MISSION NEPTUNE
EXPEDITION PARTNERS

Call for Partnership in Oceanographic Expeditions

Bringing together expeditions to facilitate discovery, open science and knowledge-based ocean stewardship

ABOUT MISSION NEPTUNE

The ocean lies at the center of many of humanity's greatest challenges—from climate regulation and biodiversity conservation to sustainable development, food security, and the equitable governance of marine resources. New international agreements, such as the UN Treaty on Biodiversity Beyond National Jurisdiction (BBNJ) and the Kunming–Montreal Global Biodiversity Framework, create unprecedented opportunities for science-based ocean governance. The UN Decade of Ocean Science for Sustainable Development strives to build the science foundation for managing the ocean sustainably. This task is gigantic, also because the ocean remains the largest and least known biome on planet Earth. Targeted cooperation is therefore the only path to the ocean we need.

Mission Neptune's Scientific Council is co-chaired by Dr. Margaret Leinen (Director Emeritus Scripps Institution of Oceanography) and Dr. Vladimir Ryabinin (Former Executive Secretary of IOC–UNESCO). Its Founding Partners include Dalio Philanthropies, Minderoo Foundation, Voice of the Ocean, Ifremer, the Oceanographic Institute of Monaco, TPC, Focused on Nature and the University of Khorfakkan. Its Patrons include Dr. Sylvia Earle, H.H. Sheikh Dr. Sultan bin Muhammad Al-Qasimi, H.H. Prince Hussain Aga Khan, Dr. Andrew Forrest, Carl Douglas and Chavalit Frederick Tsao.

Mission Neptune is a new but already prominent international scientific initiative to accelerate discovery of the ocean. In the course of its design, the following eight scientific domains (challenges) were highlighted as initial priorities:

Challenge 1 — Mapping of Habitats

Mapping ocean ecosystems, from shallow coastal seas to abyssal plains and seamount summits, to support the 30×30 conservation target and the designation of area-based protection measures under the BBNJ Agreement. Priority focus on understudied deep-sea and high-seas habitats where mapping data is absent or inadequate for governance purposes.

Relevant expertise: *Multibeam bathymetry; ROV survey design; habitat classification; GIS and spatial analysis; acoustic seafloor mapping; deep-sea benthic ecology*

Challenge 2 — Abundance in Key Areas

Understanding the areas of the ocean that support exceptional concentrations of biodiversity and productivity, biological hotspots, upwelling systems, frontal zones, aggregation areas for migratory species, to anticipate future trajectories of ocean biodiversity, carbon cycling and planetary resilience under climate change.

Relevant expertise: *Pelagic ecology; biological oceanography; remote sensing; species distribution modelling; climate projections; trophic dynamics*

Challenge 3 — Seamount Biodiversity

Deciphering the biodiversity dynamics of seamounts as major hotspots of oceanic life, their species richness, endemism, ecological connectivity, and vulnerability to fishing and mining, to inform their conservation and sustainable management, including the design of Marine Protected Areas in areas beyond national jurisdiction.

Relevant expertise: *Deep-sea biology; taxonomy; population genetics; eDNA and metabarcoding; ROV-based survey; connectivity modelling*

Challenge 4 — Polar Oceans

Investigating the rapidly changing Arctic and Antarctic ocean systems, including sea-ice microbiomes, polar circulation dynamics, glacial melt and their global climate feedbacks, to advance understanding of how polar change will alter ocean function and marine biodiversity at planetary scale.

Relevant expertise: *Physical oceanography; sea-ice science; polar biogeochemistry; microbiology; climate modelling; autonomous observation platforms*

Challenge 5 — Hydrothermal Systems and Bio-inspiration

Exploring hydrothermal vents, cold seeps and chemosynthetic ecosystems as frontiers of ocean science, characterising their biodiversity, biogeochemical function and ecological dynamics, and investigating the bio-inspiration potential of vent-associated organisms and processes for materials science, biotechnology and astrobiology.

Relevant expertise: *Vent biology; geomicrobiology; biogeochemistry; hydrothermal fluid chemistry; extremophile physiology; biomimetics*

Challenge 6 — Blue Carbon Sinks

Quantifying the ocean's role as a carbon sink, through biological, physical and chemical pump processes, sediment carbon storage, and the carbon functions of specific ecosystems including deep-sea sediments, cold-water corals and seagrass beds, and assessing how warming, acidification and circulation changes may alter these climate-regulating functions.

