

25-26 October 2018
Berlin (Germany)

2nd
**ARCTIC SCIENCE
MINISTERIAL**

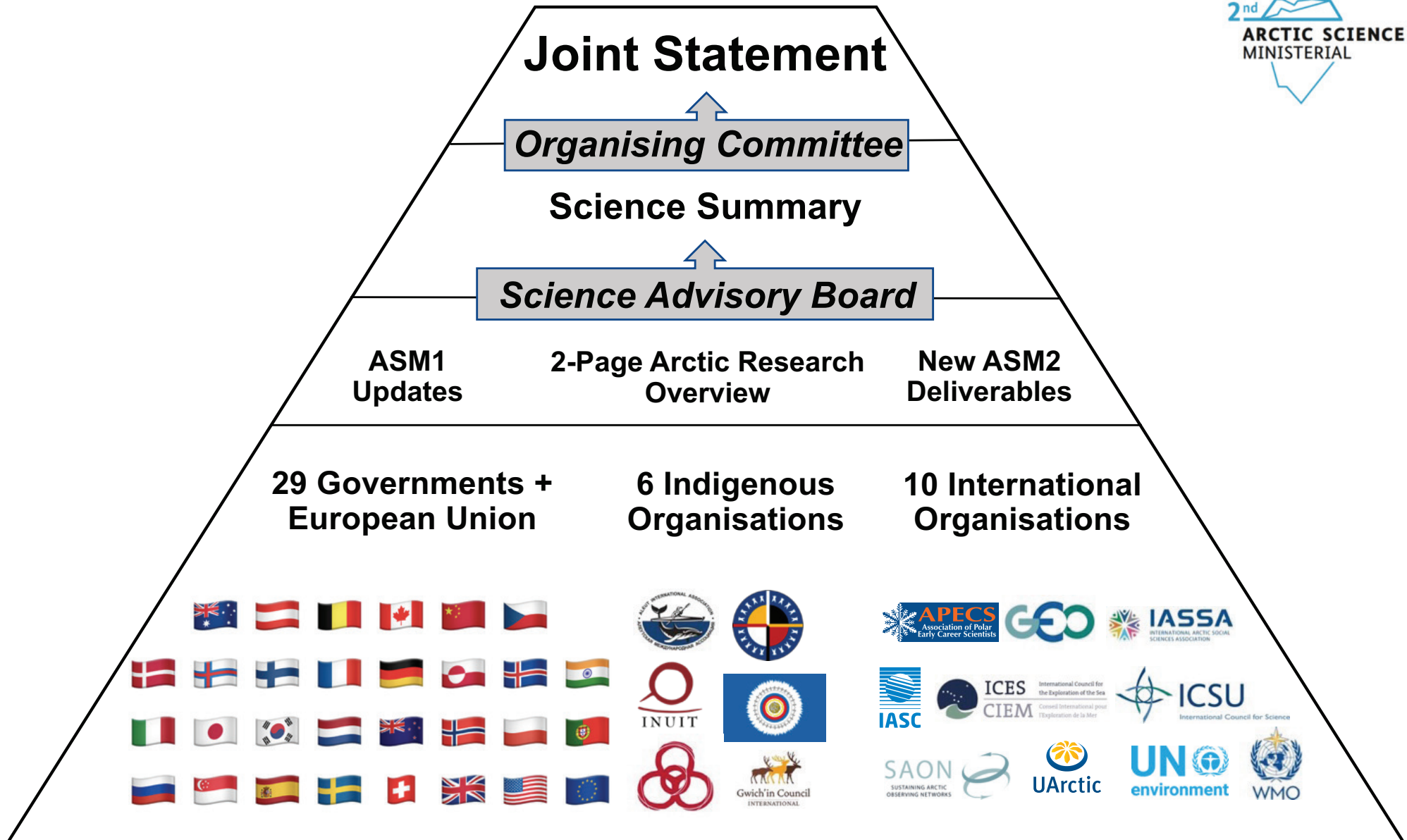


Ministry of
Education
and Culture



Bundesministerium
für Bildung
und Forschung

ASM2 Teleconference 14 September 2018



The ASM2 Process

ASM2 Science Advisory Board

Karin Lochte (GER, Chair)
Tuula Aarnio (FIN, Ex Officio)
Jenny Baeseman (Baeseman Consulting)
Tim Eder (GER, Ex Officio)
Kelly Falkner (USA)
Attilio Gambardella (EC, Ex Officio)
Larry Hinzman (IASC)
Kirsi Latola (FIN)
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Volker Rachold (GER, Ex Officio)
Andrea Tilche (EC)
Huigen Yang (CHI)

