

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

# ICSU Union Members of SCAR

## Executive Summary

**Authors: J. Baeseman****Important Issues or Factors:**

The SCAR Secretariat has reached out to the ICSU Union members on several occasions over the past year to try to improve working relations. Several Unions agreed to participate by sharing a poster of their activities in the SCAR Activities Poster session during the Open Science Conference. In ICSU's review of SCAR, more interaction was recommended.

**Recommendations/Actions and Justification:**

SCAR Delegates may want to consider encouraging a stronger interaction between the SCAR Secretariat and Union Secretariats as well as representatives of the Unions to SCAR to try to enhance communication and exchange.

**Budget Implications:**

If SCAR would like to increase collaborations, it may be good to include a travel line for the Executive Director to attend the ICSU General Assemblies.

## Background on Union Members

SCAR has 9 ICSU Union members who have interests in the Antarctic. Collaboration with the Unions is mostly done through Representatives to SCAR chosen by the Unions. In the ICSU Review of SCAR (2016) it was recommended that stronger ties be formed amongst the ICSU Union members and the SCAR Community. The list of Unions and contact points can be found here: <http://www.scar.org/members-and-officers/unions>.

The SCAR Secretariat reached out to all the Union members and asked for a short update on activities to be shared with the SCAR Community. Only Andres Barbosa, the International Union of Biological Sciences (IUBS) representative in SCAR and Ian Alison, representative for International Union of Geodesy and Geophysics (IUGG), provided updates. In addition to providing updates IUBS and IUGG will also be participating in the SCAR Activities Poster Sessions, as well as the International Astronomical Union (IAU). Abstracts from the Unions participating in the SCAR Activities Poster Session are provided below. Other Unions with no response are listed further down.

## Updates from Union Members

### *International Union of Biological Sciences (IUBS)*

[www.iubs.org](http://www.iubs.org) - SCAR Rep.: [Dr Andres Barbosa](#), Spain

#### Background on IUBS

IUBS (International Union of Biological Sciences) is a non-governmental, non profit organization created in 1919. IUBS is currently composed of 28 national members (Academies, Science Council, Royal Societies...) and 84 scientific members (international biological societies). Thus IUBS represents a wide network of disciplines dealing with the biology of microorganisms, plants and animals, ranging from cell biology, genetics, taxonomy to ecology and concerned with such different domains as seed testing, horticultural sciences, marine biology and biological education.

IUBS objectives are to promote biological sciences, coordinate international and interdisciplinary cooperation, support scientific programmes and conferences. Our goal is to counteract the fragmentation within biology by developing a unified biology approach.

IUBS' main activity is to initiate, facilitate and coordinate research and other scientific activities necessitating international, interdisciplinary cooperation. IUBS conducts international collaborative research programmes in close cooperation with its National and Scientific Members.

In December 2015, the IUBS General Assembly was held in Germany. Lectures on "Frontiers in Unified Biology" from Paul Shrivastava (Future Earth), Anne Larigauderie (IPBES), Thomas Brooks (IUCN) were followed by a panel discussion on "our common Future". Scientific symposia were organized on: biological consequences of global change: current challenges, building an informatics agenda on unified biology, integrated biology education for future earth, integrative climate change biology – biodiversity, functional traits and lessons from the past, bionomenclature: making nomenclatural codes - concepts and tool for modern research, biology and the societal interfaces, from urban biology to sustainable BiodiverCities.

For the next triennium, IUBS has decided to implement programmes on climate change, education, bioinformatics, bionomenclature and agroecosystems, developing collaborations with Future Earth.

#### Major Achievements in the Area of Antarctic Research

Currently there is not any activity of IUBS related to Antarctic Research

#### Future Plans in the Area of Antarctic Research

There are not specific plans for future activity in Antarctic research, but we expect to strengthen the relations with SCAR to help the implementation of Antarctic Research within some of our current programmes.

#### Areas of Collaboration with SCAR and Their Effectiveness

Considering the IUBS and the SCAR programmes (AntEra and AntEco) there are common areas for collaboration around global change and its biological consequences and biodiversity. Collaboration can be developed including the Antarctic perspective to IUBS programmes:

**Biological consequences of global change**

Impact of global change on outbreaks of biological disasters, such as diseases, impact of global change on biological invasion of alien species; impact of global change on abundance and range shift of endangered species; impact of global change on community structure and biodiversity of different ecosystems; nonlinearity and interactions of global change in affecting biological populations.

**Integrated climate change biology**

Develop methods that can be used to measure past, present and future; develop modelling for trait evolution and community dynamics through time; investigate what are functional “tipping points” before ecological collapse, can we jointly estimate detectability and occurrence in the fossil record?; how can we use fossil record to inform about future environmental changes?

