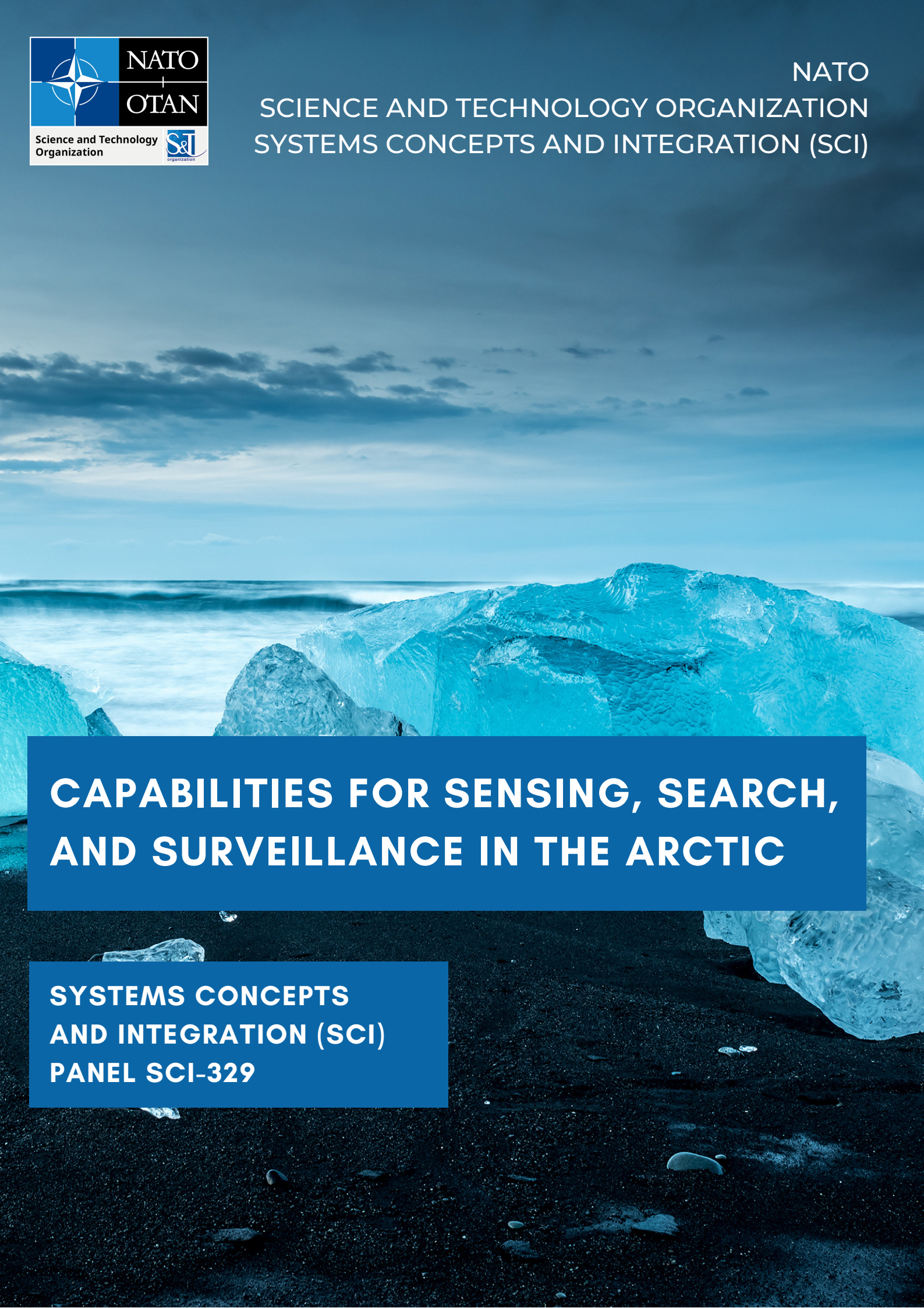
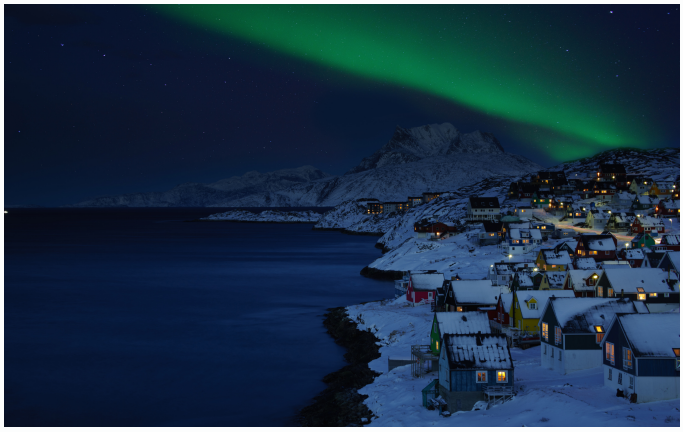
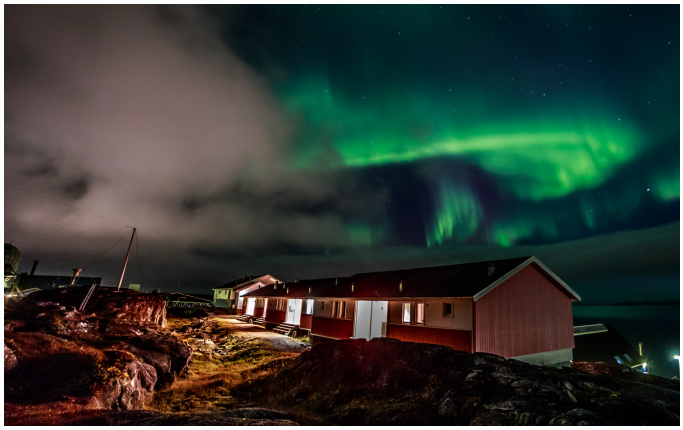
NATO
SCIENCE AND TECHNOLOGY ORGANIZATION
SYSTEMS CONCEPTS AND INTEGRATION (SCI)

