IASC Atmosphere Working Group Meeting Summary

Edinburgh, UK, 21st March 2024
Steve Arnold, Jo Browse (UK representatives)

The meeting was attended by around ~25 representatives with around half on-site and the rest attending online. Both UK representatives Jo Browse and Steve Arnold attended in person. New members of the Steering Group were presented by the chair (chair *Gijs de Boer* [USA], vice-chair *Jennie Thomas*, [France]) and new representatives welcomed. New representatives included *Iris Thurnherr* (replacing Julia Schmale) for Switzerland, and *Henrik Skov* (replacing Jakob Klenø Nøjgaard and Jens Hesselbjerg) as Denmark's representative. The new AWG fellow, *Patrik Winiger* from Switzerland, was also introduced. All AWG members were encouraged to actively participate in ASSW and engage with early career researchers (ECRs) as well as support the ICARP-IV process, which was identified as a priority for the working group.

AWG priorities for 2024

1) Further **support the Arctic science community**, such as support the next generation of scientists (ECRs), foster international collaboration and advance cross-national projects (e.g., YOPP, MOSAiC, PACES).

2) Adopt a framework on how to support this community (supported by **new AWG *implementation plan*)** which provides measurable tasks and actions to help the group achieve goals and strategic plans.

3) Enhance AWG meeting attendance and member engagement by **enhancing the value proposition of AWG** activities. The current average member attendance is 50-60 %, but a higher attendance would be appreciated.

4) **Foster a collaborative environment** that includes all AWG nations.

Summary of AWG activities in 2023

In 2023 activities supported by the IASC AWG included four meetings and seven workshops. Additionally a steering Group meeting-workshop was held in February 2024 in Stockholm, during which the implementation plan for the AWG was developed. Specific activities supported included:

- **3rd MOSAiC Science conference**
  The 3rd MOSAiC Science conference was held at AWI in Potsam, Germany (26 February – 1 March 2023). It was identified that there is a need to move further towards cross-cutting research and promote knowledge-transfer into the climate modeling community. One suggestion was to embed ECRs into other research groups (potentially funded by IASC).
- **HELiPOD at MOSAiC - status of data and first results**
  HELiPOD is a tool to study interactions between the surface and the atmosphere and allows for vertical and horizontal mapping. Discussion focused on the best way to exploit such data and incorporate these tools into future campaigns including IPY2030.
- **MOSAiC: improved BL modeling in climate models**
  MOSAiC provided an impressive dataset of measurements on ABL dynamics. An overall aim of MOSAIC is to use these datasets to improve the representation of these processes in climate/Earth system models.
- **ARTofMELT spring 2023 expedition**
  ARTofMELT (Atmospheric Rivers and the onseT of Arctic MELT) was a research expedition that took place in the Fram Strait in 2023 (8 May to 13 June). This campaign provided data on a poorly observed period in the Arctic, the melt onset.
- **Air Pollution in the Arctic workshop**
  PACES 5th open science meeting was held last year at FMI and Helsinki University, Finland (June 2023), were ongoing and planned PACES activities were discussed. A future workshop on long-term planning for IPY is planned for November 2024, jointly with BEPSII and CATCH.
- **Arctic Geoengineering – 1st workshop**
  Geoengineering to save the Arctic?" - project is part of an IASC cross-cutting project for 2023-2024. The project aims to address geoengineering topics to cool the Arctic, and assess its, potential efficacy, impacts and ethical considerations. More input to this project was gathered during the hybrid workshop held on Tuesday 26 March during ASSW24.
- **Polar Vortex Workshop Update**

In September (11-13 September, 2023) a workshop was held in the UK discussing the influence of the lower stratospheric polar vortex (SPV) on cold air outbreaks (CAOs) under climate warming.

Overview of new initiatives proposed for support

- **Polar Coupled Analysis and Predictions for Services (PCAPS).** The goal of PCAPS is to improve forecasting in the Arctic and Antarctic.
- **CleanCloud** CleanCloud is a sister project to CERTAINTY and ESA AIRSENSE and has collaborations with other projects, such as OptimESMs. GdB:.
- **CERTAINTY** stands for Cloud-aERosol inTeractions & their impActs IN The earth sYstem and is an EU funded project (from the Horizon Europe programme), active from 1 Jan 2024 to 31 Dec 2027. The overarching aim for CERTAINTY is to improve model representation of aerosol-cloud interactions for climate and weather. This project is a resource for the community and open for new researchers to join.
- **GreenFjord: Greenland fjord ecosystems & changing climate** GreenFjord is a project that aims to answer: What are the consequences of environmental change on fjord ecosystems? This project started in 2022 and is currently within an intensive observing period (2023-2025). The interdisciplinary project is open for new groups to join, especially modelers are welcome.

General discussion suggested that all four projects should be supported but that the AWG should do more to connect with modellers and ensure maximum exploitation of the data from these and other campaigns/projects. Potentially there is scope to fund data mining or support ERCs in working with large multi-disciplinary datasets.

AWG Involvement with ICARP-IV
Eight of the members in AWG are actively engaged in planning for ICARP-IV via the **Research Priority Teams** (RPTs). The AWG will ensure representation of the whole breadth of atmospheric community and/or nation interests, and not just those of specific engaged members. Time will be dedicated during the coming AWG quartal meetings for updates on ICARP-IV RPT discussions and actions. It was agreed that a metric for the success and impact of ICARP-IV should be developed.

Increasing the value proposition of AWG
Members were asked to consider the value and benefit of AWG membership, and considerations in ensuring active participation from members. Discussion suggested that high degree of European membership (requiring meetings on European time zones) may discourage or reduce non-European involvement. Overrepresentation of European contributions could also lead to an overlap of initiatives. Historically, the AWG has distributed funding to everyone asking but it was agreed that funding allocations need to be routed by a clear strategy. It was suggested that the AWG needed more science focused meetings to 1) engage members and 2) develop projects in-line with our strategy i.e. more proactively developing seed projects for larger international initiatives such as MOSAiC. It was also suggested that the WGs needed joint meetings to help develop cross cutting projects.

The AWG implementation plan
The new implementation plan was developed previous to ASSW24 as a strategy document to replace the last implementation plan which centred around three key projects; MOSAIC, YOPP and PACES. The four draft aims of the plan are:

1. Identify and enable support for priority topics to advance understanding of the Arctic atmosphere and its role in the Earth system.
2. Enable development of research networks that foster linkages across career stages, disciplines, and backgrounds.
3. Actively engage the atmospheric science community to implement the IASC Strategic Plan and enhance the visibility and effectiveness of IASC.
4. Facilitate practices in Arctic atmospheric science to ensure ethical and fair research practices and outcomes.

Discussion focused on the need to actively seek and develop projects which further these aims. In particular the need for scientific discussion (as well as governance) to identify priority topics. It was acknowledged that this plan is still a living document requiring ongoing development.