Rapport fra Antarktisseminaret 2022

NORSK·POLARINSTITUTT

Forskningsrådet

Rapporten er sammenstilt av Christina A. Pedersen og Birgit Njåstad (Norsk Polarinstitutt) og Jon Børre Ørbæk og Marianne Johansen (Norges forskningsråd). Forsidebildet er tatt av Stein Tronstad (Norsk Polarinstitutt)

Innholdsfortegnelse

Innledning

Det fjerde norske Antarktisseminaret ble arrangert 3.-4. mai 2022 i Framsentret i Tromsø. Seminaret etterfølger seminarene fra 2016, 2018 og 2020. Deltagelsen var høy med hele 75 påmeldte og viser med tydelighet behovet for å skape en møteplass for hele det norske antarktisforskermiljøet.

Også denne gang stod Norsk Polarinstitutt og Norges Forskningsråd sammen om arrangementet. Seminaret hadde samme målsetninger som tidligere om å være:

- møteplass for norske antarktisforskere innenfor hele det vitenskapelige spekteret (natur, samfunn, historie, statsvitenskap, mv.)
- arena for formidling av pågående antarktisforskningsprosjekter
- arena for formidling av rammer for norsk antarktisforskning
- tankesmie for utvikling av nye idéer og strategier knyttet til tverrfaglig antarktisforskning

Nytt av året var etableringen av en fagkomite som fikk i oppgave å utvikle den faglige delen av programmet. Fagkomiteen bestod av:

- Petra Langebroek, NORCE
- Jostein Bakke, UiB
- Sebastien Moreau, NP
- Peder Roberts, UiS
- Elisabeth Isaksson, NP
- Mattias Forwick, UiT

Den faglige delen av seminaret la til rette for et mangfold av presentasjonen innenfor tre interdisiplinære sesjoner.

- *Antarktis fra kontoret*

Feltarbeid spiller en viktig rolle for mye, om ikke det meste av antarktisforskningen. En del forskning (f.eks. innenfor modellering) kan likevel gjøres uten at forskere har opphold i Antarktis: data fra skipslogger, jordobservasjonssatellitter og andre kilder kan benyttes som grunnlag for studier. Men noe går kanskje også tapt når forskerne selv ikke har feltopphold i Antarktis: For eksempel kan personlig kunnskap om feltlokaliteter gi innsikt som man kan gå glipp av når man belager seg på bruk av fjerninnsamlet data. Denne sesjonen tar imot bidrag som tar for seg alle aspekter av antarktisforskning utført fra kontoret, inkludert både resultatene av slik forskning og fordelene eller ulempene ved valgte tilnærminger til slik forskning.

- *Hav-is interaksjon*

I Antarktis er vann og is i nær kontakt og begge påvirker hverandre på ulike måter. I denne sesjonen inviterer vi til bidrag som fokuserer på prosesser langs iskanten, især interaksjonen mellom hav, isbreer og isbremmer. Temaer som kan belyses inkluderer prosesser knyttet til isbremmer og innlandsisen, som smelting, kalving og (in)stabilitet, samt påvirkingen av innlandsiser på havets biogeokjemi og marine økosystemer. Vi ønsker velkommen bidrag fra ulike disipliner som bygger på observasjons-, fjernmålings- og/eller modelleringsmetoder.

- *Antarktis og Sørishavet: fortid, nåtid, framtid*

Antarktis er et gåtefult kontinent der informasjon om naturlige prosesser og forhold som eksisterte og fant sted før instrumentelle målinger ble påbegynt er arkivert. Derfor kan Antarktis potensielt brukes som et fortidens analog for nær of fjern fremtid. Antarktis sin fremtid er også avhengig av de valg menneskeheten gjør, samt miljøendringer av global karakter. Sesjonen inviterer til bidrag som belyser prosesser i Antarktis fra jordens indre til universets ytre, og langs tidslinjer som strekker seg fra den geologiske fortid, via historiske arkiver, samt nåtiden og fremtiden.

Fagkomiteen bidro til å at fagsesjonene på årets seminar fungerte usedvanlig bra.

Programmet inneholdt ellers en nøkkelinnledning av Jemma Wadham (University of Bristol og UiT Norges arktiske universitet) om dypets hemmeligheter og hvordan det Antarktis som ligger under isen påvirker jordens karbonsyklus. Det ble også gitt en omfattende gjennomgang av det nye nasjonale infrastrukturprosjektet Troll observasjonsnettverk (TONe) og mulighetene det bringer med seg. I tillegg til vanlig postersesjon, ble alle posteransvarlige gitt mulighet til å promotere sin poster i en ett-minuttspresentasjon før mingletid rundt posterene. Nytt av året var posterpris til den beste posteren. Denne gikk i år til Aga Nowak fra UNIS og NP for posteren: Blue-ice ecosystems in Jutulsessen, Dronning Maud Land, Antarctica.

I SCAR sesjonen ble det som vanlig gitt en oppdatering fra SCAR delegaten Ole Arve Misund, Norsk Polarinstitutts direktør, og de nasjonale representantene i SCAR formelle grupper og komiteer, før økten ble avsluttet med parallellsesjoner med dialog mellom de nasjonale representanter og resten av fagmiljøet i gruppene:

- Life Science
- Physical Science
- Geoscience
- Humanities and Social Sciences (HASS)

En kort rapport fra hver gruppe er gitt på de neste sidene.

Seminaret ble avsluttet med paneldebatt og dialog omkring ambisjoner for norsk antarktisforskning, med deltagere fra Norsk Polarinstitutt, forskningsrådet og SCAR-arbeidsgruppene: Ole Arve Misund (direktør Norsk Polarinstitutt), Jon Børre Ørbæk (spesialrådgiver Norges forskningsråd), Kenichi Matsuoka (Norsk Polarinstitutt og norsk representant i SCAR arbeidsgruppe Physical Science), Bjørn Krafft (Havforskningsinstituttet og norsk representant i SCAR arbeidsgruppe Life Science), Synnøve Elvevold (Norsk Polarinstitutt og norsk representant i SCAR arbeidsgruppe Geoscience), og Peder Roberts (Universitetet i Stavanger og chief offiser in SCAR Standing Committee HASS (Humanities and Social Sciences).

Deltagerne fra Antarktisseminaret 2022 samlet i Lysgården i Framsentret. Foto: NP.

Program Antarktisseminaret 2022

Sted: Auditoriet, Framsentret, Tromsø
#Antarktisseminaret2022

Tirsdag 3. mai		
Registrering fra kl 08:15		
Åpningssesjon 09:00-10:15 *Chair: Birgit Njåstad*		
09:00-09:30	Velkommen	Norsk Polarinstitutt, Forskningsrådet
09:30-10:15	Nøkkelinnledning: Secrets of the Deep: How does subglacial Antarctica impact Earth's carbon cycle	Jemma Wadham, University of Bristol og UiT Norges arktiske universitet
Kaffe og benstrekk 10:15-10:45		
Troll observasjonsnettverk infrastruktur 10:45-12:15 *Chair: Christina A. Pedersen*		
10:45-10:55	Troll observasjonsnettverk (TONe) infrastruktur	Christina A. Pedersen og Nalan Koc, Norsk Polarinstitutt
10:55-11:45	Korte presentasjoner av de ulike delene av infrastrukturen	TONe arbeidspakkeledere
11:45-12:05	Mulighetene i TONe. *Informasjon om tilgang til infrastrukturen. Refleksjoner/ideer/spørsmål.*	Christina A. Pedersen og Birgit Njåstad, Norsk Polarinstitutt
12:05-12:15	Forskningsrådets forventninger til TONe	Jon Børre Ørbæk, Forskningsrådet
LUNSJ kantina Framsenteret 12:15-13:15		
Antarktis fra kontoret 13:15-15:00 *Chair: Peder Roberts*		
13:15-13:30	Spesielt invitert foredrag: Chair-borne glaciology: how satellite synthetic aperture radars revolution-ized the way we look at the Antarctic - with recent examples from the Dronning Maud Land coast	Jelte van Oostveen, NORCE
13:30-13:45	Mapping evolution of meltwater systems in Dronning Maud Land, East Antarctica between 2014 and 2021	Anirudha Vijay Mahagaonkar, Norsk Polarinstitutt

13:45-14:00	Southern Hemisphere sea ice observed from space	Signe Aaboe, MET
14:00-14:15	SCAR International Iceberg Database and Antarctic iceberg dissolution	Olav Orheim, Polarviten
14:15-14:30	Southern Ocean connectivity from Lagrangian trajectories	Tore Hattermann, Norsk Polarinstitutt
14:30-14:45	Application of Controlled Meteorological Balloons in Antarctica	Lars R. Hole, MET
14:45-15:00	Seismic Station TROLL – the First Decade	Johannes Schweitzer, NORSAR
Kaffe og benstrekk 15:00-15:20		
Hav-is interaksjon 15:20 – 17:05 *Chairs: Petra Langebroek og Sebastien Moreau*		
15:20-15:35	Spesielt invitert foredrag: What does it take to change from a cold to a warm regime in the southern Weddell Sea?	Kjersti Dae, Universitetet i Bergen
15:35-15:50	The Norwegian ice shelf-ocean observatory	Tore Hattermann, Norsk Polarinstitutt
15:50-16:05	Basal melting and oceanic observations at Fimbulisen ice shelf, East Antarctica	Katrin Lindbäck, Norsk Polarinstitutt
16:05-16:20	Simulating the effect of small-scale basal features on the Fimbulisen ice shelf	Qin Zhou, Akvaplan Niva
16:20-16:35	Phytoplankton blooms in the Southern Ocean	Megan Lenss, Norsk Polarinstitutt
16:35-16:50	Oseanografiske observatorium i Antarktis - Weddell Watch	Svein Østerhus, NORCE
16:50-17:05	Ocean temperature forcing in glacial-interglacial Antarctic Ice Sheet simulations	David Chandler, NORCE
Poster-presentasjoner 17:05-17:30 *Chair: Christina A. Pedersen*		
17:05-17:30	Introduksjon av postere og helpdesker (1 min-1 lysark for hver)	
POSTERMINGLING med drikke og snacks Lysgården, Framsenteret 17:30-19:00 Postere og helpdesker		
Tapasbuffet, Lysgården, Framsenteret fra 19:00		

Onsdag 4. mai		
Kaffe 08:45-09:00		
Antarktis og Sørishavet: fortid, nåtid og framtid 09:00-10:45 *Chair: Elisabeth Isaksson og Matthias Forwick*		
9:00-9:15	Spesielt invitert foredrag: Isotope-based Southern Hemisphere westerly winds reconstruction reveals stable Holocene until Common Era intensification	Willem G. M. Van der Bilt, Universitetet i Bergen
9:15-9:30	Holocene vegetation and climate variability inferred from lake sediment records in the sub-Antarctic	Maaike Zwier, Universitetet i Bergen
9:30-9:45	Geologisk feltkartlegging i DML – Nå og fremtiden	Øyvind Sunde, Norsk Polarinstitutt
9:45-10:00	Geologisk arv - geologi av stor naturverdi i Dronning Maud Land	Ane K. Engvik, Norges geologiske undersøkelse

10:00-10:15	Extreme weather and seabird reproduction in Dronning Maud Land	Harald Steen for Sebastien Descamps, Norsk Polarinstitutt
10:15-10:30	Antarctica and colonialism	Alejandra Mancilla, Universitetet i Oslo
10:30-10:45	The future of ionospheric research in Antarctica	Wojciech Miloch, Universitetet i Oslo
Tid for fotografering 10:45-10:55		
Kaffepause, beinstrekk, mingletid og tid egne sidemøter 10:55-11:45 *Dedikert tid for mingling og egne sidemøter. Ta kontakt med arrangørene om du trenger møterom.*		
LUNSJ kantina Framsentret 11:45-12:45		
SCAR sesjon 12:45-14:45 *Chair: Birgit Njåstad*		
12:45-13:00	SCAR 2022: Sentrale prosesser og prioriteringer	Ole Arve Misund, Norsk Polarinstitutt og norsk SCAR delegat
13:00-13:35	Utvalgte høydepunkt fra SCAR science group and standing committees	De norsk representantene i SCARs science groups og standing committees
13:35-14:45	Parallelle gruppesesjoner: •Life Science •Physical Science •Geoscience • Humanities and Social Sciences (HASS) *Dialog mellom de nasjonale representanter og resten av fagmiljøet. Orientering fra representantene om pågående arbeid og diskusjoner; dialog og diskusjon rundt norske prioriteringer og ønsket innsats*	
Kaffe og beinstrekk 14:45-15:00		
Avslutning 15:00-15:55 *Chair: Nalan Koc*		
15:00-15:05	Utdeling av posterpris	Forskningsrådet
15:05-15:50	Paneldebatt og dialog: Ambisjoner om norsk Antarktisforskning. *Deltagere: Ole Arve Misund (direktør Norsk Polarinstitutt), Jon Børre Ørbæk (spesialrådgiver Forskningsrådet), Kenichi Matsuoka (Norsk Polarinstitutt og norsk representant i SCAR arbeidsgruppe Physical Science), Bjørn Krafft (Havforskningsinstituttet og norsk representant i SCAR arbeidsgruppe Life Science), Synnøve Elvevold (Norsk Polarinstitutt og norsk representant i SCAR arbeidsgruppe Geoscience), og Peder Roberts (Universitetet i Stavanger og chief offiser in SCAR Standing Committee HASS (Humanities and Social Sciences).*	
15:50-15:55	Takk for denne gang	Nalan Koc, Norsk Polarinstitutt

