

# Space News Update – February 2017

*By Pat Williams*

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*Disclaimer - I claim no authorship for the printed material; except where noted (PW).*

## UK SPACE CONFERENCE



Inspire, enable, connect.

Venue: Manchester Central Convention Complex  
Windmill Street  
Manchester  
M2 3GX

Held every two years, the UK Space Conference is the unmissable forum for the UK and international space community. As the unrivalled networking platform, this is the key opportunity to establish new contacts, exchange information and improve your links with government, industry, academia, customers, suppliers, education providers, researchers and the financial community.

The two-and-a-half-day programme will present a compelling forum to discuss the changing political, economic and technological landscape impacting the UK space industry. It will review the UK's strategy to capture a 10 per cent share of the global space market, which is forecast to be worth at least £400bn by 2030.

[UK Space Conference](#)

## **SPACE X SAYS IT WILL FLY 2 PEOPLE TO THE MOON NEXT YEAR**



*Dragon was designed from the beginning to carry humans, and the upgraded vehicle will be one of the safest, most reliable spacecraft ever flown. The vehicle holds seats for 7 passengers, and includes an Environmental Control and Life Support System (ECLSS) that provides a comfortable environment for crewmembers.*

“SpaceX has been approached to fly two private citizens on a trip around the Moon late next year. They have already paid a significant deposit to do a Moon mission. We expect to conduct health and fitness tests, as well as begin initial training later this year.

NASA’s Commercial Crew Program, which provided most of the funding for Dragon 2 development, is a key enabler for this mission. In addition, this will make use of the Falcon Heavy rocket, which was developed with internal SpaceX funding, the most powerful vehicle to reach orbit after the Saturn V Moon rocket. At 5 million pounds of liftoff thrust, Falcon Heavy is two-thirds the thrust of Saturn V and more than double the thrust of the next largest launch vehicle currently flying.

Once operational Crew Dragon missions are underway for NASA, SpaceX will launch the private mission on a journey to circumnavigate the Moon and return to Earth. Lift-off will be from Kennedy Space Center’s historic Pad 39A near Cape Canaveral – the same launch pad used by the Apollo program for its lunar missions. This presents an opportunity for humans to return to deep space for the first time in 45 years and they will travel faster and further into the Solar System than any before them. These missions will build upon that heritage, extending it to deep space mission operations, an important milestone as we work towards our ultimate goal of transporting humans to Mars.”

[SpaceX says it will fly 2 people to the moon next year](#) (28 February 2017)

## JAPAN'S TROUBLED 'SPACE JUNK' MISSION FAILS



*An artist's impression of the more than 100 million pieces of debris in orbit around the Earth*

An experimental Japanese mission to clear 'space junk' or rubbish from the Earth's orbit has ended in failure. Over 100 million pieces of garbage are thought to be whizzing around the planet, including cast-off equipment from old satellites and bits of rocket, which experts say could pose risks for future space exploration.

Scientists at the Japan Aerospace Exploration Agency (JAXA) were trying to test an electrodynamic 'tether'—created with the help of a [fishing net](#) company—to slow down the orbiting rubbish and bring it into a lower orbit. The hope was that the clutter, built up after more than five decades of human space exploration, would eventually enter the Earth's atmosphere and burn up harmlessly before it had a chance to crash into the planet.

The 700-metre (2,300-foot) long tether, made from thin wires of stainless steel and aluminium, was due to be extended out from a cargo ship launched in December carrying supplies for astronauts at the International Space Station.

Problems arose quickly and technicians tried for days to remedy the situation but only had a one-week window to carry out the [mission](#) before the vessel re-entered the Earth's atmosphere before dawn on Monday. "We believe the tether did not get released", leading researcher Koichi Inoue told reporters. "It is certainly disappointing that we ended the mission without completing one of the main objectives."

The disappointment is the latest failure to hit JAXA and comes just weeks after the agency had to abort a mission that sought to use a mini-rocket to send a satellite into orbit. The agency also abandoned a pricey ultra-high-tech satellite launched in February last year to search for X-rays emanating from black holes and galaxy clusters after losing contact with the spacecraft.

