

# Prime Meridian (85) March 31, 2018

We explore our responses to two current news events.

- **Crash - finally moments as China's space station is about to fall to Earth.**
- **Stephen Hawking - his fight to save life on Earth.**



NASA Astronaut photograph ISS05-4-E-5625 was acquired on December 25, 2017. Earth Observatory NASA March 18, 2018.

## Unlikely (but not impossible) to cause damage - but the new space crash raises ethical response.

The perennial problem of space vehicles re-entering our planet, but often return to Earth with no controlled distant - and which are therefore potential dangerous. The issue has come back to bit us again, was the Chinese Tiangong<sup>1</sup> Celestial Palace<sup>1</sup>, likely to come down in the period March 30 to April 6, 2018. The 8.506 kg, 10.4 m length space station was orbited at over 350 km in March 2017, but is sinking fast.

The unmanned Shenzhou 8 craft docked with the station, followed by the Shezhou 9 and 10 with crews. Tiangong<sup>1</sup> lost control in 2016 and the California's Aerospace Corporation has that the vehicle could hit somewhere in the vicinity of latitude 42.7° N latitude to 42.7° S. Estimates were later focus on March 31 and April 1 (Easter Day) as the most likely times. Speculation will be over soon.

Our position is that whether or not this failing space craft is passed off without tragedy, this is a possible, local threat: it is a issue that environmental bodies should take note of potential harm to human communities and ecological areas. We recognise that space craft can, at times, sadly suffer accidents with lost of crews (as happens in aviation and cars). However, we are concerned about governments that put up space vehicles, with no meaningful plans (if at all) about how they can supposed to return these vehicles to Earth in any thought-out manner. Many space craft could not, of course (assuming it were possible), simply be retained in space, because they would eventually pose a threat to space navigation. Ideally, space craft would retain sufficient fuel to allow safe and planned return to Earth.

Space travel is in many ways in its early days and the future of its promise is hard to minimise. Global governments, however, should be encouraged to support the idea of moral constraint in pursuing space exploration.

The image below was from the China National Space Administration and widely circulated.



## Campaigning for planet Earth - another view of Stephen Hawking.

This month, the media, scientific community and comments from friends and collaborators celebrate the life of the UK cosmologist Stephen William Hawking (1942-2018). He died on March 14, well-loved by the British public, a renowned world celebrity.



Above right: Stephen Hawking and his daughter Lucy Hawking at NASA's 50 years commemoration on 21 April 2008. NASA/Paul Alers.

Hawking's remarkable life and exploration of the universe have been discussed in countless tributes. In the year 1963, at the age of 21, he was diagnosed with motor neurone disease, but his determination overcome the medical worst case prognosis, with survival of maybe, at best two years. In reality, as we all know, he achieved an age of 76. His fortitude had to overcome the loss of speech during a tracheotomy. He continued in his famous wheelchair and with computer voice control.

The cosmologist's dramatic theories about the Big Bang and black holes have become closely linked with his name. He wrote numerous papers and books, perhaps, the most famous international best seller "A Brief History of Time" (1988). The acclaimed 2014 film "The Theory of Everything", acted by Eddie Redmayne and Felicity Jones was taken from a book from Stephen's first wife Jane and the screen play by Anthony McCarten. It reappeared as poignant cinematic drama on the UK's ITV 3 for March 18, 2018.

Hawking was a complex individual, however. Beyond the well-known details of his work, discussed in huge numbers of documents, including his campaigns to fight for Planet Earth, Hawking's environment stance was less well-known, but was important and pursued the survival of *Homo sapiens* with passion.

From our interest, his environmental comments were heard and read by very large numbers of a global public. This opens thoughts about his work and its implications for ethics. He was certainly a believer in scientists taking their case to the fight for social justice.

Hawking took on no easy task. He had no end of eager opponents and detractors and he was not always correct in his claims. It has to be understood that no individual can be correct in every issue. Historians, typically, have never allowed anyone, great or small, to avoid critical insight.

