



The Antarctic Geospace and ATmosphere reseArch (AGATA SCAR Scientific Research Programme) and their links with the Astronomy community

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Scientific Committee on Antarctic Research



The Scientific Committee on Antarctic Research (SCAR) is a thematic organisation of the International Science Council (ISC). It was created in 1958. SCAR has a mandate and goal to **initiate, develop and coordinate high quality international scientific research in the Antarctic region** (including the Southern Ocean), and on the role of the Antarctic region in the Earth system.

The Science within SCAR is carried out through the permanent Science Groups (SGs):

- GeoSciences
- Life Sciences
- Physical Sciences

Scientific Research Programmes (SRPs) are established by the three permanent Science Groups to focus efforts on **high priority topical areas**. They are **large, overarching programmes** in scope, are often **multi-disciplinary** and have a lifetime of around eight years.

AGATA SRP approved in 2024

Until August 2024 SCAR was running 3 SRPs, none of them dealt with upper atmosphere physics and solar-terrestrial relationships. In August 2024, during the Delegates Meeting the AGATA Scientific Research Program was approved.

AGATA started in January 2025 and will last till 2032



SCAR full members in dark blue
SCAR Associate members in light blue

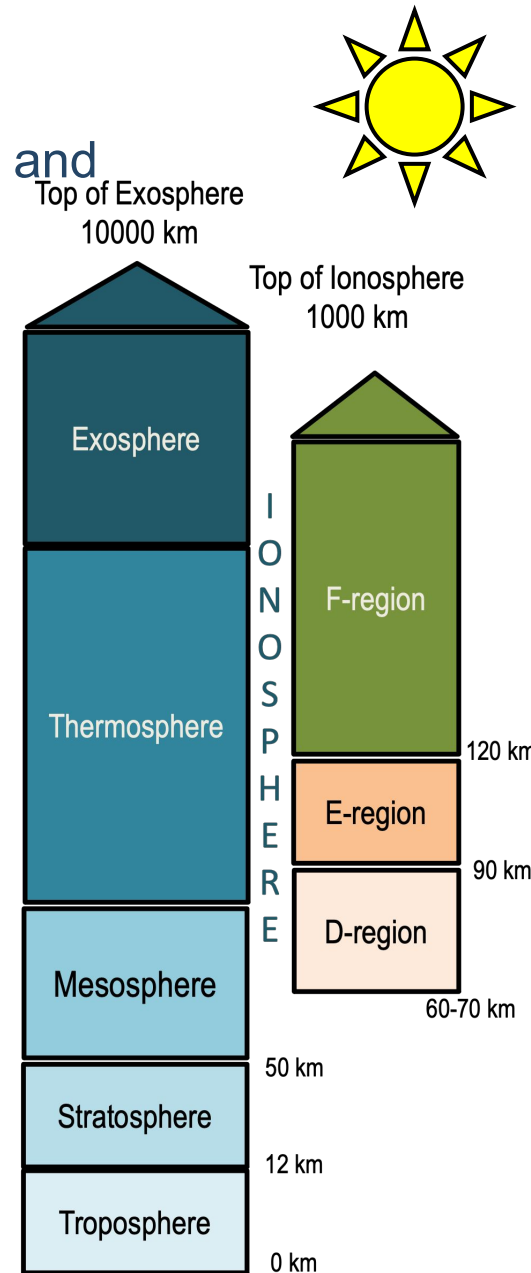


RATIONALE

AGATA aims to significantly advance the current knowledge of the Antarctic atmosphere and geospace, also in the global and interhemispheric context.

- How are different atmospheric layers coupled in the polar regions?
- How does the Antarctic and Arctic upper atmosphere respond to increased geomagnetic activity, including energy transfer from space?
- How does the whole polar atmosphere impact short- and long-term climate variations?

