BEIJING LUNAR DECLARATION 2010: A) GLUC-ICEUM11 REPORT AND RECOMMENDATIONS ON SCIENCE & EXPLORATION R. Arvidson[1,3], B.H. Foing[1,2], B. Cohen[1,5], J. Plescia[1,5], J.E. Blamont[1,2,4] & participants to GLUC-ICEUM1 (Global Lunar Conference-11th ILEWG Conference on Exploration and Utilisation of the Moon, Beijing 2010), [1]GLUC-ICEUM11 International Programme Committee, [2]ILEWG c/o ESTEC PB 299, 2200 AG Noordwijk, NL (Bernard.Foing@esa.int), [3]Washington U. St Louis (arvidson@wunder.wustl.edu), [4]CNES, [5] MSFC (Barbara.A.Cohen@nasa.gov)

GLUC-ICEUM11 2010: We report on the Beijing Lunar Declaration for those topics related to science and exploration .

Beijing Lunar Declaration 2010 (part A): " Four hundred sixty seven lunar scientists, engineers, and explorers from 26 countries assembled at GLUC Global Lunar Conference including the 11th ILEWG Conference on Exploration and Utilisation of the Moon (ICEUM11) from 31 May to 3 June 2010, in Beijing. The GLUC-ICEUM11 was co-organised by the International Lunar Exploration Working Group (ILEWG), the International Astronautical Federation (IAF) and the Chinese Society of Astronautics (CSA), with the support of China Aerospace Science & Technology Corporation (CASC). More than 50 International and Chinese high-level officials attended the opening ceremony of the Global Lunar Conference and 400 students joined a Youth event at Beijing Institute of Technology.

The conference engaged scientists, engineers, and explorers with representatives of various agencies and organisations in the discussion of recent results and activities, and the review of plans for exploration. Space agency representatives gave the latest reports on their current lunar activities and programmes.

GLUC-ICEUM11 was a truly historical meeting that demonstrated the world-wide interest in lunar exploration, discovery, and science.

More than 400 abstracts were accepted for oral and poster presentations in the technical sessions which were organised in 32 sessions within 4 symposia: Science and Exploration; Technology and Resource Utilisation; Infrastructure and Human aspects; Moon, Space and Society.

The latest technical achievements and results of recent missions (SMART-1, Kaguya, Chang'E-1, Chandrayaan-1, LCROSS and LRO) were discussed at a plenary panel and technical sessions, with the Lunar Reconnaissance Orbiter (LRO) still in operation. In particular, new Chang'E-1 results demonstrated the importance of these new observations for understanding the Moon.

Four plenary panel sessions were conducted: 1. What are the plans? 2. New mission results; 3. From space stations and robotic precursors to lunar bases; 4. Moon, Space, Society

The participants summarized their findings, discussions and recommendations as reported below.

1. Science and exploration

- World-wide access to raw and derived (geophysical units) data products using consistent formats and coordinate systems will maximize return on investment. Detailed plans should be developed and implemented for generation, validation, and release of these data products. Data should be made available for scientific analysis and supporting the development and planning of future missions. It is particularly important that the raw data be made available.

- There are important outstanding questions about the Moon that focus on understanding the: Structure and composition of crust, mantle, and core and implications for the origin and evolution of the Earth-Moon system; Timing, origin, and consequences of late heavy bombardment; Impact processes and regolith evolution; Nature and origin of volatile emplacement; Implications for resource utilization. These questions require international cooperation and sharing of data and results in order to be answered in a cost-effective manner

- Ground truth information on the lunar far side is missing and needed to address many important scientific questions, e.g., with a sample return from South Pole-Aitken Basin.

- Knowledge of the interior is poor relative to the knowledge of the surface, and is needed to address a number of key questions, e.g., with International Lunar Network for seismometry and other geophysical measurements.

- Lunar missions will be driven by exploration, resource utilization, and science; we should consider minimum science payload for every mission, e.g., landers and rovers should carry instruments to determine surface composition and mineralogy.

- It is felt important to have a shared database about previous missions available for free, so as to provide inputs to future missions, including a gap analysis of needed measurements. Highly resolved global data sets are required. Autonomous landing and hazard avoidance will depend on the best topographic map of the Moon, achievable by combining shared data.

- New research topics in such areas as in life sciences, partial gravity processes on the Moon should be pursued to support future missions."

Links: http:/sci.esa.int/ilewg, www.gluc2010.org