Poster bidrag

Fornavn	Etternavn	Institusjon	Tittel
Johanna	Brehmer-Moltmann	NP	Analysis of englacial stratigraphy in the Dome Fuji region, East Antarctica.
Elin	Darelius	UiB	New knowledge from old data: Observational evidence for on-shelf transport of Warm Deep Water driven by local dense water export
Dmitry	Divine	NP	Sea ice extent and marine climate of the Southern Ocean during the period of the early 20th century warming from logbooks of Norwegian research and whaling vessels.
Synnøve	Elvevold	NP	Naturens egne kunstverk formet av vinderosjon
Synnøve	Elvevold	NP	Magma mingling in post-tectonic intrusions in Mühlig-Hofmannfjella, Dronning Maud Land
Synnøve	Elvevold	NP	Nytt geologisk kart Jutulsessen, Dronning Maud Land
Elisabeth	Isaksson	NP	Beyond Epica-Oldest Ice drilling at Little Dome C
Josephine	Maton	NP	Records of frontal calving across the marginal ice shelves of Dronning Maud Land, East Antarctica, from 2014 until present
Kenichi	Matsuoka	NP	International RINGS initiative to address critical knowledge gap for Antarctic mass balance
Kenichi	Matsuoka	NP	Glaciological site survey for a future SIWHA ice core in central Dronning Maud Land
Per Inge	Myhre	NP	U-Pb-geochronology of intrusive rocks in Dronning Maud Land, Antarctica
Emma	Nilsson	Uppsala Universitet	Variability of Methane Sulphonic Acid in East Antarctic Firn Cores and Its Relationship with Chlorophyll-a and Sea Ice Extent in the Southern Ocean
Aga	Nowak	UNIS	Blue-ice ecosystems in Jutulsessen, Dronning Maud Land, Antarctica
Svein	Østerhus	NORCE	Klimaforskning i Antarktis -- Europeiske prosjekter ved NORCE
Svein	Østerhus	NORCE	Vår moderne oseanografiske Antarktis historie
Calvin	Shackleton	NP	Subglacial hydrology near Dome Fuji, inland East Antarctica
Torodd	Skjerve Nord	NTNU	Condition monitoring of the Antarctic glacier-ice runway of Troll Airfield
Anne Helene Solberg	Tandberg	UiB	An integrative analysis on the benthos of Astrid Ridge and Maud Rise, Southern Ocean
Liang	Zhao	NTNU	Particulate Iron Bioavailability to Phytoplankton in Antarctic Waters: Effect of Ocean Acidification
Qin	Zhou	AKVAPLAN NIVA	Developing a high-fidelity multi-scale sea-ice/ice-shelf/ocean model for the Weddell Gyre, Southern Ocean

Deltagerliste

Fornavn	Etternavn	Institusjon
Karin	Andreassen	UiT - Norges arktiske universitet
Are	Bjørdal	Norsk Polarinstitutt
Johanna	Brehmer-Moltmann	UiT / NPI
David	Chandler	NORCE
Elin	Darelius	Universitetet i Bergen / Bjerknessenteret
Laura	de Steur	Norsk Polarinstitutt
Kjersti	Daae	Universitetet i Bergen
Synnøve	Elvevold	Norsk Polarinstitutt
Ane K.	Engvik	Norges geologiske undersøkelse / Norsk Polarinstitutt
Stig	Flått	Norsk Polarinstitutt
Matthias	Forwick	UiT - Norges arktiske universitet
Ingerid	Fossum	Norges forskningsråd
Heiko	Goelzer	NORCE
Harvey	Goodwin	Norsk Polarinstitutt
John Erik	Guldahl	Norsk Polarinstitutt
Georg H.	Hansen	NILU - Norsk institutt for luftforskning
Tore	Hattermann	Norsk Polarinstitutt
Lars R.	Hole	Meteorologisk institutt
Haakon	Hop	Norsk Polarinstitutt
Katrine	Husum	Norsk Polarinstitutt
Astrid	Høgestøl	Norsk Polarinstitutt
Elisabeth	Isaksson	Norsk Polarinstitutt
Katrine	Jaklin	NORCE
Marianne	Johansen	Norges forskningsråd
Einar	Johansen	Norsk Polarinstitutt
Evy	Jørgensen	Norsk Polarinstitutt
Hanna	Kauko	Norsk Polarinstitutt
Nalan	Koc	Norsk Polarinstitutt
Bjørn	Krafft	Havforskningsinstituttet
Petra	Langebroek	NORCE / Bjerknessenteret
Megan	Lenss	Norsk Polarinstitutt
Katrin	Lindbäck	Norsk Polarinstitutt
Anne Strømmen	Lycke	NORSAR
Alejandra	Mancilla	Universitetet i Oslo
Samuel	Martinez Llobet	Norsk Polarinstitutt
Josephine	Maton	Norsk Polarinstitutt
Kenny	Matsuoka	Norsk Polarinstitutt
Yngve	Melvær	Norsk Polarinstitutt
Wojciech	Miloch	Universitetet i Oslo
Ole Arve	Misund	Norsk Polarinstitutt
Sebastien	Moreau	Norsk Polarinstitutt

Per Inge	Myhre	Norsk Polarinstitutt
Kuria	Ndungu	Norsk institutt for vannforskning
Emma	Nilsson	Uppsala universitet
Birgit	Njåstad	Norsk Polarinstitutt
Aga	Nowak	UNIS / NPI
Christine Daae	Olseng	NORSAR
Olav	Orheim	polarviten.no
Christina A.	Pedersen	Norsk Polarinstitutt
Peder	Roberts	Universitet i Stavanger
Olaf	Schneider	Norsk Polarinstitutt
Johannes	Schweitzer	NORSAR
Calvin	Shackleton	Norsk Polarinstitutt
Harald	Steen	Norsk Polarinstitutt
Rune	Storvold	NORCE
Jon Hugo	Strømseng	Norsk Polarinstitutt
Øyvind	Sunde	Norsk Polarinstitutt
Anne Helene S.	Tandberg	Universitetet i Bergen, Universitetsmuseet
Arnaud	Tarrous	Norsk institutt for naturforskning
Stein	Tronstad	Norsk Polarinstitutt
Anne	Urset	Norsk Polarinstitutt
Willem	van der Bilt	Universitetet i Bergen
Jelte	van Oostveen	NORCE
Anirudha	Vijay Mahagaonkar	Norsk Polarinstitutt
Cecilie	von Quillfeldt	Norsk Polarinstitutt
Jemma	Wadham	UiT - Norges arktiske universitet
Monica	Winsborrow	UiT - Norges arktiske universitet
Liang	Zhao	Norges teknisk-naturvitenskapelige universitet
Qin	Zhou	Akvaplan-niva
Maaike	Zwier	Universitetet i Bergen / Bjerknessenteret
Jon Børre	Ørbæk	Norges forskningsråd
Ellen	Øseth	Norsk Polarinstitutt
Svein	Østerhus	NORCE
Signe	Aaboe	Meteorologisk Institutt
Harald F.	Aas	Norsk Polarinstitutt

Geosciences Group (GSG)

National representative: Synnøve Elvevold (NPI)
Ane Engvik (NGU)

2 Research programs (PAIS, SERCE)
7 Expert groups (ADMAP, ANTOS, ANTPAS, ANTVolc, **GIANT**, GRAPE, IBCSO)
4 Action groups (AntArchitecture, **CGG**, Geoconservation, **GeoMap)**

- *Connecting Geophysics with Geology (CGG)*

- *GeoMap (Geological Mapping Update)*

Connection Geophysics with Geology (CGG)

Chair: Joachim Jacobs (since 2012) (together with F. Ferraccioli and A. Läufer)

- Identify highest priority areas where lineaments and/or apparent tectonic block boundaries intersect with outcrops
- Coordinate and develop multinational capabilities in geophysics and geology
- Plan and initiate international expeditions to key areas
- Provide improved geological maps, specifically in logistically demanding areas
- Identify worthy drill sites for basement recovery and connect to other Antarctic drilling communities

Connecting Geophysics with Geology (CGG) – activities 2018-2002

Meetings:

- Session "*Structure, evolution and heterogeneity of Antarctica's lithosphere*" at the XIII International Symposium on Antarctic Earth Science (ISAES), 22.-26.07.19, Incheon, South Korea; largest session at the conference with 54 contributions
- *CGG Action Group meeting* at the XIII International Symposium on Antarctic Earth Science (ISAES), 22.-26.07.19, Incheon, South Korea
- Session "*Geological History of Victoria Land; Reviews and New Findings*" at the XIII International Symposium on Antarctic Earth Sciences (ISAES), 22-26.07.19, Incheon, South Korea; second largest session at the conference with 33 contributions
- 36 presentations in several Potential Field & Tectonophysics sessions at the IUGG 2019, AGU 2019 Fall Meeting and EGU 2020, including an *Invited Plenary Talk* at the XIII International Symposium on Antarctic Earth Science (ISAES), 22.-26.07.19, Incheon, South Korea

Planned activities in 2020 to 2022

Planned activity
High-resolution aeromagnetic survey and geological field work in northern Victoria Land during the planned BGR expedition GANOVEX XIV (2021-22)
New aerogeophysical surveys of the Princess Elizabeth Land frontier, as part of a proposed international project- GEOEAIS- led by India & UK (earliest target field seasons 2021-22 & 2022-23)
4D Antarctica modelling efforts to help constrain crustal and lithosphere structure and its influence on Antarctic geothermal heat flux heterogeneity (2020-2022)
Contributions to new International Lithosphere Programme on East Antarctica (2020-2025).
Sampling/analyses of ice-rafted debris/moraine material off/in Dronning Maud Land
EGU/AGU, conference sessions
SRP planning meeting in Bergen, Norway, in early 2021

Field activities, other activities:

Isotopic profiling along the Dronning Maud Land Mts. to gain insights into the crustal evolution across a major accretionary plate margin in Neoproterozoic/early Paleozoic times, several papers in preparation (Jacobs, J., et al.)

Comprehensive Ar/Ar dataset of eastern DML to delineate the protracted Neoproterozoic/early Paleozoic deformation and cooling history of this part of East Antarctica (Läufer, A., et al.)

High-resolution aeromagnetic survey over the western margin of the Mariner Glacier, combined with extensive geological field work in Victoria Land, Transantarctic Mountains during BGR expeditions GANOVEX XIII (2018-19) and GANOVEX XIII/2 (2019-20)

Pre-site survey "Sub-EIS-Obs III" jointly organized by AWI and BGR with core sampling under the Eckstrom Shelf Ice at Neumayer III station in the 2018-19 Antarctic season following extensive vibroseismic surveys in the two previous seasons

Comprehensive seismic bathymetry data set beneath Eckstrom Shelf Ice collected during joint AWI/BGR project Sub-EIS-Obs (Smith, Läufer et al.)
High resolution aerogeophysical surveys of Thwaites Glacier (2018-19 & 2019-20) flown by BAS in collaboration with LDEO as part of the International Thwaites Glacier Collaboration led by NSF & NERC (Jordan, Tinto et al.)

Four European Space Agency funded research projects (PolarGAP, GOCE+Antarctica, ADMAP 2.0+ & 4D Antarctica) with BAS leading and/or contributing to airborne and satellite geophysical data analyses and modelling to investigate subglacial geology, crustal and lithospheric architecture, global supercontinent linkages and geothermal heat flux heterogeneity (Ferraccioli, Ebbing, Forsberg, et al.). Several papers published & in preparation.

Geological and geophysical contributions to new SCAR-SERCE international and interdisciplinary Geothermal Heat Flow Sub-Group, including the 2020 White Paper (Alex Burton-Johnson et al.) and contributions to the new SCAR INSANT SRP proposal development.

Application of remote sensing techniques combined with geological field and lab and geophysical data to identify bedrock and structures in northern Victoria Land, one paper published, one in preparation (Läufer, Crispini, et al.)

Full waveform ambient noise tomography to investigate the structure of East Antarctica, work in progress (Hansen, S. et al.)

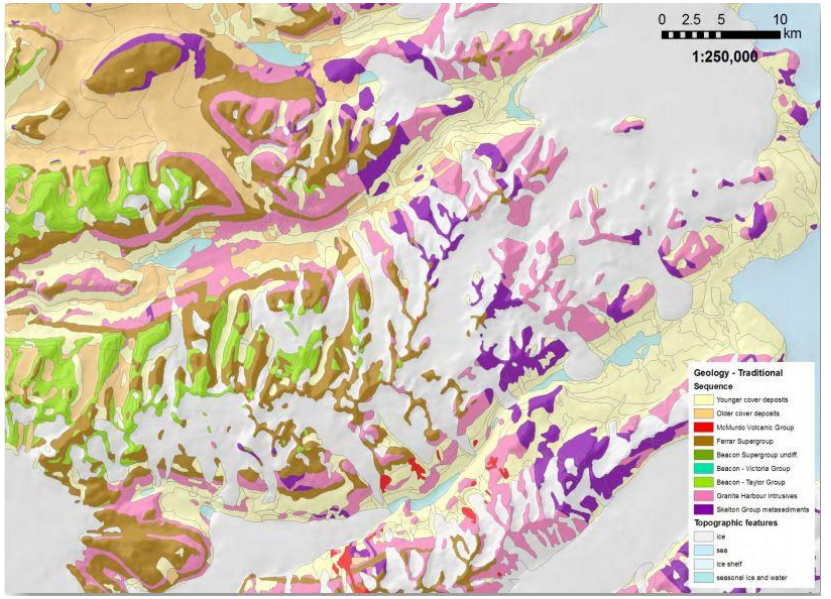
Regional-scale interpretation of magnetic anomaly field for the Mac. Robertson Land – Princess Elizabeth Land region, integrated with surface geology (Mikhalsky & Leitchenkov, 2018)

Tectonic map of Antarctica, 2nd edition. (Grikurov & Leitchenkov 2019)

Geological Mapping Update (GeoMap)

Chair: Simon Cox (NZ) og Paul Morin (USA)

Simon Cox discovers there are numerous, hard-copy, regional-scale geological maps of Antarctica that were developed last century but it can be somewhat daunting to obtain a good regional overview.