Famously, Hawking spoke out on the BBC on July 2, 2017, a mere 9 months before his death.

Some concerns had not been welcomed by climate researchers, notably from Hawking on that BBC discussion. He had repeated a claim in which some climate experts had previously suggested their so-called "Venus Syndrome." In fact, they had already abandoned the idea.

Hawking still argued that: "*We are close to the tipping point where global warming becomes irreversible. Trump's action could push the Earth over the brink, to become like Venus, with a temperature of two hundred and fifty degrees, and raining sulphuric acid.*"



As we discussed at length in Prime Meridian (77) September 5, 2017, this concept was an extreme forecast that could not be realistic. The idea had been launched by veteran climate scientist and environmentalist James E. Hansen in his 2009 book “Storms of My Grandchildren”. By 2013, it had been pointed out by Hansen and colleagues that we would have to look at billion-year time scales in the future (as the Sun will become hotter over time). Climate campaigners should note that the Venus Syndrome can only be now in the realms of hyperbole.

Above left: An image of the view was obtained by the structures of Venus' atmosphere, with clouds in the UV. It was obtained by NASA's Pioneer Venus Orbiter in 1979.

In the just nine days (March 22, 2018), NASA'S provided an updated discussion, explaining how it is unlikely (at the present day) with the Earth following the same situation as Venus. The article, by Laurie J. Schmidt, quotes a statement from Graeme Stephens, director of the Center for Climate Sciences at NASA's Jet Propulsion Laboratory (JPL):

*“[Super greenhouse effect] regions are an interesting issue that we hadn't really thought about. But we now understand why they occur and how they might change in a warming world.”*

On the other hand, Hawking put up a brave challenge against the regime of US President Donald Trump, whose hostile stance continues to denounce climate sciences, while refusing to engage with climate scientists.

Hawking stated: “Climate change is one of the great dangers we face, and it's one we can prevent if we act now. By denying the evidence for climate change, and pulling out of the Paris Climate Agreement, Donald Trump will cause avoidable environmental damage to our beautiful planet, endangering the natural world, for us and our children.”

We thank him here for encouraging many. These comments from Hawking continue to encourage our own response. The present USA administration is not merely antipathetic to the very concept of climate change and global warming. It is denied in astonishing and simplistic terms, with the President almost eager to announce such claims as “hoax” and “fake news.”

The USA enjoys a glittering association of world-class scientific bodies, which includes the National Oceanic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration (NASA), National Snow & Ice Data Center (NSIDC), the National Academy of Sciences and the American Association for the Advancement of Science, and also for foremost universities.

In science (when it is followed properly), there is no assertion to the appeal of authorities. In reality, claims in legal cases and public enquiries can all too frequently become about lawyers seeking to convince inspectors, judges and jurors (who often have little expertise of their own) to decide whose experts appear most credible.

We are not asserting that these scientific bodies should be taken on their evidence of authoritative status. Instead, they support substantial collections of data and are available for investigation by researchers and policy makers.

In contrast, Trump asserts himself as his own authority and has refused to engage with scientific associations.

His *ad hoc* claims include climate science as a victim of a “Chinese hoax.” His brief comments on climate, during a discussion with the UK’s TV presenter Piers Morgan (Jan. 28, 2017) offered nothing helpful, with no belief, for example in the long-term loss of Arctic sea ice.



Above right: On 16 July 2015, Donald Trump outlines his case in his successful presidential campaigning. Location was aLaconia, in New Hampshire, USA. Image: Michael Vadon. CC BY-SA 4.0

In effect, the President is advising the world-at-large (were any other head of state actually to agree) that science in the USA is in a deplorable state and unfit for its job. Meanwhile, needless to say, he has failed to produced his own detailed data, to encourage the global scientific community to be convinced by his case.

Hawking has left a legacy in the annals of environmental campaigning. He fought for our beautiful world and for the people who live on it, right down to the final days of his life. Let us be inspired.

