primary funding agency (MUR - Ministry of University and Research) and now includes a paragraph concerning the terms of the ECORD involvement in the next International Ocean Drilling Programme IODP³. This should sustain the national commitment in ECORD in the next two years and especially beyond 2027.

The Italian interest in the future of the drilling programme is also demonstrated by the participation in the “Workshop on the Future of Scientific Ocean Drilling” that took place last March in Nachikatsuura (Japan): five Italians registered for onsite participation in the Workshop, while seven Italians registered online in the preliminary application phase. F. Battaglia (CNR-ISP) and M. Rebesco (OGS) presented relevant contributions as first authors in the session “Climate Change and Ocean Health”.

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The JR left the port of Naples for the start of Expedition 402 on 14 February sailing towards the Mediterranean centre.
Credits: A. Camerlenghi (OGS), ECORD/IODP



The last few months of IODP related activities in Portugal were strongly connected to IODP Expedition 401: Mediterranean-Atlantic Gateway Exchange (10 December 2023 – 9 February 2024). We sailed early career researcher Manuel Teixeira from the Instituto Dom Luiz of the University of Lisbon as observer/physical properties expert on that expedition (photo on the top right). His post-cruise research will look at “Slope instability and mass movement processes affecting the Mediterranean-Atlantic Contourite Depositional System since the Messinian Salinity Crisis: implications driven by the closure and re-opening of the Mediterranean-Atlantic gateway”. During the expedition, he contributed to ship-to-shore calls between the *JOIDES Resolution* and the Ciência Viva Centre in the Algarve. In parallel to the expedition, the Ciência Viva Centre hosted an exhibit related to the science of Expedition 401, which also showcased the ECORD Sphere (see page 41).

Another outreach activity involves the papercraft model of the *JOIDES Resolution*, which became a prominent part of a diorama (photo on the bottom right) that early career researchers of the Marine Geology Division of the Instituto Português do Mar e da Atmosfera (IPMA) assembled. This diorama will be used to teach primary school students who are attending the IPMA Escolas activity in the Sedimentology and Micropaleontology Laboratory on how we obtain sediment cores from the seafloor and study paleoclimatic changes archived in those sediments.

On the science side, results from IODP Expeditions 303, 306 and 339 featured prominently in lectures given by Antje Voelker (IPMA/ESSAC), to students and scientists at Peking University (Beijing, China) in early November 2023. The upcoming EGU General Assembly in April 2024 will also have several scientific contributions arising from Expeditions 339 and 397, especially in session CL1.1.2: Orbital to millennial scale paleoclimate dynamics, with special contributions from the Iberian Margin.



Portuguese scientist Manuel Teixeira (right) and Co-chief Scientist Rachel Flecker (UK, left) discussing features visible in the working halves of a sediment core retrieved during IODP Expedition 401. Credits: ECORD/IODP.



Diorama with the *JOIDES Resolution* papercraft model for teaching activities in the IPMA Escolas programme targeting primary school students. Credits: ECORD/IODP.

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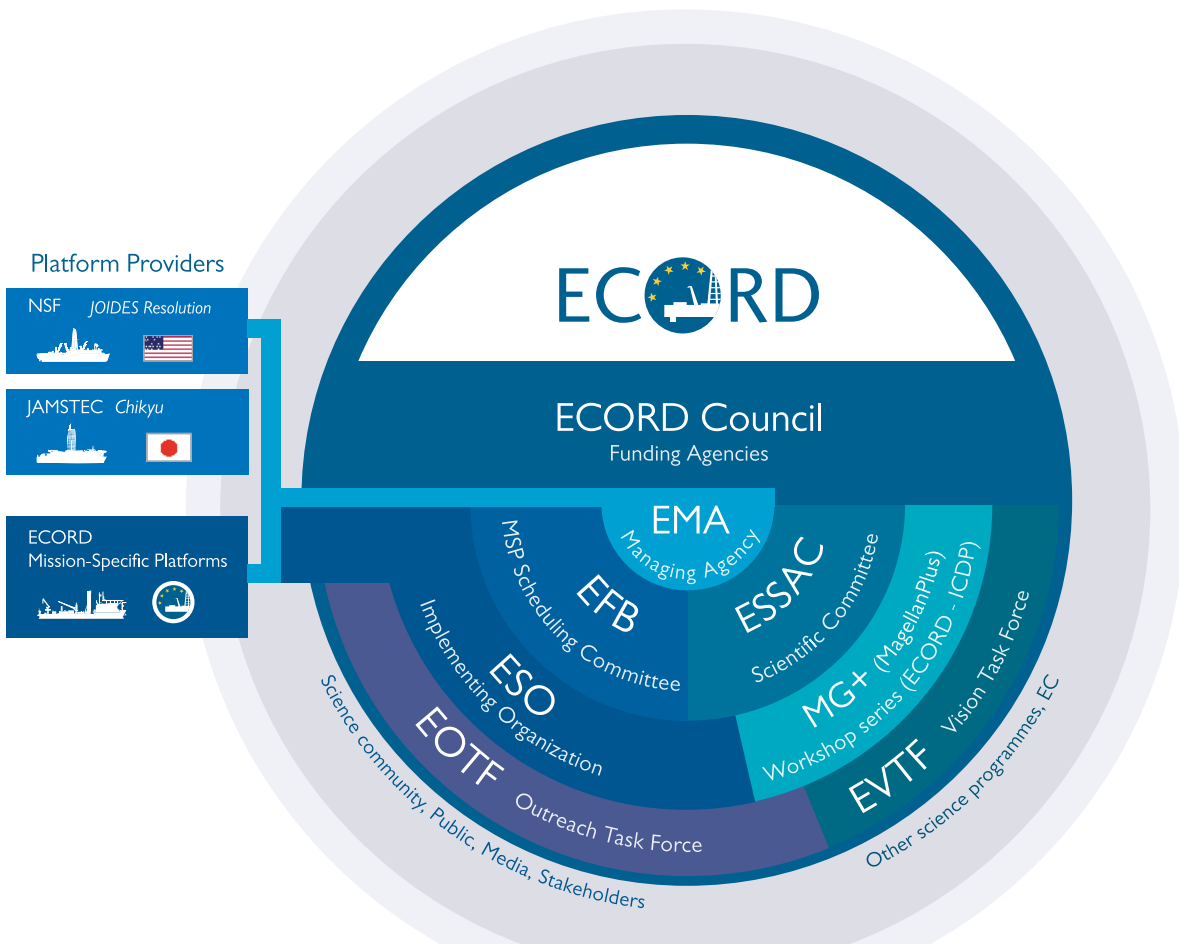
Secured samples taken from the cores during the Onshore Science Party of IODP Expedition 389, Bremen Core Repository, MARUM, Germany. Credits: M. Parker, ECORD/IODP.