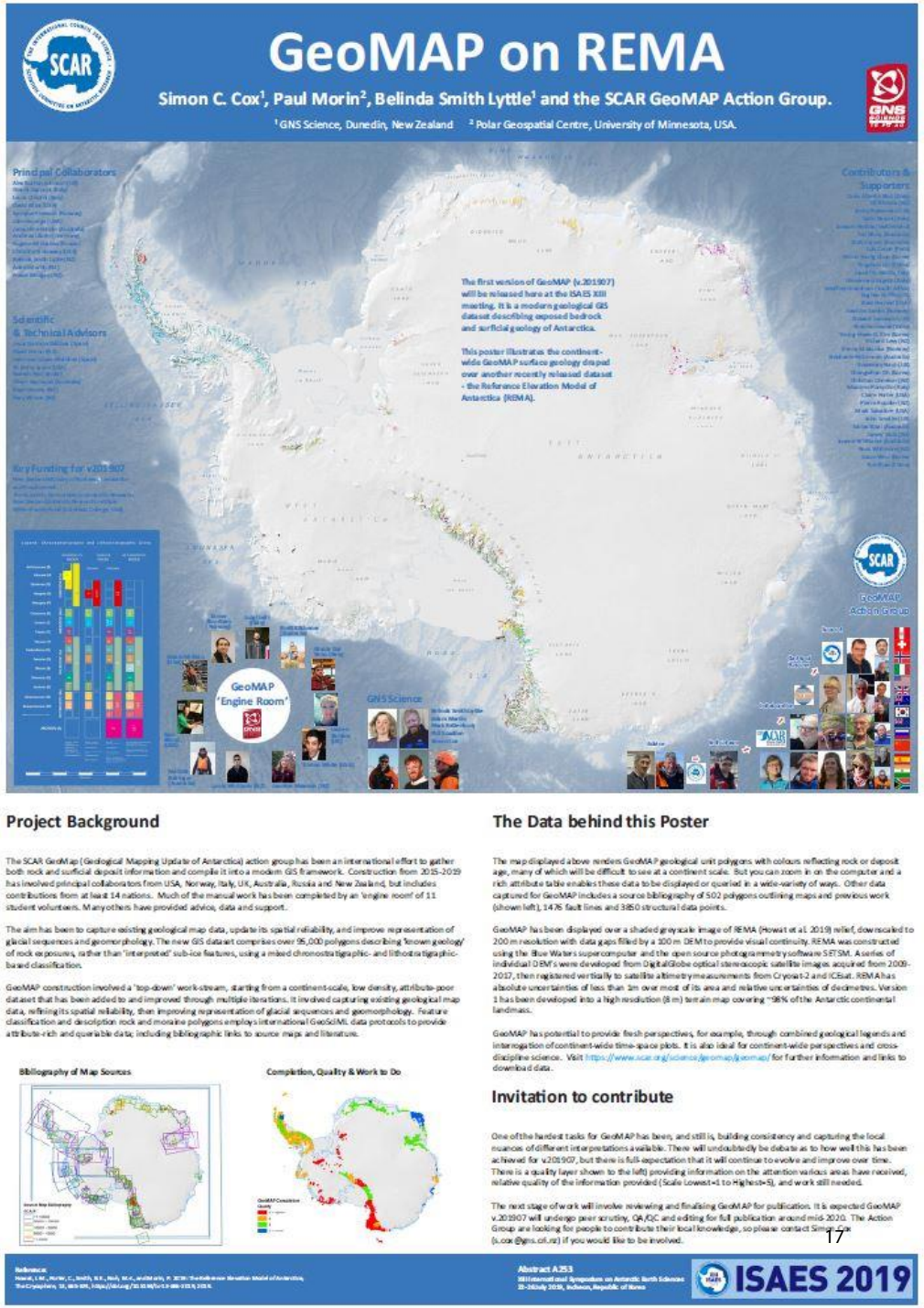
Aim:

- update geological geospatial information of Antarctica by gathering both rock and surfical deposits information and compiling it into a modern digital GIS framework

“Top down” construction starting from a continent-scale, low density, attribute-poor dataset that is added to and improved through multiple iterations

GeoMap (Geological Mapping Update)

- Principal collaborators: Norway, USA, Italy, UK, Australia, ny, Russia and New Zealand
- «Engine room» workers: 11 student volunteers
- First version of Antarctic continent-wide geological map released 2019 at XIII ISAES (International Symposium on Antarctic Earth Sciences)
- Next stage: reviewing and finalising GeoMap for publication
- And after, the datasets will continue to evolve and improve over time



National Representatives in the LifeSciences Group

Norway: Bjørn A. Krafft (Institute of Marine Research)
Andrew Lowther (Norwegian Polar Institute)

Life Sciences Activities within SCAR coordinate research focused on:

1. Understanding the impact of past, current and predicted environmental change on biodiversity and the consequences for adaptation and function.

2. Determining the effects of cold, darkness, isolation and pathogens on the health and welfare of scientists and support staff in the Antarctic.

3. Through multidisciplinary collaborations, understanding the complexities of the Antarctic environment and predicting the consequences of change.

Life Sciences Members

Officers of the Life Sciences Group
Chief Officer

Dr Yan Ropert-Coudert - CNRS, France

Deputy Chief Officer

Dr Marc Shepanek - NASA Headquarters, USA

Secretary

Assoc Prof Ian McDonald - University of Waikato, New Zealand

National Representatives in the LifeSciences Group:
34 countries represented

Life Sciences Scientific Research Programmes:

AntECO Project AntEco State of the Antarctic Ecosystem
This Scientific Research Programme aims to increase the scientific knowledge of biodiversity, from genes to ecosystems that, coupled with increased knowledge of species biology, can be used for the conservation and management of Antarctic ecosystems.

AnTERA Project - Ecosystem Resilience and Adaptation
This Scientific Research Programme aims to provide a platform for the exchange of knowledge and for the support of research on biological processes at ecological time scales especially related to environmental change.

Life Sciences Action and Expert Groups:

ANTOS Project Antarctic Near-shore and Terrestrial Observing System
This Expert Group aims to establish a biologically focussed, integrated and coordinated Antarctic-wide observation system, to identify and track environmental variability and change at biologically relevant scales, and to use this information to inform biological, physical, and earth science studies. This group is co-sponsored by SCAR's Life Sciences, Physical Sciences and Geosciences Groups.

BEPSII Project EGBAMM Biogeochemical Exchange Processes at the Sea-Ice Interfaces
This Expert Group aims to support and further develop an international community on sea-ice biogeochemistry, to stimulate the interaction between experimentalists and modellers working on this topic, and to help the community articulate research priorities and identify optimized and cost-effective approaches and research platforms in internationally resource-limited times.

ICED ProjectIntegrating Climate and Ecosystem Dynamics in the Southern Ocean
ICED is an international multidisciplinary programme launched in response to the increasing need to develop integrated circumpolar analyses of Southern Ocean climate and ecosystem dynamics.

Plastic Project seal in net Plastic in Polar Environments Action Group - Plastic-AG
This Action Group aims to examine the presence, origin and biological effects of macro-, micro- and nanoplastics, quantify the scale of the problem, and propose solutions for minimising the environmental risk and impacts on Polar ecosystems.

ImPACT monitoring Input Pathways of persistent organic pollutants to AntarCTica
This Action Group aims to facilitate coordinated investigation of chemical input to the Antarctic region, monitoring the routes through which toxic, environmental contaminants reach the continent.

ISSA Project Integrated Science for the Sub-Antarctic
This Action Group aims to provide a comprehensive overview of past and current sub-Antarctic science, to identify pressing science questions for current and future work based on national priorities, strengths, and the 1st SCAR Horizon Scan questions, identify key lessons for science, conservation, and policy across the region, and develop a network of scientists across the region, including support for early-career researchers.

JEGHBM Project Joint Expert Group on Human Biology and Medicine
Coordinate knowledge and international experience of physicians, psychologists, human physiologists and biologists who are actively engaged in medical support of Antarctic activity, as well as biomedical research in the Antarctic. This effort includes active linkages and integration to work in human biology and medicine in the Arctic, Space missions, and other extreme, remote and austere environments. This group is jointly sponsored by SCAR and the Council of Managers of National Antarctic Programs (COMNAP).

RemSens Project RemSens Remote Sensing of Birds and Animals
This Action Group aims to develop a satellite-based, Antarctic-wide, remote sensing approach to monitor bird and animal populations. This group is co-sponsored by SCAR's Life Sciences and Physical Sciences Groups.

EGBAMM Project EGBAMM Expert Group on Birds and Marine Mammals
This Expert Group is tasked with providing expert knowledge and research leadership in all matters related to birds and mammals in the Antarctic, in order to support research that will quantify the role of birds and marine mammals in the Antarctic marine and terrestrial ecosystems.

SKAG Krill closeup SCAR Krill Action Group
This Action Group aims to provide a forum to guide research directions, promote collaboration, improve understanding of krill biology and ecology, and provide a forum for information exchange.

SO CPR Project SO CPR Southern Ocean Continuous Plankton Recorder Database
This Expert Group was established to assist the development and expansion of the CPR research in the Southern Ocean and Antarctic waters, the group now focuses on the Quality Assurance and Quality Control (QA/QC) of the data and maintaining the highest methodological standards in CPR sampling and taxonomic methodology across the SO-CPR Survey laboratories.
ABI Project Acid penguin seaice Expert Group on Antarctic Biodiversity Informatics

This Expert Group aims to foster the application and development of biodiversity informatics (computationally-driven biodiversity science and information processing) in the SCAR community. It does this by coordinating and participating in a range of projects across the SCAR biodiversity science portfolio.

Andy and I – nominated for the workingroup in 2019

The first meeting suppose to be arranged in August 2020

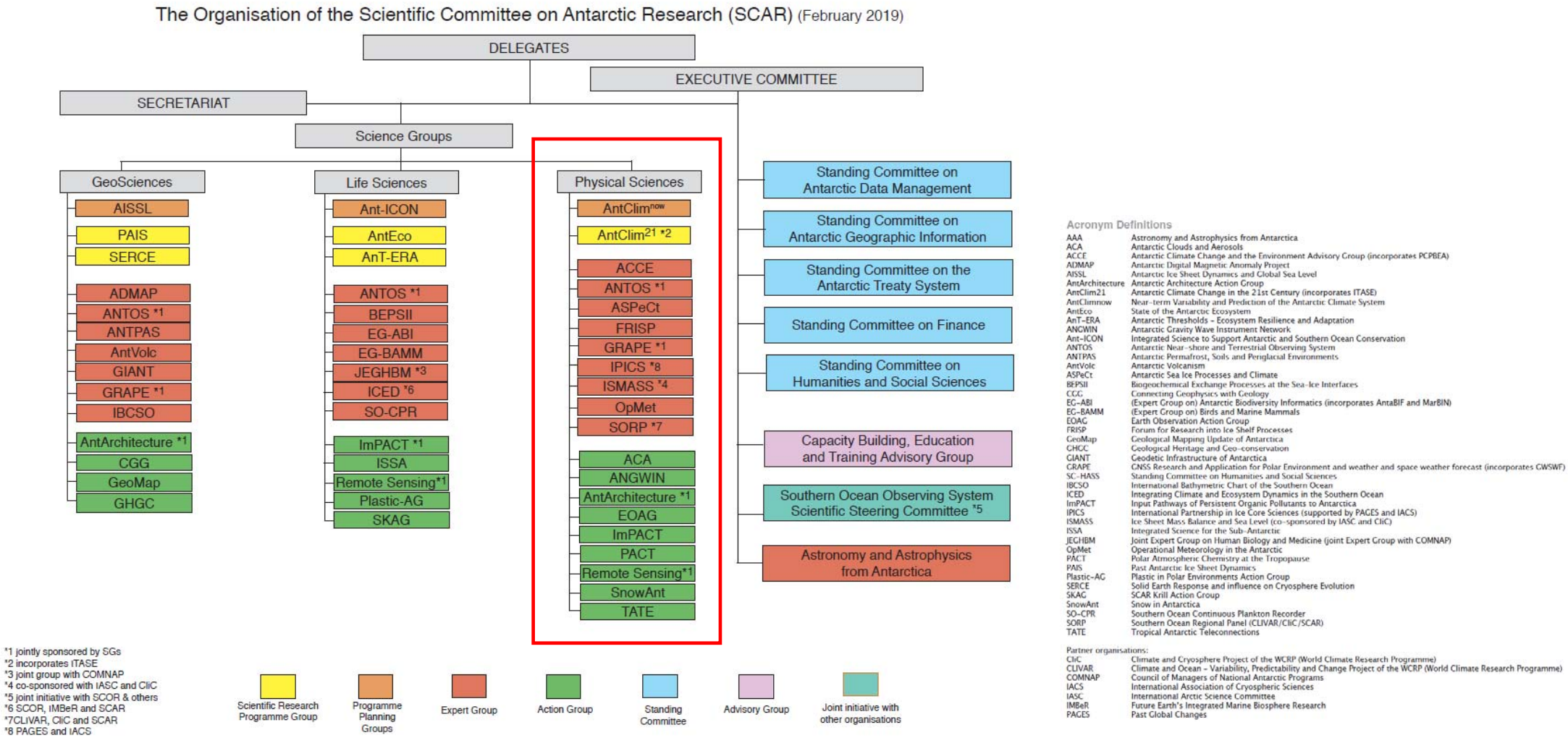
Corona, Corona…

> Life Sciences has frozen the statuses of all groups until 2022! All groups add two years to the ending date.