AGATA gathers research communities focusing on the **polar weather, atmosphere, and geospace** to study the coupling between different atmospheric layers and the impact of solar-terrestrial interactions for the conditions in the atmosphere (both lower and upper atmosphere). **This opens for innovating science encompassing different atmospheric layers and near-Earth space.**



SCIENTIFIC OBJECTIVES

Understanding and better modelling:

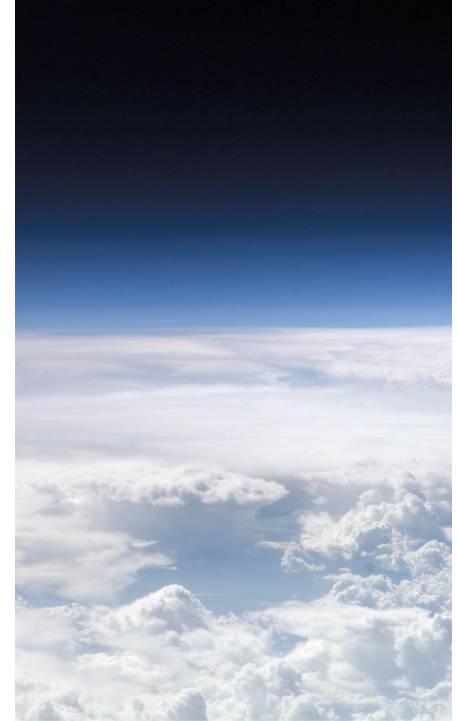
- **Coupling between the neutral and the ionized layers** in the polar atmosphere and its role in the global atmospheric circulation and energy transfer through different atmospheric layers.
- **Solar wind-magnetosphere-ionosphere coupling** at high latitudes and the related effects at low latitudes.

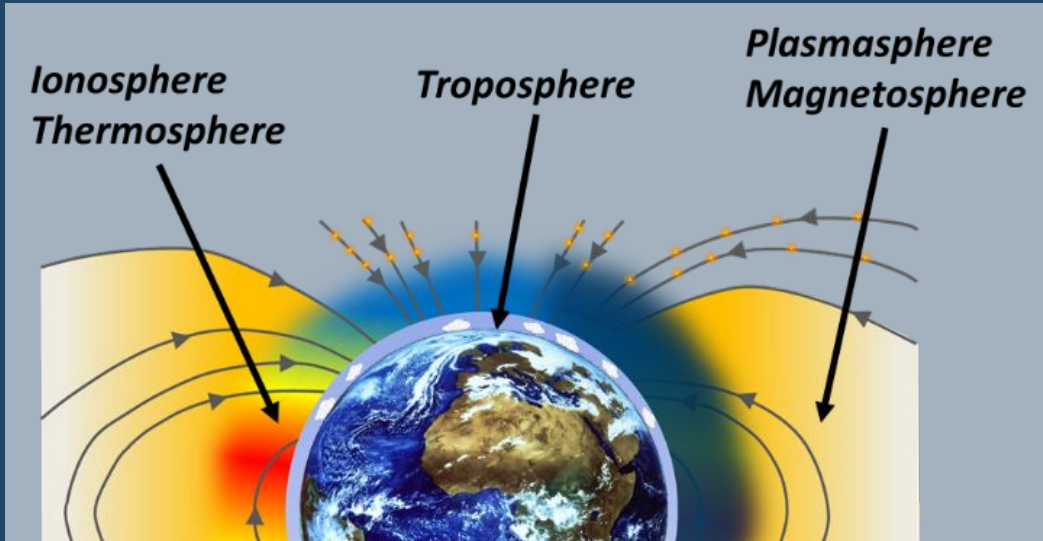
Understanding:

- **Interhemispheric symmetries and asymmetries** in response of the upper polar atmosphere to geomagnetic forcing and solar activity.
- **The origin of the long-term behaviour** of the polar ionosphere and discriminate between natural and anthropogenic contributions to such change.

Contributing to identify the contribution of **anthropogenic and natural sources** in the assessment of climate change over the poles.

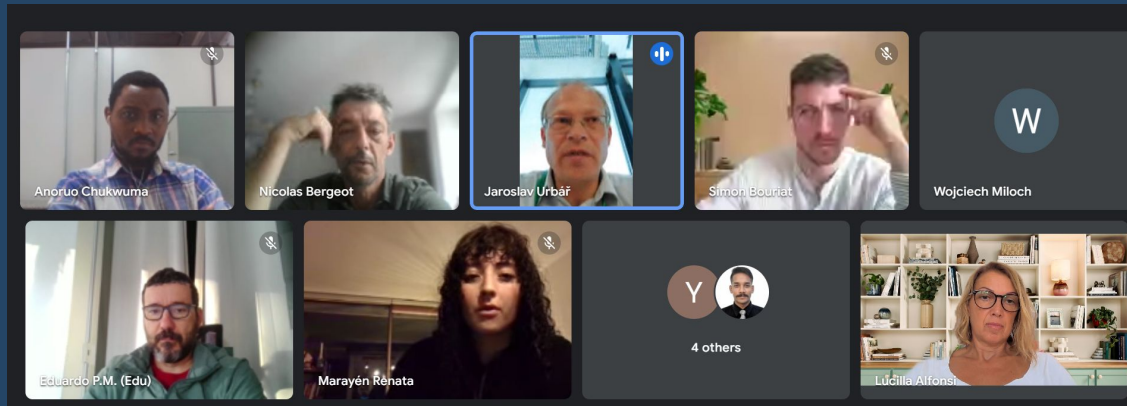
Improving the models and forecasts of upper atmosphere prediction under adverse **space weather** conditions.





