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SCAR Delegates Report 2021

Online

Application of Mexico for Associate Membership

Report Author(s)
Dra. Susana Lizano Soberón

Summary

This paper is an application by Mexico for Associate Membership of SCAR. The letter of application and an annex on scientific work undertaken through collaboration and planned participation by Mexico are provided.

Recommendations

The Delegates consider the application of Mexico for Associate Membership of SCAR.

Budget Implications

The Associate Membership fee of $7,000 would be an additional annual positive contribution to SCAR's budget.

Mexico City,
January 24,2021

Prof. Steven Chown
President of the Executive Committee
Scientific Committee on Antarctic Research

Dear Prof. Chown,

As the current President of the Mexican Academy of Sciences (AMC), I would like to express our intention to become an associated member of the Scientific Committee of Antarctic Research (SCAR). The AMC is currently member of the International Science Council without vote.

Mexican scientists have participated in SCAR related programs through its associated country members infrastructure and programs. This work has been acknowledged in peer reviewed publications. Presently, Mexican scientists are particularly active, collaborating with the national Antarctic programs of Chile, Argentina, Uruguay, Colombia, USA, Germany, UK, and, recently, New Zealand. Our Mexican colleageus support the SCAR mission of promoting and developing research in the Antarctic region, in accordance to the letter of the Antarctic Treaty and the Protocol on Environmental Protection to the Antarctic Treaty.

The wider scientific community of Mexico has expressed their interest in formalizing their participation in SCAR related programs and research groups. On behalf of the Mexican scientists actively involved in Antarctic science, we would like to thank you for your conisderation of a Mexican membership at the next virtual SCAR delegates meeting this upcoming March 2021.

We attach a summary of relevant Mexican scientific research projects, outlining our expectations and proposed contributions.

We look forward to the association of the Mexican scientific community to SCAR.

Yours sincerely,

Dra. Susana Lizano Soberón

President
Mexican Academy of Sciences

Km 23.5 Carretera Federal México-Cuernavaca, "Casa Tlalpan", Av. Cipreses s/n Col. San Andrés Totoltepec, Tlalpan, 14400, Ciudad de México, México Tel. (52-55) 58 49 4905 e-mail: aic@unam.mx http://www.amc.mx

Application of Mexico for Associate Membership

For consideration at the next
virtual SCAR Delegates Meeting
March 2021

Executive Summary

Mexico expresses its interest in formalizing their participation in SCAR related programmes and research groups, in solidarity with the SCAR mission of promoting and developing research in the Antarctic region in accordance with the letter of the Antarctic Treaty and the Protocol on Environmental Protection to the Antarctic Treaty.

The Mexican Academy of Science (AMC) supports the view and mission of the Mexican Antarctic Scientific Committee and the present application to SCAR. Moreover, the proposed agenda has been also acknowledged by the respective scientific policy collaborators in all relevant agencies of the Mexican government and science organizations like the Mario Molina Centre. The outline of the potential contributions, research interests, active programmes, future plans, and commitment to boost scientific knowledge about Antarctica, is summarized in the present agenda.

Dra. Susana Lizano Soberón
President
Mexican Academy of Sciences

MEXICAN ANTARCTIC SCIENTIFIC AGENDA

Introduction

Mexico's engagement in global environmental issues has been well acknowledged through our participation in many international agreements regarding environmental protection, endangered species conservation, sustainable management of renewable resources and climate action, through the OECD, UN and other international agencies. Perhaps the most relevant example of our shared cultural commitment to our environmental policy, is the work of renowned Mexican scientist Prof. Mario Molina, co-recipient of the 1995 Nobel Prize in Chemistry for his role in elucidating the threat to the Earth's ozone layer of man-made chlorofluorocarbon gases and its potential impact on our planet. Since then, Mario Molina centre, universities through their tertiary education and post-graduate programmes, and other research institutes, centres and organizations, have developed a pivotal position in the Mexican scientific ecosystem, promoting active and positive environmental engagement of Mexico locally and internationally, also in support of the vision of Mexican scientists participating in Antarctic research through SCAR.

The history of participation of Mexican scientists in SCAR-related programmes through active collaboration with other member countries and their infrastructure, has been acknowledged in peer reviewed publications in the past. Recently, Mexico participation in the Antarctic has been particularly active with the national Antarctic programme of Chile, through bilateral collaboration between academics and students from the INACH (Antarctic Institute of Chile) and UNAM (National Autonomous University of Mexico) as supported by both governments' foreign affairs ministries. Mexican scientists have been long time engaged with the UK, USA (including the NASA and NOAA initiatives on Antarctic research) and Argentinian Antarctic programmes. For example, Prof. Eduardo Santamaria with two Antarctic expeditions, from the Autonomous University of Southern California (UABC) is leading the regional the Pole2Pole initiative, from the Marine Biodiversity Observation Network, part of the AMERIGEOSS chapter of the Global Earth Observation System to System (chapter America). He is also already part of the Intergovernmental Oceanographic Commission, of the United Nations – UNESCO programme.