Physical Science Group

Kenichi Matsuoka (Glaciologist, Norwegian Polar Institute)
Wojciech J. Miloch (Physicist, University of Oslo)

Overall “science group” structure in SCAR



Acronym Definitions

AAA	Astronomy and Astrophysics from Antarctica
ACA	Antarctic Clouds and Aerosols
ACCE	Antarctic Climate Change and the Environment Advisory Group (incorporates PCPBEA)
ADMAP	Antarctic Digital Magnetic Anomaly Project
AISSL	Antarctic Ice Sheet Dynamics and Global Sea Level
AntArchitecture	Antarctic Architecture Action Group
AntClim21	Antarctic Climate Change in the 21st Century (incorporates ITASE)
AntClimnow	Near-term Variability and Prediction of the Antarctic Climate System
AntEco	State of the Antarctic Ecosystem
AnT-ERA	Antarctic Thresholds – Ecosystem Resilience and Adaptation
ANGWIN	Antarctic Gravity Wave Instrument Network
Ant-ICON	Integrated Science to Support Antarctic and Southern Ocean Conservation
ANTOS	Antarctic Near-shore and Terrestrial Observing System
ANTPAS	Antarctic Permafrost, Soils and Periglacial Environments
AntVolc	Antarctic Volcanism
ASPeCt	Antarctic Sea Ice Processes and Climate
BEPSII	Biogeochemical Exchange Processes at the Sea-Ice Interfaces
CGC	Connecting Geophysics with Geology
EG-ABI	(Expert Group on) Antarctic Biodiversity Informatics (incorporates AntaBIF and MarBIN)
EG-BAMM	(Expert Group on) Birds and Marine Mammals
EOAG	Earth Observation Action Group
FRISP	Forum for Research into Ice Shelf Processes
GeoMap	Geological Mapping Update of Antarctica
GHGC	Geological Heritage and Geo-conservation
GIANT	Geodetic Infrastructure of Antarctica
GRAPE	GNSS Research and Application for Polar Environment and weather and space weather forecast (incorporates GWSWF)
SC-HASS	Standing Committee on Humanities and Social Sciences
IBCSO	International Bathymetric Chart of the Southern Ocean
ICED	Integrating Climate and Ecosystem Dynamics in the Southern Ocean
ImPACT	Input Pathways of Persistent Organic Pollutants to Antarctica
IPICS	International Partnership in Ice Core Sciences (supported by PAGES and IACS)
ISMASS	Ice Sheet Mass Balance and Sea Level (co-sponsored by IASC and CliC)
ISSA	Integrated Science for the Sub-Antarctic
JEGHBM	Joint Expert Group on Human Biology and Medicine (joint Expert Group with COMNAP)
OpMet	Operational Meteorology in the Antarctic
PACT	Polar Atmospheric Chemistry at the Tropopause
PAIS	Past Antarctic Ice Sheet Dynamics
Plastic-AG	Plastic in Polar Environments Action Group
SERCE	Solid Earth Response and influence on Cryosphere Evolution
SKAG	SCAR Krill Action Group
SnowAnt	Snow in Antarctica
SO-CPR	Southern Ocean Continuous Plankton Recorder
SORP	Southern Ocean Regional Panel (CLIVAR/CliC/SCAR)
TATE	Tropical Antarctic Teleconnections

Partner organisations:

CliC	Climate and Cryosphere Project of the WCRP (World Climate Research Programme)
CLIVAR	Climate and Ocean – Variability, Predictability and Change Project of the WCRP (World Climate Research Programme)
COMNAP	Council of Managers of National Antarctic Programs
IACS	International Association of Cryospheric Sciences
IASC	International Arctic Science Committee
IMBeR	Future Earth's Integrated Marine Biosphere Research
PAGES	Past Global Changes

Terms of Reference

- take a strategic view of scientific research requirements
- share information, and identify research areas where current research is lacking;
- coordinate proposals for future research
- establish links and/or partnerships with other relevant international organizations
- identify research areas or fields that might be best investigated by a SCAR Scientific Research Programme
- establish Action Groups and Expert Groups
- make funding requests
- provide scientific advice
- inform other SCAR Subsidiary Bodies and the SCAR Secretariat well
- encourage submission of data and metadata.

Physical Science Group (PSG)

- Chief Officer:
  David H. Bromwich, Ohio State Univ. (atmospheric sciences)
- Deputy Chief Officer:
  Adriana Maria Gulisano, Instituto Antarctico Argentino (upper atmosphere sciences)
- Secretary:
  Steve Colwell, British Antarctic Survey (atmospheric sciences)

- At least one representative is required from each SCAR member country. Most countries have the representative(s).

Scope

- Within the physical realm, processes at the interfaces between **ice**, **ocean**, **land** and **atmosphere** are critical to our ability to describe and predict the response to **climate change**.
- Outstanding uncertainties will require continued research directed at
  - improving understanding of **ice sheet dynamics**, **extracting climate records** from the ice sheet,
  - exploring processes and changes in **sea-ice** and **ocean circulation**, and
  - improving understanding of **atmospheric dynamics** and **chemistry** and the **role of the ozone hole** in Antarctic climate.
- A distinct component of physical sciences research in Antarctica is based on the unique properties of the continent that favour its use as a platform for **astronomical and solar-terrestrial observations**.

Research programme and action/expert groups

- **Scientific Research Programme**
  - focus high priority topical areas and run for 8 years.
  - A new cycle starts this year, subject to the final approval by deligates

- **Action Groups**
  - address one specific issue and are short-term, usually with a lifetime of between two and four years.

- **Expert Groups**
  - have a broader focus and a longer lifetime of around six to eight years, with the option of renewal

These activities are often associated with multiple science groups with a single lead science group.

Former, current, and future Scientific Research Programme:

- Astronomy and Astrophysics from Antarctica – AAA
  - Ended, not an expert group.
- Antarctic Climate Change in the 21st Century, AntClim21
  - Ongoing, and will be followed up AntClimNOW

- Near-term Variability and Prediction of the Antarctic Climate System (AntClimNOW)
- INStabilities and Thresholds in ANTarctica (INSTANT)
  - A sort of follow-up programme of ongoing “Past Antarctic Ice Sheet Dynamics” (PAIS) under Geoscience Group.
- AntClimNOW and INSTANT have been developed by program developing groups, and their final proposal is subject to delegate’s approval.

Action Groups (2-4 years long)

- Antarctic Clouds and Aerosols – ACA
- ANtarctic Gravity Wave Instrument Network - ANGWIN
- Earth Observation Action Group - EOAG
- Input Pathways of persistent organic pollutants to AntarCTica - ImPACT
- *Remote Sensing of Birds and Animals - Remote Sensing*
- Snow in Antarctica – SnowAnt
- Tropical Antarctic Teleconnections – TATE

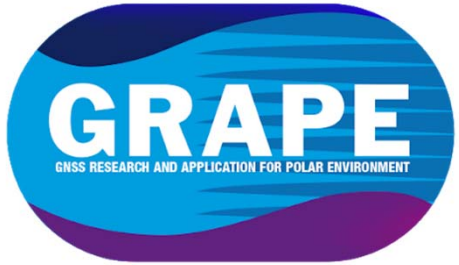
Expert groups (longer duration)

- Antarctic Climate Change and the Environment – ACCE
- Antarctic Near-shore and Terrestrial Observing System – ANTOS
- Antarctic Sea-ice Processes and Climate – ASPeCt
- Forum for Research into Ice Shelf Processes – FRISP
- GNSS (Global Navigation Satellite System) Research and Application for Polar Environment – GRAPE
- Ice Sheet Mass Balance and Sea Level – ISMASS
- International Partnership in Ice Core Sciences – IPICS
- Operational Meteorology in the Antarctic – OpMet
- Southern Ocean Region Panel – SORP

Example: GRAPE (2012-2020)

GNSS Research and Application for Polar Environment

GRAPE focuses on data sharing, expertise exchange and increasing the awareness of scientific capabilities.



Goals:

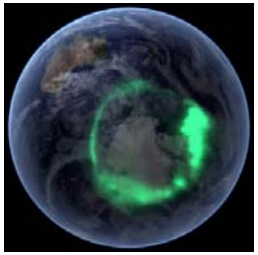
- Create and maintain distributed networks of specialized GNSS receivers particularly at high latitudes.
- Identify and quantify mechanisms that cause scintillation and control interhemispheric differences, asymmetries and commonalities in scintillation occurrence and intensity as a result of the geospace environment conditions.
- Develop ionospheric scintillation climatology, tracking and mitigation models to improve prediction capabilities of space weather.
- Retrieve tropospheric precipitable water vapor (PWV) for input to weather forecast models and to develop regional PWV climatology for atmospheric sensing in remote areas.

Recent Norwegian activities under PSG

- Present FRISP proposal for an expert group (2018)
- Nominate Quantarctica as a SCAR product, which is now primarily associated with SCADM (2016)
- Participate in Southern Ocean Regional Panel (2015-2018)
- Request budget for “IceRises Workshop”, and use SCAR’s endorsement to generate the full budget for the workshop (2012)

Recent Norwegian activities under PSG

- Participate in the GRAPE White Paper on the Polar atmosphere and Geospace, September 2020.
- Participate in the application for the Proposal Planning Group (PPG) RESOURCE “Radio Sciences Research on AntarCtic AtmosphEre” – follow up of GRAPE after 2020.
- Coordinate a community research paper related to GRAPE/RESOURCE work - outcome of online workshop.



White Paper

Polar atmosphere and Geospace: Present knowledge, infrastructures and future research directions

Authors: N. Bergeot[1], L. Alfonsi[2], P.J. Cilliers[3], G. De Franceschi[2], E. Correia[4], C-F Enell[5], M.J. Engebretson[6], I. Häggström[5], G. Heygster[7], K. Kauristie[8], M. Kosch[3], C. Lee[9], E. Macotela[10], F. Marcucci[11], W. J. Miloch[12], J. Morton[13], M. Negusini[11], E. Pottiaux[1], P.R. Shreedevi[14], P. Prikryl[15], L. Spogli[2], J.A.E Stephenson[16], O. Troshichev[17], R. Van Malderen[18], S. Zou[19], and the GRAPE EG members.

Antarktisseminaret 2022 - Book of abstracts

Table of Contents

Muntlige presentasjoner:

i rekkefølgen de presenteres i programmet

Tittel	Chair-borne glaciology: how satellite synthetic aperture radars revolutionized the way we look at the Antarctic - with recent examples from the Dronning Maud Land coast.

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Forfatterliste (Fornavn Etternavn)	Jelte van Oostveen (NORCE), Geir Moholdt (NPI)
Institusjoner (affiliations)	NORCE, NPI

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The Antarctic continent is vast, cold, inaccessible and submerged in darkness about half of the time. Such conditions are challenging for any field-based research, which was the only way to study Antarctica for most of the last century. With the launch of the first satellite synthetic aperture radar (SAR) mission in the early nineties, Antarctic glaciological research experienced a paradigm shift. It was suddenly possible to get a comprehensive view of the continent as SAR satellites were able to retrieve images irrespective of darkness, clouds and conditions on the Earth surface. Since then, the field of Antarctic remote sensing has been developing rapidly with SAR still being used as one of the primary tools to monitor and investigate glaciological processes today. We will first pay tribute to major developments in Antarctic glaciology thanks to satellite SAR remote sensing, whereafter we will discuss recent- and ongoing observations using interferometric SAR methods along the Dronning Maud Land coast, all retrieved comfortably from an office chair in Tromsø. Specifically, we will discuss ice shelf dynamics (ice velocities, grounding line detection, frontal change and calving events) of Fimbulisen ice shelf, and its changes over the past decades. Finally, we will touch upon different aspects of such an office-based research approach and its impact on the interpretation of research outcomes.

Tittel	**Mapping evolution of meltwater systems in Dronning Maud Land, East Antarctica between 2014 and 2021**

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Abstract

Surface melting over the ice shelves can have serious consequences to the ice shelf – ice sheet stability regime. They are known to cause shelf flexure, hydro-fracture and collapse which could potentially topple the entire system and further intensify future mass loss and sea level rise. Given the rapid expansion of existing meltwater systems, and development of new melt features, along the margins of Dronning Maud Land (DML), we closely map and study these features using satellite images between 2014 and 2021. We analyzed nearly 2500 optical scenes from the 5 ice shelves (IS) of DML, viz. Riiser Larsen (RL), Fimbulisen (FB), Nivlisen (NV), Muninisen (MN) and Roi Baudouin (RB), regions to find patterns of evolution and estimate lake characteristics. It was observed that Roi Baudouin had the largest average cumulative area and volume of meltwater per melt season at 884.25 ± 8.5 km^2 and 0.60 ± 0.06 km^3, respectively. RB was followed by NV (220.54 km^2 and 0.17 km^3) and then by RL (177.32 km^2 and 0.139 km^3). The extents of FB and MN were similar with areas of 9.48 km^2 and 7.69 km^2 and volumes of 0.007 km^3 and 0.005 km^3, respectively. Across all regions melting typically started in mid-December and peaked at mid to end-January. Among the 7 melt seasons studied, the summer of 2019-2020 experienced the highest amount of melt, whereas 2020-2021 had the lowest. On preliminary assessments with meteorological factors, we found good correlation between the total number of positive degree days in DJF and the peak melt area and volume (R^2 = 0.69/0.71). However, the correlation was not very strong at RL (R^2 = 0.14/0.11) and RB (R^2 = 0.19/0.12). Further assessment will be done to ascertain major factors that control melting in the sub-regions of DML – e.g. Wind speed and direction, firn air content and albedo.

Tittel	Southern Hemisphere sea ice observed from space

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Institusjoner (affiliations)	MET Norway

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Abstract

The global sea ice covers at any time of the year between 17 to 28 million km². Of this global cover the Antarctic sea ice contributes with more than half of this (in maximum conditions) and in addition, contributes with large seasonal and interannual variability. In February 2022, the sea-ice cover reached an all-time minimum since the start of satellite monitoring in the 1970s. The trends and variability of Southern Hemisphere sea ice have been a challenge for models to reproduce (Roach et al., 2021). The Antarctic continent is the same size as the Arctic Ocean and this gives a very different framework for the sea ice behaviour on the two hemispheres. Satellite remote sensing is the only cost-effective way to capture the entire picture of the Antarctic sea-ice conditions. The Norwegian Meteorological Institute has long-time experience in monitoring the global sea ice conditions in near-real-time and in climate perspectives. As of today, sea-ice products for the Southern Hemisphere consists of the concentration, the classification of the ice into age classes, and the large-scale drift of the ice. These products have a spatial resolution of 10-60 km and are therefore not meant for navigational purposes. However, they are routinely used for monitoring the long-term trends, variabilities and changing conditions in a changing climate. They provide crucial information for modellers and can be used for planning upcoming cruises and fieldwork. On the other hand, validation of Antarctic sea-ice products suffer from the limited amount of in situ observations.