ACTIONS

- *Focus on the polar regions (Antarctica and Arctic)*
- *Strengthens the collaboration between atmospheric scientists and space physics community*
- *Facilitates **sharing of data, algorithms and models, access to research infrastructure***
- *Develops and strengthens the **collaboration** between the research communities that manage and exploit ground-based and in-situ observations*
- *Runs the **AGATA mentoring program** to educate new generation of scientists (started in 2023).*
- *Is active in preparations for 5th International **Polar Year 2032/33***
- *Cooperates with other relevant initiatives!*



AGATA offers a common research and collaborative platform always open to new members.

To become a member:

<https://nettskjema.no/a/agata-registration>



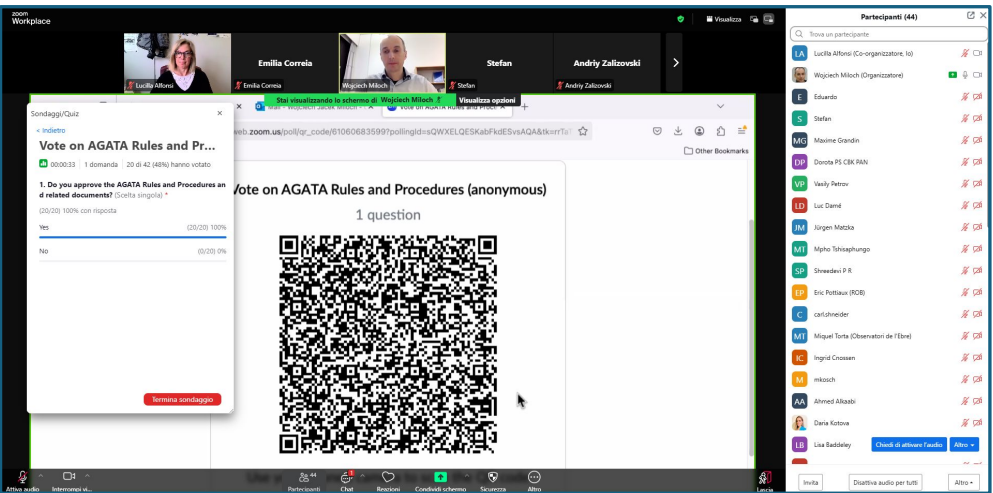
CURRENT STATE OF THE ART



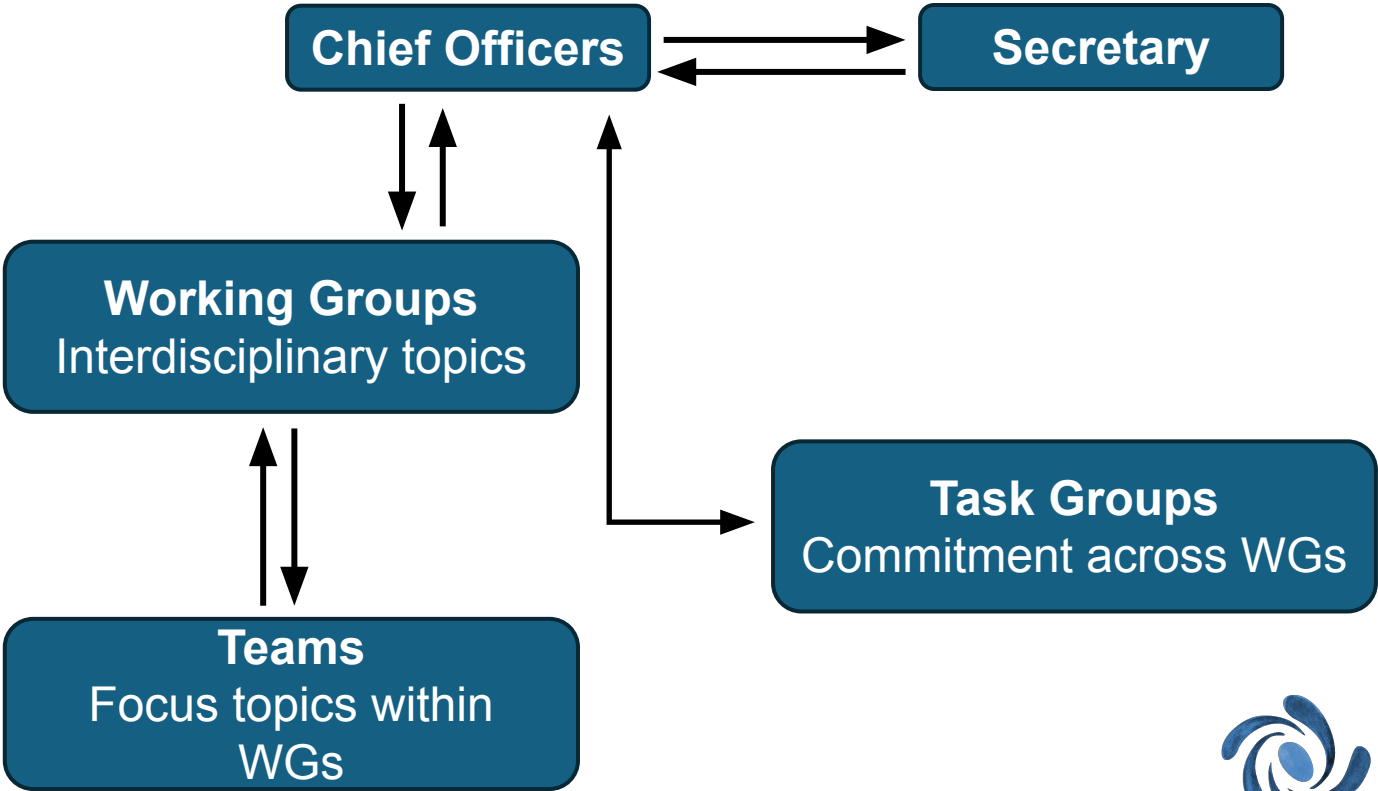
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CURRENT STATE OF THE ART

Official **Kick-Off Meeting** (March 26-28, fully online): **more than 100 participants** attending the presentations, invited talks, discussions, and adopting **AGATA Rules and Procedures**.



AGATA structure and workflow



CURRENT STATE OF THE ART

AGATA arranged the elections in June to appoint the **AGATA Steering Committee and Group Leaders**, setting up **the AGATA governance**.

Steering Committee

Chief Officers, Secretary, and Working Group Leaders

