

NEWS

Planets are round. Will that do?

Next week, by a simple show of hands at an astronomy meeting, Earth could go from being one of nine planets to one of twelve — with unknown numbers yet to be discovered.

A seven-member panel appointed by the International Astronomical Union (IAU) has recommended a new definition of a planet: any body in orbit around a star that is not a star itself nor in orbit around a much larger planet, and that is massive enough for gravity to have squished it into an approximately spherical shape.

The IAU planned to introduce the notion in a draft resolution on 16 August, after *Nature* went to press, and will discuss it on 22 August during an open session at its general assembly in Prague, Czech Republic. Two days later, if a simple majority of IAU members vote for it or a slightly revised version, that will become the official scientific word on the topic.

Under the definition, most objects with a mass greater than 5×10^{20} kilograms, and typically with a diameter greater than 800 kilometres, would qualify as planets. That would instantly elevate the asteroid Ceres and Pluto's moon Charon to planet status, as Ceres is roughly spherical and Pluto and Charon can

be described as a binary planet system. The Solar System's twelfth planet would be object 2003 UB₃₁₃, nicknamed Xena, one of many 'trans-neptunian objects' lurking on the Solar System's fringes.

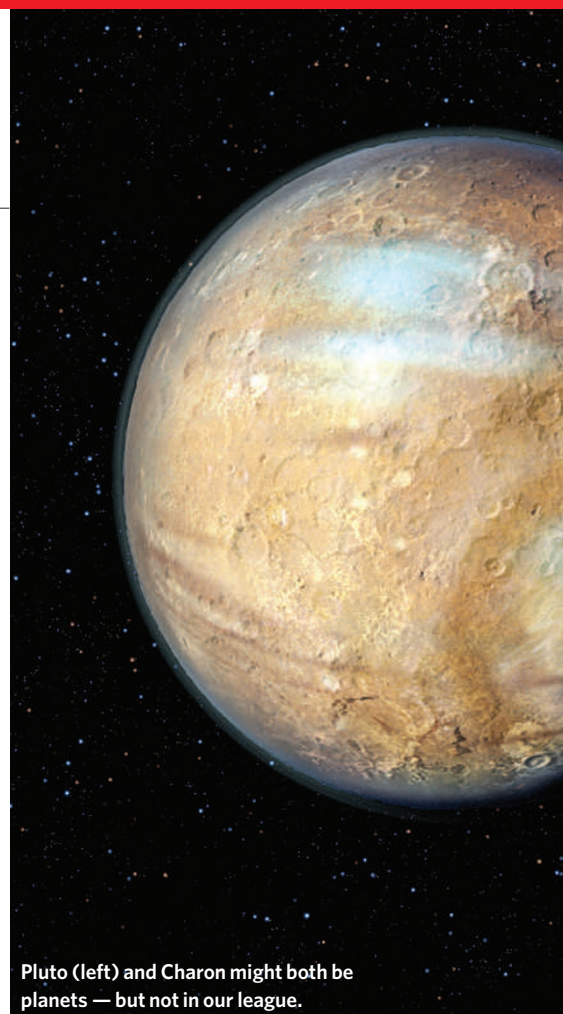
Not all are happy with the 'roundness' criterion, however. "It's not what I think of when I think of a planet," says Michael Brown, an astronomer at the California Institute of Technology in Pasadena and co-discoverer of UB₃₁₃. "I don't think of things that are a thousand times smaller than Earth."

The discovery of UB₃₁₃ beyond Pluto's orbit last year brought matters to a head. Astronomers have estimated that it is at least 2,400 kilometres in diameter — larger than Pluto, but smaller than any of the other eight planets.

All this demands a new definition of 'planet', some say. "If there is nothing accepted, we have to sit in the silly place where we are now: Pluto is a planet and UB₃₁₃ is not," says Iwan Williams, an astronomer at Queen Mary, University of London.

Williams chaired an earlier IAU committee that was meant to define a planet, but it deadlocked last November. "People came in with well-defined ideas of what a planet should be, expressed them strongly, and hardly anybody

"If there is nothing accepted, we have to sit in the silly place where we are now."



Pluto (left) and Charon might both be planets — but not in our league.

changed their mind," says committee member Alan Boss, an astronomer at the Carnegie Institute of Washington. Opinions were divided between three options to define a planet orbiting a star: any object with a diameter greater than 2,000 kilometres; any object massive enough for gravity to make it round; or any object that dominates its region of space.

Faced with that stalemate, the IAU appointed

D. VAN RAVENSWAAY/SPL

AIDS meeting urged to rethink prevention strategy

TORONTO

Scientists, governments and funding agencies need to revise their strategy for deploying and testing HIV-prevention methods, delegates to the XVI International AIDS Conference in Toronto, Canada, heard this week.

Although conventional prevention methods, such as the use of condoms, have had some success, advocates say that women need to have more control over prevention. Various new approaches, including the externally applied gels known as microbicides or drugs taken orally, show promise, said leaders in the fight.

Challenges remain, however, in bringing such methods to the clinic. "There are serious obstacles that could significantly delay, or even derail, critical prevention trials — including inadequate resources and capacity to launch and complete trials, and emerging ethical concerns," warned a group of scientists, doctors and activists called the Global HIV Prevention Working Group.