In this contribution, we present MET Norway's sea ice products for the Southern Hemisphere, how they are prepared and where to access them. We particularly look forward to the interactions with other scientists, whether they are in the field or stay in their office.

Tittel	SCAR International Iceberg Database and Antarctic iceberg dissolution

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Institusjoner (affiliations)	Norsk Polarinstitutt

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Abstract:

SCAR International Iceberg Database and Antarctic iceberg dissolution

Olav Orheim[1], Geir Moholdt[2] and Are Bjørdal[2]
[1]Formerly Norsk Polarinstitutt. [2]Norsk Polarinstitutt, 9296 Tromsø, Norway.

A database of 34 695 individual ship observations of Antarctic icebergs were collected by identical recording protocols in a programme established in 1981 through the Scientific Committee on Antarctic Research (SCAR). From the austral summers 1982/1983 to 1997/1998, icebergs were recorded by most research vessels cruising Antarctic waters. Data continued to be collected until the 2009/2010 season, but from a decreasing number of ships. The database was compiled in 2021 as the SCAR International Iceberg Database, and can be downloaded at https://doi.org/10.21334/npolar.2021.e4b9a604. It contains positions of 377 169 icebergs, of which 300 763 icebergs were classified into five different length classes for 80% of the observations, and seven classes for 20%. Collected before the era of polar orbiting satellites and on–board remote sensors, these data on Antarctic iceberg sizes and distributions are material upon which future remotely sensed iceberg data can be compared and tested. Approx. 90% of the observed icebergs are in sizes smaller than those recorded in past and current satellite-based iceberg databases.

Analyses of the iceberg distribution in the South Atlantic Ocean indicates that iceberg fracture is the dominant dissolution process for tabular icebergs in open water, with the numbers reduced to half after only 70 days. Attrition by melting is the dominant process for the dissolution of icebergs <200 m horizontal dimension. Combining iceberg dissolution rates with the observations of total iceberg populations in the Southern Ocean allows estimates of iceberg calving rates. Quantifying these makes an alternative approach to the ice sheet mass balance equation, which can be a useful independent check on numbers derived from satellite observations.

Tittel	**Southern Ocean connectivity from Lagrangian trajectories**

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Forfatterliste (Fornavn Etternavn)	Tore Hattermann (1), David Gwyther (2), Benjamin Merkel (3), Johanna M. Aarflott (4), Gary Griffith (1), Kaitlin Naughten (5), Eugene Murphy (5), Sally Thorpe (5)
Institusjoner (affiliations)	1: Norwegian Polar Institute 2: University of New South Wales 3: Akvaplan-niva AS 4: Institute of Marine Research 5: British Antarctic Survey

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In the Southern Ocean, re-entrant circumpolar currents and perpetual ocean gyres connect the basins around the continent. In this environment, self-infestation and advective transport over large distances will likely be important for shaping habitats of long-lived planktonic species, such as for instance Antarctic krill. However, the detailed pathways, time-scales and hydrodynamic barriers of the ocean south of the Polar Front are still poorly mapped and hypotheses about spatial ecosystem connectivity are largely based on conceptual models, rather than quantitative evidence. Here, we compute large ensembles of Lagrangian drifter trajectories using output of a 3D, high-resolution, general ocean circulation model, to assess the hydrodynamic connectivity of the entire Southern Ocean. We map the advective network and identify hydrodynamic provinces in a generalized framework that is independent of a priory assumptions about relevant source and sink areas. Examples are presented that assess the potentially important habitats for Antarctic krill within the Maud assessment area and their relation to other known communities in the Southern Ocean. Our results form a first step to bridge gap between characterization of ecosystem regions based on locally observed conditions, and their connection with distant drivers or “downstream receptors” that interact through ocean currents.

Tittel	**Application of Controlled Meteorological Balloons in Antarctica**

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Institusjoner (affiliations)	Meteorologisk institutt, Smith College (USA), Finnish Meteorological Institute, University of Canterbury, Christchurch (New Zealand), Institut National de la Recherche Scientifique, Centre Eau Terre Environnement (INRS-ETE) Quebec, Canada

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Controlled Meteorological (CMET) Balloons have been applied in several experiments in Antarctica since the first balloons were launched from the Troll station in Dronning Maud Land in 2012. In most cases, the balloons have been controlled remotely from the USA and Norway via the Iridium system and no travel was involved. In November 2017, boundary layer observations were made over the Ross Sea and compared with Antarctic Mesoscale prediction System (AMPS) forecasts. This flight performed 31 repeated soundings of the atmospheric boundary layer over a period of 70 hr. During the flight the balloon made close passes of the open Terra Nova Bay and Ross Sea polynyas.

Since 2013, several CMET balloons have also been launched by the crew at the Finnish Aboa station. In January 2017, a balloon performed a trans-Antartic flight from the Weddell to the Ross Sea and was airborne for 157 hours. In another experiment, two balloons were airborne for 60 and 106 hours with trajectory lengths of 885.8 km and 2367.4 km, respectively. The balloons carried out multiple controlled soundings up to 3.3 km. The most interesting feature detected by the CMET balloons was a mesoscale anticyclone over the Weddell Sea and the coastal zone, which was reproduced by the WRF model with reduced intensity. WRF results generally agreed with the observations. The results suggested here

that CMET balloons could be an interesting supplement to Antarctic atmospheric observations, particularly in the free troposphere.

Tittel	**Seismic Station TROLL – the First Decade**

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Institusjoner (affiliations)	NORSAR

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In February 2012, NORSAR installed a seismic broadband seismometer on Nonshøgda ca. 300 m north of the Norwegian Research Station Troll, Dronning Maud Land, Antarctica. This seismic station is the southernmost seismic station installed on bedrock. During the last 10 years, this seismic station was running with an up-time of more than 99% and collected continuous, high quality seismic observations, which were all transmitted to Norway and stored at NORSAR's as well as to international data centers. The excellent performance of the station and the high-quality of the recorded data result in a unique database from a region with a quite sparse seismic network. In this contribution we will give examples of research results based on these observations related to movements of the Fimbul Ice Shelf, drifting of icebergs along the coastline of Dronning Maud Land, seismic activity due to tectonics and ice movements in Dronning Maud Land, the structure of the Earth's interior and a better location of seismic events in the European Arctic.

Tittel	**What does it take to change from a cold to a warm regime in the southern Weddell Sea?**

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Understanding changes in Antarctic ice shelf basal melting is a major challenge for predicting future sea level. Currently, warm Circumpolar DeepWater surrounding Antarctica has limited access to the Weddell Sea continental shelf; consequently, melt rates at Filchner-Ronne Ice Shelf are low. However, large-scale model projections suggest that changes to the Antarctic Slope Front and the coastal circulation may enhance warm inflows within this century. We use a regional high-resolution ice shelf cavity and ocean circulation model to explore forcing changes that may trigger this regime shift. Our results suggest two necessary conditions for supporting a sustained warm inflow into the Filchner Ice Shelf cavity: (i) an extreme relaxation of the Antarctic Slope Front density gradient and (ii) substantial freshening of the dense shelfwater. We also find that the on-shelf transport over the western Weddell Sea shelf is sensitive to the Filchner Trough overflow characteristics

Tittel	The Norwegian ice shelf-ocean observatory

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Institusjoner (affiliations)	1: Norwegian Polar Institute 2: University of Bergen 3: NORCE 4: NORD University 5: British Antarctic Survey 6: Alfred Wegener Institute

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Thinning rates of Antarctic ice shelves vary widely around the continent and understanding the fate of oceanic heat that flows toward the ice shelf cavities is one of the greatest challenges for determining future sea level. Despite all practical obstacles involved in accessing the ocean beneath several hundred meters of glacier ice, Norway's competence on long-term under ice shelf monitoring is providing unique insights on the evolution of ice shelf basal mass loss in the Atlantic sector of the Southern Ocean. Below Fimbulisen, East Antarctica, 12 years of ocean temperature and velocity observations (NPI) showed that a sudden shift toward sustained warm inflow since mid-2016 was caused by large-scale changes in Southern Ocean climate. These changes had direct implications for basal melting at Fimbulisen during 2016-2019, illustrating how remote processes can impact the smaller ice shelves along the Dronning Maud Land coast. Further, multi-annual observations from below Filchner-Ronne Ice Shelf (NORCE, BAS, AWI) show that since 2015, there has been an intensification of the density-driven ice shelf cavity-wide circulation in response to reinforced wind-driven sea ice formation in the Ronne polynya, seemingly caused by westward displacements of the Amundsen Sea Low position. The new aspects of the atmosphere-ocean-ice shelf system revealed by these studies, demonstrate the usefulness and importance of reliable long-term observations at critical locations of Antarctic ice-ocean interactions.

Tittel	**Basal melting and oceanic observations at Fimbulisen ice shelf, East Antarctica**

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Basal melting has a fundamental impact on the mass balance of ice shelves. Here, we present the first two-year long record of basal melt rates at a sub-weekly resolution from the center of Fimbulisen ice shelf, East Antarctica, derived from an autonomous phase-sensitive radar. Fimbulisen is the floating extension of Jutulstraumen, a fast-flowing ice stream with the potential to rise global sea levels with over half a meter. We compare the basal melt to oceanic observations from three sub-ice shelf moorings. Detailed in situ data on the temporal variability of basal melting over longer timescales are necessary for understanding the ice shelf-ocean interaction and its response to climate change.

Tittel	**Simulating the effect of small-scale basal features on the Fimbulisen ice shelf**

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Small-scale basal features, such as channels and crevasses, are abundant on many ice shelves and play an important role on basal melting and ice shelf stability—an important source of freshwater to the Southern Ocean and regulator of global sea level. However, simulating the effect of these features on basal melting at a hundred-meter scale or smaller is still challenging even for dedicated regional simulations, which typically ignore the small-scale features and represent the ice draft as one smoothed piece. In this study, we simulate the effect of small-scale basal features on the Fimbulisen Ice Shelf (FIS) with the unstructured grid Finite-Volume Community Ocean Model (FVCOM), which allows increasing model resolution in selected regions to resolve the small-scale features. High-resolution (8 m) basal topography of the FIS, retrieved from the Reference Elevation Model of Antarctica (REMA) data, reveals that the ice thickness of the Jutulstraum ice stream changes rapidly northwards from ~1500 m to ~ 600 m within 60 km of the grounding line. It also reveals that channelized basal features of several tens of kilometers traverse the ice base along and across the ice stream, rendering complex networks on the ice base topography. We set up a fine-scale FVCOM model of the FIS ice cavity to resolve the complicated basal topography, with grid resolution varying from 50 m in the focused region along the Jutulstraum ice stream to 1500 m in the open ocean. Sensitivity studies are performed, using the high-resolution ice draft from REMA as well as smoothed versions of it, to assess the effect of small-scale basal features on the cavity circulation and melt rates of the FIS. We aim to quantify the net basal mass balance contributions from small-scale basal features and finally to parameterize their effects in coarser ocean models.

Tittel	**Phytoplankton blooms in the Southern Ocean**

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The triggers of phytoplankton blooms in the Southern Ocean remain poorly explained in scientific literature. This study seeks to explain how sea ice melt is related to phytoplankton bloom onset in the King Haakon VII Sea sector of the Weddell Gyre. We present biological and biogeochemical data along a meridional transect from the coastal polynyas to the northern edge of the sea ice. Our data suggests that bloom onset may be related to light limitation relief, iron of sea ice origin, and algal seeding and occurs prior to complete sea ice retreat. Bloom onset prior to complete sea ice melt is likely related to changes in the light regime. As sea ice thins due to melting and the dynamic breakup of ice floes, increased light is introduced into the water column allowing for primary production to initiate. Additionally, the melting sea ice releases algal cells which may act as an inoculum to the water column. Following light, iron is the most limiting factor of primary production i
n the Southern Ocean, which sea ice melt also releases to the upper mixed layer. This study describes in detail the bloom initiation directly linked to the retreat and melting of sea ice in a poorly studied region of the Southern Ocean.

Tittel	**Oseanografiske observatorium i Antarktis - Weddell Watch**

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Heilt sør i Atlanterhavet ligger Weddellhavet og verdas største flytande lekam (i volum), Filchner-Ronne isbremmen. Denne isbremmen er den store klimajokeren. Antarktis vil ikkje smelte på grunn av høgare lufttemperatur, men endringar i havetstraumane kan føre til at isbremmane vil smelte raskare.

Isbremmane i Antarktis har to viktig rolle i klimasystemet:

1) Dei fungerer som gigantiske kjølemaskinar som kjøler ned havvatn slik at det blir superkaldt og så tungt at det renner ned kontinentalskråninga og dekker botn i alle verdshava.
2) Dei fungerer som ei kraft som hindrar innlandsisen i å strøyme ut i havet.

Om endringar i havstraumane fører til at Filchner-Ronne isbremmen smelter raskare vil det føre til endringar i den globale havsirkulasjonen, meir av innlandsisen vil skli ut i havet og føre til stor auke i havnivået. Det er difor viktig at vi forstår og følger med på endringar i havvatnet under og rundt isbremmen.

NORCE drifter fleire havobservatorium i Antarktis og saman med våre samarbeidspartnerar overvaker vi havsirkulasjonen under Filchner-Ronne Isbremmen, på kontinentalsokkelen og kontinentalskråninga sør i Weddellhavet.

Her presenterer dei eksisterande observatoria, planar for framtidig utviding og drift.