Relevant expertise: *Marine biogeochemistry; carbon cycle science; sediment ecology; physical oceanography; climate modelling; blue carbon accounting*

Challenge 7 — Paleogenomic Archives

Applying paleogenomics to sub-seafloor sediment cores to reconstruct pre-human ecosystem baselines, understand how marine organisms have responded to past climate events, and establish the ecological reference states needed to assess current biodiversity change and guide future conservation targets.

Relevant expertise: *Paleogenomics; palaeoceanography; ancient DNA extraction and sequencing; bioinformatics*

Challenge 8 — Marine Genetic Resources

Advancing fundamental knowledge of marine genetic resources, including their diversity, distribution, ecological roles and potential value, in support of both scientific understanding and the equitable governance of marine genetic resources under the BBNJ Agreement's Part II framework.

Relevant expertise: *Marine genomics; metagenomics; biodiversity informatics; high-seas ecology; eDNA and metabarcoding; BBNJ governance and policy*

*Mission Neptune's approach to these scientific challenges is, on one side, through advancing technology—of observations, exploration, and modelling. On the other side, a key focus is on public engagement, literacy and policy. Detailed descriptions of the Mission Neptune Scientific Challenges and Enablers are available at this link.

Sea-going expeditions are the emblem of ocean exploration. They are key to advancing our knowledge of the ocean. Importantly, they also create inspiration, and even awe, due to fearless work in the deep ocean, acting at the frontier with unknown.

Mission Neptune would like to partner with leading ocean expeditions to maximize their value and support their success. It is the purpose of this call.

WHY BECOME A MISSION NEPTUNE EXPEDITION PARTNER?

Every oceanographic expedition requires deep expertise and a major investment of ship time, advanced technology, and human effort. Organizers always count on maximal return on these investments. Mission Neptune will strive to help partners to realize their fullest potential in expeditions—not only through scientific discovery, but also through international visibility, broad collaboration, impactful communication and strong public engagement, as well as by bridging expeditions with ocean policy and stewardship. The idea of this partnership is to increase the scientific, societal, and international impact of oceanographic expeditions while fully respecting their scientific independence and preserving the intellectual property of investigators.

The Mission Neptune Expedition Partners intends to be a growing international network of scientists, research institutions, technology innovators, philanthropic organizations, and policy leaders that creates opportunities for new collaborations or, where needed, coordination and complementary observations and shared technologies.

If an expedition partner desires to obtain support to its outreach programme, Mission Neptune will make its communications expertise available to the partner. Specific solutions can be offered as well to highlight the achievements of participating expeditions and their sponsoring organizations. They may include the use of digital media, educational initiatives, exhibitions, films, and the Mission Neptune Explorers Gallery.

Mission Neptune can also facilitate connections between expeditions and international ocean policy processes. Working collaboratively with Expedition Partners, Mission Neptune will help to facilitate the use of scientific outcomes and products in implementation of the BBNJ Agreement, the Convention on Biological Diversity, the UN Framework Convention on Climate Change, and in work of the International Seabed Authority and the UN Ocean Decade where cutting-edge scientific evidence is essential for effective decision making. These activities will complement—not replace—the policy engagements of partners.

Mission Neptune will also consider proposals to provide modest targeted co-financing, typically in the range of €50,000–€150,000, for activities that can expand scientific capability or societal impact of an expedition. Co-financing may enable complementary sampling and observations, deployment of innovative technologies, molecular analyses, participation of early-career scientists, data interoperability, communications, community engagement, policy products, or other activities.

HOW TO BECOME A MISSION NEPTUNE EXPEDITION PARTNER?

An expedition or its organizer, willing to become a partner, is invited to send to the Mission Neptune Secretariat an Expression of Interest (EoI). Prospective partners are encouraged to describe how

their expedition can contribute to the Mission Neptune's vision of comprehensive and collaborative approach to ocean exploration. In particular, the EoI is expected to demonstrate how the expedition contributes to one or more of the Mission Neptune Scientific Challenges. Interdisciplinary expeditions that address multiple challenges are particularly welcome. Applying emerging molecular, genomic, imaging, and observational techniques to discover, characterize, and understand marine biodiversity and genetic resources is another area where Mission Neptune would like to facilitate cooperation among expedition partners.