ACEX: Arctic Coring Expedition	IODP³: (IODP cubed) International Ocean Drilling Programme (starting 1 January 2025)
AGU: American Geophysical Union	JAMSTEC: Japan Agency for Marine Earth Science and Technology
AMS: Arctic Marine Solutions	J-DESC : Japan Drilling Earth Science Consortium
ANZIC: Australian and New Zealand IODP Consortium	JOIDES: Joint Oceanographic Institutions for Deep Earth Sampling
ArcOP: Arctic Ocean Paleoceanography, IODP Expedition 377	JpGU: Japan Geoscience Union
BCR: Bremen Core Repository	JR: <i>JOIDES Resolution</i>
BGR: Bundesanstalt für Geowissenschaften und Rohstoffe - Federal Institute for Geosciences and Natural Resources	JRFB: <i>JOIDES Resolution</i> Facility Board
BGS: British Geological Survey	JRSO: <i>JOIDES Resolution</i> Science Operator
BMS: Boring Machine System	MarE3: Institute for Marine-Earth Exploration and Engineering
CCOD: Canadian Consortium for Ocean Drilling	MARUM: Zentrum für Marine Umweltwissenschaften der Universität Bremen - Center for Marine Environmental Sciences, University of Bremen
CIB: <i>Chikyu</i> IODP Board	mbsf: metres below seafloor
CNR: Consiglio Nazionale delle Ricerche – National Research Council, Italy	mbsl: metres below sea level
CNRS: Centre National de la Recherche Scientifique - National Center for Scientific Research, France	MCIN: Ministry for Science and Innovation, Spain
DAFSHE: Danish Agency for Science and Higher Education	MeBo: Meeresboden-Bohrgerät - seafloor drill
DFG: Deutsche Forschungsgemeinschaft - German Research Foundation	MEXT: Ministry of Education, Culture, Sports, Science & Technology, Japan
ECORD: European Consortium for Ocean Research Drilling	MoU: Memorandum of Understanding
EFB: ECORD Facility Board	MSP: Mission-specific platform
EGU: European Geosciences Union	NHM: Natural History Museum
EMA: ECORD Managing Agency	NSF: National Science Foundation, USA
EOTF: ECORD Outreach Task Force	NWO: Nederlandse Organisatie voor Wetenschappelijk Onderzoek - Netherlands Organisation for Scientific Research
EPC: European Petrophysics Consortium	ÖAW: Österreichische Akademie der Wissenschaften - Austrian Academy of Sciences
EPSP: Environmental Protection and Safety Panel	ODP: Ocean Drilling Program
ESO: ECORD Science Operator	OSP: Onshore Science Party
ESSAC: ECORD Science Support and Advisory Committee	PI: Principal Investigator
EVTF: ECORD Vision Task Force	PMO: Program Member Office
FB: Facility Board	PSP: Personal Sampling Party
FCT: Fundação para a Ciência e a Tecnologia - National Funding Agency for Science and Technology	SEP: Science Evaluation Panel
FNS: Fonds National Suisse de la Recherche Scientifique - Swiss National Science Foundation	SMR: Science Mission Requirements
FY: Fiscal Year	SPRS: Swedish Polar Research Secretariat
GPC: Giant Piston Corer	SSO: Science Support Office
GSI: Geological Survey of Ireland	UKRI: UK Research and Innovation
IBM: Izu Bonin Mariana	USSSP: U.S. Science Support Program
ICDP: International Continental Scientific Drilling Program	VR: Vetenskapsrådet - Swedish Research Council
IKC: In-kind contribution	
IODP: Integrated Ocean Drilling Program (2003-2013) & International Ocean Discovery Program (2013-2024)	

Splitting the cores during the Onshore Science Party of IODP Expedition 389, Bremen Core Repository, MARUM, Germany. Credits: M. Parker, ECORD/IODP.





ECORD Member Countries



- | | | |
|----------------|----|---|
| Austria | 1 | Österreichische Akademie der Wissenschaften (ÖAW) |
| Canada | 2 | Canadian Consortium for Ocean Drilling (CCOD) |
| Denmark | 3 | Danish Agency for Science and Higher Education |
| Finland | 4 | Suomen Akatemia |
| France | 5 | Centre National de la Recherche Scientifique (CNRS) |
| Germany | 6 | Deutsche Forschungsgemeinschaft (DFG) |
| Ireland | 7 | The Geological Survey of Ireland (GSI) |
| Italy | 8 | Consiglio Nazionale delle Ricerche (CNR) |
| Netherlands | 9 | Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) |
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