Word cloud created using

- all projects submitted
- keywords and describing words

by Baeseman Consulting & Services for the German Arctic Office

ASM 1 Report



https://www.arctic.gov/publications/other/supporting_arctic_science.html

ASM 2 Report

- Executive summary
- Introduction and background
- Meeting agenda
- **Science summary**
- 2-page Arctic research overviews of participating countries and organisations
- Chair's summary of the Science Forum
- Joint Statement signed by the ministers
- ANNEX

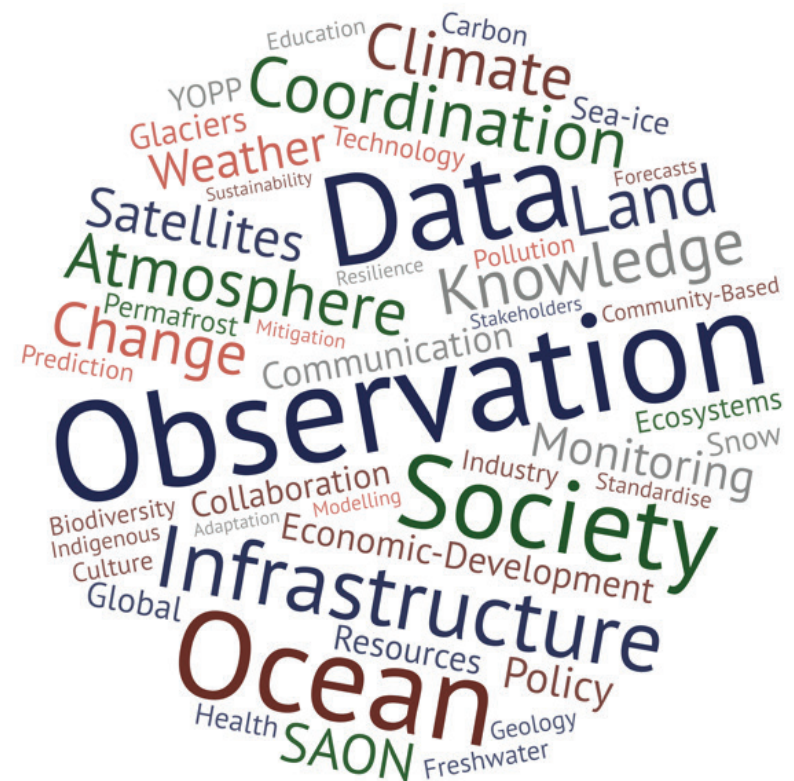
www.arcticscienceministerial.org

- Deliverables submitted by the countries and organisations
- 2-page Arctic research overviews of participating countries and organisations

Science Summary

Theme 1. Strengthening, Integrating and Sustaining Arctic Observations, Facilitating Access to Arctic Data, and Sharing Arctic Research Infrastructure

- Progress towards an integrated Arctic observing system
- Enhanced cooperation and new activities from Space Agencies
- International access to infrastructure
- Increased data access and cyberinfrastructure
- Increased cooperation on new observation technology and methods



Science Summary

Theme 2. Understanding Regional and Global Dynamics of Arctic Change

- Increased predictive capabilities and skills
- Increased Cooperation on Understanding the Arctic System
 - Sea ice
 - Marine ecosystems
 - Arctic Ocean seafloor
 - Ocean circulation
 - Terrestrial ecosystems
 - Freshwater ecosystems
 - Wildlife
 - Permafrost and Methane
 - Ice sheets, glaciers and sea level
 - Economic drivers