Advisory Board

Up to ten senior scientists in AGATA fields

Leadership Team

Chief Officers, Secretary, AGATA Working Group leaders and Task Group leaders

Management

Chief Officers and Secretary

STEERING COMMITTEE

Chief Officers: Lucilla Alfonsi (Istituto nazionale di Geofisica e Vulcanologia, Italy)
Wojciech J. Miloch (University of Oslo, Norway)

Secretary: Vacant

WG1 Coupling between atmospheric layers

Leaders: Chris Watson (University of New Brunswick, Canada), Chao Xiong (Wuhan University, China)
Deputy: Ingrid Cnossen (British Antarctic Survey, UK)

WG2 Coupling within the atmospheric layers

Leaders: Damian Murphy (Australian Antarctic Division, Australia), Rahul Rathi (Lancaster University, UK)
Deputy: Kseniia Golubenko (University of Oulu, Finland)

WG3 Coupling to geospace

Leaders: Yue Deng (University of Texas, USA), Daria Kotova (University of Oslo, Norway)
Deputy: Shane Coyle (Virginia Tech, USA)

TASK GROUP LEADERS

TG1 Data Management

Leaders: Eduardo Perez Macho (INPE, Brazil), Chris Watson (University of New Brunswick, Canada)

TG2 Scientific Infrastructures

Leaders: Stepan Poluianov (Sodankylä Geophysical Observatory, Finland), Daniel Billet (University of Saskatchewan, Canada)

TG3 Scientific Campaign Coordination

Leaders: Shane Coyle (Virginia Tech, USA), Anton Kashcheyev (University of New Brunswick, Canada)

TG4 Equality, Diversity, Inclusion (EDI)

