



IAU statement to be delivered at the 61st STSC session

under Agenda Item 11 - Long-term sustainability of outer space activities

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Madame Chair, distinguished Delegates,

The International Astronomical Union presents its perspective that the Moon offers unique opportunities for major observational discoveries in astronomical science. The Moon combines the advantages of the vacuum of space with the stability of a ground-based platform. Cheaper launch to the Moon and the development of lunar infrastructure enable these scientific opportunities, but many planned and potential activities are, in some instances, incompatible with the critical need for these scientific facilities to be free from noise and interference.

A process for the allocation, coordination around, and protection of lunar sites is needed to assure successful multiple long-term and sustainable scientific uses of the Moon and its orbital environment.

The scientific case and the unique lunar sites were detailed in the Technical Presentation, "Opportunities and Threats for Astronomical Observations from the Moon". I call your attention to the Conference Room Paper on the Protection of Astronomy and Science on the Moon, presented by the International Astronomical Union, Square Kilometer Array

Observatory, European Organisation for Astronomical Research in the Southern Hemisphere, European Astronomical Society, Open Lunar Foundation, For All Moonkind and Secure World Foundation.

The Conference Room Paper presents several examples of scientific opportunities:

1. Ultra-low frequency radio observations in the shielded zone on the far side of the Moon probe the original building blocks of the galaxies. Eventually we will want to build an array of antennae spanning some 200 km, for which there are few sites on the lunar far side. Those would need to be allocated for scientific use and protected against Unintended Electromagnetic Radiation.
2. From the Moon, long periods of continuous viewing enable the monitoring of the atmospheres of exoplanets and the search for biosignatures in the atmospheres of Earth-like planets. To suppress the thermal noise that would swamp the faint cosmic signals in the infrared, the telescope and instruments must operate under very cold conditions. On the Moon, the permanently shadowed regions on crater floors are extremely cold. However, many of these craters are also attractive for extraction of frozen water ice, an activity incompatible with the low dust, low noise environment required for telescope operation.
3. Gravitational waves propagate through the Universe from the mergers of extremely dense objects like white dwarfs, neutron stars, and black holes. The Moon is intrinsically much more seismically quiet than the Earth, and has a natural vacuum, so it provides a greatly advantageous platform. Detectors on the Moon would be sensitive to lower frequencies than those on Earth and higher than those in space,

allowing the exploration of unique classes of mergers and testing Einstein's Theory of Relativity. Disturbances generated by nearby landings and launches or by heavy equipment for exploration or mining would not be compatible with these sensitive observations.

Distinguished delegates: the ability to utilize the unique advantages of science on the Moon, including astronomy, will depend on the development of internationally accepted methods to communicate, signal intentions between actors, foster coordination and due regard between relevant users and stakeholders, avoid harmful interference, and in allocating and protecting specific sites from interfering activities.

In short, some of the most important and pioneering scientific missions on the Moon can only take place in specific locations and under specific conditions, and can only take place if they are protected from interference—even from other peaceful uses.

Such a process of transparent and internationally-accepted coordination and protection for science is needed by the time the current phase of governmental and non-governmental demonstrations and prototyping of launch, delivery, and deployment is complete.

We encourage the distinguished delegates' thinking and planning on this complex issue.

Madame Chair, Distinguished delegates and observers, thank you for your kind attention.