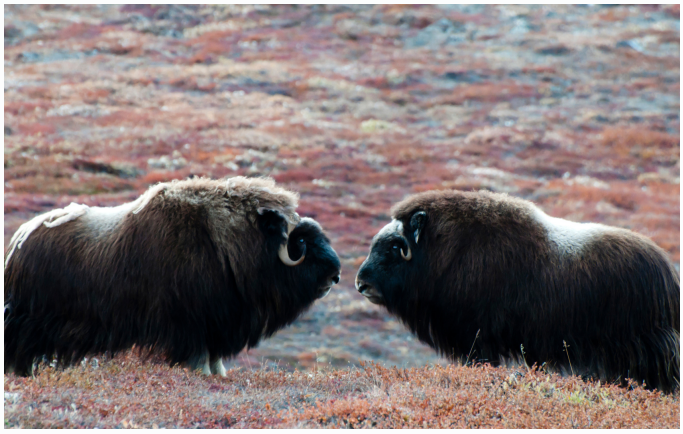


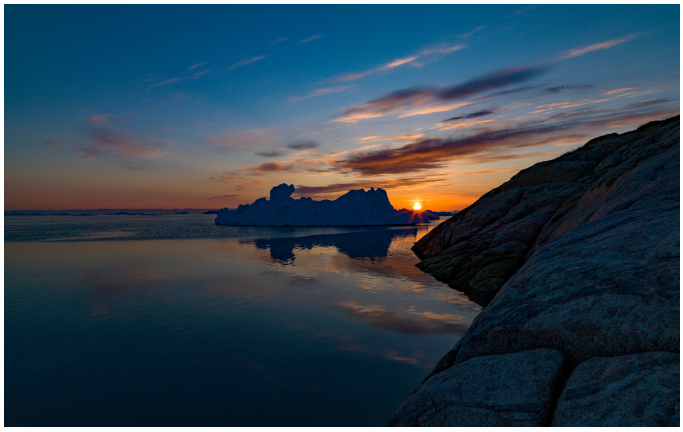
CAPABILITIES FOR SENSING, SEARCH, AND SURVEILLANCE IN THE ARCTIC

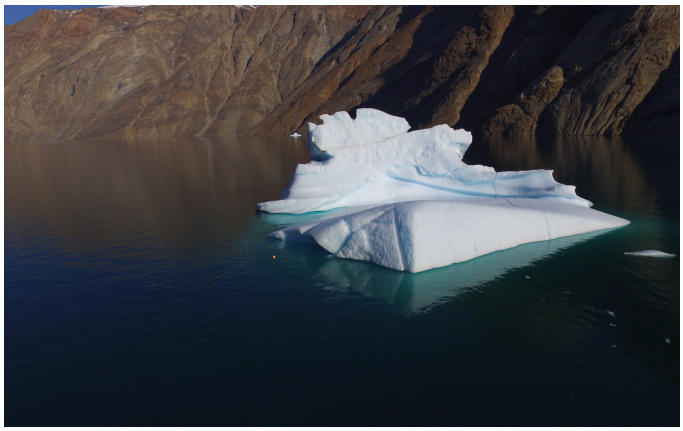
SYSTEMS CONCEPTS AND INTEGRATION (SCI) PANEL SCI-329









