

Proposal for Forming an IAA Study Group 1.12

Title of Study:

Virtual Reality -Virtual Exploration of Planets

Proposer(s):

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

Dr Marcello Coradini

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): Marcello Coradini, (ESA)

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

Secretary: E.Flamini (ASI)

Other Members:

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

D. Moura (CNES), F.Graziani (Univ. Rome), Yuri Razoumy (Russia), Li Ming (China), K.McBride (UCLA), R.Trucco (ALTEC)

Short Description of Scope of Study

Overall Goal:

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

Virtual reality has been developed considerably over the last decades on the occasion of many successful space exploration missions. Virtual reality has also made tremendous progress in non-space activities such as medicine, and games. Several attempts of JPL for instance to give access to the general public to the rovers on Mars have stimulated worldwide attention.

The study will have to create connections and interfaces with the Terrestrial Analogs study as well as analyzing preliminary investments and studies carried out in the framework of Mars/Moon exploration missions. Another important aspects is the telecommunication aspects. In order to create a virtual reality exploration program we need to increase dramatically the bit rate from Mars/Moon. Emerging countries with some established know how in space technology will have a great opportunity to participate in development and operations of telecommunications assets in space and on the ground. Moreover, familiarization with tlc techniques will have immediate beneficial spin-offs for the improvements of tlc infrastructure in their own countries. Use of small satellites is also envisaged.

The study will develop investigations to make virtual reality as a powerful and less expensive way to explore planetary surfaces. It will constitute a gate to low cost space exploration for non-space countries or space emerging countries. For space fairing countries the virtual reality may generate enthusiasm among the young generations and actively promotes science, technology, engineering, and mathematics (STEM) education. The impact in the media and on the public and the scientific community is expected to be extremely important. It should also create public engagement to communicate the benefits of space for understanding our planet.

Intermediate Goals:

Outcome of already established workshops and/or conferences should be taken into account.
To organize one IAA conference 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:

Computer experts community, members and non-members of the Academy.
Space exploration community, Scientists, engineers,
Space Agencies from Africa and Latin America and other space agencies for support

Support Needed:

*Enrico will look into the existing activity on Laser TLC in space (SMART-1, NASA missions, etc).
Karen will search for on-going activities in Virtual Reality at JPL and other NASA establishments.
Denis will look into the TRL (technology readiness levels) of the above activities. Doris will assess the scientific potential of Virtual Reality and will search if any conference, workshop*

Potential Sponsors:

IAA, Paris, 2012 Form

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Instructions and application form: see: "Scientific Activity" section at <http://iaaweb.org/content/view/256/393/>

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: