



Workshop

The future of geodetic-geophysical observational networks in Antarctica

Colorado State University, Fort Collins (CO), 29 September – 1 October, 2022

Rationale

To fulfil its overall goal questioning Antarctica's uncertain contribution to sea level, the SCAR Scientific Research Program INSTANT puts a major focus to increasing the amount and coverage of observations. With regard to the solid Earth and its interaction with ice, ocean and atmosphere there is a variety of geodetic and geophysical techniques providing in-situ (ground-based or near-surface) observations of a number of processes and/or parameters. However, technique-specific capabilities might not have been exploited to their optimum, either caused by the severe environmental Antarctic conditions and difficult logistics or by not considering synergies between different techniques. The INSTANT Sub-Committee "Probing the Solid Earth and its Interactions" (PSE) aims to considerably improve the cooperation between scientists from different disciplines being active in realising in-situ geodetic and geophysical measurements in Antarctica as well as between "observers" and "modellers".

PSE had its kick-off meeting on March 30, 2022. In this kick-off meeting, ~50 participants found it valuable and urgent to keep discussing how to realize and exploit geodetic-geophysical observational infrastructure in Antarctica in the future. This is especially critical when current GNSS and seismological infrastructure will come to its decommission phase.

Therefore, in late September 2022 we invite all interested scientists – and especially early-career scientists – to a workshop with the goal to discuss the science rationale of geodetic-geophysical in-situ measurements in Antarctica. We will evaluate the challenges and benefits of utilizing respective infrastructure in dedicated, temporarily restricted projects as well as with a long-term prospect. For this, the international cooperation and coordination will get even more important especially when defining the most important scientific questions and developing new ideas to exploit synergies in a much better way than at present. The workshop program will comprise presentations and discussion

- on the current status and results that have been achieved to date based on the existing GNSS and seismological networks;
- on the shortcomings in terms of spatial and temporal coverage preventing urging science questions to be answered;
- on ideas how to shape future national and international projects in view of constrained logistics;
- and on prospects for new, out-of-the-ordinary directions to improve the reliability and duration of unattended operation of scientific equipment in Antarctica and, thus, to reduce the carbon footprint due to a decisively reduced number of necessary re-visits.

The results of this workshop should be elaborated in a white paper (WP). An important goal is to involve early-career scientists in the workshop and in writing the WP in order to disseminate experience realizing geoscientific research in Antarctica and to empower the young generation to assume responsibility in leading new projects in the near future.



Tentative organisational details and dates

The workshop will take place at Colorado State University, Fort Collins (CO), USA. Fort Collins is located about 100 km from downtown Denver, about 115 km from Denver International Airport, and about 70 km from Estes Park, where the WAIS workshop will take place from 26 to 29 September 2022.

We are grateful to Rick Aster to support the workshop as local host. Details on accommodation, workshop venue etc. will be provided as soon as possible.

We will ask you to register for the workshop. The registration fee will be \$40 (which will cover only a minor part of the expected costs). It will be waived for students (undergraduate, graduate and PhD) and early-career scientists (PhD plus 5 years).

Additionally, we are seeking financial support from NSF and SCAR. Depending on their commitment limited funding can be provided to (partly) support the participation (especially of ECS).

Preliminary agenda

29 September 2022	~6 pm	Icebreaker reception
30 September 2022	8.30 am – 6 pm 7 pm	Workshop day 1 Workshop dinner
01 October 2022	8.30 am – 1 pm	Workshop day 2

The program will comprise science sessions (mainly on day 1) as well as a session on infrastructure, logistics and coordination. We will seek direct contact with respective experts in specific fields to cover all themes to be discussed. Additionally, we will ask for your ideas on important topics related to the above given rationale. Further contributions, e.g. on specific projects and investigations, will be possible. We especially encourage ECS to take part in the workshop and to present their research. Detailed discussion will be organized in form of break-out groups. Furthermore, we expect to finally agree on a roadmap for drafting a white paper which should be a major result of the workshop to substantiate the science directions and mid- to long-term strategies for realizing geodetic-geophysical observations in Antarctica.

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Chairs of SCAR INSTANT SC2.2 PSE

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