Tittel	Ocean temperature forcing in glacial-interglacial Antarctic Ice Sheet simulations

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Ice shelf basal melt accounts for about half the present-day ice loss from the Antarctic Ice Sheet, and is important for both ice sheet mass balance and as a source of fresh water into the Southern Ocean. In Antarctic Ice Sheet simulations over Quaternary glacial cycle time scales, neither basal melt rate nor its principal oceanographic controls (temperature and salinity of waters intruding beneath ice shelves) can be reconstructed directly from proxy records. Given the strong ice-ocean-atmosphere interactions, the ideal solution is a coupled ice-ocean-atmosphere model, but computational demands currently limit this approach to short time scales. Stand-alone ice sheet simulations can cover much longer time scales at reasonable resolution, but require an ocean forcing parameterised indirectly from alternative proxy records, or interpolated/extrapolated between/beyond simulated ocean states. Here we compare the strengths and weaknesses of three options: (i) proxy reconstructions of deep water temperatures north of 43°S; (ii) an ice sheet air temperature reconstruction, damped and lagged by a linear response function; and (iii) a glacial index method which interpolates between CMIP6 lig127k (interglacial) and lgm (glacial) end-member ocean states. We find considerable differences in the rates and magnitudes of the Antarctic Ice Sheet contribution to past sea-level changes when applying the three methods in simulations over the last two glacial cycles. Therefore, the ocean temperature forcing remains as an important but poorly-constrained modelling choice, whether investigating past warm climates or using long simulations as a spin-up for future projections.

Tittel	**Isotope-based Southern Hemisphere westerly winds reconstruction reveals stable Holocene until Common Era intensification**

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Institusjoner (affiliations)	University of Bergen, Columbia University

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The Southern Hemisphere westerly winds (SHW) sustain the Southern Ocean`s role as one of Earth`s main carbon sink, and have helped sequester nearly half of all anthropogenic CO_2 emissions since the Industrial Revolution. Observational evidence reveals dramatic shifts in the vigor of this global climate regulator as it shifts in strength and position. However, models disagree on the direction and magnitude of these changes, as well as their impact on the carbon storage. This knowledge gap is mainly attributed to a lack of baseline data: existing reconstructions are sparse, scarce, rarely extend beyond the past millennium, and are often based on rather ambiguous (indirect) measures of paleo wind strength. This study uses the hydrogen isotope ratios of sedimentary lipids from sub-Antarctic South Georgia to overcome some of these limitations and resolve Holocene changes in core SHW strength. Compound-specific analysis reveals isotopic enrichment of lake water compared to its meteoric source: this trend is indicative of evaporative water loss – a process that is typically wind-driven in similar closed basins in the SHW belt. Our reconstruction reveals stable values until ~2150 years ago when wind strength increased. Agreement with regional paleoclimate evidence shows this shift marks a trend towards a negative Southern Annular Mode (SAM) – the Southern Ocean`s main mode of atmospheric variability. Because this shift is unmatched in the past 7000 years, our findings suggest that the millennium-long SAM index that is used to benchmark future change does not capture the full range of natural variability.

Tittel	**Holocene vegetation and climate variability inferred from lake sediment records in the sub-Antarctic**

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Climate in the sub-Antarctic is strongly governed by the Southern Hemisphere Westerly Wind (SHW). The SHW influences large-scale precipitation and temperature patters, acting as a first order control on local environmental conditions. Furthermore, the SHW drives the Antarctic Circumpolar Current, thereby affects the Southern Ocean's ability to take up atmospheric CO_2 and impacts the global climate. Variations in SHW strength and latitudinal position over multi-decadal to centennial timescales have been inferred but remain unconstrained. Terrestrial records are therefore crucial. We reconstruct vegetation and (wind) climate using palynological and sedimentological records from South Georgia and Kerguelen. Local climate is inferred from changes in native plant communities: changes in the abundance of pollen from upland and lowland species indicate relative colder or warmer conditions. The influx of long-distance transported pollen from the main continental landmasses is used as a unique proxy to reconstruct variations in the SHW. On South Georgia we find variation in long-distance transported pollen from South American taxa, likely indicating variations in SHW strength, while the record from Kerguelen shows varying presence of pollen from African species, likely indicating shifts in the SHW latitudinal position. Combining these records gives a unique possibility to constrain both zonal and latitudinal shifts in SHW during the Holocene period.

Tittel	**Geologisk feltkartlegging i DML – Nå og fremtiden**

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Geologisk feltkartlegging i Dronning Maud Land (DML) fra norsk side har historiske røtter tilbake til 1954. Med etableringen av forskningsstasjonen Troll har geologer i nyere tid fått god tilgang til store deler av Fimbulheimen. Geologisk feltkartlegging i dette området er viktig av to grunner; 1) Antarktis var en stor del av superkontinentet Gondwana, og geologien innenfor DML vitner om geologiske prosesser man har liten kunnskap om; 2) Store deler av Fimbulheimen er i svært liten grad kartlagt og den kunnskapen vi har er basert på over 20-30 år gamle observasjoner. Det er grunn til å anta at vi i dag har en ny forståelse for de ulike geologiske prosessene som har dannet berggrunnen.

Årets ekspedisjon har for første gang siden 1997 kartlagt og ny-tolket et utvalgt område mellom 2°-6°Ø i vestre deler av Mühlig-Hofmannfjella. Kunnskapen i dette området er basert på feltkartlegging i 1985 og 1990, og publisert som kartbladene Gjelsvikfjella og Western Mühlig-Hofmannfjella for over 30 år siden.

Erfaringene fra årets feltarbeid viser at vesentlige bergarter og deres feltrelasjoner er ufullstendig kartlagt og delvis mistolket. Dette innebærer at deler av publiserte geologiske kart og forståelsen av regionale bergartsdannende prosesser er mangelfull. Det er derfor et stort vitenskapelig behov å fortsette det geologiske feltarbeidet i Fimbulheimen. Slik feltkartlegging har også en viktig funksjon med å styrke troverdigheten av norske geologiske ekspedisjoner internasjonalt. For å styrke vår rolle som polarnasjon (og kravinnehaver) er det nødvendig at Norge, ved NP, følger opp geofaglige aktiviteter i Antarktis ved å ta en aktiv rolle i både kartlegging og forskning.

Regelmessige feltekspedisjoner er utfordrende med hensyn til tung og dyr logistikk, og det er et stort behov for grunnleggende geologisk feltkartlegging i DML. I løpet av de siste 50 årene er det gjennomført totalt 6 geologiske feltekspedisjoner. Det vil være spesielt viktig å ha et best mulig kunnskapsgrunnlag når miljøprotokollen åpnes for å reforhandles i 2042.

Tittel	**Geologisk arv - geologi av stor naturverdi i Dronning Maud Land**

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Antarktis er kontinentet viet fred, forskning og vern av miljøet, samtidig som det har en sårbar natur. Geologi er en av faktorene i naturmiljøet som er gjenstand for kartlegging, forskning og forvaltning. Det meste av Antarktis er dekket av is, men der fjellene stikker opp som nunataker ligger berg og løsmasser godt blottlagt uten nevneverdig jordsmonn eller plantevekst. Antarktis gir oss derfor unik informasjon om geologi, samtidig som naturen er sårbar for menneskelig aktivitet.

Geologisk mangfold er variasjon i berggrunnen, løsmasser, landformer og prosessene som skaper dem. God forståelse av det geologiske mangfoldet gjør oss i stand til å forvalte natur og miljø på en god måte, i tillegg til at det øker verdien av naturopplevelsene.

Geologisk arv er viktig for vitenskap, undervisning og naturopplevelser. Verdisetting av geologisk arv bidrar til å avklare bevaringsverdigheten.

Geologisk arv er tema for en av arbeidsgruppene innen SCAR, hvor det utarbeides arbeidsplan for undersøkelse, bevaring og forvaltning av lokaliteter av geologisk verdi (https://www.scar.org/science/geoconservation/home/). Det er viktig at Norge støtter opp om det internasjonale arbeidet med erfaring og data fra Dronning Maud Land (DML).

Under de geologiske kartleggingsekspedisjonene til DML i 2018 og 2022 er det registrert lokaliteter av stor naturverdi. Lokalitetene vurderes som unike med hensyn på vitenskapelig verdi, formidling og naturopplevelser. Å registrere og verdisette geosteder er viktig for å forvalte geologisk arv. Geosteder av stor verdi i DML omfatter både berggrunn, løsmasser, geomorfologi og

landskapsformer. I Antarktis påvirker det geologiske mangfoldet interaksjonen med is og isstrømmer, og utvikling av landskapsmangfoldet.

Erfaringene fra geologisk feltarbeid i DML viser at det er behov for å registrere, beskrive og vurdere viktige geosteder, i tråd med SCARs satsning på temaet. Norges geologiske undersøkelse har utviklet en metodikk for å registrere og verdivurdere geologisk arv på norsk fastland. Denne kan brukes også i DML.

Tittel	**Extreme weather and seabird reproduction in Dronning Maud Land**

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Institusjoner (affiliations)	Norwegian Polar Institute, Norway Durham University, UK CEBC-CNRS, France

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Extreme weather events are increasingly recognised to have negative and long-lasting effects on wildlife populations. Storms are common in polar environments, so polar fauna are adapted to cope with their effects. For example, although storms can affect seabird demography and notably their breeding success, they generally only affect a portion of the population and complete breeding failure due to extreme weather is rare. Here we report on such an exceptional almost complete failure at Svarthamaren, the largest inland seabird colony in Antarctica hosting between 20,000 and 200,000 breeding pairs. This failure can be explained by an intense storm activity potentially combined with poor foraging conditions at-sea. Preliminary results indicate that breeding success was also extremely low across Dronning Maud Land, suggesting a broadscale impact. Storms and other extreme weather events are predicted by most climate models to increase in frequency and/or intensity due to anthropogenic climate change. Better understanding their impact on Antarctic seabird populations is thus be a priority.

Title: Antarctica and colonialism

Authors: Peder Roberts and Alejandra Mancilla

Abstract: This introduction explores what colonialism can do for Antarctica, and what Antarctica can do for colonialism. Ultimately, the aim is to argue that it makes sense to connect Antarctica with colonialism because doing so illuminates our understanding of both. Colonialism pushes us to ask questions not only about the practices of humans in Antarctica and the power relations established between them, but also about the overarching mindsets that have governed both specific human activities in Antarctica and larger human schemes to govern Antarctica. At the same time, Antarctica pushes us to ask where the limits of colonialism as an analytic category might lie, and how far the concept's utility extends for providing insight not available through other tools.

The chapter notes that, while imperialism has been an uncontroversial label to describe Antarctica's history and politics, it is much more contentious whether colonialism took place in Antarctica and, if it did, in what form. We examine different definitions of colonialism and different accounts of the specific moral wrong embedded in it and note that a common feature in the definitions is the domination of one group of people by another. We then discuss what analytic use the term could then have in Antarctica, where there were no people to subjugate. Our suggestion is that, despite of this, a certain colonial logic and attitude were as present as elsewhere. We suggest, moreover, that what happened and happens in Antarctica might entrench colonial structures still present at the international level. The chapter then considers decolonization as a concept and how it may expand the scope of the analysis in Antarctica, particularly in considering the structural legacies of colonialism worldwide.

Tittel	The future of ionospheric research in Antarctica

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The ionosphere is the uppermost part of the Earth's atmosphere. It is partially ionised and in the polar regions it is directly coupled to the interplanetary space. Here the solar wind transfers energy into the upper atmosphere and leads to dynamical processes such as plasma instabilities and spectacular aurora. The dynamics and structuring are distinct in the northern and southern hemispheres, mainly due to differences in the topology and strength of the Earth's magnetic field.

The ionosphere, and in particular the space weather effects and coupling between the atmosphere, magnetosphere, and space environment are best studied at high latitudes. Such studies require multi-instrumental approach, including radars, optical instruments, radio receivers and satellites. While there is a good network of such research facilities in the Arctic, instrumentation in the Antarctic is sparse. In recent years, we observe increased efforts within international cooperation in coordinating space instrumentation in Antarctica.

In this contribution, we present the current status of these activities, as well as plans for future ionospheric monitoring in Antarctica. We also show recent examples of research activity that include data from several Antarctic observatories. Finally, we demonstrate how the Troll Ionospheric Observatory with its new instruments within the Troll Observing Network contributes to these efforts.

Posterpresentasjoner:

i alfabetisk rekkefølge

Tittel	Analysis of englacial stratigraphy in the Dome Fuji region, East Antarctica.

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The search for the oldest ice in Antarctica, and the successful drilling and retrieval of deep ice cores will provide important data to gain a better understanding about changes in the earth's climate system over the past 1.5 Ma years. We analysed radar echograms to achieve a better understanding of basal conditions and continuity of the ice stratigraphy in the Dome Fuji region in East Antarctica, one of the candidate sites predicted to contain ice over 1.5 Ma years. The data was acquired by a US-Japan-Norway collaboration during the 2018/2019 season in three areas south of Dome Fuji and covering ~2000 km. This project aims to track englacial reflectors, correlating them to the published Dome Fuji age-depth model, analyse the continuity or disturbance of englacial stratigraphy, and document the thickness of radar echo-free zones at the bed, which is an indicative of disturbed ice that is no longer useful to reconstruct climate proxies. This will help to understand the processes affecting deep glacial ice, such as ice flow relating to rougher bed topography and basal melting influenced by increased ice thicknesses and geothermal heat flux. The goal is to develop a map showing areas of continuous ice stratigraphy in the englacial/basal layers and thereby contribute important information for the search of ideal core drilling sites and gain knowledge about the dome migration over multiple glacial-interglacial cycles.

Tittel	**New knowledge from old data: Observational evidence for on-shelf transport of Warm Deep Water driven by local dense water export**

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Recent modelling efforts suggest that the on-shelf heat transport around the Antarctic margin is concentrated in locations where dense shelf waters are exported and descend the continental slope. We revisit all available historical data from one such location – the Filchner overflow in the southern Weddell Sea – and show that i) mean currents in the Warm Deep Water (WDW) layer are directed upslope ii) isotherms associated with the WDW are located at shallower depths in the plume region and iii) temperatures on the shelf south of the plume region are elevated compared to locations upstream.

Tittel	Sea ice extent and marine climate of the Southern Ocean during the period of the early 20th century warming from logbooks of Norwegian research and whaling vessels.

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Our understanding of the Antarctic climate suffers from the lack of instrumental observations from the region throughout a substantial part of the 20th century. Complementary data sources such as ships' logbooks have already proven to be a successful tool in reconstructing past marine climate. Commercial whaling in the Southern Ocean (SO) left behind an extensive stratum of documents and accounts represent a promising source of valuable climate information. This work updates on the most recent findings of an ongoing project, aimed on reconstructing of past sea ice extent and climate variability in the Southern Ocean for the data sparse period of the 20th century. More than 30 documents from Norwegian whaling vessels covering the 1930s have been keyed and analyzed, providing about 6000 actual observations of air temperature, wind force and direction, state of sea surface and sometimes sea surface temperature. About 3000 observations contained consistent information on sea ice or open water conditions providing a valuable insight on sea ice conditions during this period. The study will show preliminary results on the inferred past sea ice presence in the SO during the months close to the seasonal maximum extent (November) and minimum (February). These results will be considered in the context of contemporary satellite-based observations of sea ice in the region.

Tittel	**Naturens egne kunstverk formet av vinderosjon**

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Institusjoner (affiliations)	1 Norsk Polarinstitutt 2 Norges Geologiske Undersøkelse

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Antarktis er kjent for katabatiske vinder som strømmer fra pol-platået ned mot kysten. De uvanlig sterke vindene kan slipe, polere og erodere både is, stein og fjell. Vindens eroderende kraft er relativt ubetydelig sammenlignet med vann og is i bevegelse. Men i polare ørkenområder med sterke vinder, minimal nedbør og hvor gjennomsnittstemperaturer ligger omkring -20°C eller lavere, er forholdene optimale for vinderosjon.

Vindens eroderende kraft kan observeres i nærheten av den norske forskningsstasjonen Troll i Dronning Maud Land. På en grusbelagt bakke ovenfor stasjonen ligger en rekke vinderoderte flyttblokker av granitt og kvarts-feltspatisk gneis. Gjennom flere hundretusener av år har vær og vind bearbeidet og erodert steinblokkene til de mest bemerkelsesverdige skulpturer med karakteristiske myke linjer og runde former. Sidene og toppflaten av steinblokkene er tettpakket med fordypninger og hulrom som kan være opptil 20 cm dype. I noen hulrom finnes små steiner, mens andre hulrom er fylt med is.

Under storm og orkan slynges sand og småstein opp i luften og treffer steinblokkene. Fin sand kan fly langt med vinden før den treffer og sliter på stein. De tyngste sandkornene løftes normalt ikke så høyt opp fra bakken og vil derfor erodere kraftigst nederst på steinblokka. For hver gang steinen blir truffet av en partikkel vil mikroskopiske skår blir spaltet av og etter utallige støt blir resultatet et polert utseende. Overraskende nok kan også ispartikler erodere stein. Når isen er nær smeltepunktet er den mykere enn en negl, men hardheten øker gradvis med avkjøling. Ved -40°C er ispartikler omtrentlig like hard som mineralet kvarts.

Overflateformene på steinformasjonene kalles *ventifakt* på fagspråket. *Ventifakt* er stein som har blitt polert, slitt og skulpturert ved langvarig eksponering av vinddrevet sand eller is-krystaller.

Tittel	**Magma mingling in post-tectonic intrusions in Mühlig-Hofmannfjella, Dronning Maud Land**

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Institusjoner (affiliations)	1 Norsk Polarinstitutt 2 Norges Geologiske Undersøkelse

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Our geological field expedition January/February 2022 focused on the Fimbulheimen Magmatic Province located in central Dronning Maud Land. The province is composed of various intrusive igneous rocks such as granite, monzonite, monzodiorite, gabbro and several generations of dykes, which are emplaced in high-grade metamorphic host rocks. The magmatic rocks, which intruded and crystallized at mid-crustal levels between 530-485 Ma, are post-collisional and related to orogenic collapse stage during the Late Neoproterozoic-Cambrian East African-Antarctic orogeny. Preliminary work by Sunde et al. (in prep) suggests that the magma composition and characteristics evolved with time.

Observations during field work in Mühlig-Hofmannfjella have revealed different types of interaction between coeval felsic and mafic/intermediate magmas. The principle types of exchange between coexisting magmas are thermal, chemical and mechanical interaction. We have observed several examples of mechanical interaction, also known as magma mingling. This type of interaction have resulted in a visible blend of two rock types where the original magmas partially retain their identities. We will present a variety of macroscopic evidence for magma mingling in the form of mafic magma enclaves and composite dikes.

Further studies, including U-Pb geochronology, major and trace element analyses, as well as isotopic analyses, will be performed in order to evaluate the petrogenesis and the genetic links between the different magmas.

Tittel	**Nytt geologisk kart Jutulsessen, Dronning Maud Land**

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Institusjoner (affiliations)	1 Norsk Polarinstitutt, Norge 2 Norges Geologiske Undersøkelse 3 University of Pretoria, Sør-Afrika 4 Universitetet i Bergen, Norge 5 Rhodes University, Sør-Afrika 6 University of the Free State, Sør-Afrika

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Norsk Polarinstitutt utga i 2021 et nytt geologisk kart over Jutulsessen, Dronning Maud Land (1:50 000). Det geologiske kartet inneholder både geologisk og geomorfologisk informasjon, og er tegnet på nytt topografisk grunnlag som er utarbeidet av kartseksjonen ved NP. Kartbladet er trykt på begge sider, og inneholder som tilleggsinformasjon en enkel og kortfattet tekst, satellittfoto, diagram som viser en oversikt over tektoniske hendelser, samt fotografier av ulike geologiske og geomorfologiske feltrelasjoner. Det nye geologiske kartet er et viktig bidrag til kartlegging av naturgrunnlaget i Jutulsessen. Målgruppen er forskning, forvaltning og interesserte legfolk. Beskrivelser og fotografier med bildetekst er utformet med tanke på besøkende ikke-geologer på Troll forskningsstasjon.

Tittel	Beyond Epica-Oldest Ice drilling at Little Dome C

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At the remote Little Dome C site in Antarctica, the first ice core drilling campaign of Beyond Epica-Oldest Ice has been successfully completed. The campaign is an unprecedented effort in paleoclimatology studies, as its purpose is to go back in time by 1.5 million years to reveal invaluable information on temperature and on the concentration of greenhouse gases in the atmosphere in the past. The project started in 2019 and will last seven years. It is funded by the European Commission and supported by significant financial and in-kind contributions from the participating nations. The project involves twelve European and non-European international research institutes with NPI being one. Little Dome C is an area of 10 km^2 located 34 km from the Italian-French Concordia Station — one of the most extreme places on Earth. Glaciologists, engineers and technicians of the international team have worked at an altitude of 3,233 metres above sea level, over 1,000 km away from the coast, in one of the harshest places on the planet.

Tittel	**Records of frontal calving across the marginal ice shelves of Dronning Maud Land, East Antarctica, from 2014 until present**

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Estimating rates of ice mass loss at marine terminating glacier fronts and ice shelves in Antarctica remains a key challenge in sea-level rise projections. Even though ice shelves do not have a direct impact on sea-level rise as they float freely, they play an important role in the stability of upstream grounded ice through the buttressing they exert. Continuous monitoring of Antarctic marine terminating glacier fronts and ice-shelves will be a key component in understanding dynamic instabilities and estimating past, present, and future frontal ablation. Here in this work, we present a record of calving frontline positions from 2014 until present in the Dronning Maud Land area. Frontlines were manually digitized using optical satellite imagery acquired by Landsat-8 and Sentinel-2 during the austral summer months, typically between December and March, every year. This dataset, which will further be extended for whole of Antarctica, can be valuable for estimating advance and retreat rates of marine terminating glaciers and ice-shelves as well as their frontal ablation when combined with ice thickness and discharge data. Eventually this could be a vital input to several Antarctic mass budget models that predict future sea level rise and mass balance of Antarctica.

Tittel	**International RINGS initiative to address critical knowledge gap for Antarctic mass balance**

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Institusjoner (affiliations)	Norwegian Polar Institute

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IPCC's recent repots addresses rapidly increasing sea-level contribution from the Antarctic Ice Sheet. The lack of ice thickness data at the margin of the ice sheet (grounding zone) is pointed out as one of the main sources of uncertainty for accurate estimation of Antarctic ice discharge. It is also the location where the bed topography matters the most as it controls the stability of the grounding zone. There is therefore an urgent need to carry out airborne surveys around the entire Antarctic Ice Sheet margin. To fill this major knowledge gap across all the margins of Antarctica for the first time, we initiated a new international initiative RINGS centered at SCAR's Action Group. The primary goal of RINGS is to provide more accurate and complete reference bed topography data for robust assessments of ice discharge from all around Antarctica. This dataset will also tremendously improve the accuracy of ice-sheet models by providing a better mapping of the grounding zone.

Tittel	**Glaciological site survey for a future SIWHA ice core in central Dronning Maud Land**

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We carried out first glaciological surveys at Kamelryggen Ice Rise and Kupol Verbljud Ice Rise at 16E, east of Lazarev Ice Shelf in the central Dronning Maud Land (DML) during the 2021-22 field season. The primary purpose of this survey is to select a deep ice coring site to study westerlies, sea ice, and atmospheric carbon dioxide since the Last Glacial Maximum about 20,000 years ago at a high temporal resolution. An earlier MADICE project did similar work on the other two ice rises in this region, but one of them has experienced surface melting that largely disturb chemical proxies of the ice core, and the other has limited temporal coverage because of its ice thickness. To select the best core site in central DML, we decided to survey two more ice rises as an India-UK-Norway collaboration SIWHA. Preliminary analysis of the data collected in this season shows that the both ice rises have clear Raymond Arches and smooth bed, fulfilling the minimum requirement of the core site.

Tittel	**U-Pb-geochronology of intrusive rocks in Dronning Maud Land, Antarctica**

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Institusjoner (affiliations)	1: Norsk Polarinstitutt. 2: Norges Geologiske Undersøkelse. 3: Universitetet i Oslo

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The latter stages of Ediacaran-Cambrian orogeny in Dronning Maud Land in East Antarctica was characterised by intrusion of large volumes of deep-seated magmas. They were emplaced into orogenic rocks of both Stenian/Tonian and Ediacaran ages, which represent various events related with assembly and breakup of the Rodinia and east Gondwana supercontinents, respectively.

We want to try to understand the late-stage magmas better, and present U-Pb CA-ID-TIMS-data from igneous zircon. The data are from samples which intruded between 515 and 490 Ma. Some of them have clearly distinguishable ages separated by millions of years, which represent different pulses into this lower crustal terrane. However, we are able to confidently distinguish ages for zircon separated by as little as 4-500 thousand years, both within the same sample, and also from one sample to another. The intrusion age is thus represented by the youngest magmatic zircon in the sample. The high-resolution timing variability opens up the possibility to track temporally the geochemical and thermal regime that prevailed when the magmatic rocks we map on the surface today were formed. We can define two end-member scenarios: 1). Slow cooling and crystallization of zircon from one parental magma; 2). Renewed pulses of input magma (inherited grains, i.e. xenocrystic to the final intrusion).

Tittel	Variability of Methane Sulphonic Acid in East Antarctic Firn Cores and Its Relationship with Chlorophyll-a and Sea Ice Extent in the Southern Ocean

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Methane sulphonic acid (MSA) is produced in the atmosphere via oxidation of dimethyl sulphide (DMS), which in turn originates in the oceans as a product of marine primary productivity. The seasonal sea ice zone is a very important source region for DMS emissions to the atmosphere, which constitutes the foundation to use MSA as a proxy for sea ice. Four ice and firn cores drilled on Fimbul Ice Shelf and dated and analysed for MSA as well as other ions (Vega et al. 2016, 2018) have been utilised in this master thesis. Seasonal and annual average MSA concentration is compared to sea ice extent anomalies in the Southern Ocean to evaluate if there is any significant correlation. Furthermore, the MSA concentration in the cores is compared to chlorophyll-a concentration near the seasonal sea ice margin. Since atmospheric circulation patterns can influence the variability in the MSA record due to for example changes in wind transport strength and source region, an attempt is made to evaluate the specific conditions prevalent over the spatial and temporal scales covered in this project.

Vega, C.P., Isaksson, E., Schlosser, E., Divine, D., Martma, T., Mulvaney, R., Eichler, A. & Schwikowski-Gigar, M. (2018). Variability of sea salts in ice and firn cores from Fimbul Ice Shelf, Dronning Maud Land, Antarctica. *The Cryosphere*, 12 (5), 1681–1697. https://doi.org/10.5194/tc-12-1681-2018

Vega, C.P., Schlosser, E., Divine, D.V., Kohler, J., Martma, T., Eichler, A., Schwikowski, M. & Isaksson, E. (2016). Surface mass balance and water stable isotopes derived from firn cores on three ice rises, Fimbul Ice Shelf, Antarctica. *The Cryosphere*, 10 (6), 2763–2777. https://doi.org/10.5194/tc-10-2763-2016

Tittel	**Blue-ice ecosystems in Jutulsessen, Dronning Maud Land, Antarctica**

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Surface of the Antarctic Ice Sheet is one of the harshest habitats on the planet, yet, thanks to the very sparse research, we now know it is also Earth's largest freshwater ecosystem. It contains bacteria, algae, viruses and other microbes that are transported there by wind and redistributed by ice flow.

In order for life to flourish in Antarctica, microbial communities moved below the surface of the ice. Translucent blue-ice offers them protection from the surface conditions and enough solar radiation for photosynthesis to take place. In addition, generated heat has the capacity to melt the ice and where debris is present, generate a greenhouse-type environment called a cryoconite hole.

These greenhouse power plants of microbial activity within the Antarctic Ice Sheet usually contain both oxygen producing phototrophic communities that are adapted to low-light conditions, and heterotrophic organisms that produce carbon dioxie. In addition to gasses, cryoconite hole ecosystems take part in production of organic carbon, nittrogen and other life supporting nutrients.

