International Arctic Science Committee
Atmosphere Working Group

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Strategy and Work Plan for the Atmosphere Working Group

The scientific scope of the Atmosphere Working Group (AWG) includes research towards understanding and prediction of Arctic change. Arctic air pollution is a key priority, which has key influences on Arctic climate through trace gas and aerosol forcing, is harmful to Arctic communities and ecosystems, and may mediate important high latitude climate feedbacks. Other key priorities are snow, reconstruction of Arctic paleoclimates, and to improve our knowledge of aerosol-cloud interactions in the Arctic including their controls on the aerosol population. Several of these priorities are cutting across several IASC Working Groups. The geographic scope of the AWG is the Arctic but will also include the Arctic´s responses to global change processes and impacts of Arctic changes on the general atmospheric circulation.

The AWG has identified five core topics for its mission:

- Clouds, Water Vapor, Aerosols, Fluxes
- Arctic Air Pollution
- Coupled Arctic climate system
- Arctic Weather extremes
- Linkages (two way): Role of the Arctic in the global climate system

These topics have been put under the three pillars of the AWG: *MOSAiC*, *PACES*, and *YOPP/PPP*.

MOSAiC was born out of the AWG and is now scheduled to start in fall 2019. A priority is to better understand how the coupled Arctic climate system functions, in particular under rapid Arctic climate change that will not only affect the local Arctic climate, but might also be affecting hemispheric circulation patterns and global change. The main aim is to improve our modelling capabilities via improved process understanding leading to better parameterisations.

PACES is now a fully established IGAC Activity, co-sponsored by IASC. Discussions are underway with the international aircraft research communities regarding development of a large international field experiment (IMPAACT). The overall outcome of these activities will be better knowledge and model predictions of import of trace gases and aerosol into the Arctic from mid-latitudes, and of climate forcing associated with short-lived pollutants. Important cross-cutting linkages with other IASC Working Groups are being explored and implemented around the themes of Arctic socio-economic development, local air pollution and its societal as well as ecosystem impacts.

The AWG initiated a Task Force for engagement with *YOPP/PPP*. A workshop will be proposed to facilitate engagement between YOPP science projects with the aim to guide over-arching scientific goals. Activities will include engaging with the various YOPP task teams. AWG will also engage in YOPP's satellite and modelling activities for improving the predictability of Arctic and sea ice change. A follow-up workshop after the conclusion of YOPP will also be proposed.

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Three Pillars of the AWG with Timelines for 2017-2021

MOSAiC	PACES	PPP/YOPP
• Implementation Workshop 11/2017, St. Petersburg (AARI) • 3/2018 MOSAiC science conference • Spring/2019 MOSAiC implementation meeting • Fall/2019 Start of MOSAiC field operations • Fall/2020 End of MOSAiC • 2021 MOSAiC science conference	• 6/2017 - 2nd PACES Open Science workshop • 6/2017 - PACES workshop • 11/2017 - PACES Implementation Plan • 12/2017 - Joint PACES / CATCH AGU session • 5/2018 - Workshop on local Arctic air pollution • 2019-2020 – potential ground-based campaigns • 2020-2021 - Large-scale field experiments (IMPAACT)	• Mid/2017 Start of YOPP • 1/2018 ISAR 5 potential AWG session • 1/2019 YOPP conference initiated by AWG • Mid/2019 End of YOPP • Mid/2020 YOPP conference initiated by AWG