



The Scientific Committee
on Antarctic Research



SCAR e il Programma Nazionale di Ricerche Antartide

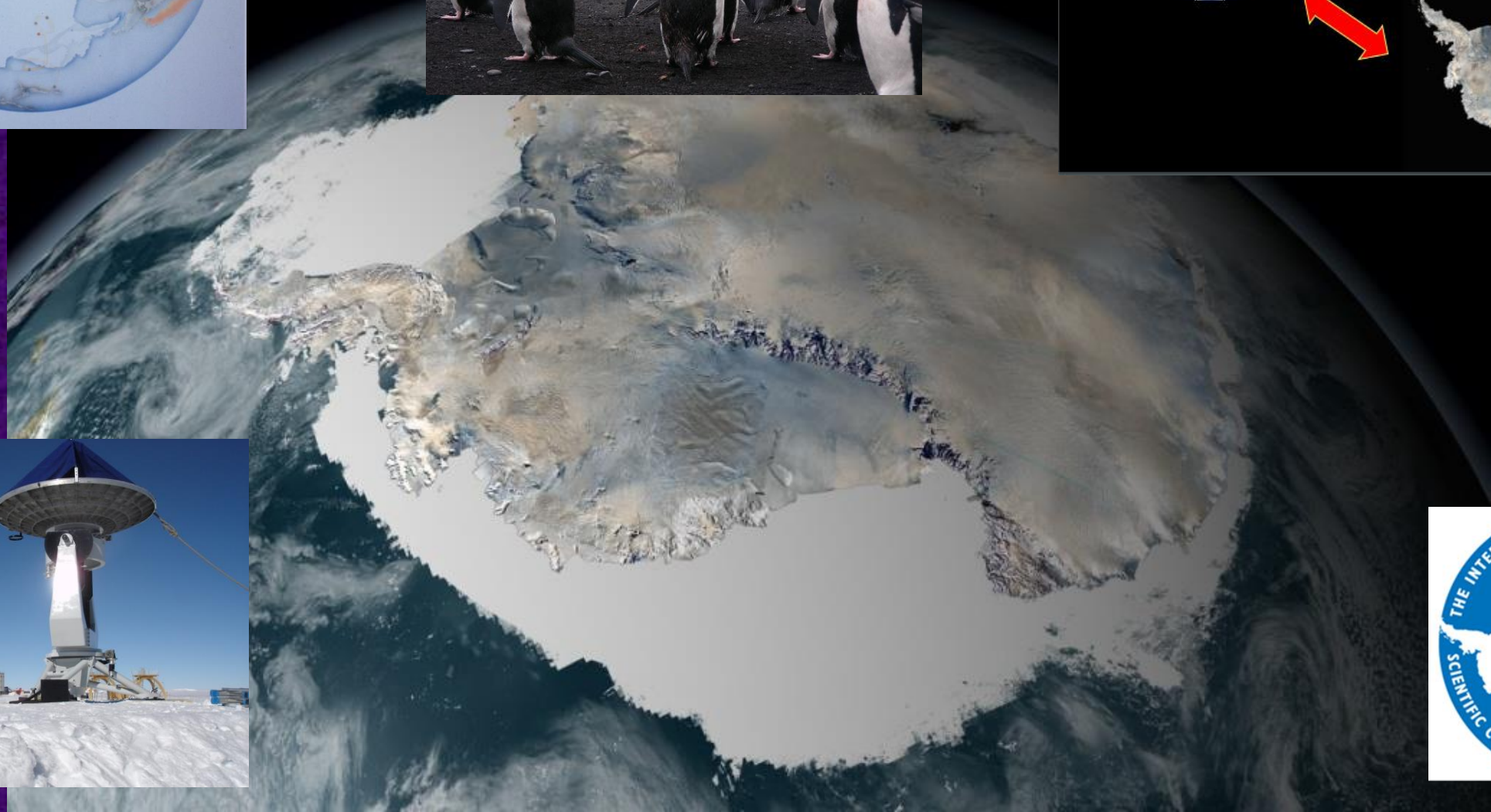
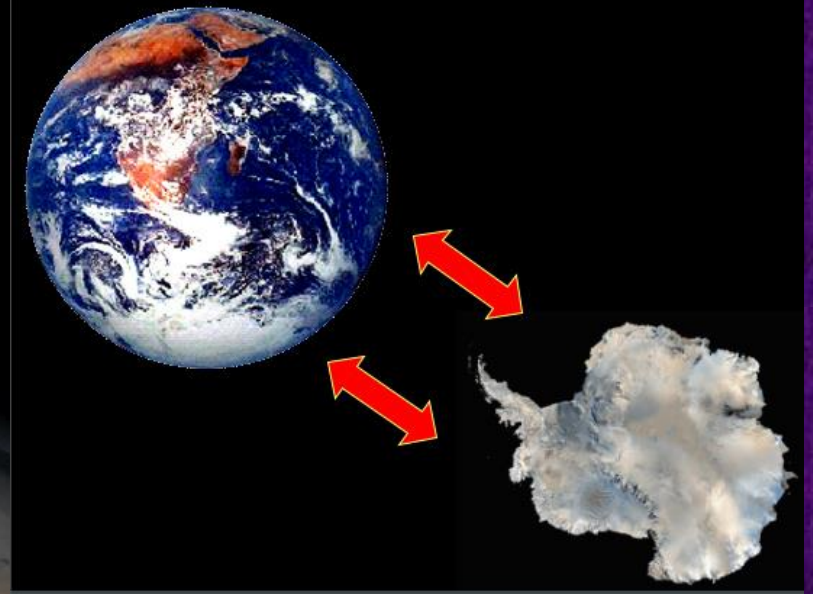
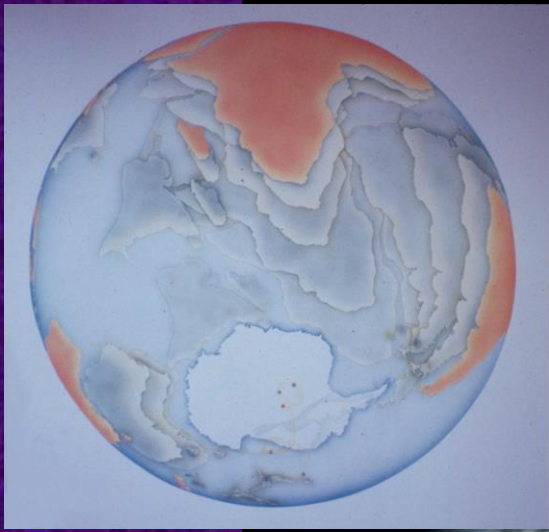
Jerónimo López-Martínez

Presidente dell'SCAR

Universidad Autónoma de Madrid, Spagna

XII Conferenza Nazionale sulla Ricerche in Antartide

20-21 ottobre 2015, Accademia Nazionale dei Lincei, Roma, Italia



What is SCAR ?