In keeping with our environmental position, as ratified signatories of the Paris Agreement and with a continued support for the International Carbon Action Partnership, our national scientific Antarctic research community wishes to further develop the national technological and operational capabilities for peaceful research missions to the Antarctic Continent, to deepen our knowledge on Antarctic processes of global impact, and to improve our legislation concerning climate change, renewable energy, conservation and sustainability.

The Mexican Academy of Science (AMC) supports the participation of Mexican scientists (through their local educational or research organizations) in the various SCAR groups, programmes and communities, as guided by the Protocol on Environmental Protection to the Antarctic Treaty. The AMC also supports positive communication between Mexican government agencies and other international organizations of the Antarctic Treaty System in support of the best implementation of the Antarctic science programmes with Mexican participation. The members of the Mexican Antarctic programme initiative and their respective organizations commit to continuously support SCAR's national and international programmes, as relevant to Mexican participation in Antarctic expeditions.

Mission

The mission of the Mexican Antarctic scientific agenda is to implement the recommended SCAR guidelines addressed to research institutions and universities and to facilitate the execution of continuous research in Antarctica through national infrastructure as well as other countries' platforms. Also, to further international collaboration through engagement in SCAR activities, programmes, projects, networks and committees. It also aims to promote Antarctic research worldwide to further our human collective understanding of the social, economic, cultural, environmental, political and technological role of Antarctica in the world.

Vision

The vision embodied in the Mexican Antarctic scientific agenda is to contribute actively to the continuous increase of our scientific understanding of climate change issues and the social effects of the impacts of global warming on our local and global ecosystems. It aims to lead Antarctic research into understanding the correlations between changes in the southern continent and their impacts on wider Mexican environmental systems.

Objectives

The Mexican Antarctic Science Community has many medium- and long-term research objectives as per project requirements, however the general objectives of the initiative are to:

- Provide Antarctic scientific knowledge and data to Mexican educational, research and civil organizations as well as to government agencies who need to better understand the regional impacts of the effects of Antarctica on the global climate change and the environmental strains that puts on the local Mexican ecosystems.
- Promote the development of independent scientific research by Mexico in Antarctica, while promoting the advancement of Mexico´s environmental policy in all areas relevant to the international Antarctic legislation in collaboration with all the national agencies involved in Antarctica affairs.
- Further our understanding on how to best support the natural resilience of the biodiversity in Mexico and the region (Central-North America and the Caribbean).
- Communicate the work, findings and significance of Antarctic research by Mexican scientists and institutions, nationally and internationally.
- Support all Antarctic international organizations to increase their engagement with Mexican science organizations and government agencies and continue to build positive global relations in Antarctica with all member states.
- Actively encourage the participation of Mexican scientists and their organizations in the work of the scientific groups, programmes, events, action groups and community development within SCAR as part of bilateral or multilateral projects between different government agencies.
- Assist Mexican research organizations and universities alike, to monitor and track changes in Antarctic environmental systems and climate change and their local implications in Mexican environments.
- Promote the education of highly qualified personnel to lead the future of Mexican scientific research and technological innovation in Antarctica.
- Conduct efforts to become a signatory member of the Antarctic Treaty (ATS) as a mid-term objective, and to officially ratify the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).

- Contribute to preserve peace and global security in Antarctica, through arts, culture and social science programmes.

Scientific Agenda

Mexican scientific research contribution to Antarctic science can be found in some SCAR science programmes for the previous 10 years. The activities of the Mexican science projects on specific areas have depended on the scientists' interest, resources and available capabilities to execute Antarctic research. In the upcoming years, Mexican scientists aim at further developing the structure necessary to implement SCAR guidelines and to increase the efficient allocation of national support to help answer the 80 key Antarctic science questions. The proposed Mexican Antarctic science committees and potential collaboration could be summarized as:

Geosciences – IG-UNAM (Geography Institute, UNAM) & CICESE (Centre of Scientific Research and Superior Education of Ensenada, Baja California, Mexico) and government agencies (Mexican Secretariat of the Navy – SEMAR, Secretariat of Environment and Natural Resources – SEMANARNAT, Mexican Agency of International Co-operation and Development – AMEXCID)

- Geography, including vulcanism and paleo climates (*past Antarctic Ice Sheet Dynamics and Solid Earth Responses and influences on Cryospheric Evolution*)
- Oceanography, glaciology, ocean currents, acidification, and CO2 systems (*International Bathymetric Chart of the Southern Ocean & Antarctic Sea-ice Processes and Climate).*
- Cartography and Hydrography including coastal line (*Ice Sheet Mass Balance and Sea Level)* and natural resources monitoring (*Antarctic Near-shore and Terrestrial Observing System*)

