

Cosmic Whack-A-Mole – the Pluto Problem

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People often overlook the obvious.

— Dr. Who

Abstract

In 2006, the IAU (International Astronomical Union) redefined what a ‘planet’ is and that has opened the door for discontents to challenge the criteria on which this re-definition was made — not just to go back, but to go forward, but in a different direction. But where will it end? Or will new factions in astronomy continue to arise and offer still more definitions for ‘planet’, ad infinitum? How long will we be in this Cosmic Whack-A-Mole contest until we finally resolve the ‘Pluto Problem’? A solution to this mess is proposed by my AI superbrain computer G.O.R.D.O.

1 Introduction

When the IAU demoted Pluto from being a planet to being a *dwarf planet*, I didn’t particularly care. After all, with the ever-growing knowledge we’ve gained about the solar system, resulting from better telescopes coming on-line and from many planetary probes sent to the remote parts of the solar system, the nomenclature we inherited from the beginning of the twentieth century seemed to be inadequate. I simply took it on faith that the IAU made the reasonable decision at the time.

By 2006, the IAU found it difficult to continue to call Pluto a planet when it was by then considered to be just a minor member of the Kuiper Belt, and there were known to be a lot of Kuiper objects of similar sized or larger.

So, it altered the definition of a ‘planet’ to the following:

Planetary Necessities:

1. The object must orbit the sun.
2. The object must be in hydrostatic equilibrium (that is, it must be roughly spherical) due to gravitational contraction.
3. The object must gravitationally clear-out its orbital surroundings.

Recently, a lot of excitement was generated by the publication of a paper in the journal *Icarus* Volume 374, 1 March 2022, going by the title:

Moons are planets: Scientific usefulness versus cultural teleology in the taxonomy of planetary science

Authors: Philip T.Metzger, W.M.Grundy, Mark V.Sykes, Alan Stern, James F.Bell III, Charlene E.Detelich, Kirby Runyon, Michael Summers

They begin their abstract with:

We argue that taxonomical concept development is vital for planetary science as in all branches of science, but its importance has been obscured by unique historical developments.

And later say that:

We present evidence that taxonomical alignment with geological complexity is the most useful scientific taxonomy for planets.

Although I agree with the authors that it's time to overhaul the taxonomy, I will argue below that we must first overhaul the scientific vocabulary. If you thought the general public was angry when the IAU demoted Pluto, wait till they find out that we now have planets orbiting other planets! The next section is my attempt to begin a solution to avoid this potential problem, as well as fix some others. For a convenience, in this paper I will refer to this looming taxonomy problem as the 'Pluto Problem'.

2 G.O.R.D.O.'s Solution

A few weeks ago, I stated the Pluto Problem to my brilliant AI computer named G.O.R.D.O.¹ and asked it to find a solution that could appease the growing number of dissidents. Two weeks later, G.O.R.D.O. was ready. It rang the bell to alert me that it wanted to communicate with me. So, I logged onto the computer and the following is the computer printout of the session:

Patrick: Hello, Computer.

G.O.R.D.O.: Hello, Patrick.

Patrick: So, you think you have a solution to the Pluto Problem?

G.O.R.D.O.: Yes, I have a possible solution.

Patrick: Great! Well?

G.O.R.D.O.: Invent new words.

Patrick: Invent new words?!

G.O.R.D.O.: Is there an echo in here?

Patrick: Sorry. Do you have any specific suggestions?

G.O.R.D.O.: Only if you promise not to laugh.

¹Not for real, of course. G.O.R.D.O. is a fictional character.

Patrick: I promise I won't laugh.

G.O.R.D.O.: Before I tell you, I should explain my rationale.

Patrick: That makes sense. Go ahead.

G.O.R.D.O.: The field of solar-system astronomy has matured a great deal in the last century. However, the vocabulary of the subject has not kept up. Thus, there are now too few words chasing too many concepts, both new and old, resulting in the overloading of terms or a clash of priorities in redefining terms. Confusion threatens to settle in and disrupt the subject for the foreseeable future.

Patrick: I know. I saw that looming. Go on, please.

G.O.R.D.O.: Unfortunately, this issue will never be resolved solely on the basis of scientific merit.

Patrick: Really? Why not?

G.O.R.D.O.: There are too many meritable, but irreconcilable, platforms to argue from. There are too many criteria to sort through, too many subtleties of definition, and far too many gray areas that will have to be resolved by fiat. Such as, how big this? How much mass? How spherical? How swept out of the matter in the orbit neighborhood? How massively different from its moons's masses? How eccentric its orbit? Etc.

Patrick: I see. Then what's the solution?

G.O.R.D.O.: Arbitration.

Patrick: Aren't all solutions to controversies like this settled by arbitration, anyway?

G.O.R.D.O.: No.

Patrick: Then how else?

G.O.R.D.O.: Find a dictator.

Patrick: Excluding that, can you arbitrate this for us?

G.O.R.D.O.: I can try. On the matter of the definitions of both 'moon' and 'planet', we shall leave them as they were defined circa 1980, with the exception that no object beyond the orbit of Pluto shall be accepted into the classification of 'planet'.

Patrick: Isn't that going to cause problems in the astronomy community to stop calling things planets just because they're not inside the orbit of Pluto?