- An Interdisciplinary Scientific Body of the International Council for Science (ICSU)
- An observer to the Antarctic Treaty and the United Nations Framework Convention on Climate Change
- Currently 39 Member Countries and 9 ICSU Unions

SCAR's Mission for 57 Years



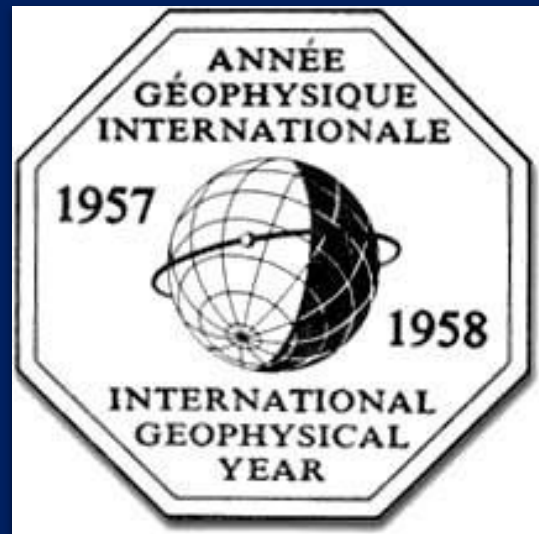
Science Leadership - initiate, develop and coordinate international scientific research in the Antarctic and Southern Ocean region

Scientific Advice - provide objective and independent scientific advice to the Antarctic Treaty System and other bodies



SCAR

- SCAR was a creation of the International Geophysical Year and had its first meeting in February 1958
- There were originally 12 nations and 4 ICSU unions



SCAR Membership

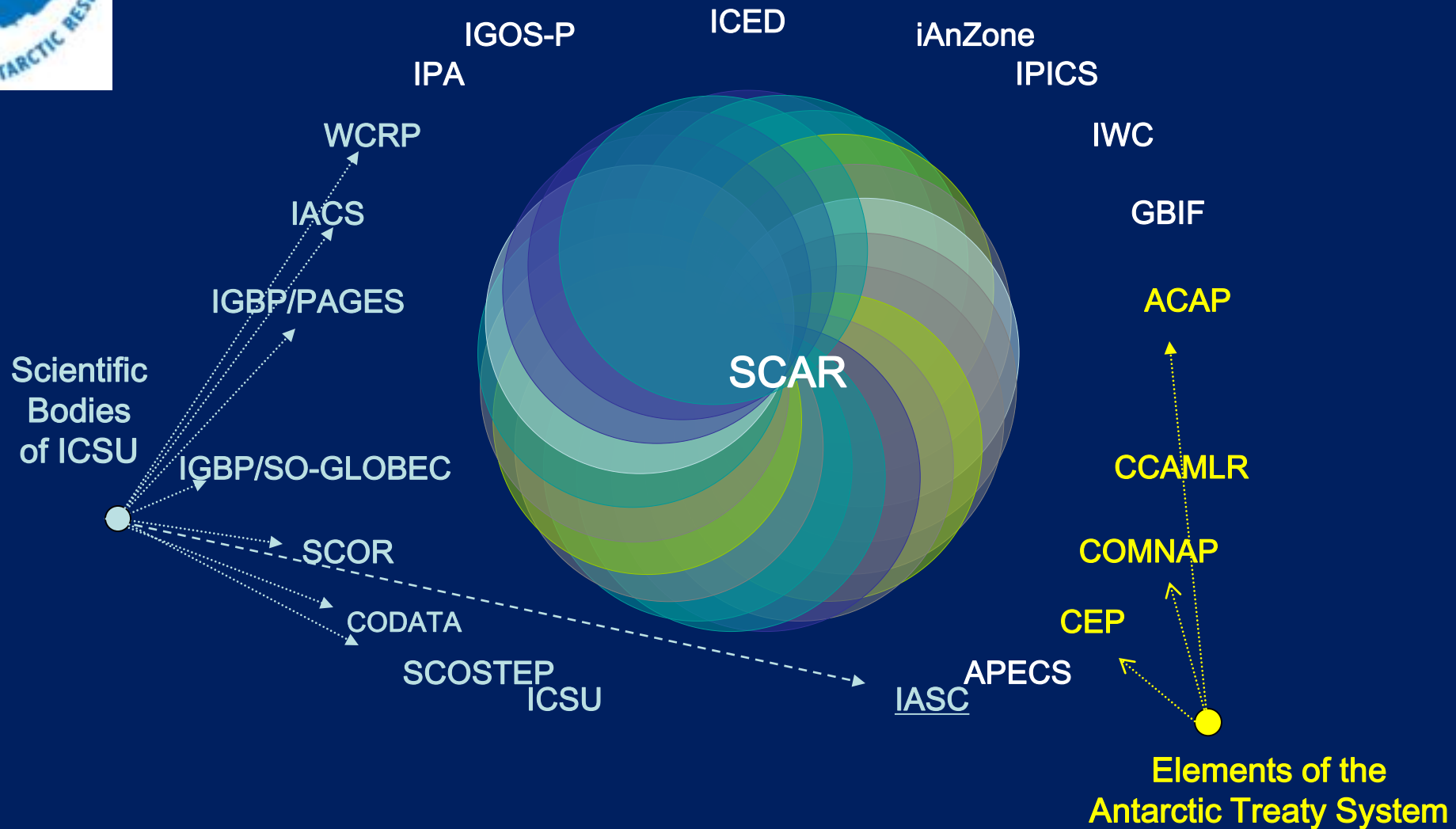
- 1958-1977 membership remained unchanged (12)
- In 1987 **Italy** joined SCAR as an Associate Member and in 1988 became a Full Member
(at that time SCAR had 17 member countries and today has 39)

SCAR Membership

- **31 Full Members:** Argentina, Australia, Belgium, Brazil, Bulgaria, Canada, Chile, China, Ecuador, Finland, France, Germany, Italia, India, Japan, Korea, Malaysia, Netherlands, New Zealand, Norway, Peru, Poland, Russia, South Africa, Spain, Sweden, Switzerland, UK, Ukrania, Uruguay, USA.
- **8 Associate Members:** Czech Republic, Denmark, Iran, Monaco, Pakistan, Portugal, Romania, Venezuela.
- **9 ICSU Scientific Unions:** IAU, IGU, INQUA, IUBS, IUGG, IUGS, IUPAC, IUPS, URSI



Strength Through Partnerships



SCAR Conferences, Thematic Symposia, and Workshops

- SCAR Biennial Open Science Conference
- SCAR International Symposium on Antarctic Earth Sciences (ISAES)
- SCAR International Symposium on Antarctic Biology
- International Glaciological Symposium
- Thematic Workshops and sessions
e.g. SRPs, Ice Drilling, SOOS, ISMASS, ICOP, EUCOP, AGU, EGU,.....

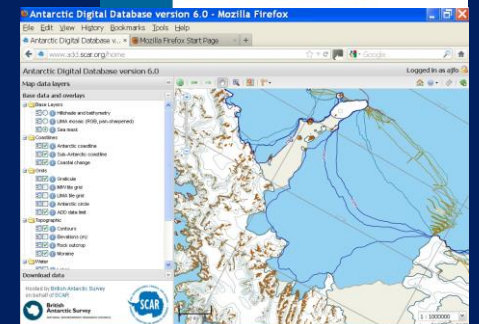
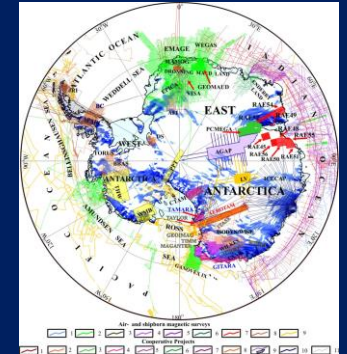
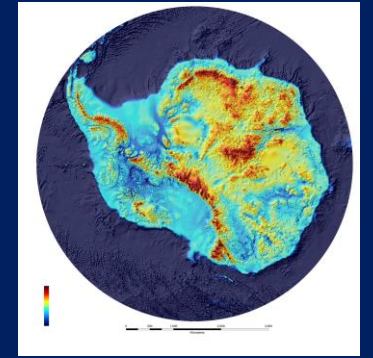
Some SCAR Conferences, Thematic Symposia, and Workshops held in Italy

- 1989 SCAR Executive Committee Meeting, Siena
- 1994 XXIII SCAR Delegates Meeting, Rome
- 1994 VI International Symposium on Antarctic Biology (ISAB), Venice
- 1995 SCAR Executive Committee Meeting, Siena
- 1995 VII International Symposium on Antarctic Earth Sciences (ISAES), Siena
- 2001 Final ANTOSTRAT Symposium, Erice
- 2003 VII International Symposium on Antarctic Glaciology (ISAG), Milan
- 2005 Cenozoic stratigraphic record from the East Antarctic Margin, Spoleto
- SCAR Cross linkages workshops in 2009 (Modena) and 2010 (Castiglioncello)
-
- 2015 (July) Workshop of the SCAR Expert Group on Antarctic Volcanism, Catania



Data, Information and Products

- Antarctic Digital Database,
- Antarctic Digital Magnetic Anomaly Project,
- Antarctic Map Catalogue,
- Antarctic Master Directory,
- Antarctic Bedrock Mapping,
- Composite Gazetteer of Antarctica,
- International Bathymetric Chart of the Southern Ocean,
- Seismic Data Library System
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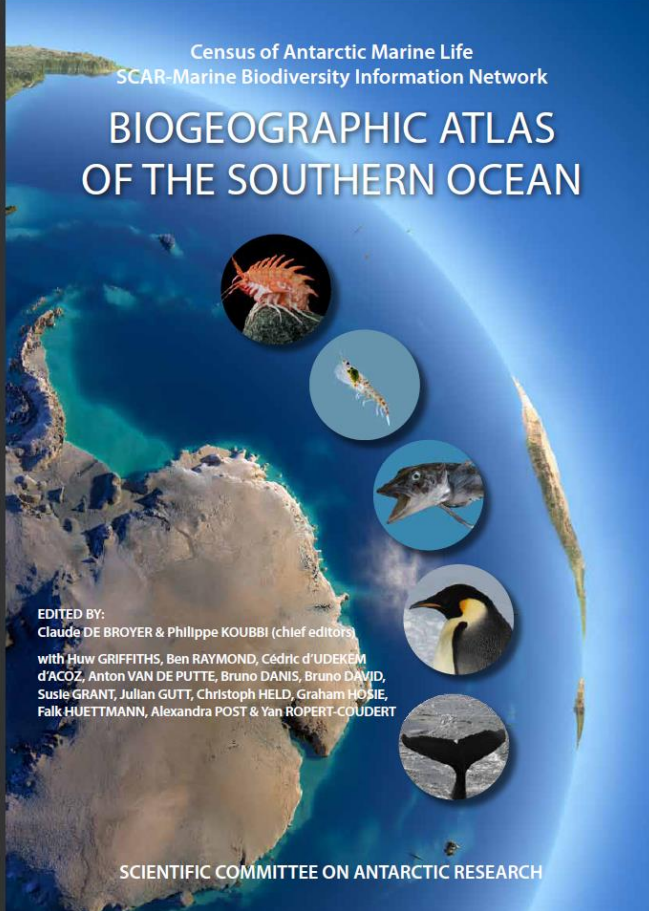


Some SCAR Publications

- *Antarctic communities: species, structure and survival*. B. Battaglia, J. Valencia and D. Walton (Eds.). 1997. Cambridge, Cambridge University Press, 464 p. (Proceedings of the VI SCAR Symposium on Antarctic Biology, Venice, Italy, 30 May-3 June 1994).
- *The Antarctic region: geological evolution and processes*. C.A. Ricci (Ed.). 1997. Siena, terra Antartica Publication, 1206 p. (Proceedings of the VII International Symposium on Antarctic Earth Sciences, Siena, Italy, 10-15 September 1995).
- *Antarctic Climate Evolution*. F. Florindo and M. Siegert (Eds.). 2009. Developments in Earth and Environmental Sciences, 8, Elsevier, 593 p.
- *Antarctic Climate Change and the Environment*. J. Turner, R.A. Bindshadler, P. Convey, G. Di Prisco, E. Fahrbach, J. Gutt, D.A. Hodgson, P.A. Mayewski and C.P. Summerhayes. 2009. Cambridge, SCAR, 526 p.

