



## **MOSAiC – The International Arctic Drift Expedition**

### **Announcement of Opportunity**

Issued on: 24th August 2017

Full Proposals deadline: 4pm on 31st January 2018

### **1. Summary**

Proposals are invited for a new Research Programme which will provide the opportunity for participation in the Multidisciplinary drifting Observatory for the Study of Arctic Climate ([MOSAiC](#)) initiative.

This opportunity is in partnership with the Department for Business, Energy and Industrial Strategy (BEIS), and is expected to support up to 6 two-month berths on the MOSAiC expedition and associated research proposals that are compatible with the MOSAiC [Science](#) and [Implementation](#) plans. Up to £1.8m is available from NERC for this call, with a maximum cost to NERC of £300k per research proposal.

Proposals are invited for this call from eligible UK researchers (see [NERC Grants Handbook](#) for standard eligibility criteria).

The closing date for full proposals is 16:00 on 31<sup>st</sup> January 2018.

In support of the development of proposals compatible with the MOSAiC [Science and Implementation Plans](#), a travel fund will be made available to enable UK applicants to attend the 13-16 November 2017 MOSAiC [Implementation Workshop](#) in St Petersburg. Funds will be awarded on a first come, first served basis, although if required some balancing may be made across organisations. Those interested should contact [mosaic@nerc.ac.uk](mailto:mosaic@nerc.ac.uk) for further information.

### **2. Background**

The Arctic is the fastest changing environment on the planet ([IPCC 2014](#)), with warming rates exceeding twice the global average. The dramatic changes in the Arctic climate system and the fast retreat of Arctic sea ice strongly affects global climate. However, the observed rate of climate change in the Arctic is not well reproduced in climate models, with many processes poorly represented because they are not well understood. This understanding is limited by a lack of year round observations in the central Arctic.

The inability of modern climate models to reproduce Arctic climate change is one of the most pressing problems in understanding and predicting global climate change. MOSAiC has been designed in response to this research need and will provide a step change in understanding of the coupled Arctic climate system and in its representation in global climate models. It will do this by conducting a year-long study from the RV *Polarstern* as it drifts in the ice across the central Arctic Ocean from October 2019 to October 2020. The goal is to enhance understanding of central Arctic Ocean coupled atmosphere-ice-ocean-ecosystem processes to improve numerical models for sea ice forecasting, extended-range weather forecasting, climate projections and climate change assessment.

MOSAIC is organised around the broad science question: **What are the causes and consequences of an evolving and diminished Arctic sea ice cover?**

Co-ordinated with this top level science question is a suite of sub-questions around which the specific observational and modelling activities of MOSAiC are organised. These are:

- I. What are the seasonally-varying energy sources, mixing processes, and interfacial fluxes that affect the heat and momentum budgets of the Arctic atmosphere, ocean and sea ice?
- II. How does sea ice formation, drift, deformation and melting couple to atmospheric, oceanic and ecosystem processes?
- III. What are the processes that regulate the formation, properties, precipitation and life time of Arctic clouds and their interactions with aerosols, boundary layer structure and atmospheric fluxes?
- IV. How do interfacial exchange rates of biogeochemical process- related trace gases trigger the Arctic climate system?
- V. How do sea ice and pelagic ecosystems respond to changes in Arctic sea ice?
- VI. How do ongoing changes in the Arctic climate system impact large-scale heat, momentum and mass fluxes and how do these changes feed back into the Arctic climate and ecosystem?

This programme will address the 'Managing Environmental Change' challenge in the NERC strategy. Outputs will contribute to enhanced understanding of the regional and global consequences of Arctic climate change and sea-ice loss, and improve weather and climate predictions. As such it will support safer maritime and offshore operations, contribute to an improved scientific basis for future fishery and traffic along northern sea routes, increase coastal-community resilience, and support science-informed decision-making and policy development. Improved understanding of the impact of Arctic climate change on conditions world-wide will provide stakeholders and decision-makers with improved knowledge for adapting to climate change and develop target oriented mitigation strategies.

