

## **The Arctic in the age of marine robotics**

(Co-led by Dr. A. Marzocchi, NOC; Ms J. Nightingale, University of Southampton; Dr. S. Sareh, Royal College of Art)

Marine robotics is rapidly expanding into the Arctic Ocean, where it will intersect with Indigenous knowledge systems, traditional livelihoods, and established governance arrangements. Aligned with the principles of the Arctic Council, this session is explicitly preparatory: it focuses on how researchers and technology developers should engage in equitable and respectful relationships with Arctic communities. We explore ethical, social, and design considerations for marine robotics, including opportunities for community-led monitoring and citizen science that support shared stewardship. The session brings together marine scientists and roboticists, social scientists, and designers, and contributes to the shaping of the International Polar Year (2032-33) by advancing inclusive, co-produced approaches to Arctic Ocean observations and governance.

**Workshop output:** The session will aim to produce tangible outputs (depending on the participants' expertise and composition), designed as a preparatory step before wider engagement with Arctic research and local communities; such as: 1) a concise ethical and engagement framework that translates Arctic Council principles into practical guidance for marine robotics researchers, identifying early-stage decision points, responsibilities, and pathways for respectful collaboration; and/or 2) a prototype participatory monitoring concept, combining draft protocols and design sketches for community-informed observation using marine robotics, intended as a proof of concept to be refined through future co-production with local communities.