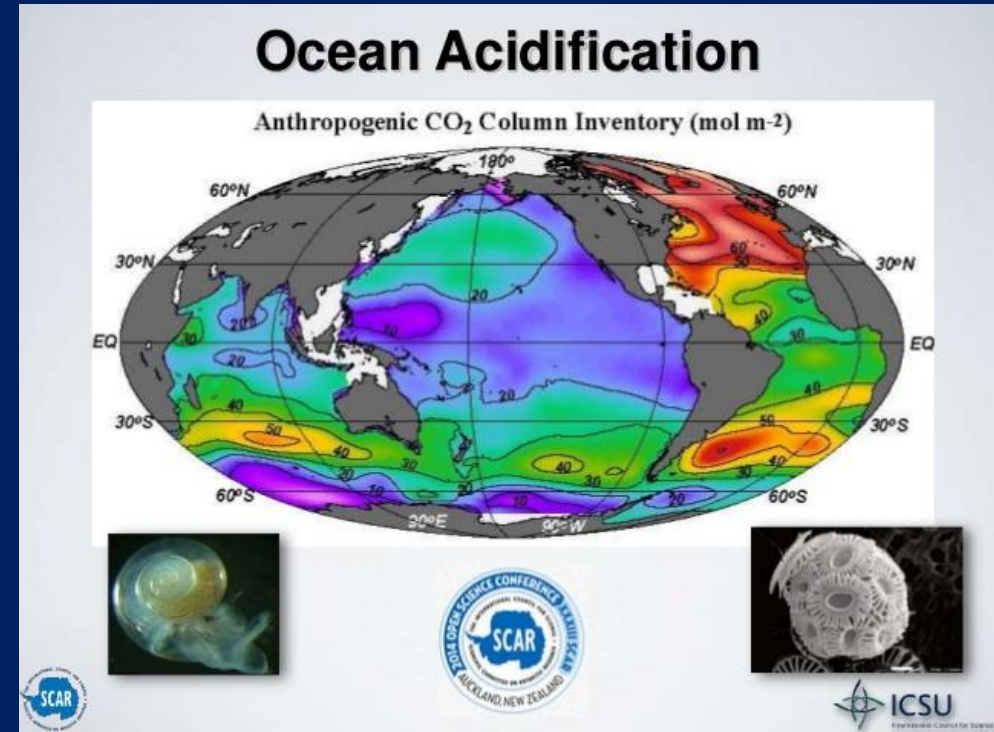
Some SCAR Publications

- *Composite Gazetteer of Antarctica (South of latitude 60°S)*. Collated by R. Cervellati and M.C. Ramorino (for the SCAR Working Group on Geodesy and Geographic Information). 1998. Rome, Programma Nazionale di Ricerche in Antartide, 2 vol.v + 227, and 328 p.
- *Composite Gazetteer of Antarctica (South of latitude 60°S). (Supplement to the First Edition)*. Collated by R. Cervellati and M.C. Ramorino (for the SCAR Working Group on Geodesy and Geographic Information). 2000. Rome, Programma Nazionale di Ricerche in Antartide, 46 p.
- *Composite Gazetteer of Antarctica (South of latitude 60°S). (Supplement to the 1998 Edition)*. Collated by R. Cervellati and M.C. Ramorino (for the SCAR Working Group on Geodesy and Geographic Information). 2004. Rome, Programma Nazionale di Ricerche in Antartide, 100 p.



(2014)

Some SCAR Publications



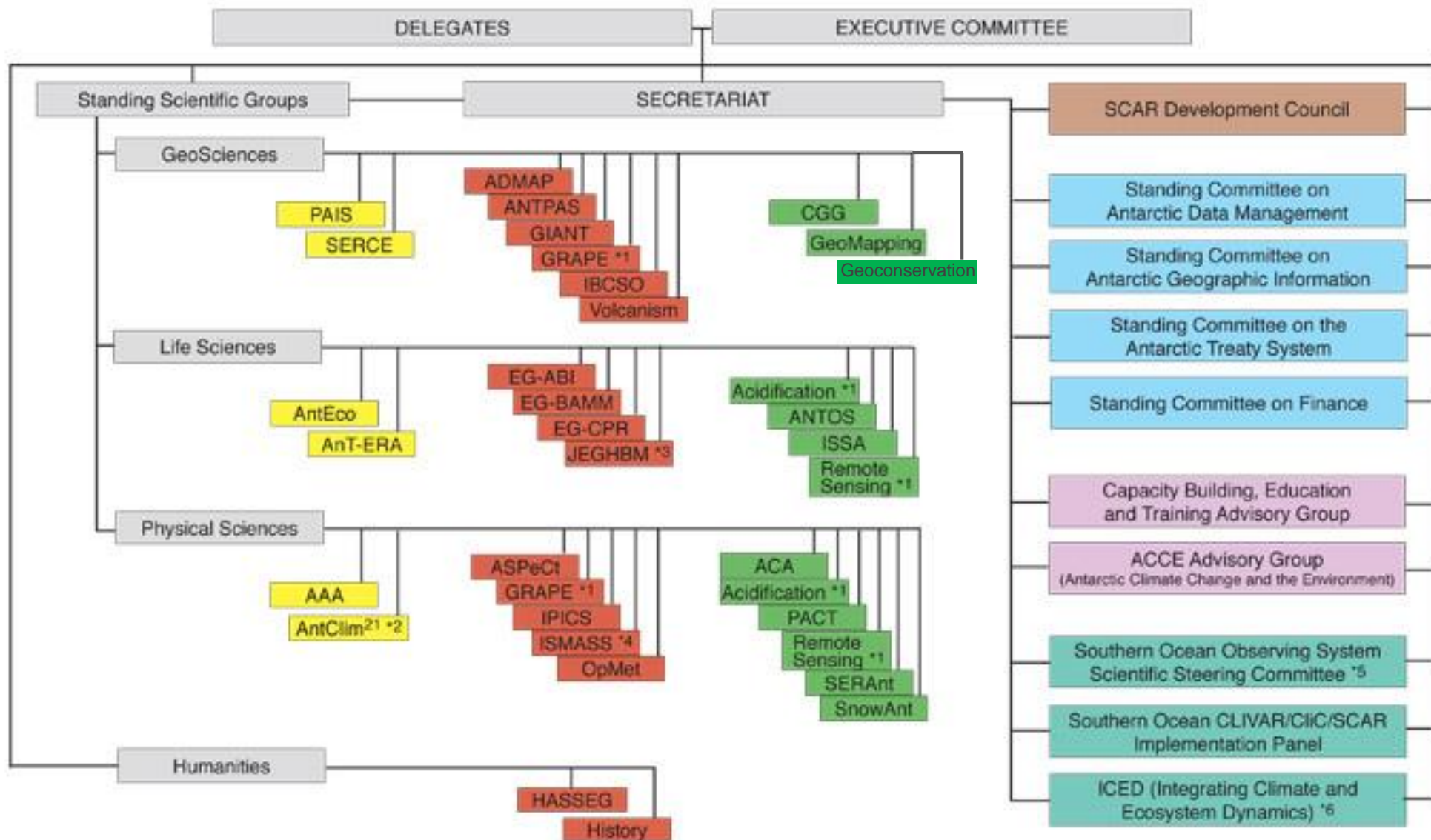
(2016)