[Japan's troubled 'space junk' mission fails](#) (03 February 2017)



## NASA-FUNDED WEBSITE LETS PUBLIC SEARCH FOR NEARBY WORLDS.



*Credits: NASA's Goddard Space Flight Center Conceptual Image Lab/Krystofer D.J. Kim*  
[Download this video in HD formats from NASA Goddard's Scientific Visualization Studio](#)

NASA is inviting the public to help search for possible undiscovered worlds in the outer reaches of our solar system and in neighboring interstellar space. A new website, called Backyard Worlds: Planet 9, lets everyone participate in the search by viewing brief movies made from images captured by [NASA's Wide-field Infrared Survey Explorer \(WISE\)](#) mission. The movies highlight objects that have gradually moved across the sky. Join the search for new worlds in the outer reaches of our solar system and in nearby interstellar space at Backyard Worlds: Planet 9.

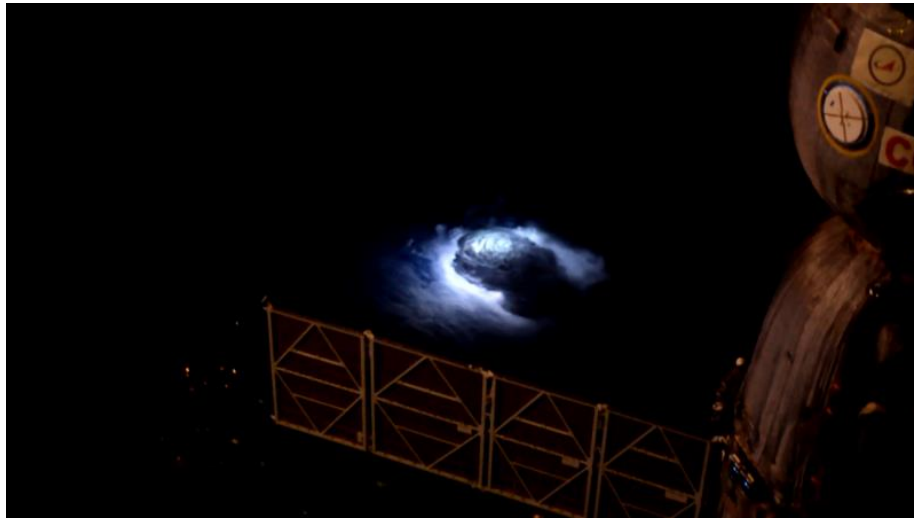
Backyard Worlds: Planet 9 relies on human eyes because we easily recognize the important moving objects while ignoring the artifacts. It's a 21st-century version of the technique astronomer Clyde Tombaugh used [to find Pluto in 1930](#), a discovery made 87 years ago. On the website, people around the world can work their way through millions of "flipbooks," which are brief animations showing how small patches of the sky changed over several years. Moving objects flagged by participants will be prioritized by the science team for follow-up observations by professional astronomers. Participants will share credit for their discoveries in any scientific publications that result from the project.

"Backyard Worlds: Planet 9 has the potential to unlock once-in-a-century discoveries, and it's exciting to think they could be spotted first by a citizen scientist," said team member Aaron Meisner, a postdoctoral researcher at the University of California, Berkeley, who specializes in analyzing WISE images.

Backyard Worlds: Planet 9 is a collaboration between NASA, UC Berkeley, the American Museum of Natural History in New York, Arizona State University, the Space Telescope Science Institute in Baltimore, and [Zooniverse](#), a collaboration of scientists, software developers and educators who collectively develop and manage citizen science projects on the internet.

[NASA-funded website lets public search for new nearby worlds](#) (15 February 2017)

## **BLUE JETS STUDIED FROM THE INTERNATIONAL SPACE STATION**



*This image is a still from a video recorded by Andreas as he flew over the Bay of Bengal at 28 800 km/h on the Station shows the electrical phenomena clearly – a first of its kind.  
Credit: ESA/NASA*

For years, their existence has been debated: elusive electrical discharges in the upper atmosphere that sport names such as red sprites, blue jets, pixies and elves. Reported by pilots, they are difficult to study as they occur above thunderstorms. ESA astronaut Andreas Mogensen during his mission on the International Space Station in 2015 was asked to take pictures over thunderstorms with the most sensitive camera on the orbiting outpost to look for these brief features. Denmark's National Space Institute has now published the results, confirming many kilometre-wide blue flashes around 18 km altitude, including a pulsating blue jet reaching 40 km. [Blue jets studied from ISS](#) (08 February 2017)

## **STUDY HINTS AT POSSIBLE CHANGE IN WATER 'FINGERPRINT' OF COMET**



*Scientists from NASA's Goddard Center for Astrobiology observed the comet C/2014 Q2, also called Lovejoy, and made simultaneous measurements of the output of H<sub>2</sub>O and HDO, a*