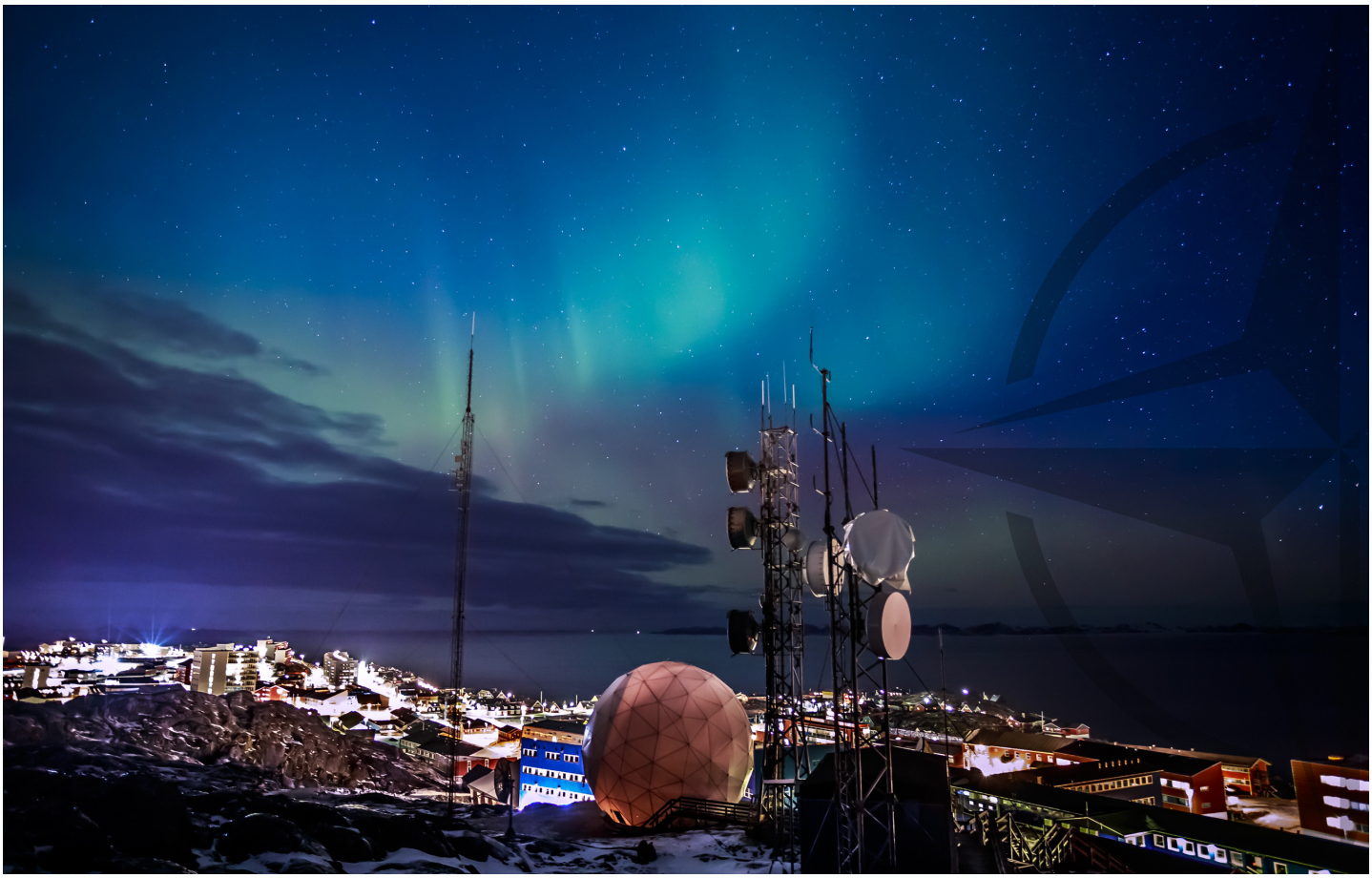


NUUK, GREENLAND, KINGDOM OF DENMARK, 19-21 JUNE 2023

CONTACTS:

NATO Science and Technology Organization
mailbox@cso.nato.int
https://www.linkedin.com/company/natosto/

Forsvarsministeriets Materiel- og Indkøbsstyrelse
fmi@mil.dk
https://www.linkedin.com/company/fmn-fmi/



A rapidly changing environment

The Arctic has always held strategic importance for NATO. As the gateway to the North Atlantic, the region is home to key trade, transport and communication channels between North America and Europe. With Finland's recent accession to the Alliance, six of the eight Arctic countries are now NATO Nations.

