

Antarctic Geospace and ATmosphere reseArch AGATA

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AGATA (Antarctic Geospace and ATmosphere research) is a new established Programme Planning Group approved by SCAR to propose a new Scientific Research Programme (SRP). The proposed SRP will contribute to answering the outstanding scientific questions within atmospheric and space physics over polar regions:

- How are different atmospheric layers coupled in the polar regions?
- How does the upper polar atmosphere respond to increased geomagnetic activity, including energy transfer from space into the ionosphere?
- How can we improve the understanding of the Antarctic atmosphere by radio signals from the GNSS or other satellites, and from ground based radars?

Answering these questions will not only have implications on the understanding of processes in the polar atmosphere, but it will also greatly improve our understanding of the global atmospheric dynamics, thus contributing to the development of large-scale whole atmosphere and climate models.

AGATA will bring together communities which investigate the polar atmosphere and geospace, with a particular focus on Antarctica, but also with a bi-polar perspective. AGATA will be a coordinated, worldwide effort to monitor, investigate and better understand the physics of the polar atmosphere and the impact of the Sun-Earth interactions on the polar regions. AGATA will take advantage of existing and planned instrumentation in Antarctica, but also in the Arctic and satellite-based observations, and it will aim for coordinated research efforts and data exchange. AGATA will also be important for sciences that depend on the removal and mitigation of negative effects of the atmosphere on their observations. To learn more see [1,2].

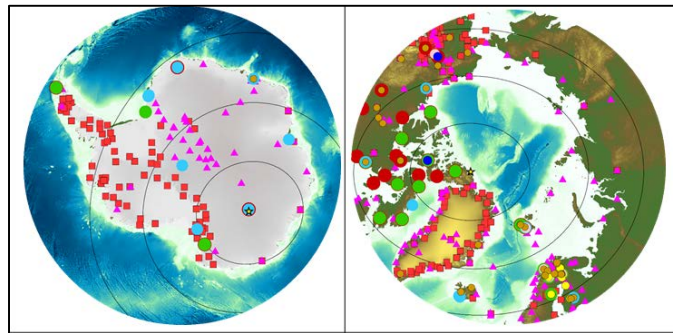


Figure 1. Scientific instrumentation infrastructure in Antarctica and Arctic regions (from [1])

References

- [1] L. Alfonsi, et al. "Review of Environmental Monitoring by Means of Radio Waves in the Polar Regions: From Atmosphere to Geospace." *Surv Geophys* **43**, 1609–1698 (2022). doi: 10.1007/s10712-022-09734-z
- [2] N. Bergeot, L. Alfonsi, P.J. Cilliers, G. De Franceschi, E. Correia, C-F Enell, M.J. Engebretson, I. Häggström, G. Heygster, K. Kauristie, M. Kosch, C. Lee, E. Macotela, F. Marcucci, W. J. Miloch, J. Morton, M. Negusini, E. Pottiaux, P.R. Shreedevi, P. Prikryl, L. Spogli, J.A.E Stephenson, O. Troshichev, R. Van Malderen, S. Zou and the GRAPE EG members (2020). Polar atmosphere and Geospace: Present knowledge, infrastructures and future research directions <https://scar.org/scar-library/reports-and-bulletins/scar-bulletins/5570-scar-bulletin-203/>