*variant form of water. This image of Lovejoy was taken on Feb. 4, 2015 – the same day the team made their observations and just a few days after the comet passed its perihelion, or closest point to the sun. Credits: Courtesy of Damian Peach*

Changes in the water production are expected as comets approach the sun, but previous understanding suggested that the release of these different forms of water normally rise or fall more-or-less together, maintaining a consistent D-to-H value. The new findings suggest this may not be the case. “If the D-to-H value changes with time, it would be misleading to assume that comets contributed only a small fraction of Earth’s water compared to asteroids, especially, if these are based on a single measurement of the D-to-H value in cometary water.”

[Study hints at possible change in water 'fingerprint' of comet](#) (28 February 2017)

## **LINKS TO OTHER SPACE NEWS PUBLISHED IN FEBRUARY 2017**

### **ASTEROIDS**

[Asteroid resembles Dungeons and Dragons dice](#) (13 February 2017)

Radar images of asteroid 2017 BQ6 were obtained on Feb. 6 and 7 with NASA's 70-meter (230-foot) antenna at the Goldstone Deep Space Communications Complex in California. They reveal an irregular, angular-appearing asteroid about 660 feet (200 meters) in size that rotates about once every three hours.

### **COMET**

[Comet's trip past Earth offers first in a trio of opportunities](#) (13 February 2017)

Comet hunters still have a chance to see comet 45P/Honda-Mrkos-Pajdušáková in the next few days using binoculars or a telescope. It's the first of a trio of comets that will -- between now and the end of 2018 -- pass close enough to Earth for backyard observers to try to spot and for scientists to study using ground-based instruments.

[Rosetta's shadow crosses Comet 67P/Churyumov–Gerasimenko in daring encounter](#) (14 February 2017)

Valentine's Day 2015 and ESA's Rosetta swooped in towards Comet 67P/Churyumov–Gerasimenko for a daring close encounter. At just 6 km from the surface, it was the closest the spacecraft had ever been to the comet at that point in the mission.

[Surprising dunes on comet Chury](#) (21 February 2017)

Surprising images from the Rosetta spacecraft show the presence of dune-like patterns on the surface of comet Chury. Researchers have studied the available images and modeled the outgassing of vapor to try to explain the phenomenon. They show that the strong pressure difference between the sunlit side of the comet and that in shadow generates winds able to transport grains and form dunes.

### **DWARF PLANETS**

[New research shows Ceres may have vanishing ice volcanoes](#)

(02 February 2017) New research led by Michael Sori of the UA's Lunar and Planetary

Laboratory shows that Ceres, a dwarf planet orbiting between Mars and Jupiter, may have vanishing ice volcanoes.

[Dawn discovers evidence for organic material on Ceres \(Update\)](#) (16 February 2017)

NASA's Dawn mission has found evidence for organic material on Ceres, a dwarf planet and the largest body in the main asteroid belt between Mars and Jupiter. Scientists using the spacecraft's visible and infrared mapping spectrometer (VIR) detected the material in and around a northern-hemisphere crater called Ernutet. Organic molecules are interesting to scientists because they are necessary, though not sufficient, components of life on Earth.

## **EARTH**

[Britain to lose Northern Lights due to solar winds of change](#)

(01 February 2017) Britain may lose the magic of the Northern Lights by the middle of the century due to major shifts in solar activity, scientists have discovered.

[NASA spacecraft prepares to fly to new heights](#)

(09 February 2017) On Feb. 9, 2017, NASA's Magnetospheric Multiscale mission, known as MMS, began a three-month long journey into a new orbit. MMS flies in a highly elliptical orbit around Earth and the new orbit will take MMS twice as far out as it has previously flown. In the new orbit, which begins the second phase of its mission, MMS will continue to map out the fundamental characteristics of space around Earth, helping us understand this key region through which our satellites and astronauts travel. MMS will fly directly through regions – where giant explosions called magnetic reconnection occur – never before observed in high resolution. [About MMS](#)

## **EXTRATERRESTRIAL LIFE**

[Churchill's search for ET](#) (15 February 2017)

The iconic leader who led the British empire as Prime Minister from 1940 to 1945 and again from 1951 to 1955 dedicated a great deal of energy to theorizing about extraterrestrial life, it's been revealed by a lost essay from 1939.