Although the Arctic has historically been an area of low tensions, climate change is rapidly transforming the landscape, presenting both opportunities and challenges for NATO Nations. Melting sea ice has opened new shipping routes, presenting avenues for trade and commerce, and authoritarian regimes such as Russia and China are expanding their activities in the High North.

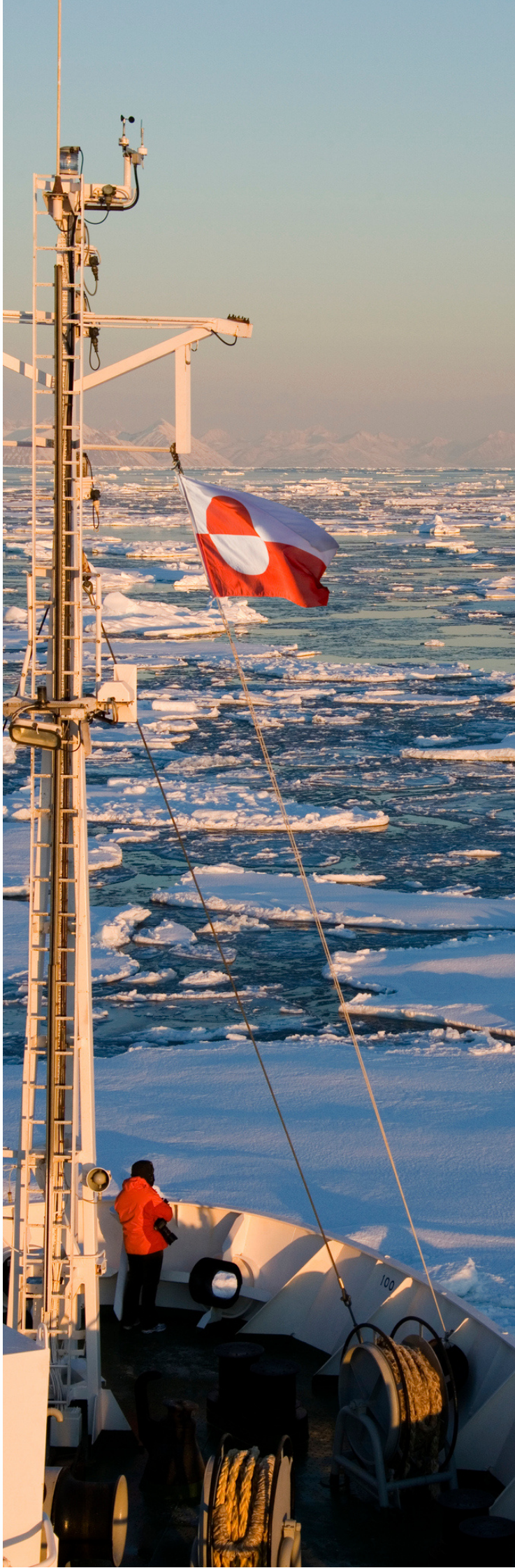
Against this increasingly dynamic backdrop, NATO is taking important steps to ensure stability, security and co-operation in the Arctic. It has increased its presence in the region, with the creation of a new NATO Command, and conducts regular Arctic exercises – including the major Trident Juncture and Cold Response exercises – to ensure operational readiness in all conditions.

Maintaining military advantage in the High North

Science and technology (S&T) play a critical role in enabling NATO's ability to deter and defend, and in developing cutting-edge capabilities to ensure military advantage. S&T is especially crucial in the Arctic, where harsh conditions pose unique challenges to Alliance military operations.

Sensing, search and surveillance capabilities, for example, will be key to successful operations in the High North, enabling NATO and Nations to model and predict the changing environment, and to detect threats from the air, surface and underwater/under ice. Having a clear and comprehensive view on the Arctic as it continues to change, and as adversaries accelerate their activities, is an essential first step to securing the region.

The NATO Science and Technology Organization (STO) has carried out a wide range of research on cutting-edge sensors and sensor technologies over the years, yet it has only recently begun focusing on how these technologies could be applied within the Arctic environment. And although space-based systems will be crucial to enabling sensing, search and surveillance operations, the systems that NATO currently uses were designed for deployment in lower-altitude environments. Ensuring security and prosperity in the Arctic demands the most advanced sensor technologies and capabilities.



Sensing, search and surveillance in the Arctic

To help bridge this gap, the NATO STO has organised a Research Specialists' Meeting (RSM) on "Capabilities for Sensing, Search and Surveillance in the Arctic", held in Nuuk, Greenland, Kingdom of Denmark, on 19-21 June 2023. Organised under the STO Systems Concepts and Integration (SCI) Panel, the meeting will bring together leaders from military, government, academia and industry to discuss technological solutions to the unique challenges that the Arctic region poses. The event will cover the latest developments in sensing systems (RF, EO/IR, acoustic), sensor data fusion, remote sensing and image interpretation, and the use of data from multi-platform sensor systems, among other topics. Keynote speeches will be delivered by high-level leaders and experts, followed by a series of discussions.

The meeting also coincides with the 2023 NATO Innovation Challenge on "Monitoring the Arctic: from space to seabed", co-organised by the NATO Innovation Hub and the NATO Communications and Information Agency (NCIA), and hosted by the Joint Arctic Command.

Topics to be covered:

- **RF, EO/IR, acoustic and environmental sensing systems;**
- **Sensor data fusion;**
- **Remote sensing and image interpretation;**
- **Communication systems;**
- **Assessing, estimating or predicting sensor system performance;**
- **Using data from multiplatform sensor systems;**
- **Platforms and systems integration;**
- **Space capabilities;**
- **Search and rescue;**
- **Shortcomings of current capabilities for Arctic operations**

