

Proposal for Forming an IAA Study Group 1.11

Title of Study: **Comparative Climatology -
Studying Planetary Climate to Understand our Planet**

Proposer(s):

(Must be member(s) of the Academy M or CM) Dr Marcello Corradini

Primary IAA Commission Preference: Commission 1

(From Commission 1 to Commission 6)

Commissions: 1 Space Physical Sciences, 2 Space Life Sciences, 3 Space Technology & Systems Development, 4 Space Systems Operations & Utilization, 5 Space Policy, Law & Economics, 6 Space and Society: Culture and Education

Secondary IAA Commission Interests:

(From Commission 1 to Commission 6)

Members of Study Team

Chair(s): Radhika Ramachandran

(Must be member(s) of the Academy, M or CM)

Secretary: Adriana Ocampo (NASA HQ)

Other Members:

(Open to members and non- members of the Academy)

Mark A. Bullock (Southwest Res. Ins., Boulder CO)

Roger-Maurice Bonnet (ISSI, Bern CH)

Jeff Hollingsworth (NASA Ames)

Lori Glaze (NASA Goddard)

Sanjay Limaye (Univ. Wisconsin, Madison)

James A. Cutts (JPL)

Short Description of Scope of Study

Overall Goal:

(Expected scientific or practical benefit of the study group's efforts)

The purpose of comparative climatology is to develop an understanding of the most fundamental rules that govern planetary climates. Foremost, the observation of similar processes on two or more planets permits a comparison of physical laws operating in different contexts. Mathematical models that simulate the chemistry and physics of climate can be verified and their limits understood by comparing the outcomes of numerical experiments for different planets. Where numerical models fail to explain observations, a comparison of the physics and chemistry operating under different conditions offers an opportunity to fundamentally improve the predictive power of these models.

Comparative climatology has the potential to improve the fundamental understanding and mathematical treatment of climate processes on Earth, Venus, Mars and Titan. However, it is also extremely useful for interpreting the growing data on planets around other stars. To the extent that

improved understanding leads to a general theory of planetary climate, it will be possible to more accurately envision and model the atmospheres of terrestrial exoplanets. As the observational data become more accurate and diverse, it may eventually be possible to predict whether any given rocky planet around another star is habitable

Possible cross-fertilization with other IAA studies such as the one on disaster management is recommended. The cosmic study will investigate the commonality of studying climate on Earth and on other planets. One of the main goals is to investigate existing meteorological organization and university capacities and solicit interest, from developing countries and space emerging countries. A particular focus will be made to offer affordable access to space exploration in Latin America and Africa in using the IAA network. The economic impact and national interest for countries hit by severe climate will be conducted.

The cosmic study will engage selected international experts to formalize a global space climatology sciences education and public outreach (EPO) model that: (1) strengthens Latin America's and Africa's future space exploration workforce; and (2) promotes science, technology, engineering, and mathematics (STEM) education and public engagement to communicate the benefits of space for understanding our planet and living in Latin America and Africa; and (3) underlining the importance for involving countries, organizations and individuals who can provide new contributions to the Robotic and Human Exploration endeavor.

Intermediate Goals:

Outcome of already established workshops and/or conferences should be taken into account. To organize an IAA conference in Latin America or/and in Africa to identify interested partners.

Methodology:

(Email works, workshops, stand alone conferences, interim publications, etc.)

The cosmic study will be conducted in two phases,

A first step with recommendations length of minimum of 5 to a maximum of 10 pages, in time for the January Heads of Space agencies Summit

A second step conducted in 2014 will aim at building a database of capabilities and more detailed investigations

Time Line:

(Cannot exceed three years)

Deadline for preliminary draft: October 31, 2013.

Full study December 2014.

Final Product (Report, Publication, etc.):

Preliminary report to be published on the occasion of the 2nd IAA Head of Space Agencies Summit to be held in January 2014.

Final report available in end of 2014

Target Community:

Climateexperts community, members and non-members of the Academy.
Remote sensing community, Scientists, engineers,
Space Agencies from Africa and Latin America in first priority
Other space agencies for support

Support Needed:

Cassie, Karen, Denis and Enrico have volunteered to look into their personal and institutional archives in order to provide supportive materials.
World Meteo Organizations, Eumetsat, national meteorological organizations, Space Agencies

Potential Sponsors:

Eumetsat, National Meteorological organizations, Universities, Labs
UN, World bank

To be returned to the IAA Secretary General Paris

*by fax: 33 1 47 23 82 16 or
by email: sgeneral@iaamail.org*

Date: 06/19/2013

(No Signature required if document authenticated).

Follow-up Section for IAA use only

Initial Phase

Application received:

Commission Approved:

SAC Approved:

Web Site Section opened:

Members Formally Appointed by IAA:

Final Phase

Peer Review by Commission Completed:

Recommended by the Commission:

Final Report Received:

SAC Approved:

BOT Accepted:

Publisher Selected:

Study Published: