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RESERVATION OF A LUNAR ZONE FOR SETI PURPOSES

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Abstract

The proposal of Dr. Jean Heidmann is well known: to reserve a crater in the Moon for SETI purposes. This proposal besides its scientific merits has an undeniable worth as legal project. It offers an opportunity to invigorate the principle of the Common Heritage of Mankind applied to the Moon and its natural resources. This principle was enshrined by the Moon Agreement and the common feeling of the peoples of the United Nations.

It is worthful to remind that the expressions *common heritage of mankind* and *natural resources* have a content that goes beyond economics. The heritage of the present generation is composed of all the spiritual, natural and cultural assets resulting from the creation and work of their predecessors. This heritage together with the assets derived from the work and progress of the living generations, constitute the Common Heritage of Mankind.

The reservation of a lunar zone for scientific activities, and its further utilization aiming to the common good of humanity, must be recognized and constitute a precedent for future utilization of the diverse forms of common heritage recognized to mankind and that are integrated in a whole of non-transferable and unrenounceable rights.

The benefit derived from such initiative are multiple because it shall increase SETI activities and by other side, it corresponds adequately with the 46th Congress issue: **Benefits of Space for Humanity** in the planning of space systems and services.

Benefits of Space for Humanity

The exploration and use, including exploitation of Space and celestial bodies, is fundamentally a scientific and cultural enterprise. In this sense we use the word humanity, that is to say, a new dimension for the human nature, where the condition of being a man has a new scenario according with its ethimology, from *humanus* pertaining to man, from *homo-hominis*, a man.

Activities in outer space and celestial bodies are, in accordance with international law, space law and celestial bodies law, inspirated in multiple legal principles: common interest of humanity; progress of the exploration and utilization of outer space with peaceful purposes; benefits of all peoples; exploration and use of outer space as a province of all mankind; freedom of exploration and use and free access to all areas of

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celestial bodies; freedom of scientific investigations; astronauts recognized as envoys of mankind in outer space; cooperation and mutual assistance with due regard to the corresponding interests of all other countries; protection against potential harmful interference of activities of other, to prevent the Moon from becoming an area of international conflict; benefits derived from the exploitation of the natural resources of the Moon and celestial bodies; open information to the public and international scientific community of lunar activities; prevention of the disruption of the existing balance in the lunar environment from the Moon to the Earth or from the Earth to the Moon; regime of common heritage of mankind for the Moon and its natural resources; neither the surface nor the sub-surface of the Moon nor any part thereof of natural resources in place shall become property of any State, international intergovernmental or non-governmental organization, national organization and non-governmental entity or any natural person.

As it can be noticed, there exists a legal framework sufficiently broad and complete to develop the proposal of affecting a crater in the Moon with specific aims: the benefit of humanity. All precedent principles had entered into force by ratification or accession of international instruments known as *Corpus Iuris Spatialis*.

The National Academy of Air and Space of France, initiated in 1990 the study of the contributions of the space conquest for humanity. The conclusions of this study were approved in 1992. The French Academy yearns that the conclusions of the workshop debate may result useful for all who have decide or will decide the space projects and programs in the following decades. [1] One of the more concerning problems to preview future benefits for humankind is the human activity in outer space: "Threaten by the human activity, that may destruct in only some years what nature needed several millions of years to built, this imposes the necessity to preserve Earth. It is a priority if we pretend to follow observing the universe altogether and wondering ourselves for its richness... Measures taken after the Apollo missions have demonstrated that there is no other place more stable than the Moon's surface, in any case more stable than Earth, the quakes in the Moon are much more weak than earthquakes; thus, the installation of an interferometer on the Moon's surface shall imposed itself.[2]

The first benefit from outer space are telecommunications. The time has come to verify if we can expect a benefit from a celestial body: the Moon for SETI communications.

The protected farside lunar-based SETI facility is proposed to be located in Saha crater, for many reasons. Except for emissions from interplanetary probes, the lunar farside is free of all human radio pollution. Requirements are reduced just to a very limited zone. Saha crater has a 100 km diameter. I has a nearly circular strong rim, with double walls on the western side. The floor looking generally smooth at large scale, is partly crossed by a more or less alignment of modest heights and has an impact crater about 15 km large; a larger 30 km crater straddles the N-W rim. The depth of the West wall, is an important element for protection from the Earth radio frequency interference. [3]

