

## COSPAR ICEUM13: Pasadena Lunar Declaration 2018

Bernard H. Foing (1,2), Carle Pieters (3), Gregory Schmitt (4) & COSPAR ICEUM13 Participants  
(1) ESA ESTEC ; (2) ILEWG ; (3) Brown U; (4) SSERVI; ([Bernard.Foing@esa.int](mailto:Bernard.Foing@esa.int))

Lunar, Planetary and Space Explorers attended the 13th ILEWG International Conference on Exploration and Utilisation of the Moon (ICEUM13) from 16 to 20 July 2018 at COSPAR 42nd Assembly in Pasadena, California. The ICEUM13 was co-organised by the International Lunar Exploration Working Group (ILEWG [1-12]) with support of COSPAR Panel on Exploration, COSPAR commissions B, E, F, and representatives from agencies, SSERVI and space research institutions.

*COSPAR participants of ICEUM13A B3.3 session on Lunar science and Exploration:*

- Appreciated great talks given at session showing lively ongoing research and projects
- Recognise the work from ILEWG, SSERVI partnerships
- Endorse ILD international lunar decade 2020-2030 proposal (submitted by the late David Dunlop)
- Recommend to consider astrophysics, heliophysics and radio science from the Moon
- Encourage to consider life sciences experiments on precursor robotic missions
- Call for studying opportunities from commercial landers and missions
- Endorse small and cubesats for lunar science and exploration
- Call for communication links infrastructures and services
- Reiterate guidelines for protection of environment and to keep the Moon farside radio quiet
- Request a study of opportunities of large cargos (Blue origins, Space X) by ILEWG/SSERVI
- Endorse the extension of B2 sub-commission tasks to “planetary maps, cartography, geodesy, reference frames & data management”

*COSPAR participants of ICEUM13B PEX2 Human and Robotic Exploration of Moon, Mars and NEOs:*

- Attended Interdisciplinary talks on science, technology, radiation, human spaceflight, habitats, life support
- Noted key aspects of radiation research, health risks, countermeasures, travel to Mars
- Noted the interest of MoonMarsNEOs in situ resources utilisation, sustainability for programme and links to UN Sustainable Development Goals (SDGs)
- Recognize the need for robotic MoonMars precursor missions, to address Strategic Knowledge Gaps, technology development, terrestrial analogues
- Recommend to ILEWG, IMEWG, SSERVI and partners to define Reference design scenarios for robotic village outposts and for Habitats on Moon, Mars and NEOs
- Urge to improve ways how to engage stakeholders, private funding, public and youth, to make progress and to ensure benefits
- Ask to discuss an effective mechanism for establishing priorities, and organising commercial partners to come in
- Recommend a Rational and multi-purpose driven programme
- Reiterate the need for protection of environments regarding science, utilisation and ethical considerations, and the establishment of a framework for planetary stewardship

These recommendations were endorsed unanimously by ICEUM13 participants and by COSPAR Moon B3 sub-commission and were presented at COSPAR commission B meeting.

*For the ICEUM13-COSPAR2018 B3.3/PEX2 sessions Pasadena participants in Pasadena,*

*Prof Bernard Foing (ESA, ILEWG & VU Amsterdam), Main Science Organiser*

*Prof Carle Pieters (Brown U.) , Dr Gregory Schmitt (SSERVI), Deputy Organisers*

## References

- [1] H. Balsiger et al. Eds, International Lunar Workshop, 1994 May 31-June 3, Beatenberg, Switzerland. Proceedings. Ed. European Space Agency, 1994. ESA-SP-1170
- [2] R.M. Bonnet et al, 'Mission to the Moon, Europe's Priorities for Scientific Exploration and Utilisation of the Moon', European Space Agency, ESA SP-1150, June 1992
- [3] W. Huntress, D. Stetson, R. Farquhar, J. Zimmerman, B. Clark, W. O'Neil, R. Bourke& B. Foing,'The next steps in exploring deep space - A cosmic study by the IAA', Acta Astronautica, Vol 58, Issues 6-7, 2006, p302-377
- [4] P. Ehrenfreund et al. "Toward a Global Space Exploration Program: A Stepping Stone Approach" (Advances in Space Research, 49, n°1, January 2012), prepared by COSPAR Panel on Exploration (PEX)
- [5] [http://www.lpi.usra.edu/leag/GER\\_2011.pdf](http://www.lpi.usra.edu/leag/GER_2011.pdf);
- [6] GLUC/ILEWG/ICEUM11 Beijing Lunar Declaration  
<https://www.lpi.usra.edu/meetings/leag2010/pdf/3052.pdf>  
<https://www.lpi.usra.edu/meetings/leag2010/presentations/TuePM/arvidsonEtAl.pdf>
- [7] ICEUM10LEAG-ILEWG-SRR, Cape Canaveral 2008  
<http://www.lpi.usra.edu/meetings/leagilewg2008/>
- [8] ICEUM10 Cape Canaveral Lunar Declaration 2008  
<https://www.lpi.usra.edu/meetings/leagilewg2008/declaration.shtml>
- [9] U National Research Council (2007), The Scientific Context for Exploration of the Moon
- [10] P. Ehrenfreund , B.H. Foing, A. Cellino Editors, The Moon and Near Earth Objects), Advances in Space Research, Volume 37, Issue 1, pp 1-192, 2006
- [11] ICEUM8 Beijing Lunar Declaration 2006  
<https://www.sciencedirect.com/science/article/pii/S027317708001683?via%3Dihub>
- [12] ICEUM9 Sorrento declaration  
<https://www.lpi.usra.edu/meetings/nlsc2008/pdf/2099.pdf>