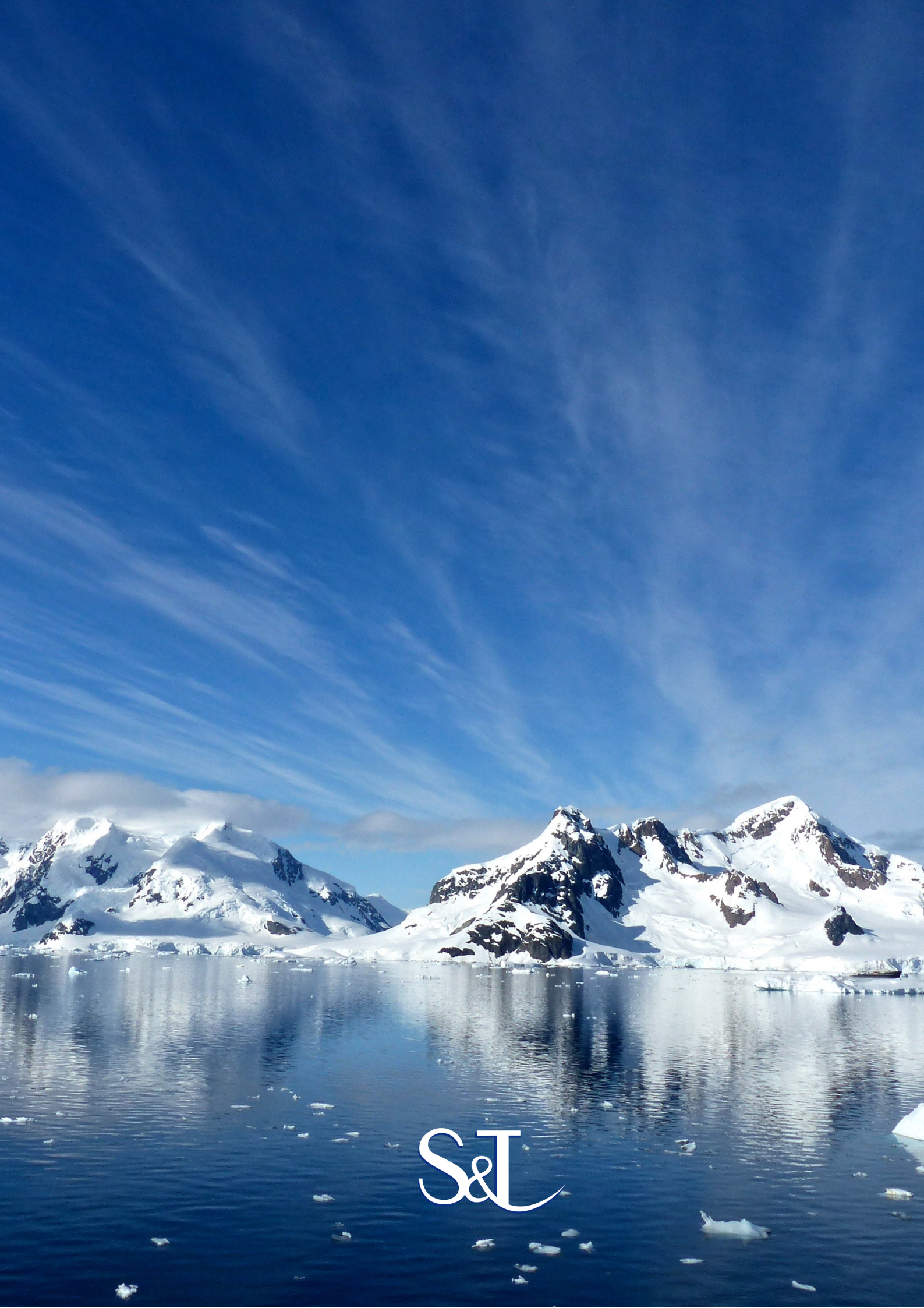
Towards a secure and prosperous Arctic

The RSM is an important part of a broader NATO effort to secure the High North, in particular, and to maintain its technological advantage, more broadly. It builds upon previous work carried out by the SCI Panel, including a Research Symposium (SCI-283) that established the importance of space capabilities in coalition operations.

The strength of NATO's collective defence ultimately rests upon close cooperation and interoperability amongst Nations, and the coalescence of National capabilities. Through the STO Collaborative Programme of Work (CPoW), NATO aims to equip all Nations with the S&T they need to develop the interoperable, cutting-edge capabilities that ensure battlefield success. Encompassing all cooperative scientific activities and research undertaken by NATO and Partner Nations, the CPoW is built upon a collaborative business model that brings together 5,000 of the best and brightest scientists and engineers in government, industry and academia from across the Alliance. Together, these researchers form the world’s largest defence-focused collaborative scientific network.

This work will only become more critical in the years to come. Russia’s war of aggression in Ukraine has been a tragic reminder of the fragility of peace in the Euro-Atlantic area, and has reshaped the global security landscape. Climate change could further destabilize governments, economies and ecosystems across the globe, and the Arctic is on the front lines of this transformation. NATO remains committed to ensuring peace and stability in the region over the decades to come, and S&T is the key to delivering on its mission.

For more information about the NATO Science and Technology Organization, please visit www.sto.nato.int.


S&L