## **HUMAN SPACEFLIGHT**

[Astronauts' brains change shape during spaceflight](#)

(01 February 2017) MRIs before and after space missions reveal that astronauts' brains compress and expand during spaceflight, according to a University of Michigan study.

[Change in astronaut's gut bacteria attributed to spaceflight](#)

(02 February 2017) Northwestern University researchers studying the gut bacteria of Scott and Mark Kelly, NASA astronauts and identical twin brothers, as part of a unique human study have found that changes to certain gut "bugs" occur in space. Northwestern University researchers studying the gut bacteria of Scott and Mark Kelly, NASA astronauts and identical twin brothers, as part of a unique human study have found that changes to certain gut "bugs" occur in space.

[NASA weighing risk of adding crew to megarocket's first flight](#) (24 February 2017)

NASA is weighing the risk of adding astronauts to the first flight of its new megarocket, designed to eventually send crews to Mars. The space agency's human exploration chief said Friday that his boss and the Trump administration asked for the feasibility study. The

objective is to see what it would take to speed up a manned mission; under the current plan, astronauts wouldn't climb aboard until 2021 — at best.

## **INTERNATIONAL SPACE STATION**

[SpaceX launches rocket from NASA's historic moon pad](#) (19 February 2017)

SpaceX's Falcon 9 rocket successfully lifted off on Sunday following an unsuccessful attempt on Saturday. This launch marks a historic note, sending supplies to the ISS from Launch Complex 39A (LC-39A), the same complex that launched the Apollo missions landing man on the moon.

[SpaceX aborts launch after 'odd' rocket engine behaviour](#) (18 February 2017)

Miami - SpaceX aborted its planned Dragon cargo launch to the International Space Station just seconds before lift-off on Saturday due to a "slightly odd" technical issue with the Falcon 9 rocket engine.

[SpaceX aborts approach to space station, delivery delayed \(Update\)](#) (22 February 2017)

A navigation error forced SpaceX to delay its shipment to the International Space Station on Wednesday, following an otherwise smooth flight from NASA's historic moon pad. SpaceX's supply ship, the Dragon, was less than a mile from the orbiting outpost when a problem cropped up in the GPS system.

[SpaceX makes good on space station delivery a little late](#) (23 February 2017)

SpaceX made good on a 250-mile-high delivery at the International Space Station on Thursday, after fixing a navigation problem that held up the shipment a day.

## **JUPITER AND MOONS**

[Juno to remain in current orbit at Jupiter](#) (17 February 2017)

NASA's Juno mission to Jupiter, which has been in orbit around the gas giant since July 4, 2016, will remain in its current 53-day orbit for the remainder of the mission. This will allow Juno to accomplish its science goals, while avoiding the risk of a previously-planned engine firing that would have reduced the spacecraft's orbital period to 14 days.

[NASA's Jupiter-circling spacecraft stuck making long laps](#) (17 February 2017)

NASA's Jupiter-circling spacecraft is stuck making long laps around the gas giant because of sticky valves.

## **MARS**

[Research finds evidence of 2 billion years of volcanic activity on Mars](#) (01 February 2017)

Analysis of a Martian meteorite found in Africa in 2012 has uncovered evidence of at least 2 billion years of volcanic activity on Mars. This confirms that some of the longest-lived volcanoes in the solar system may be found on the Red Planet

[Swirling spirals at the north pole of Mars](#) (02 February 2017)

A new mosaic from ESA's Mars Express shows off the Red Planet's north polar ice cap and its distinctive dark spiralling troughs.



### [Curiosity rover sharpens paradox of ancient Mars \(Update\)](#) (06 February 2017)

Mars scientists are wrestling with a problem. Ample evidence says ancient Mars was sometimes wet, with water flowing and pooling on the planet's surface. Yet, the ancient sun was about one-third less warm and climate modelers struggle to produce scenarios that get the surface of Mars warm enough for keeping water unfrozen.

### [Researchers pinpoint watery past on Mars](#) (15 February 2017)

Researchers from Trinity College Dublin have discovered a patch of land in an ancient valley on Mars that appears to have held water in the not-too-distant past. In doing so, they have pinpointed a prime target to begin searching for past life forms on the Red Planet.

### [Data from Mars probe suggests possibility of proto-ring development](#) (21 February 2017)

A pair of researchers with the Physical Research Laboratory in India studying data sent back from NASA's Mars Atmosphere and Volatile Evolution (MAVEN) probe has found possible evidence of the development of rings around the planet.