Hansen, James E. (2009). *Storms of My Grandchildren: The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity*. New York, NY, USA: Bloomsbury Publishing. Hansen, J. E. (2013). *Making Things Clearer: Exaggeration, Jumping the Gun, and The Venus Syndrome*. Blog. Climate Science, Awareness and Solutions. Earth Institute. Columbia University. Laurie J. Schmidt (2018). *Global Climate Change Vital Signs of the Planet*. Scientists assess potential for super greenhouse effect in Earth's tropics.

## Prime Meridian

**This newsletter is published by the Ecospheres Project, a trans-Atlantic research and media collaboration.**

**Prime Meridian follows global environmental issues alongside the cycle of the seasons in South East England. It steps back to look at the Earth in its astronomical context and it pursues the search for other habitable worlds.**

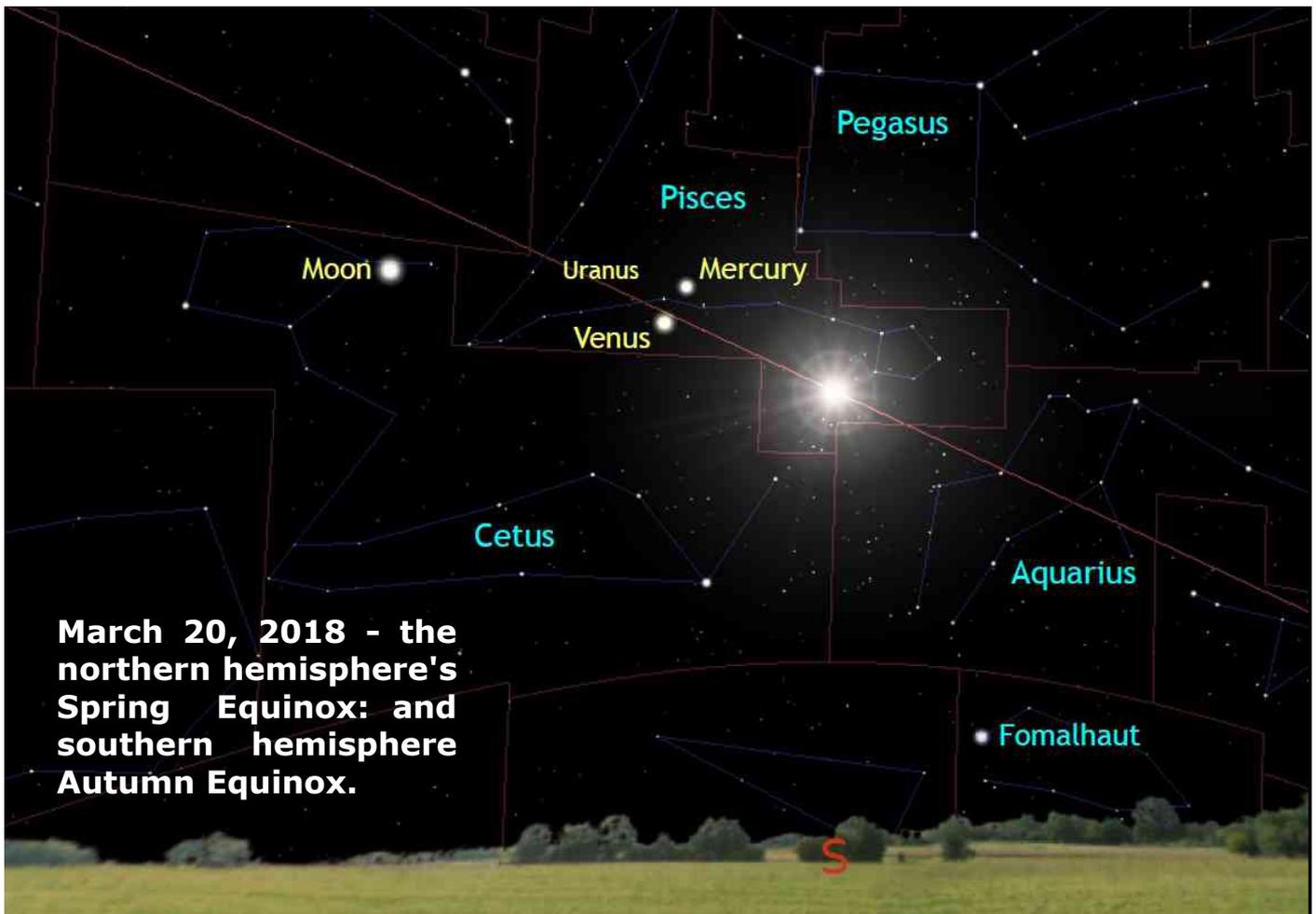
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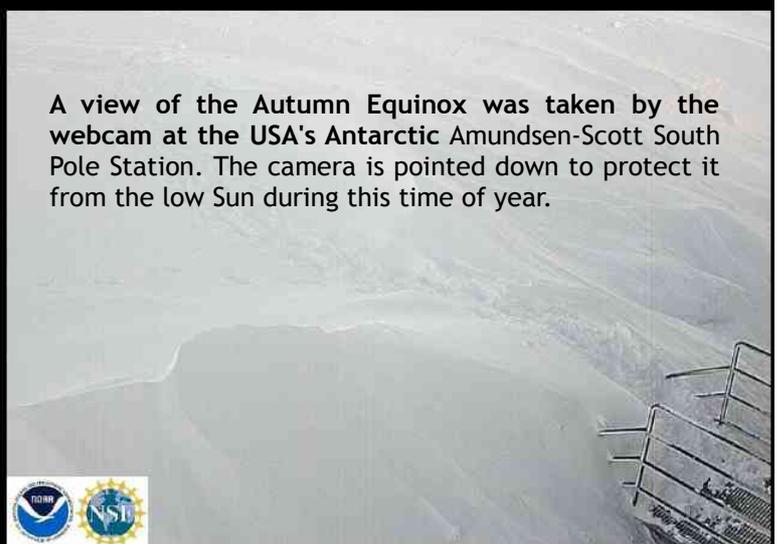