- *Science in the Snow. Fifty years of international collaboration through the Scientific Committee on Antarctic Research.* D.W.H. Walton and P. D. Clarkson. 2011. Cambridge, SCAR, 258 p.

Some relevant changes in the SCAR structure

- In 1988 the SCAR WG on Logistics disappears due to the creation of the Council of Managers of National Antarctic Programmes (COMNAP), that had its first meeting in 1989
- Important review of the SCAR structure in early 2000s. New structure and reorganization approved in 2002 (Shanghai). First SCAR meeting under the new structure in 2004 (Bremen and Bremerhaven)
- SCAR Structure review in 2015-2016 to be approved in the 2016 SCAR Meeting

The Organisation of the Scientific Committee on Antarctic Research (SCAR) (December 2014)



*1 jointly sponsored by SSGs
 *2 incorporates ITASE
 *3 joint group with COMNAP
 *4 co-sponsored with IASC and CIC
 *5 joint initiative with SCOR & others
 *6 SCOR, IGBP and SCAR

 Scientific Research Programme Group

 Expert Group

 Action Group

 Standing Committee

 Advisory Group

 Joint initiative with other organisations

SCAR Scientific Research Programmes

- Major cutting-edge research questions
- International in participation and interdisciplinary in scope
- Expected duration: 6 to 8 years
- Strategic and implementation plans required
- 2-year internal and 4-year external review
- Data management policy and outreach plan



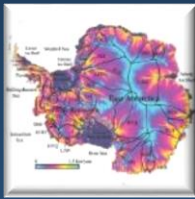
SCAR Scientific Research Programmes

The new generation of SCAR SRPs

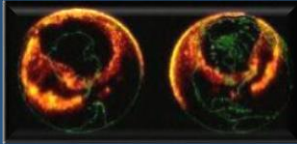
- **State of the Antarctic Ecosystem (AntEco)**
- **Antarctic Ecosystems: Adaptations, Thresholds and Resilience (Ant-ERA)**
- **Past Antarctic Ice Sheet Dynamics (PAIS)**
- **Solid Earth Responses and Influences on Cryospheric Evolution (SERCE)**
- **Antarctic Climate 2100 (AntClim²¹)**
- **Astronomy and Astrophysics in Antarctica (AAA)**

SCAR Scientific Research Programmes

2004-2010



SALE
ATHENA



ICESTAR

2004-2012



AGCS

2005-2013



ACE



EBA

2010 -2018



AAA

2013- 2021(?)

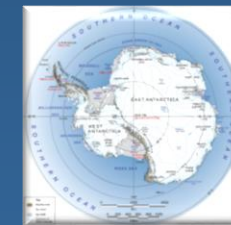


SERCE

AnT-ERA



AntClim²¹



PAIS

AntEco



SCAR Elected Officers from Italy

- A. Peri, Chief Officer Permanent Working Group on Human Biology and Medicine, 2000-2002
- M. Candidi, Chief Officer Permanent Working Group on Solar-Terrestrial and Astrophysical Research, 2000-2002
- A. Capra, Chief Officer Standing Scientific Group on Geosciences, 2004-2010
- G. di Prisco, co-Chair of the Scientific Research programme Evolution and Biodiversity in the Antarctic (EBA), 2005-2013
- M. Candidi, Chief Officer Standing Scientific Group on Physical Sciences, 2006-2010
- A. Meloni, SCAR Vicepresident, 2006-2010
- M. Guglielmin, co-Chair Expert Group on Antarctic Permafrost, Soils and Periglacial Environments, since 2010
- M. Pompilio, co-Chair Expert Group on Antarctic Volcanism, since 2014
-
- SCAR fellowships to Italian early career researchers in: 2003, 2007, 2008, 2009



Cross linkages workshop in Modena, Italy (2009)

Scientific Advice to Policy Makers

- SCAR provides scientific advice to policy makers e.g. the Antarctic Treaty and the UNFCCC
- Advice to the Treaty is through the Standing Committee on the Antarctic Treaty System
- Provides papers (WPs and IPs) on subjects such as climate change, non-native species, persistent organic pollutants, ocean acidification,...
- Also provides a SCAR Science Lecture in ATCMs



Secretariat of the Antarctic Treaty
Secrétariat du Traité sur l'Antarctique
Секретариат Договора об Антарктике
Secretaría del Tratado Antártico