### 3. Scope

#### 3.1 Programme objectives

The overarching objective of the MOSAiC initiative is to: ‘enhance process-level understanding of the coupled central Arctic climate system that will improve numerical models for sea ice forecasting, extended-range weather forecasting, climate projections, and climate change assessment.’<sup>1</sup>

The motivations for the initiative and outline of the specific science questions around which it is organised are described in the MOSAiC [Science](#) and [Implementation](#) Plans.

The aim of this research programme, in partnership BEIS, is to provide the opportunity for the UK scientific community to engage with the MOSAiC expedition through the funding of six research proposals that will each utilise a two month berth on the RV *Polarstern*. Proposals must demonstrate that they cannot be undertaken without this opportunity and align with the overarching aim of MOSAiC and the specific science questions detailed in the [Science Plan](#) (outlined in Section 2).

In support of the development of proposals compatible with the MOSAiC [Science and Implementation Plans](#), a travel fund will be made available to enable UK applicants to attend the 13-16 November 2017 MOSAiC [Implementation Workshop](#) in St Petersburg. Funds will be awarded on a first come, first served basis, although if required some balancing may be made across organisations. Those interested should contact [mosaic@nerc.ac.uk](mailto:mosaic@nerc.ac.uk) for further information.

#### 3.2 Proposal requirements

All proposals are required to align with the MOSAiC [Science Plan](#) and receive endorsement from the MOSAiC project board prior to being submitted to NERC.

Applicants should discuss their idea **as soon as possible** with the relevant MOSAiC team coordinator for their research area (see list below) to ensure that the project being proposed supports the overall MOSAiC scientific plan and appropriately coordinates with other MOSAiC activities.

Applicants will subsequently be required to contact Anja Sommerfeld ([Anja.Sommerfeld@awi.de](mailto:Anja.Sommerfeld@awi.de)) in the MOSAiC office and the appropriate team coordinator (see below), with a short description of their proposed project. Descriptions should include scientific plans and objectives, logistical consideration and required berth space. **Please note that applicants to this call are only able to apply for a single berth on one 2 month leg of the expedition.**

Proposals descriptions must be submitted to MOSAiC no later than **13th December 2017**, and copied to [mosaic@nerc.ac.uk](mailto:mosaic@nerc.ac.uk), for assessment by the MOSAiC project board.

Proposal ideas approved by MOSAiC will receive a letter of endorsement, a copy of which must be included with submitted proposals to NERC to confirm the eligibility of the project idea.

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<sup>1</sup> [MOSAIC Science Plan](#)

Applicants must outline within proposals why their proposed programme of work requires access to the MOSAiC expedition and cannot be undertaken via any other mechanism.

#### MOSAiC Team Coordinators

<b>Atmosphere</b>	Matthew Shupe & Markus Rex	<a href="mailto:matthew.shupe@NOAA.gov">matthew.shupe@NOAA.gov</a> <a href="mailto:markus.rex@AWI.de">markus.rex@AWI.de</a>	U Colorado & AWI
<b>Sea-Ice</b>	Donald Perovich & Marcel Nicolaus	<a href="mailto:donald.k.perovich@USACE.ARMY.mil">donald.k.perovich@USACE.ARMY.mil</a> <a href="mailto:marcel.nicolaus@AWI.de">marcel.nicolaus@AWI.de</a>	CRREL & AWI
<b>Ocean</b>	Christine Provost & Benjamin Rabe	<a href="mailto:Christine.Provost@LOCEAN-IPSL.UPMC.fr">Christine.Provost@LOCEAN-IPSL.UPMC.fr</a> <a href="mailto:benjamin.rabe@AWI.de">benjamin.rabe@AWI.de</a>	UPMC & AWI
<b>Bio-Geochemistry Ecosystem</b>	Brice Loose & Ellen Damm	<a href="mailto:brice@GSO.URI.edu">brice@GSO.URI.edu</a> <a href="mailto:ellen.damm@AWI.de">ellen.damm@AWI.de</a>	URI & AWI
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## 4. Programme requirements

### 4.1 Programme funding

Up to £1.8m is available for this call from NERC to fund up to 6 research proposals with a maximum cost to NERC of £300k each proposal.

The funding to cover the cost of each 2 month berth on the RV *Polarstern* has been provided by a contribution from BEIS. This includes the cost of the return transfer to the RV *Polarstern* and accommodation aboard ship. Transfer to the RV *Polarstern* will be via helicopter from St Petersburg or resupply ice breaker, from currently unspecified ports, depending on the leg. The cost of travel to and from the transfer departure point is not covered by the berth fees and so should be included in proposals if required. Departure points for preferred legs should be discussed with the MOSAiC team coordinator when discussing initial ideas to ensure appropriate requests for funding are made.

Proposals should include formal request (and access costs) for NERC Services and Facilities (e.g. HPC, isotope analyses) where relevant. No additional funding is available to cover NERC Service and Facilities costs, therefore all costs associated with the use of NERC Services and Facilities must be included within the funding limit of proposals.

If National Marine Equipment Pool (NMEP) equipment is required as part of a proposal contact must be made with Marine Planning and National Marine Facilities (NMF) as soon as possible to ensure that the equipment is compatible with use on the *RV Polarstern*. SME's requesting equipment must be submitted and approved by Marine Planning no later than 30<sup>th</sup> November 2017 to ensure that costs are received in time for inclusion in proposal budgets.

#### *4.2 Implementation and delivery*

The duration of proposals may be variable but may not exceed 36 months.

It is anticipated that proposals will start approximately 6 months ahead of the start date for their requested expedition leg, with expedition dates starting from October 2019.

#### *4.3 Knowledge Exchange and Impact*

Knowledge exchange (KE) is vital to ensure that environmental research has wide benefits for society, and should be an integral part of any research.

All applicants must consider how they will or might achieve impact outside the scientific community and submit this with their application as a [Pathways to Impact](#) statement, with associated delivery costs where relevant. Pathways to Impact activities do not have to be cost-incurring; it is not a requirement to include funded activities. Any funds required to carry out any proposed, outcome-driven activities identified within the Pathways to Impact **must** be fully justified within the Justification of Resources statement.

The Pathways to Impact will identify those who may benefit from or make use of the research, how they might benefit or make use of the research, and methods for disseminating data, knowledge and skills in the most effective and appropriate manner.

An acceptable Pathways to Impact is a condition of funding. Grants will not be allowed to start unless unacceptable Pathways to Impact are enhanced to an acceptable level within 2 months of notification of the panel outcome.

All funded projects may also be required to engage with programme-wide KE activities, in which case appropriate funding for which will be provided by the programme.

#### *4.4 Data Management*

The [NERC Data Policy](#) must be adhered to, and an [outline data management plan](#) produced as part of proposal development. NERC will pay the data centre directly on behalf of the programme for archival and curation services, but applicants should ensure they request sufficient resource to cover preparation of data for archiving by the research team.

#### *4.5 NERC Facilities*

Prior to submitting a proposal, applicants wishing to use a NERC service or facility must contact the facility to seek agreement that they could provide the service required. Applicants wishing to use a NERC facility will need to submit a mandatory 'technical assessment' with their proposal (including aircraft but excluding ships and HPC). For NERC, this means a quote for the work which the facility will provide. A [full list](#) of the Facilities requiring this quote can be found here on the NERC website. The costs for the service or facility (including NMF costs) must be included within the Directly Incurred Other Costs section of the Je-S form and also within the facilities section of the Je-S form. Further information on [NERC services and facilities](#) can be found on the NERC website.

Applicants must ensure that they approach the required service or facility in sufficient time to enable the 'technical assessment' and cost to be provided ahead of proposal submission. All SME's for NMEP equipment use must be submitted no later than 30<sup>th</sup> November 2017.

#### *4.6 Programme management*

It will be a condition of grant awards that the lead PIs of the awarded grants will work closely for the life time of the programme with the defined Programme Management arrangements.

#### *4.7 Reporting requirements*

As with all NERC grant holders, there will be a requirement to report through the RCUK reporting system; this is required annually and continues for up to five years post grant end.

