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Legal Implications of the IAU Resolutions on Planet Definition: Some Preliminary Observations

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ABSTRACT

This paper will consider the legal aspects of the IAU Resolutions on Planet Definition, paying particular attention to the Outer Space Treaty of 1967 and the Moon Agreement, as well as the COSPAR planetary protection policies. Pertinent terminology within legal texts will be examined, including relevant United Nations General Assembly Resolutions. In addition, the legal significance of the terms "planet," "dwarf planet," and "small solar system bodies" will be explored, together with the binding nature *vel non* of resolutions adopted by scientific bodies.

INTRODUCTION

The International Astronomical Union (IAU) made headlines in August, 2006, when it resolved to remove Pluto from the classification of a "planet." This reclassification was the result of the adoption of new definitions for "planet," "dwarf planet," and "small solar system bodies." This action by the IAU generated substantial public interest, as it changed what had been the prevailing scientific as well as common and popular knowledge for the past 70 years, namely, that there were 9 planets orbiting our sun. But was this a revolutionary development, or has the significance of the IAU resolutions been overestimated? More specifically, what is the legal significance of the scientific definitions of "planet," "dwarf planet," and "small solar system bodies?"

DISCUSSION

The resolutions adopted by the IAU are as follows:

Resolution 5A

> The IAU . . . resolves that planets and other bodies, except satellites, in our Solar system be defined into three distinct categories in the following way:
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> (1) A planet is a celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to over come rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, and (c) has cleared the neighborhood around its orbit.
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> (2) A "dwarf planet" is a celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a

hydrostatic equilibrium (nearly round) shape, (c) has not cleared the neighborhood around its orbit, and (d) is not a satellite.

(3) All other objects, except satellites, orbiting the Sun shall be referred to collectively as "Small Solar System Bodies."

Resolution 6A

The IAU further resolves: Pluto is a "dwarf planet" by the above definition and is recognized as the prototype of a new class of Trans-Neptunian objects.

The IAU referred to another category of celestial bodies, that of "Trans-Neptunian objects." Although not specifically defined in the resolutions, "Trans-Neptunian objects" appear to include dwarf planets and small solar system bodies with at least part of their orbit beyond the orbit of Neptune. The question is presented, how do these IAU definitions compare and comport with the applicable *corpus juris spatialis*?

The international legal community long has considered natural space objects, but has utilized substantially different terminology than the IAU. In December, 1961, the United Nations General Assembly unanimously adopted Resolution 1721(XVI)A, which provided, in pertinent part

(a) International law, including the Charter of the United Nations, applies to outer space and celestial bodies;

(b) Outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation

UNGA Resolution 1721 established a precedent for the utilization of the term "celestial bodies" in the legal regulation of outer space. The Outer Space Treaty of 1967 continued this precedent, incorporating the concept into the phraseology of "outer space, including the Moon and other celestial bodies," which appears in the title of the instrument as well as in numerous articles throughout the text.

This formulation of "outer space, including the Moon and other celestial bodies" has been incorporated into subsequent legal texts, including the Moon Agreement of 1979, and UNGA Resolution 51/122 in 1996. Moreover, the phrase has not been revised in the past 40 years, although article 1.2 of the Moon Agreement provides that references to the Moon include orbits around and trajectories to the body.

Conspicuously absent from both the Outer Space Treaty and the Moon Agreement are any references to "planets." Similarly, these international instruments do not mention "dwarf planets," "small solar system bodies," or "Trans-Neptunian objects." The *corpus juris spatialis* expressly applies to the activities of states concerning "celestial bodies," but that term is not specifically defined in the legal texts. Some guidance as to what constitutes a celestial body can be found in the plain language of "the Moon and other celestial bodies," which indicates that the Moon itself is a celestial body.

Fasan has assembled a compilation of efforts by legal authors to define what constitutes a celestial body, with opinions variously including or excluding the sun, and comets, asteroids, and other "planet-like subsidiaries." Nevertheless, there was no dissent noted from the inclusion of planetary bodies and their satellites within the meaning of celestial bodies. Even assuming arguendo that some comets, asteroids or other "planet-like subsidiaries" are not celestial bodies, it seems clear that Pluto, and its satellites, are uniformly considered to be celestial bodies, notwithstanding any scientific definition of "planet" or "dwarf planet." Indeed, the IAU resolutions themselves expressly consider "planets" and "dwarf planets" to be celestial bodies.

To the extent the international scientific community defines terms which are not expressly set forth or unquestionably synonymous with words or phrases contained within treaties and other international agreements, such definitions may not have binding legal effect. However, these definitions may play a crucial role in scientific self-regulation. That is, the actions of scientific governing bodies may be fully applicable to the activities of their constituent members, and compliance may be necessary for the fulfillment of international obligations, both treaty and otherwise. This presupposes, however, that the actions of the governing body were validly adopted in conformity with the laws and regulations of appropriate states, as well as with the internal policies, practices, and governing documents of the adopting organization.

The situation may be quite different if the scientific community was to adopt a resolution which was in direct conflict with an international legal text, for example, by a definition of "celestial body" which excluded Pluto, and thereby removed that body from the protections of the *corpus juris spatialis*. In such a case, from a strictly legal perspective, the treaty or other international agreement would take precedence over scientific self-regulation. Barring such a direct conflict, specific scientific definitions could be considered to be complementary to the more general terminology of the space treaties. Nevertheless, the definitions adopted by one scientific governing body are not necessarily binding on third parties or other scientific organizations.

A case in point concerns the COSPAR planetary protection policy. This scientifically defined policy is intended to protect pristine celestial environments from biological contamination caused by earth-based interplanetary spacecraft, in compliance with international treaty commitments. Pursuant to the current formulation of the COSPAR policy, varying levels of planetary protection are to be implemented, ranging from essentially none, to complete sterilization of spacecraft, depending generally upon the type of mission and target body combination. Significantly, and despite the nomenclature, the planetary protection policy is not restricted to "planets," and the mission type/target body combinations are not differentiated by whether or not the target body is a "planet." Rather, the COSPAR policy extends to both planets and their moons, and is based upon assessments of whether or not the target body is of interest in the search for life. Thus, the applicability of the planetary protection policy to Pluto is not dependent upon its classification as a planet, dwarf planet, or Trans-Neptunian object.

REFERENCES

IAU Resolutions 5A, 6A, text reproduced in Dissertatio cum Nuntio Sidereo III, August 24, 2006, IAU Congress newspaper, **www.astronomy2006.com/ga-newspaper.php**

UNGA Resolution 1721 (XVI) A, *International Co-operation in the Peaceful Uses of Outer Space,* December 21, 1961

UNGA Resolution 51/122, *Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interests of All States, Taking into Account the Needs of Developing Countries*, December 13, 1996

Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *opened for signature* January 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205, *text reproduced in* UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 3 (2002)

Treaty on Principles Governing the Activities of States on the Moon and Other Celestial Bodies, *entered into force* July 11, 1984, *text reprinted in* UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 27 (2002); *and* 18 I.L.M. 1434 (1979)

COSPAR Planetary Protection Policy, **http://www.cosparhq.org/scistr/PPPolicy.htm**

Fasan, *Asteroids and Other Celestial Bodies - Some Legal Differences*, 26 JOURNAL OF SPACE LAW 33 (1998)

Sterns and Tennen, *The Future of Planetary Protection: Is There Reason For Optimism?*, IAF Paper No. IAC-06-E6[1].5 (2006)