



WP 10

Agenda Item: 4.2.2

Person Responsible: J.W.V. Storey

**XXXIV SCAR Delegates Meeting
Kuala Lumpur, Malaysia, 29-30 August 2016**

AAA

Astronomy and Astrophysics from Antarctica

Executive Summary

Authors: John Storey (Chief Officer AAA), in conjunction with the AAA Steering Committee.

Important Issues or Factors:

SCAR AAA is operating well, as it works to achieve its objectives. Broadly stated, these are to coordinate astronomical activities in Antarctica in a way that ensures the best possible outcomes from international investment in Antarctic astronomy, and maximizes the opportunities for productive interaction with other disciplines.

SCAR AAA continues to welcome astronomers from additional countries into the community of Antarctic astronomy. In 2015 - 2016 this has included Taiwan and Thailand.

SCAR AAA is scheduled to wind up at the end of 2018.

Recommendations/Actions and Justification:

This report is provided for information only. No action is required.

Budget Implications:

Continuing funding is requested at the approved level; funding is used to support travel to SCAR/AAA meetings and for production of outreach materials.

Introduction/Motivation

Astrophysical observations require minimum interference from the Earth's atmosphere: low thermal background, low absorption, and high angular resolution. Antarctica offers exceptionally good conditions found nowhere else on earth. This leads to programs that are aimed at understanding the overarching processes in the Universe, from the origin of structure in the first few moments after the Big Bang, to the nature of dark matter and the evolution of galaxies, to the birth and life-cycle of stars and of planetary systems around other stars.

There are three broad benefits offered by Antarctica:

1. The moderate “launch costs” for Antarctic plateau observatories make them an extremely attractive alternative to space,
2. The predictable paths followed by high altitude balloons at the edge of the polar vortex facilitates long-duration scientific balloon observatories,
3. The vast amounts of clean ice on the plateau make it ideal for particle physics experiments.

Astronomy & Astrophysics from Antarctica (AAA) adds value by fostering international collaboration in order to permit goals to be achieved that are beyond those of single national programs. In addition, AAA is actively fostering international cooperation in the Arctic, and is developing links between astronomers and researchers in other fields such as atmospheric physics and ionospheric science.

AAA is led by a Steering Committee, supported by four Working Groups.

Progress during 2015 — 2016.

The main activities of AAA during 2015 included:

- Participation in the XXIX IAU General Assembly (Honolulu Hawai'i, 3—14 August 2015), including staffing of a SCAR AAA display booth for the duration of the meeting.
- Preparation of a white paper on “The technological challenges and logistical needs of the Antarctic astronomy and astrophysics community” for the COMNAP *Roadmap* process.
- Organisation of the Third AAA Workshop, AAA2015 (Volcano, Hawai'i, 7—10 August 2015). This workshop was attended by 38 people from ten countries.

Future Plans

In its first four years, SCAR AAA worked hard to meet its initial objectives; providing a forum to facilitate international cooperation, clarify science goals, consolidate comparative site testing data, and raise the profile of SCAR within the international astronomical community and the general public.

In its second four years, SCAR AAA is building upon the progress made so far by developing a robust international platform for astronomical cooperation in Antarctica. Specifically, SCAR AAA takes on board the recommendations of the external reviewers in 2014, who called upon us to:

- Formulate a clearer vision with informative advice on what type of observations are needed where,
- Encourage collaboration by all countries towards new accomplishments, not repetition of existing results,
- Extend the site-testing database to cover astronomical data, including consideration of joining the Astronomical Virtual Observatory,
- Increase education/outreach, especially to general public, colleges, high schools, museums,
- Build more capacity in countries with less developed capacity.

From this, the following operational plan for 2014 – 2018 emerged. The key goals for this period are to:

- I. Create an Antarctic Plateau International Astronomical Observatory (APIAO)
- II. Extend the current site testing searchable database to become a data portal,
- III. Increase outreach activities directed towards the general public and the international astronomical community, especially in those countries with less developed astronomical programs in Antarctica.

To implement this plan, SCAR AAA has reviewed its internal structure and concluded that its four working groups are currently well-suited to these tasks – no change is needed. However, some rotation of the key roles within SCAR AAA is desirable, especially if this can be done in a way that maintains gender balance and generational representation. To implement this, we have recently replaced roughly half of our Steering Committee members as part of a planned rotation, and will replace the remainder (including the Chief Officer) in 2016.

Recommendations/Expected Outcomes

Since its inception, SCAR AAA has held workshops in Australia, Italy and the US during the “off” years between SCAR Open Science Conferences. These have been very well attended, with a wide international reach to the astronomical community (and beyond). In 2017, a further workshop is planned, with Thailand as the currently preferred location.

Additional meetings have also been sponsored in France, China, and Australia. These meetings have focussed on the “internationalisation” of otherwise national or regional infrastructure projects in Antarctica. This practice will continue through to the conclusion of AAA in 2018, as we continue striving for better cooperation within the international Antarctic astronomy community.

The legacy of AAA will include a comprehensive publication and data portal of Antarctic astronomy and site testing publications, freely accessible to the world's scientific community.

During 2017, the AAA SRP must assess the future direction it should take, whether this be an application to the SCAR Delegates for a further extension, proposal of a new SRP with a differing emphasis, or creation of one or more Expert Groups or Working Groups.

Current membership of the AAA SRP Steering Committee

| Name | Nationality | Member until | Gender |
|------------------|--------------------|---------------------|---------------|
| Lyu Abe | France | 2016 | male |
| Jenni Adams | NZ | 2018 | female |
| Michael Ashley | Australia | 2018 | male |
| Jennifer Cooper | USA/APECS | 2018 | female |
| Xiangqun Cui | China | 2016 | female |
| Takashi Ichikawa | Japan | 2016 | male |
| Albrecht Karle | USA | 2016 | male |
| Silvia Masi | Italy | 2016 | female |
| Anna Moore | USA | 2018 | female |
| John Storey | Australia | 2016 | male |
| Charling Tao | France/China | 2018 | female |
| Lifan Wang | China | 2018 | male |

AAA Working Groups:

- **Working Group A: Site testing, validation and data archiving.**
 - Chair: Tony Travouillon, Vice-chair: Jon Lawrence
- **Working Group B: Arctic site testing.**
 - Chair: Eric Steinbring, Vice-chair: Ming-Tang Chen
- **Working Group C: Science goals.**
 - Chair: Michael Burton, Vice-chair: Zak Staniszewski
- **Working Group D: Major new facilities.**
 - Chair: Peter Tuthill, Vice-chair: Xuefei Gong