## **5. Application process**

### *5.1 How to apply*

#### *5.1.1 Full Proposals*

*Closing Date: 31st January 2018*

Full proposal must be submitted using the Research Councils' Joint Electronic Submission system (Je-S). Applicants should select Proposal Type - 'Standard Proposal' and then select the Scheme – 'Directed' and the Call – 'MOSAIC JAN18'.

Applicants must ensure that their proposal is received by NERC by 4pm on the closing date (at which point the Je-S portal closes). Applicants should leave enough time for their proposal to pass through their organisation's Je-S submission route before this date. Any

proposal that is incomplete, or does not meet NERC's eligibility criteria or follow NERC's submission rules (see [NERC Grants Handbook](#)), will be office rejected and will not be considered.

All attachments, with the exception of letters of support and services/facilities/equipment quotes, submitted through the Je-S system must be completed in single-spaced typescript of minimum font size 11 point (Arial or other sans serif typeface of equivalent size to Arial 11), with margins of at least 2cm. Please note that Arial narrow, Calibri and Times New Roman are not allowable font types and any proposal which has used either of these font types within their submission will be rejected. References and footnotes should also be at least 11 point font and should be in the same font type as the rest of the document. Headers and footers should not be used for references or information relating to the scientific case. Applicants referring to websites should note that referees may choose not to use them.

Applicants should ensure that their proposal conforms to all eligibility and submission rules, otherwise their proposal may be rejected without peer review. More details on NERC's submission rules can be found in the [NERC research grant and fellowships handbook](#) and in the [submission rules](#) on the NERC website.

Proposals for this call should be submitted in standard grant format following the requirements outlined in Section F of the [NERC research grant and fellowships handbook](#).

Please note that on submission to council ALL non PDF documents are converted to PDF, the use of non-standard fonts may result in errors or font conversion, which could affect the overall length of the document.

Additionally where non-standard fonts are present, and even if the converted PDF document may look unaffected in the Je-S System, when it is imported into the Research Councils Grants System some information may be removed. We therefore recommend that where a document contains any non-standard fonts (scientific notation, diagrams etc), the document should be converted to PDF prior to attaching it to the proposal.

No associated studentships can be requested under this call.

It is anticipated that proposals will start approximately 6 months ahead of the start date for their requested expedition leg, with expedition dates starting from October 2019.

## *5.2 Eligibility*

Normal individual eligibility applies and is in Section C of the [NERC research grant and fellowships handbook](#). Research Organisation eligibility rules are in Section C of the handbook.

NERC research and fellowship grants for all schemes may be held at approved UK Higher Education Institutions (HEIs), approved Research Council Institutes (RCIs) and approved Independent Research Organisations (IROs). Full details of [approved RCIs and IROs](#) can be found on the RCUK website.

Please note that investigators may only be involved in one proposal submitted to this call.

## 6. Assessment Process

Proposals will be assessed by an independent panel of international experts and members of the NERC Peer Review College where possible, who will make a funding recommendation to NERC.

The assessment criteria to be used will be as follows:

- Research Excellence
- Fit to Scheme (see Section 3.2 Proposal Requirements)

Feedback will be provided to both successful and unsuccessful applicants.

NERC will use the recommendations of the moderating panel along with the overall call requirements and the available budget in making the final funding decisions.

## 7. Timetable

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|---|--------------------------------|
| • Announcement published:   | 24 <sup>th</sup> August 2017   |
| • Deadline for SME submission   | 30 <sup>th</sup> November 2017 |
| • Deadline for submission of project ideas to MOSAiC:                     | 13 <sup>th</sup> December 2017 |
| • Deadline for submission of full proposals:                              | 31 <sup>st</sup> January 2018  |
| • Assessment panel meets:   | April 2018                     |
| • Anticipated start date for projects:<br>of the requested expedition leg | Approx. 6 months ahead         |

## 8. Contact

For all enquiries, please contact:

Katy Chamberlain or Jessica Surma

[mosaic@nerc.ac.uk](mailto:mosaic@nerc.ac.uk)