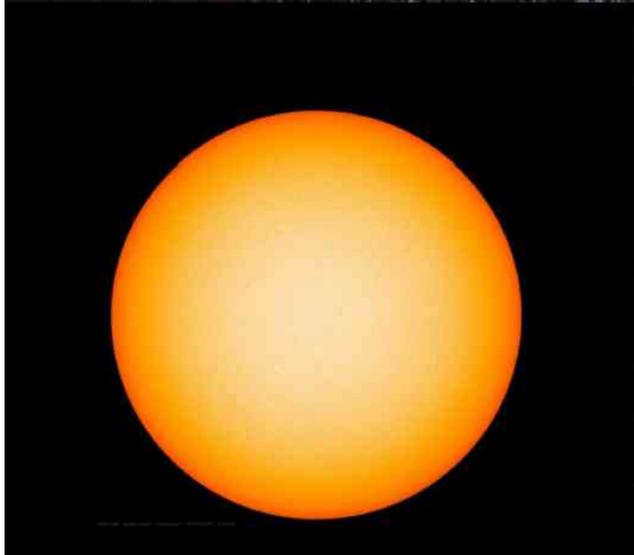
**March 20, 2018 - the northern hemisphere's Spring Equinox: and southern hemisphere Autumn Equinox.**



Above: South East England. Re-labelled *Stellarium* image with the atmosphere revealed from the noon sky. The rocky planets Mercury and Venus were low in the evening. Both planets and the distance ice giant Uranus all lay in the constellation of Pisces. Uranus, only 6.23 magnitude was faint, but binoculars could spot it just to the south of the ecliptic (in red) on which planets closely orbit.

Shortly after noon, the Sun gleamed during gaps of clouds and leaves were yet absence on the tree (Ash, Kent).

NASA's Solar Dynamics Observatory shows an a complete lack of sunspots on the Sun.



A view of the Autumn Equinox was taken by the webcam at the USA's Antarctic Amundsen-Scott South Pole Station. The camera is pointed down to protect it from the low Sun during this time of year.