The poster will present results of the Blue-ice Oases of Microbial Life on the Antarctic Ice Sheet (BIOICE) project funded by Forskningsrådet as part of the Forskerprosjekt FRINATEK. The presentation will focus on the Jutulsessen Blue-ice in the Dronning Maud Land, and the creation, distribution and properties of the cryoconite holes within it. The poster will also reveal unexpected and suprising properties of this remarkable, yet severly understudied, environment.

Tittel	**Subglacial hydrology near Dome Fuji, inland East Antarctica**

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Nearly half of the Antarctic Ice Sheet bed is thawed, and meltwater can flow in extensive drainage networks, accumulate into large subglacial lakes, accrete onto the base of the ice sheet, and discharge into the ocean. Constraints on subglacial hydrology are therefore crucial to our understanding of local to regional ice dynamics, basal conditions, and ice sheet mass balance, with particular importance for guiding the drilling of deep ice coring sites as part of palaeo-climate investigations. Subglacial water beneath interior sectors of ice sheets is mostly controlled by fluctuations in bed topography, due to the relatively flat overlying ice surface. Geothermal heat flux is also impacted on a local scale by topography, being concentrated within valleys and attenuated along ridges, with significant implications for basal conditions, melting, and subglacial hydrology. Predictions of subglacial water drainage patterns are therefore largely dependent on the reliability of the subglacial topography used for calculations. In the interior East Antarctic Ice Sheet, radar-derived ice thickness data from both historical and recent radar surveys has allowed us to improve the resolution and reliability of subglacial topography, with increased weighting given to more recent data with greater locational and depth accuracy. We apply a topographic correction to the geothermal heat flux, and calculate the subglacial hydraulic head using the updated topography, predicting subglacial drainage patterns beneath the ice dome, as well as assessing the sensitivity of subglacial drainage to shifting ice sheet topography and basal conditions over glacial-interglacial timescales.

Tittel	**Condition monitoring of the Antarctic glacier-ice runway of Troll Airfield**

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Forfatterliste (Fornavn Etternavn)	Torodd S. Nord Sven Lidström Knut V. Høyland Harald Faste Aas Anne Urset
Institusjoner (affiliations)	NTNU/NP

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Send inn abstraktet innen 4. mars til mjo@forskningsradet.no. Vennligst marker eposten med Antarktisseminaret 2022.

Troll Airfield is an inland airport on Dronning Maud Land. It serves as the main passenger access to Troll research station, as well as a hub for transfer flights to other research stations. Extensive asset management is devoted to keep the runway open, and this contribution highlights some of its engineering difficulties dealt with the past seasons. Glacier ice as a construction material differs from conventional runway materials in sense that its strength (which again determines the maximum tire pressure which the airfield can withstand), is highly depending on environmental states such as temperature and air contents (porosity). The glacier runway is susceptible to time-dependent deformations (creep) under slow loading scenarios such as taxing operation or parked condition, whereas it behaves brittle under fast loading such as landing impact.
In addition to the complexities posed by the ice material itself, structural flaws such as crevasses and cryoconites (melt holes), are continuously monitored and repaired using a patching technique. In 2018, an extensive field investigation program was carried out to evaluate effective means for assessing the mechanical strength of the runway, but also determine the strength of the ice provided by the patching technique. A borehole jack was used to measure the ice strengths of the two ice types. The ice temperature ranged from -2°C to -15°C, with most tests conducted in the colder range. The strength was measured at two depths on the runway: 10 cm and 20 cm. Expectedly the cold ice was stronger than the warm ice. The patch ice was in general weaker than the blue ice. Our hypothesis is that much of the strength difference

is caused by colour differences between the parch and glacier ice, as the patch ice was generally darker and thus warmer than the glacier ice.

Tittel	An integrative analysis on the benthos of Astrid Ridge and Maud Rise, Southern Ocean

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Forfatterliste (Fornavn Etternavn)	Anne Helene S. Tandberg(1), Luis Martell(1), Francisca Correia de Carvalho(1), Jon A. Kongsrud(1), Anne K. Sveistrup(2), Joan J. Soto Àngel (1), Tone Ulvatn (1), Aino Hosia (1)
Institusjoner (affiliations)	(1) Universitetet i Bergen, Universitetsmuseet (2) Havforskningsinstituttet

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Send inn abstraktet innen 25. april til mjo@forskningsradet.no. Vennligst marker eposten med Antarktisseminaret 2022.

Den bentiske faunaen i Kong Haakon VII hav er betydelig mindre utforsket enn tilsvarende fauna i nærliggende deler av Sørishavet. Toktet i 2019 (F/F Kronprins Haakon) til akkurat disse farvannene var blant annet drevet av å få mer kunnskap om disse havområdene. Bunndyrsdiversiteten ved Astridryggen (67-69°S, 12°E, 2000-1200 m) og Maud Rise (65°S, 2°E, 1750-1200m) ble utforsket med en kombinasjon av bomtrål, epibentisk slede og ROV med HD-video og innsamlingskapasitet (ROV Ægir6000). Dette har gitt oss den første vurderingen av bentisk fauna på Astridryggen og den andre noensinne for Maud Rise.

Innsamlet materiale, som består av omtrent 900 kuraterte prøver samt 36 timer video, er analysert for å vurdere tilstedeværelse av sårbare marine økosystem (VME) indikerende taksa, i tillegg til å beskrive faunistiske sammenhenger. Tidlige analyser indikerer en høy diversitet, tilstedeværelse av sjeldne arter og og høy abundans av noen fåtallige megafauna taksa. Det er en klar forskjell mellom faunaen på Astridryggen og Maud Rise.

Et stort referansebibliotek for DNA-strekkoder og andre genetiske markører (COI, 16S, MtMutS) er under oppbygning basert på det innsamlete materialet, med spesifikke vouchere lenket til videoinformasjon og geolokalisering.

Tittel	**Particulate Iron Bioavailability to Phytoplankton in Antarctic Waters: Effect of Ocean Acidification**

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Forfatterliste (Fornavn Etternavn)	Liang Zhao[1], Nicolas Sanchez[1], Agneta Fransson[2], Melissa Chierici[3], Murat V. Ardelan[1].
Institusjoner (affiliations)	1. Norwegian University of Science and Technology, 2. Norwegian Polar Institute, 3. Institute of Marine Research.

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Send inn abstraktet innen 4. mars til mjo@forskningsradet.no. Vennligst marker eposten med Antarktisseminaret 2022.

Iron is essential for many cellular functions in primary producers, thus having the potential to affect ecosystem processes (e.g., ocean-atmosphere carbon exchange). This is particularly relevant in High Nutrient – Low Chlorophyll zones (e.g., the Southern Ocean). Conventionally, it is dissolved iron (DFe) considered bioavailable to marine phytoplankton whereas particulate iron (PFe) is not. However, ongoing climate change including ocean acidification (OA) and warming, may affect PFe potentially to be source for bioavailable Fe. We tested the bioavailability of one PFe species, goethite (α-FeO (OH)), to phytoplankton community in Southern Ocean under the effect of OA (pH_T ca. 7.5) and ambient manipulation.

In March 2019, we ran an on-deck incubation experiment with the natural phytoplankton community present in open waters in the Dronning Maud Land (DML) region. Different chemical and biological parameters during the incubation were determined, including dissolved iron (DFe), total acid leachable iron (TaLFe), macronutrients including nitrate (NO_3^-), phosphate (PO_4^{3-}) and silicate, total pH (pH_T), dissolved inorganic carbon (DIC), the concentration & fugacity of carbon dioxide (fCO_2), chlorophyll a (Chla) concentration & *in vivo* fluorescence. There was no significant difference in DFe & TaLFe trends among treatments along time, suggesting no goethite addition effect. The major differences were between pH treatments, being the ambient pH treatments with higher Chla and macronutrients drawdown.

The results show that the phytoplankton assemblage was more severely influenced by OA than iron bioavailability. Goethite, as one type of PFe, is insoluble under the tested OA scenarios. Additionally, there could be PO_4^{3-} remineralization in all treatments and species shift composition, but further analysis of phytoplankton community and bacterial abundance are needed. Exceptionally high DFe in the area precludes

the idea of possible DFe limitation, hence further research regarding PFe bioavailability to phytoplankton under regular low DFe concentration in the Southern Ocean is recommended.

Tittel	**Developing a high-fidelity multi-scale sea-ice/ice-shelf/ocean model for the Weddell Gyre, Southern Ocean**

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Forfatterliste (Fornavn Etternavn)	Tore Hattermann
Institusjoner (affiliations)	Akvaplan-niva; Norwegian Polar Institute

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Recent developments of ice-ocean interaction modules in the Unstructured Grid Finite Volume Community Ocean Model (FVCOM) pave the way toward a next-generation multi-scale sea-ice/ice shelf/ocean circulation model for the Weddell Gyre (WG), to provide regionally accurate hindcasts and projections for the larger Dronning Maud Land seascape. The primary challenge in modeling the Weddell Gyre regime is the need to simulate complex processes occurring on a wide range of spatial-temporal scales, such as deep and bottom water formation, sea ice formation/melt, slope front processes and circulation under ice shelves, which interact through large scale ocean currents in this sector of Antarctica. Based on the sea-ice and ice shelf-augmented version of FVCOM, we designed a model domain covering the wider WG circulation in the Atlantic sector of the Southern Ocean. Utilizing the flexibility of the unstructured triangular grid method, the WG model spans a zonal and meridional extent of about 4000 km x 4000 km while at the same time covering the Kong Håkon VII Hav and Dronning Maud Land continental shelf break regions at scales of down to 1.5 km mesh resolution, as has been found to be required to resolve the (eddy-driven) slope front and processes that determine the deep-ocean-to-coast exchange processes, water mass formation and controls on primary productivity in those regions. Initial test simulations, further model setup refinements and tuning experiments are expected to last through 2022, with first hydrodynamic hindcast simulation results being expected for early 2023. The perspective is to develop a multi-purpose modelling tool and incorporate an ecosystem component targeted for the Norwegian sector of the Antarctic coastal waters and deep ocean embedded in the wider circulation regime.

Tittel	**Klimaforskning i Antarktis -- Europeiske prosjekter ved NORCE**

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Forfatterliste (Fornavn Etternavn)	Svein Østerhus, Petra Langebroek, Elaine McDonagh, Priscilla Mooney, David Chandler, Gunn Janne Myrseth, Catherine Lourdes Dy
Institusjoner (affiliations)	Norwegian Research Centre AS - NORCE

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NORCE forskarar koordinerer og deltar i fleire Europiske Antarktiske forskingsprosjekt. Her vil vi presentere nokre av dei europeiske klimaprosjekta ved NORCE.

PolarRES er eit europeisk Horizon 2020-forskingsprosjekt der ein studerer samspelet mellom atmosfæren, hava og havis i Arktis og Antarktis. Dette for å gi ny innsikt i dei viktigaste fysiske og kjemiske prosessane i desse interaksjonane på lokalt og regionalt nivå.

TiPACCs er eit europeisk Horizon 2020-forskingsprosjekt som undersøker risikoen for framtidige bråe og store endringar i antarktiske klimakomponentar.

SO-CHIC er eit europeisk Horizon 2020-forskingsprosjekt som vil bidra til å redusere usikkerheit i klimavarsla. Det overordna målet er å forstå og kvantifisere variasjonen i varme- og karbonbudsjetta i Sørishavet gjennom å undersøke nøkkelprosessane som kontrollerer utvekslinga mellom atmosfæren, havet og havis ved hjelp av en kombinasjon av observasjons- og modelleringsmetoder.

SO-ICE er eit European Space Agency (ESA) prosjekt som bruker toppmoderne jordobservasjonsteknikkar for å måle flyten og tjukkleiken på isbremmane i Weddellhavet i Antarktis. Observasjonar og modellering av havsirkulasjon vil deretter bli brukt for å undersøke korleis havet både driv og reagerer på endringar av isbremmane.

Vi jobbar også med finansiering til et nytt europeisk Horizon Europa – forskingsprosjekt som vil kartlegge viktige prosesser i Antarktis-iskappa og Sørishavet, via verknaden dei har på havnivåstigning, djupvassdanning, havsirkulasjon og klima. Ein innovativ og ambisiøs kombinasjon av

observasjonar og numeriske, inkludert utvikling av kopla isdekke-klimamodellar, vil bli brukt for å betre predikere korleis endringar i Antarktis og Grønlandsisen verkar inn på det globale klimaet.

Tittel	**Vår moderne oseanografiske Antarktis historie**

Innsenders fornavn	Svein
Innsenders etternavn	Østerhus
Epost	
Forfatterliste (Fornavn Etternavn)	Gunn Janne Myrseth, Svein Østerhus
Institusjoner (affiliations)	Norwegian Research Centre AS - NORCE

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Vår oseanografiske forsking i Antarktis er sterkt knyt til oppfinninga av «Bergens-straummålaren, seinare kjent som Aanderaa RCM (Recording Current Meter) straummålaren.

I 1968 reiste oseanografen Thor Kvinge på den «International Weddell Sea Oceanographic Expeditions» med isbrytaren «USS Glacier» til Weddellhavet. Kvinge sette ut fire Aanderaa straummålarar i området nord for den gigantiske Filchner-Ronne isbremmen. Dette er eit område med svært mykje sjøis og vanskeleg tilgjengeleg. Året etter når straummålarane skulle hentast inn var det så mykje is at skipet ikkje greidde å komme fram til området der riggane var sette ut. Det same gjentok seg fleire år og først etter fem år greidde dei å hente inn straummålarane. Instrumenta og måleriggane hadde overlevd fem år i havdjupet utan å bli tært opp av sjøvatn.

Det blei ein verdssensasjon, for første gong hadde nokon greidd å måle havstraumane i Antarktis i over meir enn eitt år. Ein bragd som løfta vår Antarktisforsking og gav oss eit godt verktøy til systematisk utforsking av hava i Antarktis. Ei utforsking vi framleis held på med her i NORCE.

På denne posteren vil vi fortelje historia om vår oseanografiske Antarktishistorie ved hjelp av bilete, tekst og filmen “Iskalde klimaforskere – Pionérene i Antarktis”.