



Leadership and Revised Structure of the SCAR INSTANT (Instabilities and Thresholds in Antarctica) Programme

1. Introduction & Background

INSTANT is a new SCAR strategic research programme (SRP) that addresses - *the question of Antarctica's uncertain contribution to sea-level change*. It utilises a multidisciplinary Earth systems approach combining geoscience, physical sciences, biological and social sciences to improve understanding of the interactions between the ocean, atmosphere, solid Earth and the Antarctic Ice Sheet (AIS) and aims at ensuring effective communication on this topic with stakeholders.

The goal of INSTANT:

“Quantify the Antarctic ice sheet contribution to past and future global & regional sea-level change, from improved understanding of atmosphere, ocean and solid Earth interactions and feedbacks with the ice sheet, so that key stakeholders can better anticipate and assess the risk in order to manage and adapt to sea-level change and evaluate mitigation pathways”.

To achieve this, INSTANT and its partners (e.g. WCRP) will focus on the poorly understood processes and feedbacks that influenced ice-sheets in the past, are influencing observed ice sheet changes, and will influence Antarctica's contribution to future global sea-level change. The key outcomes will be reconstructions of past and projections of future ice mass changes, with reduced uncertainties due to an improved knowledge of rate-determining instabilities and irreversible thresholds, which will be shared with various stakeholder groups. The ice sheet projections will be integrated into probabilistic sea-level projection frameworks for Intergovernmental Panel on Climate Change (IPCC) representative concentration pathways (RCPs) and shared socioeconomic pathways (SSPs)

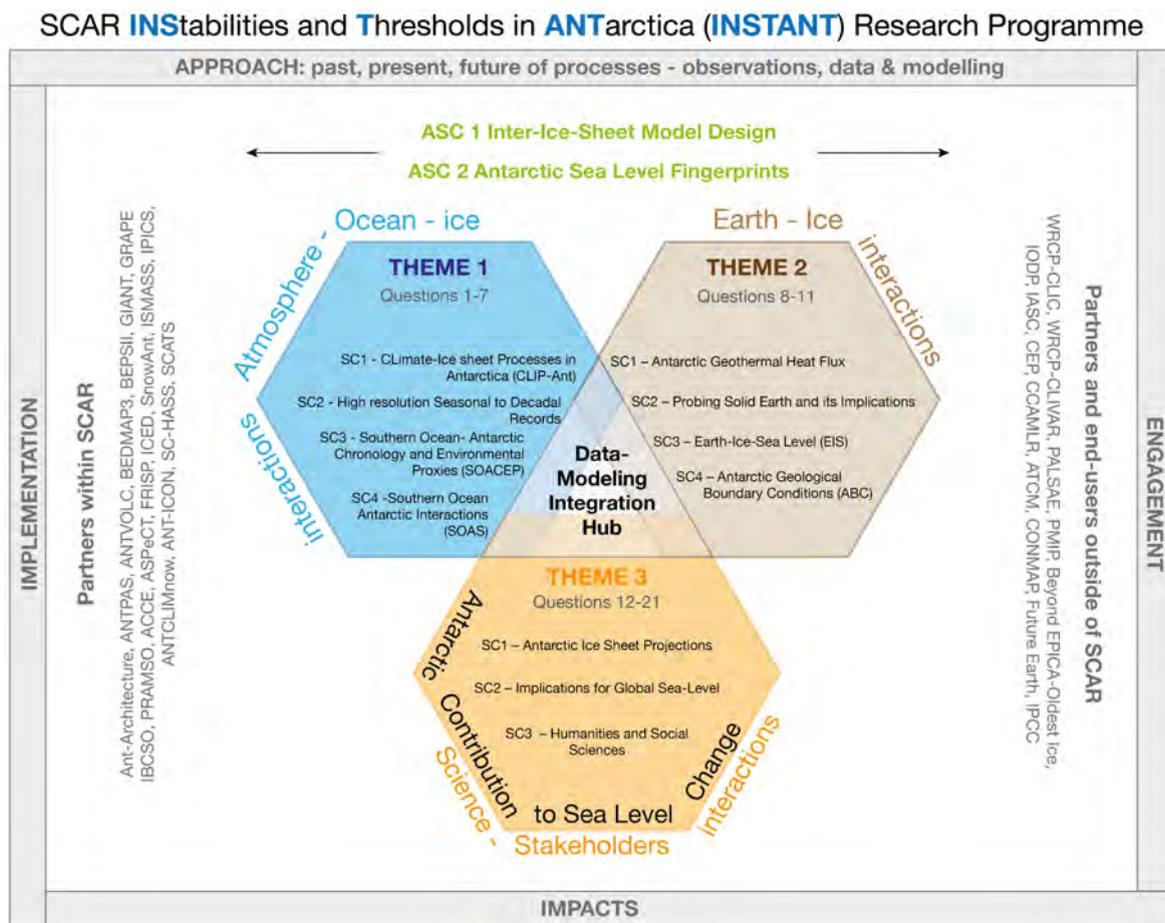
INSTANT will foster the implementation of research in each Theme (see below) using a proven integrated data-model approach that involves:

1. Recent observations and paleo-reconstructions of the ice-atmosphere-ocean-Earth system, identifying forcings, feedbacks, and rates of change.
2. Process understanding at all time scales.
3. Modelling at all time scales (reconstructions and projections).
4. Engagement with representative stakeholders throughout the SRP.

Key contributions of INSTANT are at the interface of science and policy, and will involve engagement between earth system scientists, social scientists, practitioners, decision-makers, planners and publics. Stakeholder engagement and science communication will play an important role in this SRP. INSTANT will provide scientific evidence to assess the

effectiveness of, and risks associated with, climate change mitigation pathways (e.g., UNFCC¹ Paris Agreement). This evidence will also guide adaptation approaches required to avoid the worst impacts, such as coastal flooding and erosion, groundwater inundation and salinization, habitat loss and large-scale human migration. The impacts of sea-level and ice sheet change around Antarctica are also of critical interest to CCAMLR², COMNAP³ and Antarctic Treaty System parties, as they will have profound implications for key Antarctic stakeholder groups including national programme operations, tourism and fisheries.

2. Revised structure of INSTANT



Themes

The revised programme structure includes 3 Themes (Fig. 1):

1. **Atmosphere-Ocean-Ice Interactions:** Improved understanding of atmospheric and ocean forcing processes on ice sheet dynamics.
2. **Earth-Ice Interactions:** Improved understanding of solid Earth processes and feedbacks on ice sheet dynamics and regional to global non uniform sea-level variations.

¹ UNFCCC = United Nations Framework Convention on Climate Change

² CCAMLR = Commission for the Conservation of Antarctic Marine Living Resource

³ COMNAP = Council of Managers of National Antarctic Programs

3. **Antarctic Contribution to Sea-Level Change - Science-Stakeholder Interactions:**
Here the aim is to integrate the science outputs of Themes 1-2 and improve our ability to reconstruct and predict the Antarctic ice sheet contribution to sea-level change and reduce uncertainties. We will provide greater understanding to policy-makers, practitioners/operators, and the public of the importance of improved projections of the Antarctic contribution to global sea-level change, as well as their impacts, risks and implications.

Themes are as large as previous SRPs (e.g. PAIS or SERCE). They are sub-programmes where an integrated data-model system science approach is used to address priority questions outlined in the INSTANT science and implementation plan (SIP) (*Questions 1-21*).

Role of Theme leaders:

- Provisional theme leaders are listed in Table 1.
- They should develop a high-level work plan based on the INSTANT SIP.
- Theme Leaders ensure that progress is being made towards addressing the strategic priority questions, identify gaps and opportunities for collaboration, funding, capacity development and engagement, propose workshops and products (e.g. thematic publications).
- Theme Leaders will have representation on the Steering Committee and will help in annual reporting to SCAR EXCOM.
- Balancing diversity for genders, nationalities and career stages within the leadership is a strong focus of INSTANT. The Steering committee will seek to build capacity in leadership over the course of the SRP to achieve balance in gender, nationality and career stage within the leadership of INSTANT.
- Rotation of the leadership needs to be considered at least once in the duration of the programme and can also be suggested by the Steering Committee.

Subcommittees (Within Themes) (SCs)

Subcommittees within themes focus on key research tools/capabilities and/or problems needed to address the theme questions. Theme leaders can also be subcommittee leaders. Balancing diversity for genders, nationalities and career stage within the leadership is strongly encouraged. The INSTANT Steering committee may help identify sub-committee co-leaders to preserve gender, nationality and career stage balance within the leadership of the SCs. Rotations of the leadership needs to be considered by the SCs leadership team at least once in the entire duration of the programme and may also be guided by the Steering Committee.

Role of sub-committee leaders:

- Initial promoters and or leaders of subcommittees are listed in Table 1.
- Subcommittees are where the research community engages to facilitate the work plan.
- Subcommittees need to identify their team and develop a science and implementation plan that addresses.

- o The key questions and rationale
 - o Potential partners and collaborators (within and outside of SCAR).
 - o How the work will be implemented (meetings, research consortia, workshops etc.)
 - o Products
 - o Impacts
 - o Engagement and communication
 - o Capacity development.
- The first step for INSTANT is to get the Subcommittees up and running.

Across Theme Subcommittees (ASCs)

Across Theme Subcommittees have been developed to ensure interaction and collaboration between the Themes and focus on shared research capability required by all themes. The ASCs are key to ensuring that data, observations and modelling communities are operating and interacting effectively to achieve the goals of INSTANT. Across Theme Subcommittees and Promoters or Leaders are listed in Table 1. These Subcommittees may work with existing projects/programmes communities to ensure INSTANT is utilising the best observations and models to address its questions and goals.

Data-Modelling Integration Hub

The Data-Modelling Integration Hub is hosted by Theme 3 and the Inter-ice sheet model design across theme subcommittee, but will be contributed to by all Themes. It is virtual and will take the form of workshops that bring together key groups and scientists from all Themes to provide a data-modeling vision of Antarctic's ice sheet evolution capable of reducing the uncertainties in past and future projections of AIS mass loss. The Data-Modelling Integration Hub will be a place where collaboration and coordination between INSTANT and its partners will occur (e.g. ISMASS and ISMIP).

Steering Committee

Membership of the Steering Committee is listed in Table 1 (below). The Steering Committee will meet once a year in person and 2 times per year online. The Steering Committee has oversight of the INSTANT Programme and Budget, and will approve all activities and requests for funding. It will also organise and annual reports to the SCAR Executive Committee. Rotation of the members of the Steering Committee may be considered at least once in the entire duration of the programme, including INSTANT co-chiefs.

Budget and Leveraging

The budget (\$50K annually) will be held centrally and managed by the Steering Committee. All subcommittees will provide updated annual work plans to their Theme leaders with

indicative budgets/costs for planned activities. Applications will be made by Theme leaders to the SC for budgeted line items as required.

SCAR INSTANT provides a powerful brand and funding for its activities should leverage other sources, sponsors and organisations. Previous SCAR SRPs have been very successful in leveraging significant funds for workshops, meetings, publications, summer schools and engagement. Preference will be given to using INSTANT funds for those activities that leverage significant co-funding and promote inter-communities and disciplinary discussions.

Table 1. SCAR INSTANT Leadership

Chief Officers				
Naish	Tim	New Zealand		Tim.naish@vuw.ac.nz
Colleoni	Florence	Italy		fcolleoni@inogs.it

Steering Committee				
Goelzer	Heiko	Norway	ISM/ISMIP	heig@norceresearch.no
Alessio	Rovere	Germany	PALSEA	arovere@marum.de
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Escutia	Carlota	Spain	PRAMSO	cescutia@ugr.es
Liggett	Daniela	New Zealand	SC-HASS	daniela.liggett@canterbury.ac.nz

Theme 1 Atmosphere-Ocean-Ice interactions - Leaders				
Goodwin	Ian	Australia		ian.goodwin@mq.edu.au
Thomas*	Liz	UK		lith@bas.ac.uk
Golledge	Nick	New Zealand		Nicholas.golledge@vuw.ac.nz
Silvano#	Alessandro	UK		a.silvano@soton.ac.uk
Theme 2 Earth-Ice interactions - Leaders				
Lloyd	Andrew	USA		andrewl@ldeo.columbia.edu
Simms#	Alex	USA		asimms@geol.ucsb.edu
Stocchi*	Paolo	Netherlands		Paolo.Stocchi@nioz.nl
Theme 3 Antarctic Contribution to Sea level Changes & Science - Stakeholders interactions - Leaders				
Levy*	Richard	New Zealand		r.levy@gns.cri.nz
Kopp	Bob	USA		robert.kopp@rutgers.edu
Nowicki#	Sophie	USA		sophien@buffalo.edu
DeConto	Rob	USA		deconto@geo.umass.edu
Priestley	Rebecca	New Zealand		Rebecca.priestley@vuw.ac.nz

*Represent Theme on SC, #Alternate representative on SC

ASC – 1 Inter-Ice Sheet Model Design				
Ritz	Catherine	France		catherine.ritz@univ-grenoble-alpes.fr
Goelzer	Heiko	Norway		heig@norceresearch.no
ASC - 2 – Antarctic Sea Level Fingerprints				
Rovere	Alessio	Italy		arovere@marum.de
Barlow	Natasha	UK		N.L.M.Barlow@leeds.ac.uk

ASC - 3 Earth Observations (To be defined)**Theme 1 – SC1 – Climate-Ice sheet Processes in Antarctica (CLIP-Ant)**

Silvano	Alessandro	UK		a.silvano@soton.ac.uk
Gasson	Edward	UK		E.Gasson@exeter.ac.uk

Theme 1 – SC2 – High-Resolution Seasonal to Decadal Records

Thomas	Liz	UK		lith@bas.ac.uk
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Vance	Tessa	Australia		Tessa.Vance@utas.edu.au

Theme 1 – SC3 – Southern Ocean- Antarctic Chronology and Environmental Proxies (SOACEP)

DeSantis	Laura	Italy		ldesantis@inogs.it
Grant	Georgia	New Zealand		g.grant@gns.cri.nz

Theme 1 – SC4 – Southern Ocean Antarctic Interactions (SOAS)

Weber	Mike	Germany		mike.weber@uni-bonn.de
Lamy	Frank	Germany		frank.lamy@awi.de
Abhijith (Abhi) Ulayottil	Venugopal	New Zealand		a.ulayottilvenugopal@gns.cri.nz
Molly	Patterson	USA		patterso@binghamton.edu

Theme 1 – SC5 – Global to Regional Climate Modeling (REGANT) – temporary Leaders

Abe-Ouchi	Ayako	Japan		abeouchi@aori.u-tokyo.ac.jp
Colleoni	Florence	Italy		fcolleoni@inogs.it

Theme 2 – SC1 – Antarctic Geothermal Heat Flux (GHF)

Staal	Tobias	Australia		tobias.staal@utas.edu.au
Losing	Mareen	Germany		mareen.loesing@ifg.uni-kiel.de
Burton-Johnson	Alex	UK		alerto@bas.ac.uk

Theme 2 – SC2 – Probing Solid Earth and its Implications

Scheinert	Mirko	Germany		mirko.scheinert@tu-dresden.de
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Theme 2 – SC3 – Earth-Ice-Sea Level (EIS)

Klemann	Volker	Germany		volkerk@gfz-potsdam.de
Caron	Lambert	USA		lambert.caron@jpl.nasa.gov
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Okuno	Jun'ichi	Japan		okuno@nipr.ac.jp

Theme 2 – SC4 – Antarctic Geological Boundary Conditions (ABC)

Jamieson	Stewart	UK		stewart.jamieson@durham.ac.uk
'Mickey' Mackie	Emma	USA		emackie@ufl.edu

Theme 3 – Data-Modelling Integration Hub

Golledge	Nick	New Zealand		Nicholas.golledge@vuw.ac.nz
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Ritz	Cat	France		catherine.ritz@univ-grenoble-alp es.fr

Theme 3 – proposed SC1 – Antarctic Ice Sheet Projections

Nowicki	Sophie	USA		sophie.nowicki@nasa.gov
DeConto	Rob	USA		deconto@geo.umass.edu

Theme 3 – proposed SC2 – Implications for Global Sea-Level

Levy	Richard	NZ		r.levy@gns.cri.nz
Van de Wal	Roderick	Netherlands		r.s.w.vandewal@uu.nl
Kopp	Bob	USA		robert.kopp@rutgers.edu

Theme 3 – proposed SC3 – Humanities and Social Sciences

Priestley	Rebecca	NZ		Rebecca.priestley@vuw.ac.nz
tbc				

