

Geophysical Research Abstracts,  
Vol. 10, EGU2008-A-11893, 2008  
SRef-ID: 1607-7962/gra/EGU2008-A-11893  
EGU General Assembly 2008  
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## **Sorrento Lunar Declaration,**

B.H.Foing and ICEUM9 participants

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More than 200 International Lunar Explorers gathered at the 9th International Conference on Exploration and Utilisation of the Moon (ICEUM9), held 22 - 26 October in Sorrento, near Naples. It was hosted by ASI Italian Space Agency and ESA, organised together with the International Lunar Exploration Working Group (ILEWG). The ICEUM9 conference engaged Lunar Explorers (veteran and young, scientists, engineers, industry and organisations) in the review of recent activities and the preparation of the next steps on the Moon. Exciting ICEUM9 real time events included the watch of ISS International Space Station passing over Sorrento, and the live broadcast of the STS-120 Discovery launch, docking to ISS and astronauts handshake. The SMART-1 team presented latest results from the data analysis, and unveiled new polar image mosaics maps and other data, as well as technology lessons that will be used to assist future missions and the definition of the next landers. Since 4 October, the Japanese Kaguya spacecraft has been orbiting the Moon and has detached its sub-satellites. The ICEUM9 participants could witness in real time on 24 October the successful launch of Chang'E 1, the first Chinese lunar mission. The Indian Chandrayaan-1 mission (carrying three European and two US instruments) is preparing for launch in Spring 2008. Last but not least, the NASA Lunar Reconnaissance Orbiter and LCROSS impactor are scheduled for joint launch in October 2008. Representatives of National space agencies as well as ESA gave the latest news on their current lunar exploration activities and plans. ICEUM experts discussed science, technology, missions and plans, starting or enhancing collaborations for future space exploration. Several ICEUM splinter task groups presented their work on "Science of and from the Moon", "Living on the Moon", "Key technologies", "Utilisation of lunar resources", "Infrastructures for lunar bases", "Society, law, policy, economics",

"Public outreach, education, arts, multi-cultural aspects". During the Lunar Science sessions, the most recent discoveries on the Moon and concepts for future missions were debated. In the technologies sessions, lunar exploration activities were presented on missions, landers, rovers, robotic outposts, and habitats. Young Lunar Explorers (with travel support from ESA, ASI and ILEWG) organised one of the sessions, to brainstorm, present their ideas, dreams and hands-on lunar projects. They reflected on low cost missions, human habitats, lunar governance.

The ICEUM9 participants recommend to space agencies and lunar exploration stakeholders: - That, in view of the new framework document for international exploration developed by the Space Agencies Exploration Coordination Group, the ECG could benefit from the capabilities and knowledge of the ILEWG technical membership and ICEUM previous work and legacy - To advance the integration and analysis of data and results from historical and new lunar missions - To sustain the resources for the lunar community, in synergy with Mars and other planetary science and exploration missions - To use opportunities for international cooperation at all levels (agency, mission, instrument, science, subsystem, or operations). This can increase sustainability through investment in the upcoming missions that are multi-purpose by design. - To continue efforts by space agencies and communities on previous ILEWG and ICEUM recommendations. We recognise the progress and coordination between agencies made on the technical issues of the Beijing06 declaration such as: cross-calibration targets, common co-ordinates reference frame, PDS-PSA compatible data archiving data formats. - To address outstanding lunar science questions remaining to be resolved (relating to mineralogy, geochemistry, interior structure, gravity, topography, polar regions, volatiles, environment protection) as well as the scientific investigations that can be performed from the Moon as a platform (astrophysics, solar physics, Earth observations, life sciences) - To encourage much closer interactions between projects at a scientist-to-scientist level in order to ensure that the synergies within these complementary approaches yield the maximum scientific return. - To evolve ICEUM unique gatherings, moving to a workshop mode to promote these interactions between worldwide missions and to fully utilise the incredible wealth of lunar data that are now coming in. We have reached a cusp point where we need to find a new way of working together more effectively, with a sustained oriented international effort to support projects from space agencies. - To give more emphasis on the human aspects within the ILEWG community, and to build up cooperation on human international lunar missions. - To support and ensure Lunar data dissemination via modern free web-based interfaces, especially for countries without immediate access to the current databases or analysis tools. - To establish an informal Lunar Surface Operations Working Group under the ILEWG, which would aid in the definition of compatibility issues, such as interoperability for both initial robotic and later human

missions. We need now to exchange information and coordinate the studies of national lunar missions that could lead to complementary elements of a global robotic village.

- To reaffirm commitment to support the presence of Young Lunar Explorers (YLEs) in the international lunar exploration programme, based on the success of the already existing student lunar projects and the emergence of new missions building on past experience.
- To support the undertaking of a broader range of student lunar projects such as cubesats and instruments piggybacking on missions to the Moon,
- To expand our support to student lunar lander projects as a logical next step in the YLE's vision of lunar exploration.
- To encourage low-level data exchange program development so that YLEs may have access to scientific data from lunar missions to enhance their research.
- To initiate discussion in areas of immediate political and legal concern regarding lunar exploration and the use of the Moon for the benefit of human kind.
- To engage the public (and in particular youth) in science and technology in this International Lunar Decade, from the Lunar Odyssey excitement of upcoming orbiters and landers.

We, ICEUM9 participants, reaffirm our commitment to international lunar exploration, from the science analysis of current precursor robotic missions, to the global robotic village, and the preparation of international human settlements on the Moon.

Endorsed unanimously by the ICEUM9 participants, Sorrento, Italy, 26 October 2007

ILEWG website: <http://sci.esa.int/ilewg> ICEUM9 website: <http://sci.esa.int/iceum9>