Physical sciences – IA-UNAM (Institute of Astronomy, UNAM) & INAOE (National Institute of Astrophysics, Optics and Electronics) and national research networks (National Association of Universities and Higher Education – ANUIES, Advisory Science Council – CCC)

- Astrophysics, Astronomy (*Antarctic Digital Magnetic Anomaly Map Project & Antarctic Gravity Wave Instrument Network),* Atmospheric monitoring (*Antarctic Clouds and Aerosols*) and nanosat telecommunications (*Global Navigation Satellite Systems & Earth Observation)*
- Remote sensing technology, including marine bio-optics and weather monitoring (*Input pathways of persistence organic pollutants to Antarctica*)
- Climate change technology development (*Antarctic Climate Change in the 21st Century, Operational Meteorology in the Antarctic & Antarctic Climate Change and the Environment*)

Life sciences – ICMYL-UNAM (Institute of Marine and Limnological Sciences, UNAM) & INECOL (National Institute of Ecology) and other educational and research centres

- Evolutionary biology and climate change in Antarctic ecosystems (*Antarctic Thresholds - Ecosystem Resilience and Adaptation & Integrating Climate and Ecosystem Dynamics*)
- Aquatic biogeochemistry (*Biogeochemical Exchange at the Sea-Ice Interfaces)* and Phytoplankton zooplankton (*Southern Ocean Continuous Plankton recorder Database & Tropical Antarctic Teleconnections*)

- Molecular ecology (*State of the Antarctic Ecosystem & Antarctic Biodiversity Informatics*), and bacterial ecosystems, including algae flourishment.
- Environmental Conservation and protection, marine birds and mammals (*Expert Group on Birds and Marine Mammals* & *Plastic in Polar Environments*)

Social sciences – COMECSO (Mexican Council of Social Sciences)

- Antarctic Treaty System politics and Mexican science diplomacy
- Environmental arts and Mexican Antarctic culture and eco-tourism
- Socio-economic implications in Mexico of climate change in Antarctica

Expectations of the United Mexican States from the Associated Membership of SCAR

The Mexican scientific community expects to increase international collaborative efforts to address key global issues that have an impact on Mexican ecosystems. Our inclusive objectives will allow Mexican scientists, academics, post-docs, postgrad and undergrad students to have better opportunity to advance their research projects while gaining access to international funding schemes, information and Antarctic samples generated and collected by other international Antarctic research groups. Mexican scientists expect to have an active participation in SCAR research groups and committees, to have their opinion heard regarding relevant research from their local peers and external collaborators alike.

Ideally, most working groups could actively participate on improving the synergy between other SCAR initiatives. It is expected that SCAR will also facilitate the international engagement of Mexican scientists and their research to better identify specific research opportunities to continue building the shared scientific knowledge about Antarctica. Mexican society would expect to increase their cultural understanding of climate change issues, its local and global impacts, and the social impacts of global warming, through science communication. Mexico, as a community interested in improving its participation in global policies on climate change, expects help from SCAR on science-based best practices to guide foreign policy, regarding sustainable management of resources, environmental protection of the southern ocean and minimizing the human impact of Antarctic expeditions.

Planned Contribution of the United Mexican States to SCAR 2020

One of the key objectives of the Mexican Antarctic Programme initiative is to understand how Antarctic environments are changing, the impacts and threats they face, and the global impact of the processes occurring in Antarctica. Key to Mexican scientists is to pave the way for Antarctic research to reach civil organizations and government agencies to communicate the regional and global impacts of climate change and the environmental strains that puts on the local Mexican ecosystems. The Mexican Antarctic Programme initiative aims at developing positive communication between those agencies to facilitate development of SCAR projects, especially regarding the Mexican participation in Antarctic expeditions trough national infrastructure and active collaboration with other countries' Antarctic programmes.

We are committed to provide support in public legislation to ensure the sustainable management of natural resources and conservation strategies for Mexican biodiversity and the Central-North America-Caribbean regions. Part of our objective is to help Mexican research organizations and universities alike, to monitor and track changes in the Antarctic ecosystems

while translating its applied science into new technologies with relevance in physics, chemistry, environmental sciences, biotechnology and alternative energy sources.

The AMC and supporting organizations of the Mexican Antarctic Programme initiative, agree to actively support SCAR mission to be inclusive and to promote Antarctic research worldwide, to further our human collective understanding of the social, economic, cultural, environmental, political and technological role of Antarctica in the world, to keep the peace in Antarctica and to comply with the Antarctic Treaty policies as guided by the Protocol on Environmental Protection to the Antarctic Treaty, and to build innovation and interdisciplinary capability across Mexican research organizations and to build international collaboration with other Antarctic Research Programmes. Mexican scientists are committed to actively participate in the work of the Antarctic research groups, programme planning groups, action groups, expert groups and the Southern Ocean Observing System to increase conservation efforts affecting the management of Antarctica and the Southern Ocean, and increase understanding of the role of the Antarctic region in the Earth system and its impact in Mexican ecosystems.

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