A Questionnaire for Jurists

In the last two years, Heidmann, astronomer of the Paris Observatory, exposed not only in different scientific fora his proposal for

the establishment, next coming 20-30 years, of a lunar crater protected from human made radio frequency interference, dedicated to high sensitivity radioastronomy, such as SETI. The proposal was also presented asking for legal commentaries in a paper submitted to the IISL Jerusalem Colloquium. The five questions posed by the author were answered in the discussion following the presentation by Steven E. Doyle, who suggested to publish a specific, technical proposal taking into account the experience obtained by existing radioastronomy fixed facility operators. Next step will be informal consultations in the ITU for registration and recognition. In order to establish priority of right of the far side facility, it would be necessary to activate and complete an international registration procedure with the ITU and to have the facility identified in the international radio frequency mechanism. Dr. Doyle suggested also the submission of this project proposal to ICSU-COSPAR, the IAA and the IAU. All these steps would create a historical precedent and provide for information in the near future when space activities will be undertaken on the Moon.[4] Other comments and suggestions were made by Lubos Perek, Henry J. Meyerhoff, Vladimir Kopal, and me. Summarizing these opinions and adding other reflections, I can offer an updated and wider basis for discussion of the questionnaire:

1. How to initiate the discussion?

By starting a discussion among international academic organizations, IAF, IISL, IAA, ICSU-COSPAR, IAU; afterwards ITU/Bureau of Radio Communications, Study Group for frequencies 1-5 GHz.

2. What legal problems are raised?

The establishment of the priority in the right of the facility by a registration procedure with the ITU.

3. How can they be solved?

By paying special consideration to the principles of the Moon Agreement, in particular Art. 3, the use of the Moon exclusively for peaceful purposes; and Art. 11, the Moon and its natural resources are the common heritage of Mankind.

4. How a mutual understanding can be planned?

By publishing a common specific system proposal through the international academical institutions mentioned above, to be presented at the UN COPUOS and ITU;

5. In which frame can it be elaborated?

To recognize the reservation of a lunar zone which constitutes a precedent for future utilization of the Common Heritage of Mankind, and providing useful information in the near future when other space activities will be undertaken on the Moon.

The above mentioned issues may be solved if the IISL Board consider in a specific Colloquium session the Legal and Regulatory Issues Arising from the Protected Radio Astronomy Operation off the Earth with regard to legal aspects of the SAHA crater proposal.

Time to Act

In view that in case an extraterrestrial artificial signal is discovered, this will be immediate proof that civilizations are plenty in the cosmos, and the odds are that, with our freshing acquired experience, we shall read-

ily unravel a dozen of them within a few years. Then the drive to investigate them, in all of their obligatory varieties, will get quite strong. Extrapolating the fact that for the last 30 years the efficiency of our SETI detection systems doubled each eight months, a dramatic progression, we shall get access to fainter and fainter extraterrestrial emitters. Unfortunately, the Earth or near-Earth man-made radio interferences will become a stronger and stronger obstacle to this investigations.[5]

In the same sense, Klein and Gulkis consider that in view of the near future SETI technological improvements, the dramatic increase in the level of human-made radiofrequency interference will be catastrophic. [6]

Conclusion

Man has always waited a benefit from the Moon, particularly since he could visit it. Among other reasons because it is the natural satellite of Earth, it is reached by the law humanity has elaborated expressly, this has allowed giving it the advantages of the new legal regimes that legal science has been able to elaborate to improve the future of humankind. Among other, humankind created the principle of Common Heritage of Mankind. The crater Saha project shall be the first concrete application of the principle of Common Heritage of Mankind in its real interpretation, 29 years after of having expounded this principle by Argentina in the United Nations and 26 years after being presented the first draft Agreement by Argentina in the United Nations.

Nothing opposes this project to receive the academic, legal and political support and thus become a soon reality.

Footnotes

1 *Annales de l'Academie Nationale de l'Air et de l'Espace*, 1991-1992, 108.

2 R. M. Bonnet, La recherche spatiale, *Annales*, cit., 129-130.

3 J. Heidmann, Saha crater: A candidate for a SETI lunar base, *Acta Astronauta*, 32, 6,471.

4 Report of the discussions held after the 4 sessions of the 37th Colloquium on the Law of outer Space, *Proceedings of the Thirty-Seventh Colloquium on the Law of Outer Space*, Jerusalem 1994, Ed. AIAA, Washington DC 1995, 320.

5 J. Heidmann, SETI from the Moon, 1, paper to be expounded at the Trieste Conference on Chemical Evolution, IV: Physics of the Origin and Evolution of Life, manuscript by courtesy of the author.

6 M. J. Klein and S. Gulkis, *Bioastronomy: the Search for Extraterrestrial Life* (Edited by J. Heidmann and M. J. Klein). Lecture Notes in Physics, No. 390, 203. Springer, Heidelberg 1991, quoted by J. Heidmann in Saha Crater: A candidate for a SETI Lunar Base cit. 471.