Summary of International Interest per Theme

1. Strengthening, Integrating and Sustaining Arctic Observations, Facilitating Access to Arctic Data, and Sharing Arctic Research Infrastructure
1.1 Progress towards an integrated Arctic observing system
1.2 Enhanced cooperation and new activities from Space Agencies
1.3 International access to infrastructure
1.4 Increased data access and cyberinfrastructure
1.5 Increased cooperation on new observation technology and methods
2. Understanding Regional and Global Dynamics of Arctic Changes
2.1 Increase predictive capabilities and skills
2.2 Increased Cooperation on Understanding the Arctic System
2.2.1 Sea ice changes
2.2.2 Marine and Terrestrial Ecosystems
2.2.3 Permafrost and Greenhouse Gases
2.2.4 Ice Sheets and Sea Level Change
2.2.5 social and economic drivers
3. Assessing Vulnerability and Building Resilience of Arctic Environments and Societies
3.1 Identifying risks and minimizing impacts of climate and global changes
3.2 Developing adaptation and resilience-building strategies
3.3 New technologies for improving sustainability of the Arctic
3.4 Increasing awareness and building adaptive capacity
3.5 Protocols for equitable, ethical engagement and involvement of Knowledge and communities in research
Indigenous

Level of international interest

	High
	Medium
	Some

		1. Strengthening, Integrating and Sustaining Arctic Observations, Facilitating Access to Arctic Data, and Sharing Arctic Research	2. Understanding Regional and Global Dynamics of Arctic Changes	3. Assessing Vulnerability and Building Resilience of Arctic Environments and Societies
Countries	Canada			
	China			
	Czech Republic			
	Denmark			
	Faroe Islands			
	Finland			
	France			
	Germany			
	Greenland			
	Iceland			
	India			
	Italy			
	Japan			
	the Netherlands			
	Norway			
	Poland			
	Portugal			
	Republic of Korea			
	Russia			
	Singapore			
	Spain			
	Sweden			
	Switzerland			
	UK			
	US			
	EU			
Arctic Indigenous Peoples	Aleut	-	-	-
	Athabaskan	-	-	-
	Gwichin	-	-	-
	ICC			
	RAIPON			
	Saami Council			
International Organisations	APECS	-	-	-
	GEO	-	-	-
	IASC		-	-
	IASSA	-	-	-
	ICES	-	-	
	ICSU	-	-	-
	SAON		-	-
	UArctic	-	-	
	UNEP	-	-	-
	WMO	-	-	-

Level of interest in themes based on number of projects submitted

	Major interest
	Medium interest
	Some interest
-	Not enough information



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2-page Arctic research overviews of participating countries and organisations



GERMANY

Germany operates one of the world's largest Arctic research programmes aiming to inform society and policymakers about the consequences of climate change in the Arctic. "Germany's Arctic Policy Guidelines" by Germany's Federal Foreign Office put science and environment at the centre of Germany's approach to engaging with Arctic nations. Germany's Arctic research programme is outlined in the 2015 publication "Rapid Climate Change in the Arctic - Polar Research as a Global Responsibility". Germany is investing substantially into polar research logistics and is building a new icebreaking vessel, Polarstern II.



Alfred Wegener statue in front of the AWIPEV Arctic Research Base © Alfred Wegener Institute (CC-BY 4.0)

ARCTIC RESEARCH FUNDERS/INSTITUTIONS

The Federal Ministry of Education and Research (BMBF) supports Arctic research through targeted funding programmes, and by sponsoring the *Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research* (AWI), as the national polar institute. AWI concentrates on observational and modelling studies of all elements of the Polar Earth System in the Arctic and Antarctic. Main research foci in the Arctic include climate change and its impact on global climate processes. The BMBF framework programme MARE-N (Coastal, Marine and Polar Research for Sustainability) supports interdisciplinary sustainability research, including both natural and social sciences, on polar and marine issues. Funded by BMBF, the GEOMAR Helmholtz Center for Ocean Research is a leading centre of oceanography and has worked for decades in the Arctic Ocean (Laptev Sea). BMBF-funded entities which, in turn, award financial support to individuals, include the German Research Foundation (DFG), and the German Academic Exchange Service (DAAD). DFG runs a Priority Programme titled, "Antarctic Research with Comparable Investigations in Arctic Sea Ice Areas".