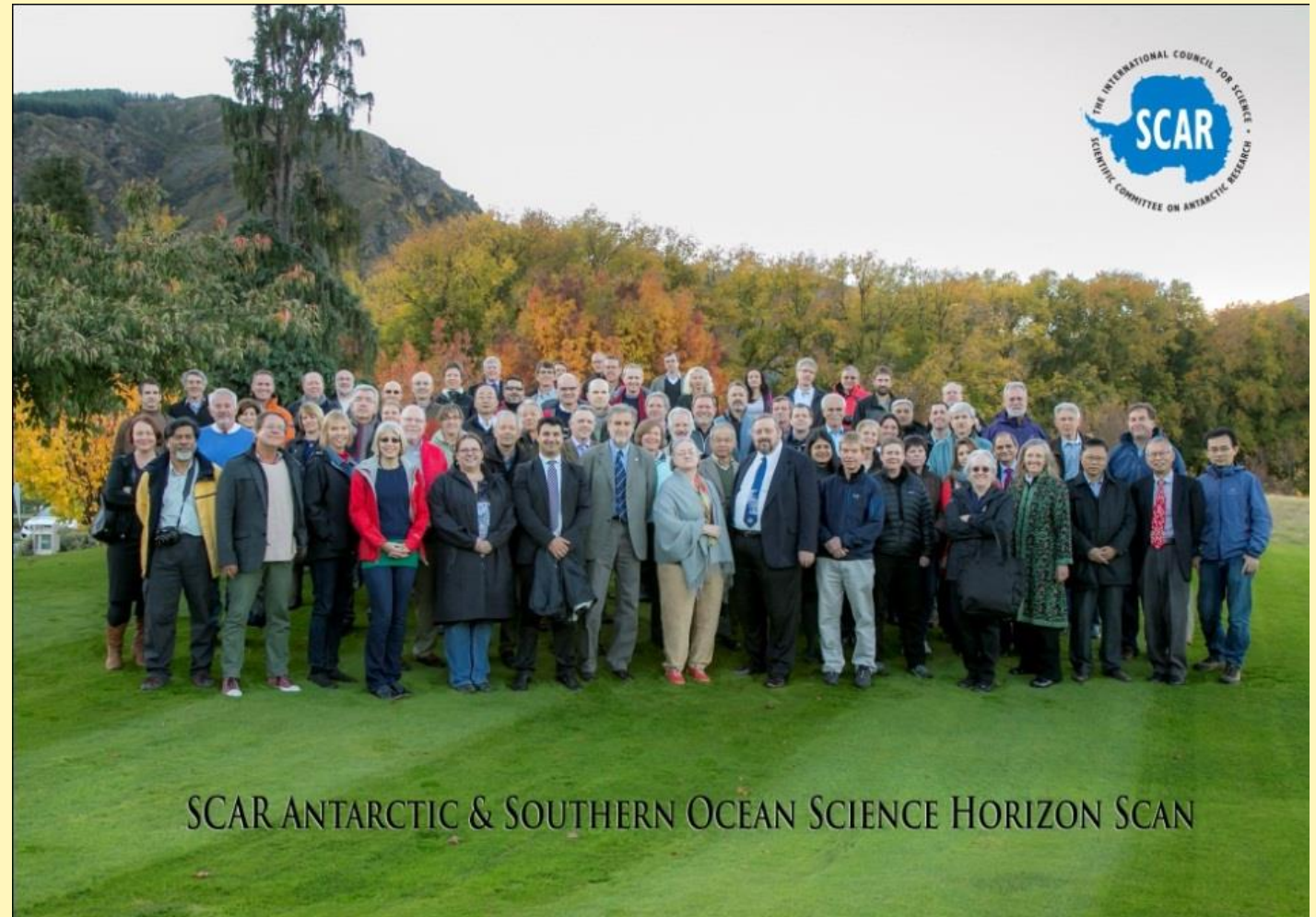
The 1st SCAR Antarctic and Southern Ocean Science Horizon Scan

The international Antarctic community came together to “scan the horizon” to identify the highest priority scientific questions that researchers should aspire to answer in the next two decades and beyond.

An Inclusive Process

- **Community-wide Question solicitations**
 - Round 1 – 751 questions
 - Round 2 – 115 questions
- **Retreat invitation nominations**
 - 789 nominations of 510 individuals
- **Scientists, Program Directors/Managers, policy makers, decision makers and early career scientists**

- 75 Retreat attendees from 22 countries





The 1st SCAR Antarctic and Southern Ocean Science Horizon Scan

Antarctic Atmosphere and Global Connections

1. How is climate change and variability in the high southern latitudes connected to lower latitudes including the Tropical Ocean and monsoon systems?
2. How do Antarctic processes affect mid-latitude weather and extreme events?
3. How have teleconnections, feedbacks, and thresholds in decadal and longer term climate variability affected ice sheet response since the Last Glacial Maximum, and how can this inform future climate projections?
4. What drives change in the strength and position of Westerly winds, and what are their effects on ocean circulation, carbon uptake and global teleconnections?
5. How did the climate and atmospheric composition vary prior to the oldest ice records?
6. What controls regional patterns of atmospheric and oceanic warming and cooling in the Antarctic and Southern Ocean? (Cross-cut: "Southern Ocean")
7. How can coupling and feedbacks between the atmosphere and the surface (land ice, sea ice and ocean) be better represented in weather and climate models? (Cross-cut: "Southern Ocean" and "Antarctic Ice Sheet")
8. Do past amplified warming of Antarctica provide insight into the effects of future warming on climate and ice sheets? (Cross-cut: "Antarctic Ice Sheet")
9. Are there CO₂ equivalent thresholds that forestall collapse of all or part of the Antarctic Ice Sheet? (Cross-cut: "Antarctic Ice Sheet")
10. Will there be release of greenhouse gases stored in Antarctic and Southern Ocean clathrates, sediments, soils, and permafrost as climate changes? (Cross-cut: "Dynamic Earth")
11. In the recovery of the ozone hole preceding as expected and how will its recovery affect regional and global atmospheric circulation, climate and ecosystems? (Cross-cut: "Antarctic Life" and "Human")

Southern Ocean and Sea Ice in a Warming World

12. Will changes in the Southern Ocean result in feedbacks that accelerate or slow the pace of climate change?
13. Why are the properties and volume of Antarctic Bottom Water changing, and what are the consequences for global ocean circulation and climate?
14. How does Southern Ocean circulation, including exchange with lower latitudes, respond to climate forcing?
15. What processes and feedbacks drive changes in the mass, properties and distribution of Antarctic sea ice?
16. How do changes in iceberg numbers and size distribution affect Antarctica and the Southern Ocean?
17. How has Antarctic sea ice extent and volume varied over decadal to millennial time scales?
18. How will changes in ocean surface waves influence Antarctic sea ice and floating glacial ice?
19. How do changes in sea ice extent, seasonality and properties affect Antarctic atmospheric and oceanic circulation? (Cross-cut: "Antarctic Atmosphere")
20. How do extreme events affect the Antarctic cryosphere and Southern Ocean? (Cross-cut: "Antarctic Ice Sheet")
21. How did the Antarctic cryosphere and the Southern Ocean contribute to glacial-interglacial cycles? (Cross-cut: "Antarctic Ice Sheet")
22. How will climate change affect the physical and biological uptake of CO₂ by the Southern Ocean? (Cross-cut: "Antarctic Life")
23. How will changes in freshwater inputs affect ocean circulation and ecosystem processes? (Cross-cut: "Antarctic Life")

Antarctic Ice Sheet and Sea Level

24. How does small-scale morphology in subglacial and continental shelf bathymetry affect Antarctic ice sheet response to changing environmental conditions? (Cross-cut: "Dynamic Earth")
25. What are the processes and properties that control the form and flow of the Antarctic Ice Sheet?

26. How does subglacial hydrology affect ice sheet dynamics, and how important is it? (Cross-cut: "Dynamic Earth")
27. How do the characteristics of the ice sheet bed, such as geothermal heat flux and sediment distribution, affect ice flow and ice sheet stability? (Cross-cut: "Dynamic Earth")
28. What are the thresholds that lead to irreversible loss of all or part of the Antarctic ice sheet?
29. How will changes in surface melt over the ice shelves and ice sheet evolve, and what will be the impact of these changes?
30. How do oceanic processes beneath ice shelves vary in space and time, how are they modified by sea ice, and do they affect ice loss and ice sheet mass balance? (Cross-cut: "Southern Ocean")
31. How will large-scale processes in the Southern Ocean and atmosphere affect the Antarctic Ice Sheet, particularly the rapid disintegration of ice shelves and ice sheet margin? (Cross-cut: "Antarctic Atmosphere" and "Southern Ocean")
32. How fast has the Antarctic Ice Sheet changed in the past and what does that tell us about the future?
33. How did marine-based Antarctic ice sheets change during previous inter-glacial periods?
34. How will the sedimentary record beneath the ice sheet inform our knowledge of the presence or absence of continental ice? (Cross-cut: "Dynamic Earth")

Dynamic Earth - Probing beneath Antarctic Ice

35. How does the bedrock geology under the Antarctic Ice Sheet inform our understanding of supercontinent assembly and break-up through Earth history?
36. Do variations in geothermal heat flux in Antarctica provide a diagnostic signature of sub-ice geology?
37. What is the crust and mantle structure of Antarctica and the Southern Ocean, and how do they affect surface motions due to glacial isostatic adjustment?
38. How does volcanism affect the evolution of the Antarctic lithosphere, ice sheet dynamics, and global climate? (Cross-cut: "Antarctic Atmosphere" and "Antarctic Ice Sheet")
39. What are and have been the rates of geomorphic change in different Antarctic regions, and what are the ages of preserved landscapes?
40. How do tectonics, dynamic topography, ice loading and isostatic adjustment affect the spatial pattern of sea level change on all time scales? (Cross-cut: "Antarctic Ice Sheet")
41. Will increased deformation and volcanism characterize Antarctica when ice mass is reduced in a warmer world, and if so, how will glacial- and ecosystem be affected? (Cross-cut: "Antarctic Life")
42. How will permafrost, the active layer and water availability in Antarctic soils and marine sediments change in a warming climate, and what are the effects on ecosystems and biogeochemical cycles? (Cross-cut: "Antarctic Life")

Antarctic Life on the Precipice

43. What is the genomic basis of adaptation in Antarctic and Southern Ocean organisms and communities?
44. How fast are mutation rates and how extensive is gene flow in the Antarctic and the Southern Ocean?
45. How have ecosystems in the Antarctic and the Southern Ocean responded to warmer climate conditions in the past? (Cross-cut: "Antarctic Atmosphere" and "Oceans")
46. How has life evolved in the Antarctic in response to dramatic events in the Earth's history? (Cross-cut: "Dynamic Earth")
47. How do subglacial systems inform models for the development of life on Earth and elsewhere? (Cross-cut: "Eyes on the Sky")
48. Which ecosystems and food webs are most vulnerable in the Antarctic and Southern Ocean, and which organisms are most likely to go extinct?
49. How will threshold transitions vary over different spatial and temporal scales, and how will they impact ecosystem functioning under future environmental conditions?
50. What are the synergistic effects of multiple stressors and environmental change drivers on Antarctic and Southern Ocean biota?
51. How will organisms and ecosystems respond to a changing soundstage in the Southern Ocean? (Cross-cut: "Human")
52. How will next-generation contaminants affect Antarctic and Southern Ocean biota and ecosystems?

53. What is the exposure and response of Antarctic organisms and ecosystems to atmospheric contaminants (e.g. black carbon, mercury, sulphur, etc.), and are the sources and distributions of these contaminants changing? (Cross-cut: "Antarctic Atmosphere" and "Human")
54. How will the sources and mechanisms of dispersal of propagules into and around the Antarctic and Southern Ocean change in the future?
55. How will invasive species and range shifts of indigenous species change Antarctic and Southern Ocean ecosystems? (Cross-cut: "Human")
56. How will climate change affect the risk of spreading emerging infectious diseases in Antarctica? (Cross-cut: "Human")
57. How will increases in the ice-free Antarctic intertidal zone impact biodiversity and the likelihood of biological invasions?
58. How will climate change affect existing and future Southern Ocean fisheries, especially krill stocks? (Cross-cut: "Human")
59. How will linkages between marine and terrestrial systems change in the future?
60. What are the impacts of changing seasonality and transitional events on Antarctic and Southern Ocean marine ecology, biogeochemistry, and energy flow?
61. How will increased marine resource harvesting impact Southern Ocean biogeochemical cycles? (Cross-cut: "Human")
62. How will deep sea ecosystems respond to modifications of deep water formation, and how will deep sea species interact with shallow water ecosystems as the environment changes?
63. How can changes in the form and frequency of extreme events be used to improve biological understanding and forecasting? (Cross-cut: "Antarctic Atmosphere")
64. How can temporal and spatial "omic-level" analyses of Antarctic and Southern Ocean biodiversity inform ecological forecasting?
65. What will key marine species tell us about trophic interactions and their oceanographic drivers such as future shifts in frontal dynamics and stratification?
66. How successful will Southern Ocean Marine Protected Areas be in meeting their protection objectives, and how will they affect ecosystem processes and resource extraction? (Cross-cut: "Human")
67. What ex situ conservation measures, such as genetic repositories, are required for the Antarctic and Southern Ocean? (Cross-cut: "Human")
68. How effective are Antarctic and Southern Ocean conservation measures for preserving evolutionary potential? (Cross-cut: "Human")

Near-Earth Space and Beyond - Eyes on the Sky

69. What happened in the first second after the universe began?
70. What is the nature of the dark universe and how is it affecting us?
71. What are the differences in the inter-hemispheric conjugacy between the ionosphere and that in the lower, middle and upper atmosphere, and what causes these differences?
72. How does space weather influence the polar ionosphere and what are the wider implications for the global atmosphere? (Cross-cut: "Antarctic Atmosphere")
73. How do the generation, propagation, variability and climatology of atmospheric waves affect atmospheric processes over Antarctica and the Southern Ocean? (Cross-cut: "Antarctic Atmosphere")

Human Presence in Antarctica

74. How can natural and human-induced environmental changes be distinguished, and how will this knowledge affect Antarctic governance? (Cross-cut: all other Clusters)
75. What will be the impacts of large-scale, direct human modification of the Antarctic environment? (Cross-cut: "Antarctic Life")
76. How will external pressures and changes in the geopolitical configurations of power affect Antarctic governance and science?
77. How will the use of Antarctica for peaceful purposes and science be maintained as barriers to access change?
78. How will regulatory mechanisms evolve to keep pace with Antarctic tourism?
79. What is the current and potential value of Antarctic ecosystem services?
80. How will humans, diseases and pathogens change, impact and adapt to the extreme Antarctic environment? (Cross-cut: "Antarctic Life")

Outputs



Process and Outcomes

Kennikutt *et al.*, 2015, *Antarctic Science*

Opinion/Editorial Piece

Kennikutt *et al.*, 2014, *Nature*

Targeted topical/theme publications in specialized journals

Next step:

The COMNAP “Antarctic Roadmap Challenges Project”

- Focus on three of the challenges identified using the SCAR Horizon Scan list of questions:

Technology, access and extraordinary logistic requirements

www.comnap.aq/ProjectsSitePages/ARC.aspx

Technological Challenges

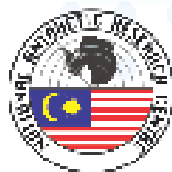
- Innovative experimental designs, new applications of existing technology, invention of next generation technologies and the development of novel air-, space- or even animal-borne observing or logging technologies.
- Methodologies, instruments and sensors to probe from the molecular level to the edge of the universe.
- Observing technologies that can be autonomously deployed for long periods of time.
- New unbiased and “clean” methodologies to retrieve samples under challenging conditions in remote locations.
- Improved models that accurately portray the Antarctic and predict at temporal and spatial scales that support inform policy- making.

Extraordinary Logistics

- Expanded year-round access to the continent and the Southern Ocean.
- Innovation to allow those who may never go to the ice to access information, data and samples.
- Astrophysics research, including cosmology, will require exquisitely sensitive sensors and facilities to house these capabilities on the high Antarctic plateau, and deployment on ultra-long duration balloons.
- Networks of stations that continuously monitor the Earth's ionosphere in both polar regions will be essential to support near-Earth space research.
- Barriers to international collaboration need to be minimized, and new innovative, mutually beneficial models for partnerships that share ideas, logistics and facilities need to be explored.

Some ongoing issues

- New SCAR Strategic Plan 2017-2022
- Review of the SCAR Structure
- Support to the new generation of Antarctic scientists (SCAR Fellowships programme)
(in 2015 awarded 5 Fellowships, in total 51 since the start of the programme in 2002)
- Capacity building (Visitor Professors programme)
- Next biennial SCAR Meeting and Open Science Conference in August 2016, Malaysia



XXXIV SCAR BIENNIAL MEETINGS INCLUDING THE SCAR OPEN SCIENCE CONFERENCE 2016

20-30 AUGUST 2016
KUALA LUMPUR, MALAYSIA



SECOND CIRCULAR

www.scar2016.com

ABSTRACT SUBMISSION FOR THE SCAR 2016 OPEN SCIENCE CONFERENCE

Abstract submission is now open on the conference site www.scar2016.com. If you are submitting an abstract for an oral or poster session, please view the full list including session descriptions and select the most suitable theme below. Abstract submission closes on 14th February 2016.

Sessions* **

- S1. Antarctica in a global system - drivers and responses
- S2. Evolution of the physical and biological environment of Antarctic and the Southern Ocean over the 21st and 22nd centuries
- S3. Sustained efforts for observing, mapping and understanding the Southern Ocean and its role in current and future climate
- S4. Past Antarctic ice sheet dynamics A: the paleoceanographic and ice-distal record
- S5. Past Antarctic ice sheet dynamics B: from glacial and ice-proximal records to models
- S6. Glaciers and ice sheet mass balance
- S7. Antarctic oldest ice challenge
- S8. Solid earth responses and influences on cryospheric evolution
- S9. Status and trends in Antarctic sea ice and ice shelves
- S10. Subglacial aquatic environments
- S11. Antarctic permafrost, periglacial processes and soil development
- S12. Snow and ice in Antarctica
- S13. Antarctic meteorology and climatology
- S14. Antarctic climate variability during the past two millennia
- S15. Solar-terrestrial physics in the polar regions
- S16. Global Navigation Satellite System Research and applications
- S17. Astronomy and astrophysics from Antarctica

- S18. Subglacial geology and significant events in the geological evolution of Antarctica
- S19. Antarctic volcanism in space and time - magmatic tectonic and paleoenvironment aspects and linkages
- S20. Observing and mapping the Antarctic continent
- S21. Remote sensing of the Antarctic Environment: Multi-disciplinary advances
- S22. Spatial analyses of Antarctic biodiversity: Bioregionalisation and bioinformatics
- S23. Microbes, diversity, and ecological roles
- S24. Physiological adaptations in Antarctic organisms
- S25. Molecular ecology and evolution
- S26. Effects of sea-ice changes and ocean warming on marine ecosystem functioning and services
- S27. Impacts of environmental changes on Antarctic ecosystems and biota
- S28. Diversity and distribution of life in Antarctica
- S29. From the top: Higher trophic predators as ecosystem sentinels
- S30. Southern Ocean Outposts: the links to the Southern Ocean islands
- S31. Ocean acidification
- S32. Human biology and medicine
- S33. The role of humanities and social sciences in Antarctic studies
- S34. Footprints in Antarctica, and Antarctica's footprint: perspectives from history
- S35. Data access and sharing for cutting edge science
- S36. Antarctic education, outreach and training
- S37. Innovative communication of Antarctic science
- S38. Scientific advice for policy
- S39. Antarctic research and the media
- S40. Environmental contamination in Antarctica
- S41. Evidence based conservation and environmental management in Antarctica

* Please note that sessions with low abstract submissions will be merged with similar sessions

** Session descriptions are available here: http://scar2016.com/?page_id=3478

Final comments

- Importance and advantages of international cooperation
- Practical reasons and existence of the Antarctic Treaty framework
- If SCAR did not exist, it should be invented
- SCAR success is only possible thanks to the international support and the work of a enthusiastic community

SCAR appreciates and thanks the continuous support from Italy and the Italian scientists



Italy from International Space Station. NASA, Oct. 2014

For further details on SCAR activities

see: www.scar.org



SCAR flag flying over the Ridge A international observatory

(Photo C. Kulesa, I