In addition, IUBS could interact with SCAR throughout some of the other programmes:

**Bionomenclature**

Promote guidelines and an international agenda on nomenclatural activities in a world in which discovery of biodiversity is increasingly based on molecular tools and delivered digitally. Molecular discovery is currently diverging from type-based naming and information on biodiversity is becoming fractured without a coherent digital infrastructure. As with the Codes of nomenclature, we are in need of a unified infrastructure for registering new entities and integrating knowledge about them.

Finally, collaborations can be developed around the main questions related to biology included in the SCAR Scan Horizon:

- Antarctic life on the precipice
- Human presence in Antarctica

**Suggestions/Recommendations**

Invitation of chairs of SCAR Life Sciences Standing Scientific Group and SCAR programmes (AntEra and AntEco) to IUBS meetings to discuss and develop future collaboration would be desirable. The development of a future IUBS programme related to Antarctic biological issues would be a way to strengthen collaborations.

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Email of Secretariat contact: [nfomproix@iubs.org](mailto:nfomproix@iubs.org)

**International Union of Geodesy and Geophysics - IUGG**

[www.iugg.org](http://www.iugg.org) - SCAR Rep.: [Dr Ian Allison](#), Australia; Alternate: [John Turner](#), UK

**Background on the Union**

The International Union of Geodesy and Geophysics (**IUGG**) is the ICSU Union dedicated to advancing, promoting, and communicating knowledge of the Earth system, its space environment, and the dynamical processes causing change (<http://www.iugg.org/>). IUGG has been one of the nine Union Member since SCAR's inception in 1958. IUGG is comprised of eight semi-autonomous disciplinary-based Associations, dealing with Cryospheric Sciences (IACS), Geodesy (IAG), Geomagnetism and Aeronomy (IAGA), Hydrological Sciences (IAHS), Meteorology and Atmospheric Sciences (IAMAS), Physical Sciences of the Oceans (IAPSO), Seismology and Physics of the Earth's Interior (IASPEI) and Volcanology and Chemistry of the Earth's Interior (IAVCEI).

**Major Achievements in the Area of Antarctic Research**

Each of the IUGG Associations has had some past (since at least the IGY), and ongoing involvement in Antarctic science. Strong current areas of common scientific interest between SCAR and IUGG Associations include those with IACS (ice sheets, snow, sea ice, cryosphere and climate) (see *separate IACS report to SCAR 34*); ICPM (polar meteorology); IAPSO (Southern Ocean observing

system); IAG (gravity measurements [particularly to quantify ice sheet mass loss], positioning techniques and technologies); IASPEI (Earth structure and geodynamics, geothermal heat flow, seismological observation and interpretation) and IAGA (magnetic observations).

### **Future Plans in the Area of Antarctic Research**

IUGG is currently developing its contribution to the ICSU Future Earth initiative, a 10-year program that will develop the knowledge for responding effectively to the risks and opportunities of global environmental change and for supporting transformation towards global sustainability in the coming decades. IUGG's Union Commission on Climatic and Environmental Change (CCEC) has responsibility for ensuring that this will be an all-Union perspective, it will also ensure that IUGG's contribution is regionally comprehensive, and includes the Antarctic and Southern Ocean.

### **Areas of Collaboration with SCAR and Their Effectiveness**

IACS has a 3-party MoU on collaboration with SCAR and IASC [International Arctic Science Committee] that was developed following the International Polar Year 2007-2008.

But in general, cooperation and information exchange between SCAR and IUGG occurs at the level of individual scientists who have involvement in both organisations. This includes organization of Antarctic-related symposia at SCAR and IUGG conferences.

There may be potential for more formal collaboration within the large SCAR Scientific Research Programmes (SRPs) on Antarctic Climate Change in the 21st Century; Past Antarctic Ice Sheet Dynamics, and Solid Earth Responses and influences on Cryospheric Evolution. There is, however more immediate scope to develop stronger formal links with activities of the Action and Expert Groups of SCAR Standing Scientific Groups. These could include links with the SCAR groups on clouds & aerosols, climate change & environment, sea ice processes & climate, GNSS research, ice cores, ice sheets, Sun-Earth Relationships, snow in Antarctica, magnetic anomaly mapping, Antarctic volcanism, and geodetic infrastructure.

### **Upcoming Meetings**

IACS Scientific Assembly: International Symposium on the Cryosphere in a Changing Climate, 12-17 February 2017, Wellington, New Zealand.