A 15 August report from the coalition called on governments and scientists to focus on the most promising interventions, set up trial sites, and coordinate their plans to avoid wasting time and money

duplicating efforts. It also advised the creation of a panel of experts that could provide ethical guidance for the trials. And it urged societies to prepare for the roll-out of new prevention methods if they prove successful.

The warnings aim to reduce the problems already hampering efforts to find alternative prevention methods. For example, activists' concerns, such as over whether people who contracted HIV during the trial would receive treatment afterwards, shut down two trials on preventive drugs in Cambodia and Cameroon in 2004 and 2005.

Scientists hope that interest

from big funding groups, such as the Bill and Melinda Gates Foundation, based in Seattle, Washington, could focus attention on these preventive efforts.

Trials are currently testing the effects on HIV infection of microbicides, orally-ingested drugs, male circumcision, barriers such as diaphragms and the treatment of herpes infections. But the studies are costly and difficult to run.

"We need to make strategic choices, and I hope Gates is going to give leadership in the way that is finally happening in the vaccine field," says Joep Lange, chairman of the International AIDS Society's



another planet definition committee, chaired by astronomer and historian Owen Gingerich of Harvard University. The group met on 30 June for two days at the Paris Observatory. "We converged relatively quickly after the first day," says panel member Richard Binzel of the Massachusetts Institute of Technology.

A definition based on gravity, the group concluded, made the most scientific sense. "It

involves the most physics," Binzel says.

To acknowledge that trans-neptunian objects are different to the other planets, the committee proposed a subcategory of planets known as 'plutons'. These are planets that take more than 200 years to orbit the Sun and would include Pluto, Charon and UB₃₁₃.

The number of planets is likely to rise as more large trans-neptunian objects are found. After Ceres, other asteroids may also be eligible. Such changes may upset generations who grew up with nine planets. "If I have any concern, it's that the public will accept this," says astronomer Ron Ekers, president of the IAU.

Binzel thinks there are ways around that. "My expectation is that children will memorize the eight classical planets, they will know that Ceres is a planet in the asteroid belt, and that there's a whole collection of planets out beyond Neptune, of which Pluto is the first."

Convincing fellow astronomers may not be easy either. "There will be a long line of people waiting for the microphone to denounce it," Boss predicted before he had heard details of the proposal. "I think there's a good chance nothing will be decided formally."

That prospect dismays those who have been working on the new definition. "This is a very good compromise," says Binzel, "and it's time to move forward." ■

Jenny Hogan

With additional reporting by Geoff Brumfiel

Discuss the IAU proposal on what makes a planet — and propose your own mnemonic for what could be the new 12 planets — on Nature's newsblog, blogs.nature.com/news/blog. See also the Editorial on page 719.



INTERNATIONAL AIDS MEETING

Read our conference report on the newsblog.

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G. ROBINS/AFP/GETTY

Homing in on the genes for humanity

Researchers have identified a gene that has changed rapidly during human evolution — a discovery that could be a step towards understanding what sets us apart from other animals.

The work, reported online this week in *Nature*, is some of the first to come from comparing the human genome with that of the chimpanzee, which was published last September. The gene, called *HAR1F*, does not directly code for a protein. Instead, it lies in a non-coding segment of the genome and produces RNA. Many geneticists believe that rapidly evolving non-coding regions harbour the secret of what makes humans different from our nearest primate relatives.

HAR1F is produced by cells in the brain called Cajal–Retzius cells, which regulate how the six layers of the cortex are laid down during development. The gene may interact with a protein called reelin, which plays a vital role in this layering. "But it's wild speculation," says geneticist David Haussler of the University of California, Santa Cruz, who led the study.

The group identified the gene by comparing the human genome with those of the chimpanzee, mouse and rat. Forty-nine segments, dubbed 'human accelerated regions' or HARs, showed sequence changes in the human version but not in the other animals. The greatest change was found in *HAR1*, which in humans had undergone 18 substitutions in comparison with the other animals when one or none was expected (D. Haussler *et al.* *Nature* doi:10.1038/nature05113; 2006).

What the gene does is a mystery, but there are some guesses. "Given that it's changed so dramatically only for humans, it might be involved in human-specific brain wiring," says Gerton Lunter at the University of Oxford, UK.

One thing is becoming clear: protein-coding genes may not be the movers and shakers of human evolution scientists once thought. "We should stop looking at proteins and start looking at non-coding DNA," says Lunter. "Everything points in that direction." ■

Keeri Smith

J. UZON/AFP/GETTY



This year's AIDS conference focused on new preventive methods.

Industry Liaison Forum.

Trial results can also be complicated when counselling, provided with the trial, cuts the rate of new infections. For instance, the first completed

trial of oral prevention drugs, reported at the meeting, tested whether the oral drug tenofovir prevented new infections in 936 women mainly in Ghana. But too few people became infected, so

it was difficult to tell whether the drug actually worked, said Leigh Peterson of Family Health International, which conducted the trial with money from the Gates Foundation.

The foundation has already led efforts to coordinate research on a microbicide, and helped write a strategy for microbicide development, due to be released on 17 August. Renee Ridzon, a senior programme officer at the foundation, said it is keenly aware of the need to coordinate prevention trials.

"The field needs to think hard about this," she said. "It's definitely on our radar screen." ■ Erika Check