G.O.R.D.O.: My estimation is that 39 percent of the community will not like it.

Patrick: Then why do it?

G.O.R.D.O.: My projections are that it will solve many more problems than it creates.

Patrick: Fair enough. But what's so special about 1980?

G.O.R.D.O.: I go by the dictum: If you must arbitrate, Arbitrate!

Patrick: My apologies, GORDO. I guess it is half a century after the discovery of Pluto. But you have to define those two terms for us for clarity.

G.O.R.D.O.: First, I will define the 'solar system' as that region of space that includes everything from the sun to the outskirts of the Kuiper Belt and the Oort Cloud. What do you think?

Patrick: That's fine by me. Please proceed.

G.O.R.D.O.: Planet – origin of the term: planeta [Latin], meaning 'wanderer', lights that appear in the heavenlies that are beyond the orbit of the Moon, and that move persistently relative to the fixed stars. They shall consist precisely of Mercury, Venus, Earth,² Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, and nothing else. They have the general characteristics of revolving around the Sun and being of roughly spherical shape. Moons are the natural satellites of the planets, having a minimum mass, as determined by the IAU.

Patrick: What if 'planet'-like objects are found orbiting the planets, or within the asteroid belt, the Kuiper Belt, or the Oort Cloud?

G.O.R.D.O.: The number of planets shall be fixed at nine, as given above. Planet-like objects being found among the various moons, or within the asteroid belt, or within the Kuiper Belt, or the Oort Cloud will have a new designation, under a new naming scheme.

Patrick: So, now we come to your new 'words', as you put it, right?

G.O.R.D.O.: Right. We begin with SSO(s), which stands for Solar-System Object(s), which shall include at a minimum the Sun, the nine planets, and their natural satellites, the asteroids, the comets, and the objects within the Kuiper Belt and the Oort Cloud.

Patrick: Anything else to reveal?

G.O.R.D.O.: Yes. Subcategories of SSOs shall include MSSOs, which stands for Major Solar-System Objects, which are the objects that are roughly spherical due to gravitational compaction.

Patrick: So, the planets are just a subset of these MSSOs, right?

G.O.R.D.O.: Affirmative.

Patrick: Go on, please.

G.O.R.D.O.: A subclass of the MSSOs are the AMSSOs, which stands for Active Major Solar-System Objects.

Patrick: I suppose 'active' stands for 'geologically active', right?

G.O.R.D.O.: Affirmative.

²Under the Copernican Model of the Solar System.

Patrick: What objects does this category cover?

G.O.R.D.O.: It includes geologically active planets, moons, asteroids, and Kuiper belt objects.

Patrick: That should make the planetary geologists happy, because they demanded to have those special MSSOs placed on an equal footing.

G.O.R.D.O.: That was one of my prime considerations. But, under this naming convention, you don't have to put up with 'planets in orbit around other planets' on a routine basis, as was one of your demands.

Patrick: Is there more?

G.O.R.D.O.: Affirmative. For the purpose of giving humans a more user-friendly name than MSSO, I made a replacement word for 'planet' from the Hungarian word for planet, which is *bolygo*. A modification of the word is necessary so as not to offend a native speaker of Hungarian. The derivative terms I invented from the term 'bolygo' are similar in meaning to, but not identical to, *planet*, *planetary*, and *planetology*, and they are, respectively, *bolytar*, *bolytary*, and *bolytology*.

Patrick: By choosing your standardizing reference year as 1980, that guarantees the inclusion of Pluto in your list of planets, whereas, if you had chosen a year from 2006 or later, that would have eliminated it from the list.

G.O.R.D.O.: Correct. For most of the twentieth century astronomers agreed that Pluto should be called a planet. Logically, there is no harm in including it in the revised list of planets, as the list is being established by fiat. However, whether you include Pluto or not in your list of planets, I suggest that you do not include any objects beyond the orbit of Pluto.

Patrick: What's the best argument you can give me to include Pluto in the list of planets?

G.O.R.D.O.: The next closest Kuiper Belt object that could qualify is Eris, which is about twice as distant from the Sun as Pluto.

Patrick: You mean that if we include Pluto in the list, we aren't likely to have a new Kuiper Belt object be found any time soon that will start up the controversy all over again?

G.O.R.D.O.: Affirmative. But stick to the nine-member list by fiat to settle the matter once and for all.

Patrick: I like your suggestions, GORDO, but why should they listen to me? I'm not one of their astronomical group.

G.O.R.D.O.: Ironically, that could work in your favor.

Patrick: True. Do you have anything else to add?

G.O.R.D.O.: Negative.

Patrick: Then, I'm logging off, GORDO. Thanks. Job well done.

G.O.R.D.O.: GORDO signing out.

3 Conclusion

Pluto a 'planet' again? Well, yes, but that wasn't my motivation for this paper. If Pluto doesn't become a 'planet' again, I won't lose any sleep over it. What I most wanted to do is to prevent the situation where 'planets are orbiting planets'. As for the word 'bolytar', if you don't like it, feel free to think up something better.

The latest faction attempting to take hold of the word 'planet' wants to use the fallacy of *poisoning the well* against the status quo. Anyone with some patience can notice that there are transluminous objects in the night sky that move relative to the fixed stars. One does not need to be of a mystical or astrological bent to notice that.