

What is a Planet? Nadine Barlow's Editorial

The following editorial article appeared in Flagstaff's Arizona Daily Sun newspaper on Tuesday, August 29, 2006.

The International Astronomical Union has voted to demote Pluto from full planetary status, but as a planetary scientist, I know that reclassifying Pluto as a dwarf planet will not make any difference scientifically—we will still study it.

But humans are resistant to change. Most of us grew up learning that our solar system contains nine planets, and we are upset by this change. Because Pluto was discovered at Lowell Observatory, Flagstaff residents definitely have a vested interest in this little world.

One benefit arising from this controversy is the enhanced awareness that science is not static. I first realized this in fifth grade when I learned about the discovery of Saturn's moon Janus. Janus was the first new moon discovered in 15 years, the first new moon in the lifetime of that fifth-grader. That was when I realized that science is not just a bunch of facts discovered long ago. Science changes as new information is obtained through technological advances.

Planets originally were defined as objects moving relative to the stationary background stars. That definition no longer fits the diversity of objects comprising our solar system. We need a definition based on physics. We need to keep it simple. That is why I liked the definition proposed by the planet definition committee appointed by the IAU: A planet orbits a star and has sufficient mass so its gravity has pulled it into a sphere. It is short, simple and comprehensible.

We could then subdivide planets into terrestrial, giant and perhaps dwarf planets. We teachers would not force students to learn the names of all the planets, especially once the count reached more than about 15. Instead we would focus on the physical characteristics that set the planetary subgroups apart: composition, size, rotation rate, etc.

Memorizing the names of the planets is not science. Science involves understanding planetary similarities and differences and what they imply about the solar system's evolution.

The planet definition committee, which included planetary scientists, astronomy historians and science writers, originally proposed a definition which would have made Pluto-Charon a double planet and given us at least a 12-planet solar system.

Before forming the committee, the IAU requested input on possible members from the American Astronomical Society's Division for Planetary Sciences, the largest international organization of planetary scientists. Many members of the final committee were on the list submitted by Division for Planetary Sciences' Executive Committee.

The planet definition committee spent months working on this issue and did a very thorough job, drawing upon community input to develop their recommendation. The rejection of their proposed definition by those attending the IAU General Assembly in Prague is an insult to the committee's hard work.

The resolution to bestow planetary status upon only eight objects was hastily thrown together in one week during the meeting. Those voting on the resolution to demote Pluto represented only 5 percent of the entire IAU membership, and planetary scientists comprised about 10 percent of those voting. Why the small turnout? Only those in attendance in Prague could vote. Most of us could not attend the meeting because we lacked travel funds and/or had academic commitments.

That is what bothers me about this vote. Planetary scientists, not cosmologists studying distant galaxies, should have the majority input into the criteria for defining a planet and it should be their vote that prevails. I would accept a new definition of what constitutes a planet if it had been discussed and approved by the planetary community.

Changing the designation of a planet is not unprecedented in the history of astronomy: Ceres joined the planetary ranks when it was discovered in 1801, but with the discovery of additional small objects orbiting between Mars and Jupiter, it was later relegated to the title of largest asteroid.

However, now we are confronted with a convoluted definition that requires that a planet not only orbit the sun and is spherical but must also gravitationally clear its orbital neighborhood of debris. "Neighborhood" is not defined in the approved resolution. How far out does it extend? Does "debris" include non-natural debris, such as spacecraft? If so, then the Earth may not qualify as a planet. I know many NAU students in my Introductory Astronomy class will have trouble understanding this definition. I really feel sorry for elementary school teachers who have to explain this to their students.

We need a good definition for a planet. The IAU-approved resolution is not it.

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