Leaders: Aderonke Akerele (Obafemi Awolowo University Campus, Ile Ife, Nigeria), Inga Beck (SCAR, UK)

TG5 Capacity Building, Training, Education

Leaders: Maria Graciela Molina (FACET-Universidad Nacional de Tucuman, Argentina), Babatunde Rabi (African University of Science and Technology, Nigeria), P R Shreedevi (Vikram Sarabhai Space Centre (India)

TG6 Communication, Dissemination and Outreach

Leaders: Eduardo Mendoza (National Institute of Astrophysics, Optics and Electronics, Mexico), Victoria Valdivia (European Space Policy Institute, Austria)

WG1 Coupling between atmospheric layers

WG2 Coupling within atmospheric layers

WG3 Coupling to geospace

TG1 Data Management

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Call for members ongoing!

Next actions of WGs and TGs



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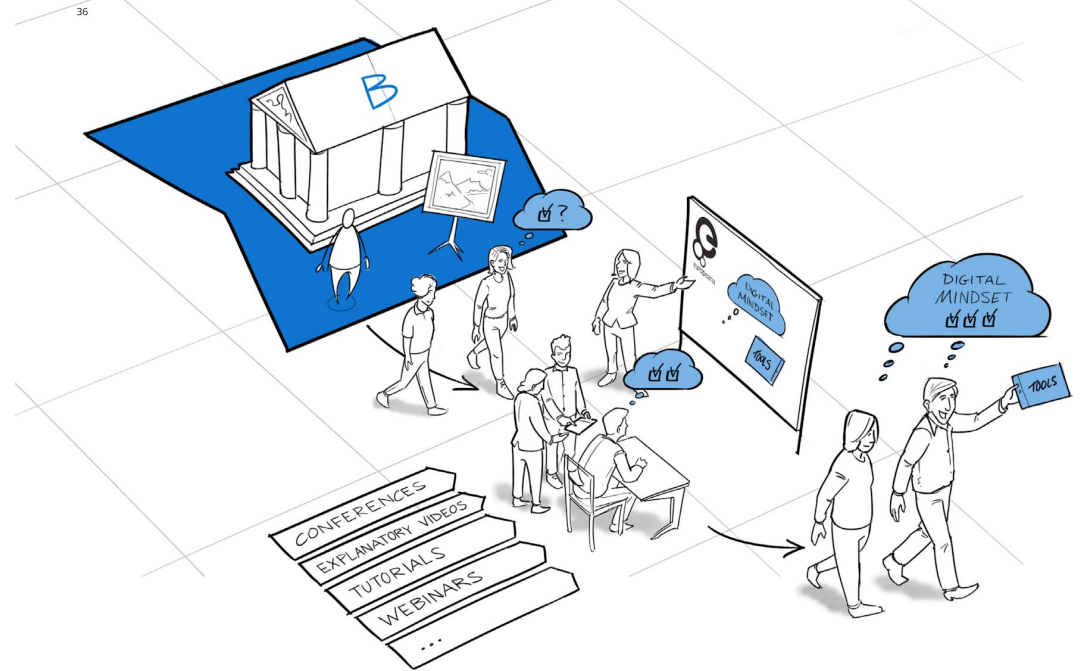
- State of the art
- Gap and trade-off analysis
- Roadmap how to proceed
- Coordination of activities within and across WG and TG



AGATA capacity building initiatives

- Mentoring programme
- Workshop: April 2026?
- School/Workshop: August 2026 before the SCAR OSC.

CAPACITY BUILDING



created with
SKETCHY
BUSINESS

Capacity Building, European Foundation and Sketchy Business, 2020, The Netherlands, public domain

AGATA presence at international conferences

- URSI AP-RASC (Sydney, Australia 17-22 August, 2025)
- IAGA/IASPEI Meeting (Lisbon, Portugal, 31 August-5 September, 2025)
- European Space Weather Week (Umeå, Sweden, 27-31 October, 2025)
- Beacon Satellite Symposium (Rome, Italy, 10-14 November, 2025)
- United Nations/Costa Rica Workshop on Machine Learning applied to Space Weather and Global Navigation Satellite Systems (San José, Costa Rica 16-20 February 2026)
- SCAR Open Science Conference (Oslo, Norway, 10-14 August, 2026)



AGATA
ANTARCTIC GEOSPACE AND
ATMOSPHERE RESEARCH

Everyone involved in AGATA must register!

Join us!

Registration form:



<https://nettskjema.no/a/agata-registration>