The Federal Ministry for Economic Affairs and Energy (BMWi) funds the Federal Institute for Geosciences and Natural Resources (BGR), and the German Aerospace Center (DLR). For five decades, the BGR has improved the understanding of the geological evolution and the resource potential of the circum-Arctic continental margin. DLR conducts extensive research and development work in aeronautics, space, energy, transport and security, and contributes to Arctic research through its satellite missions and remote sensing programmes.



MAJOR ARCTIC RESEARCH INITIATIVES

International research projects coordinated by Germany (AWI)

- **EU-PolarNet** - Connecting Science with Society develops and delivers a strategic framework for European polar science and the use of polar infrastructure.
- **Advanced Prediction in Polar regions and beyond:** Modelling, observing system design and Linkages associated with Arctic Climate change (APPLICATE) provides model improvements in climate prediction.
- **Arctic Research Icebreaker Consortium** - A strategy for meeting the needs of marine-based research in the Arctic (ARICE) gives funded access to six research icebreakers including the MOSAIC expedition.
- **European Research Cluster Aerosols and Climate** investigates aerosols and their link to climate change.
- **Permafrost thaw and the changing Arctic coast**, science for socio-economic adaptation (NUNATARYUK) analyses organic matter released from thawing permafrost and risks to local communities.
- **Year of Polar Prediction (YOPP)** is an internationally coordinated period of intensive observing, modelling, prediction and education activities (International Coordination Office hosted by AWI).



RV Polarstern operating during polar night © Alfred Wegener Institute/ Stefan Hendricks

- **Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAIC)** is the first year-round expedition into the central Arctic exploring the processes in atmosphere, sea ice and Arctic Ocean.

Large national research projects

- **Arctic Amplification (AC)** investigates climate relevant processes and feedback mechanisms that cause Arctic amplification. (DFG funded)
- **The Changing Arctic Transpolar System (CATS)** studies environmental changes in the Laptev Sea. (BMBF funded)
- **Quantifying Rapid Climate Change in the Arctic:** Regional Feedbacks and Large-scale Impacts (QUARCCS) models interactions of Arctic atmosphere, ocean, sea ice, and snow. (BMBF funded)
- **Greenland Ice Sheet Ocean Interaction (GROCE)** investigates the complex processes at the boundary between the Greenland Ice Sheet and the adjacent oceans. (BMBF funded)
- **The Circum-Arctic Structural Events (CASE)** project conducts studies on the structural geology, petrography and geochemistry of Arctic volcanic provinces, and aeromagnetics of areas covered by ice and water. (BGR funded)

ARCTIC RESEARCH INFRASTRUCTURE

Vessels

The research icebreaker Polarstern is the most important tool of German Polar Research.

Field stations

- **AWIPEV Arctic Research Base** is operated jointly in Ny-Alesund by the AWI and the French Polar Institute Paul Emile Victor (IPEV). It offers living quarters and workrooms for researchers focusing on basic research in environmental sciences.
- **The research station "Samoylov Island"**, which is operated by the Siberian Branch of the Russian Academy of Sciences, is used for collaborative permafrost research.

Aircraft

Research aircraft Polar 5 and 6 are Basler BT-67 planes, operated by AWI, have been specially modified to fly under extreme polar conditions. The German High Altitude and Long Range Research Aircraft (HALO) will conduct three missions in the Arctic until 2021.

Satellites

Germany shares satellite missions with many entities. The Earth Observation Center (EOC) at the DLR is Germany's centre of expertise.

