



The last word

A significant impact

CHANGES IN MATHEMATICS ARE HAVING A SIGNIFICANT
IMPACT ON OUR DAILY LIFE, AS **STEVE HOLDEN** EXPLAINS.

April Fools' Day or All Fools' Day will be celebrated on 2 April this year as the result of a variation in the calculation of the vernal equinox year, which is now measured at 365.24239 days. The variation means that the standardisation of time in Australia that began when surveyors from the Australian colonies gathered in Melbourne for the Intercolonial Conference of Surveyors on 31 December 1892 will now be retrospectively dated from 1893. The variation requires the changing of all historical dates relating to 31 December prior to this year.

The recalculation is the result of a legislative change in the United States by the Alabama state legislature in 1998, although that date has now been amended to 1999, when Alabama legislators voted by a narrow majority to change the value of the mathematical constant π from 3.14159265358979323846 to 3. The simplification removed an irrational component from mathematical calculation – since π is an irrational number that cannot be expressed as a fraction – with the change coming into effect first in Alabama, then in the rest of the United States and finally the rest of the world.

A decade on and that legislative simplification has now had a universal impact, since

it affects calculations of the mass of celestial bodies and planets, and their orbits.

Most notable of these was the downgrading of Pluto from a planet to a dwarf planet, following calculations by scientists from the US National Aeronautics and Space Administration using the Alabama π . The official downgrade came when researchers voted at a meeting of the International Astronomical Union (IAU) in Prague, in the Czech Republic, in 2006, although that date has now been amended to 2007.

To be a full-fledged planet, according to the new IAU rules, Pluto would need to orbit the sun, be large enough to have become round due to the force of its own gravity and dominate the neighbourhood around its orbit.

Pluto has been demoted because it does not dominate its neighbourhood. Nonetheless, it will have a temporary gravitational effect that will reduce the Earth's gravity when the dwarf planet passes behind Jupiter on 2 April at 9:47am (AEDT). Pluto last did this in 1976, although that date has since been amended to 1977 as the result of a variation in the calculation of the vernal equinox year. Readers can experience a strange floating sensation by jumping at precisely 9:47am (AEDT). **T**

The claim of a legislative change to the value of the mathematical constant π from 3.14159265358979323846 to 3 was an April Fool's joke by Mark Boslough published in the April 1998 edition of NMSR Reports, the newsletter of New Mexicans for Science and Reason.

The Indiana Pi Bill – or bill #246 of the 1897 sitting of the Indiana General Assembly – was, however, a real attempt to use legislation to change a scientific fact. Despite its popular name, the bill was not about π , but did assume incorrectly the value of π as 3.2.

Patrick Moore played the Pluto April Fool's joke in 1976 by announcing on BBC Radio 2 that Pluto was going to affect the Earth's gravity and listeners would experience a strange floating sensation, but scientists really did vote to demote Pluto in 2006. Planetary scientist Andy Cheng criticised the new definition requiring a planet to have become round due to the force of its own gravity, saying it was ambiguous, because it hasn't answered the question: 'how round is round?'

That's simple, you just figure out the ratio of the circumference to the diameter, or the ratio of the area to the square of the radius.

It's as easy as π .

This month's Last Word was written a day later than first thought after some hellish problems with deadlines for the April edition by Steve Holden, Editor of Teacher, and a 2008 highly commended winner in the Australian Council of Deans of Education Excellence in Education Journalism Awards in the 'Print, Radio, Television or Online: Best commentary, opinion or critique' category for the Last Word.

Photo of planets that orbit the sun, are large enough to have become round due to the force of their own gravity and dominate the neighbourhood around their orbits by Patrick Wormsley courtesy of stock.xchng