IAPSO-IAMAS-IAGA Joint Assembly: 27 August – 1 September 2017, Cape Town, South Africa

IAVCEI Scientific Assembly 2017: 14-18 August, 2017, Portland, Oregon, USA

IAG-IASPEI Joint Scientific Assembly: 30 July - 4 August, 2017, Kobe, Japan

IAHS Scientific Assembly: 9 – 15 July, 2017, Port Elizabeth, South Africa

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## **Union Members Participating in SCAR Activities Poster Session**

### ***International Astronomical Union (IAU)***

<http://www.iau.org> - SCAR Rep.: [Prof John Storey](#), Australia

The International Astronomical Union (IAU) was founded in 1919. Its mission is to promote and safeguard the science of astronomy in all its aspects through international cooperation. Its individual members — structured into Divisions, Commissions, and Working Groups — are professional astronomers from all over the world, at the Ph.D. level and beyond, who are active in professional research and education in astronomy. The IAU has 12,412 individual members from 97 countries. In addition, the IAU collaborates with various scientific organisations all over the world, and is a Union Member of SCAR.

The long-term policy of the IAU is defined by the General Assembly and implemented by the Executive Committee, while day-to-day operations are directed by the IAU Officers. The focal point of its activities is the IAU Secretariat, hosted by the Institut d'Astrophysique de Paris, France. The scientific and educational activities of the IAU are organised by its 9 Scientific Divisions and, through them, its 35 specialised Commissions covering the full spectrum of astronomy, along with its 39 Working Groups.

The IAU also works to promote astronomical education, research and public outreach actions towards the public. These activities recently culminated with the organisation of the UNESCO International Year of Astronomy in 2009, which reached out to over 800 million people from 148 countries.

### ***International Union of Biological Sciences (IUBS)***

[www.iubs.org](http://www.iubs.org) - SCAR Rep.: [Dr Andres Barbosa](#), Spain

IUBS is a non-governmental, non-profit organization created in 1919. IUBS is currently composed of 28 national members (Academies, Science Council, Royal Societies...) and 84 scientific members (international biological societies). Thus IUBS represents a wide network of disciplines dealing with the biology of microorganisms, plants and animals, ranging from cell biology, genetics, taxonomy to ecology and concerned with such different domains as seed testing, horticultural sciences, marine biology and biological education.

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### ***International Union of Geodesy and Geophysics - IUGG***

[www.iugg.org](http://www.iugg.org) - SCAR Rep.: [Dr Ian Allison](#), Australia; Alternate: [Prof John Turner](#), UK

The International Union of Geodesy and Geophysics, which has been a Union Member of SCAR since 1958, is comprised of eight semi-autonomous disciplinary Associations. Each of these has scientific topics or activities which link, or have potential to link, with those of SCAR. Some of the fields of similar interest between SCAR and IUGG Associations will be outlined, with a particular focus on activities of the newest IUGG Association, IACS ([www.cryosphericsscience.org](http://www.cryosphericsscience.org)), deals with ice and snow.

### ***International Union of Geological Sciences***

[www.iugs.org](http://www.iugs.org) - SCAR Rep.: [Prof Carlo Alberto Ricci](#), Italy

The International Union of Geological Sciences (IUGS) is one of the largest and most active non-governmental scientific organizations in the world. Founded in 1961, IUGS is a member of the International Council of Science. IUGS promotes and encourages the study of geological problems, especially those of world-wide significance, and supports and facilitates international and interdisciplinary cooperation in the Earth sciences.

With 121 national members, the Union aims to promote development of the Earth sciences through the support of broad-based scientific studies relevant to the entire Earth system; to apply the results of these and other studies to preserving Earth's natural environment, using all natural resources wisely and improving the prosperity of nations and the quality of human life; and to strengthen public awareness of geology and advance geological education in the widest sense.

The IUGS gives particular value and attention to the research conducted by the international community on the Antarctic continent - still largely unknown- and on the Antarctic region for the unique opportunity to understand the interactions between the various components of the system (including the cryosphere) and the functioning of the Earth system.

## Non-Responsive Union Members

### International Geographical Union - IGU

[www.igu-online.org](http://www.igu-online.org) - SCAR Rep.: [Prof Vladimir Kotlyakov](#), Russia

### International Union for Quaternary Research - INQUA

[www.inqua.org](http://www.inqua.org) - No SCAR Rep., [Dr. Julius B. Lejju](#) Secretary-General

### International Union of Pure and Applied Chemistry - IUPAC

[www.iupac.org](http://www.iupac.org) - No SCAR Rep., Dr John W Jost, Secretary-General

### International Union of Physiological Sciences - IUPS

[www.iups.org](http://www.iups.org) - SCAR Rep.: [Dr Yvon LeMaho](#), France

### Union Radio Scientifique Internationale - URSI

[www.ursi.org](http://www.ursi.org) - SCAR Rep.: [Dr Giorgiana De Franceschi](#), Italy