- **Sentinel-1:** 2-satellite SAR constellation is used to monitor sea ice, marine winds, waves, currents, land-use change, and land deformation (ESA/EU Copernicus program)
- **Sentinel-2:** 2-satellite constellation has optical/near-IR radiometers (ESA/EU Copernicus program)
- **Sentinel-3:** 2-satellite constellation has imaging radiometers and altimeters (ESA/EU Copernicus program)
- **Cryosat** (interferometric altimeter) measures changes in ice thickness (ESA mission)
- **SMOS** (Soil Moisture and Ocean Salinity) mission (ESA mission)
- **GRACE** (Gravity Recovery and Climate Experiment, Germany with NASA)
- **TerraSAR-X** (phased array synthetic aperture radar (SAR) antenna): DLR and Airbus DS
- **TanDEM-X** (TerraSAR-X add-on for Digital Elevation Measurement)

Points of contact:
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Helmholtz Centre for Polar and Marine Research
(www.awi.de)
German Arctic Office: Volker Rachold
(Volker.Rachold@arctic-office.de)



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Development of the Joint Statement

Since February 2018, the draft Joint Statement has been subject to **four rounds of comments** by Governments and representatives of Arctic Indigenous Peoples’.

The last round of comments ended on 24 August 2018.

The draft Joint Statement also includes **recommendations for joint actions** related to the three Themes of the ASM2.

The actions listed reflect the **inputs received by all the participants** in the ASM2.

The organisers are working now on the **final version** of the draft Joint Statement that will be signed during ASM2.



Arctic Science Forum

25 October 2018
8:30am - 6:30pm

280 invited
participants

Key Events



Evening Reception

25 October 2018
7:30pm - 10:00pm

Arctic Science Ministerial

26 October 2018
8:00am - 5:15pm

30 ministers
6 heads of indigenous
organizations



Arctic Science Forum – Draft Agenda

25 October 2018

08.30 – 10.00	Registration
10.00 – 10.30	Opening Session
10.30 – 12.20	Session 1: Strengthening, integrating and sustaining Arctic observations, facilitating access to Arctic data, and sharing Arctic research infrastructure
12.20 – 13.50	<i>Lunch break</i>
13.50 – 15.40	Session 2: Understanding regional and global dynamics of Arctic change
15.40 – 16.10	<i>Coffee break</i>
16.10 – 18.00	Session 3: Assessing vulnerability and building resilience of Arctic environments and societies
18.00 – 18.30	Closing session

Session Structure

- 1 introductory keynote, 10 minutes
- 1 complementary keynote on societal needs, 5 minutes
- 2 panels with 5 panelists, covering the topics of the theme, 45 minutes each panel including discussion

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www.arcticsscience.org

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▼ DOCUMENTS

Arctic_Science_Forum_Practical_Information.pdf

ARCTIC SCIENCE FORUM 2018

Practical Information

AGENDA

ARCTIC SCIENCE FORUM, THURSDAY, 25 OCTOBER 2018

The Arctic Science Forum will take place on 25 October 2018, 9:00 a.m. until 06:30 p.m. at the Bundesministerium für Bildung und Forschung – BMBF, Kapelle-Ufer 1, 10117 Berlin

09:00 a.m.	Registration	02:30 p.m.	Session 2 Understanding Vulnerability and Building Resilience of Arctic Environments and Societies
10:00 a.m.	Opening session	04:00 p.m.	Coffee break
11:00 a.m.	Coffee break	04:30 p.m.	Session 3 Strengthening, Integrating and Sustaining Arctic Observations, Facilitating Access to Arctic Data, and Sharing Arctic Research Infrastructure
11:30 a.m.	Session 1 Global Implications of Arctic Change	06:00 p.m.	Conclusions
01:00 p.m.	Lunch break (group photo, press conference during lunch break)		

WELCOME RECEPTION

A welcome reception, including a seated dinner for the Ministers/Heads of Delegation and a buffet dinner for other members of delegation and the participants in the Science Forum, will be hosted by the German Minister of Education and Research on 25 October 2018, 7:30 p.m. until 10:00 p.m. at the Museum für Naturkunde.

07:30 p.m.	Registration and welcome reception
08:00 p.m.	Welcome addresses
08:30 p.m.	Seated dinner for Ministers/Heads of Delegation Buffet dinner for members of delegations and participants in the Science Forum
10:00 p.m.	End