WHAT DOES IT MEAN TO BE AN EXPEDITION PARTNER?

Expedition Partners remain scientifically and operationally independent while joining an international community committed to advancing discovery, open science, innovation, and stewardship of the global ocean and its living systems.

Being selected as a Mission Neptune Expedition Partner signifies that an expedition has been recognized by the Mission Neptune Scientific Council as 1) making a valuable contribution to the Mission's scientific objectives and 2) creating opportunities for collaboration across regions, disciplines, and observing technologies.

Mission Neptune Expedition Partners will share a common commitment to scientific excellence, international cooperation, and maximizing the value of ocean exploration for society. These commitments will strengthen their individual activities and benefit the international community.

Mission Neptune is committed to ensuring that scientific discoveries contribute as broadly as possible to future research and societal benefit by adhering to **Open Science and Data** principles. The Partners therefore are expected to commit to:

- implementing FAIR (Findable, Accessible, Interoperable, and Reusable) data principles;
- depositing primary datasets in recognized international repositories within an agreed period following completion of the expedition, during which expedition investigators have priority access for scientific analysis and publication;
- providing metadata consistent with available internationally recognized standards; and
- contributing observations, where appropriate, to international ocean observing systems and global data infrastructures.

Mission Neptune recognizes that different scientific disciplines and sponsoring organizations have established data policies. The timing and mechanisms for data release will therefore be agreed collaboratively while maintaining the Mission's commitment to open science.

Mission Neptune seeks to help Expedition Partners in their **Public Engagement**. The purpose is to inspire people around the world, beyond the scientific community. Each Expedition Partner is therefore expected to have a public engagement plan appropriate to the nature of the expedition and the capabilities of the participating organizations. If desirable, Mission Neptune will help to co-design and implement this plan through communications expertise and access to appropriate platforms—to complement an expedition's own outreach activities.

EoIs are also encouraged to demonstrate how their expedition will foster scientific collaboration, strengthen partnerships across institutions and nations, contribute to international **capacity development**, and create opportunities for students and early-career scientists. For expeditions conducted within or near the Exclusive Economic Zone of another nation, Mission Neptune strongly

encourages meaningful collaboration with local scientific institutions and, where appropriate, engagement with Indigenous peoples and coastal communities. Such partnerships strengthen both scientific outcomes and the long-term impact of ocean exploration.

Expedition Partners are encouraged to identify opportunities to ensure that their scientific results contribute to **Ocean Policy**, conservation, sustainable resource management, or international scientific assessments. Where appropriate and desired by the expedition team, Mission Neptune can assist in communicating scientific findings to relevant international processes and organizations.

REVIEW AND SELECTION

Affiliation as a **Mission Neptune Expedition Partner** will be accomplished through a review of EoI by the Mission Neptune Scientific Council, a body composed of internationally recognized leaders in ocean science with collective expertise across all scientific interests of the Mission Neptune. The Council will consider each EoI from the vantage point of scientific excellence, relevance to the Mission Neptune Scientific Challenges, and its potential to make a contribution to international understanding of the ocean.
The Scientific Council will consider:

- Scientific quality and originality of the expedition;
- Alignment with one or more Mission Neptune Scientific Challenges;
- Potential contribution to and impact on international ocean observing and exploration;
- Opportunities to enhance the expedition's scientific, societal, or policy impact through partnership with Mission Neptune; and
- Commitment to the principles of open science, responsible data stewardship, and international cooperation.

Recommendations of the Scientific Council will form the basis for selecting a Mission Neptune Expedition Partner and for any associated co-financing.

PRACTICAL STEPS, DEADLINES AND CONTACTS

Prospective Partners are invited to submit their Expression of Interest to the Secretariat of Mission Neptune. EoIs are accepted on a rolling basis, with formal review cycles conducted continuously by the Scientific Council.

Step 1 – Send your EoI to the Mission Neptune Secretariat by email (secretariat@mission-neptune.com). Upon receipt, the Secretariat will confirm eligibility and schedule the EoI for the next review cycle.

Step 2 – EoI is assessed by the Mission Neptune Scientific Council against selection criteria. Applicants will be informed of the outcome within 8 weeks of the relevant review cycle.

Step 3 – Selected expeditions will formalize their partnership through a lightweight agreement covering data, communications and co-financing arrangements, where applicable.