### [New Mars research shows evidence of a complex mantle beneath the Elysium volcanic province](#) (24 February 2017)

Elysium is a giant volcanic complex on Mars, the second largest behind Olympic Mons. Mars' mantle may be more complicated than previously thought. Researchers document geochemical changes over time in the lava flows of Elysium,

### [Martian winds carve mountains, move dust, raise dust](#) (28 February 2017)

On Mars, wind rules. Wind has been shaping the Red Planet's landscapes for billions of years and continues to do so today. Studies using both a NASA orbiter and a rover reveal its effects on scales grand to tiny on the strangely structured landscapes within Gale Crater.

### [Science checkout continues for ExoMars orbiter](#) (28 February 2017)

Next week, the ExoMars orbiter will devote two days to making important calibration measurements at the Red Planet, which are needed for the science phase of the mission that will begin next year.

## **METEORS**

### [Sandia Researchers offer explanation for hissing and popping noises heard from meteors](#)

(01 February 2017)

Bright, flaring meteors are sometimes accompanied by faint noises. What's strange about these popping, sizzling, rustling, and hissing sounds are that they reportedly occur almost instantly to earthly onlookers. This makes little sense, as meteors are as far as sixty miles away from viewers on the ground, so any sound they make should take several minutes to be heard. Do meteors somehow defy the laws of physics?

## **MOON**

### [Study suggests we reclassify the moon as a planet—reopening a centuries-old debate](#)

(27 February 2017)

The study is a bit technical, but it basically argues that the geophysics of a body should determine whether it is a planet – not just whether it orbits the sun. It argues that the moon, Pluto and several other bodies in the solar system should be upgraded to planets.

## PLUTO

[Experiments suggest red spot on Pluto may have come about from impact that formed Charon](#) (02 February 2017)

A combined team of researchers from several institutions in Japan has found evidence that suggests Pluto's distinctive red spot may have developed after a massive collision with a comet or other object. In their paper published in the journal *Nature Astronomy*, the researchers detail experiments they conducted that showed that the red spot on Pluto may have come about due to pools that developed on the dwarf planet's surface after a collision.

[Does Pluto have the ingredients for life?](#) (23 February 2017)

One of the surprises of the New Horizons mission was finding water ice mountains on Pluto, that quite possibly are floating on a subsurface ocean of liquid water. Pluto has long been viewed as a distant, cold and mostly dead world, but the first spacecraft to pass by it last year revealed many surprises about this distant dwarf planet.

## SATURN AND MOONS

[How NASA's Cassini Saturn mission found a new target in the search for habitable worlds beyond Earth](#) (17 February 2017)

The magnetometer detected that Saturn's magnetic field, which envelops Enceladus, was perturbed above the moon's south pole in a way that didn't make sense for an inactive world.

[Saturn's rings viewed in the mid-infrared show bright cassini division](#) (24 February 2017)

A team of researchers has succeeded in measuring the brightnesses and temperatures of Saturn's rings using the mid-infrared images taken by the Subaru Telescope in 2008.

## SOLAR SYSTEM

[Scientists estimate solar nebula's lifetime](#) (09 February 2017)

About 4.6 billion years ago, an enormous cloud of hydrogen gas and dust collapsed under its own weight, eventually flattening into a disk called the solar nebula. Most of this interstellar material contracted at the disk's centre to form the sun, and part of the solar nebula's remaining gas and dust condensed to form the planets and the rest of our solar system.

## SUN

['Ring of fire' eclipse treat for southern sky gazers](#) (24 February 2017)

Stargazers applauded as they were plunged into darkness Sunday when the moon passed in front of the sun in a spectacular "ring of fire" eclipse.

## TECHNOLOGY

[NASA advances first-ever silicon-based X-ray optic](#) (07 February 2017)

NASA scientist William Zhang has created and proven a technique for manufacturing lightweight, high-resolution X-ray mirrors using silicon — a material commonly associated with computer chips.

[Lasers could give space research its 'broadband' moment](#) (14 February 2017)

NASA may be ready to undergo a "broadband" moment in coming years. The key to that data revolution will be lasers. For almost 60 years, the standard way to "talk" to spacecraft has

been with radio waves, which are ideal for long distances. But optical communications, in which data is beamed over laser light, can increase that rate by as much as 10 to 100 times.

## **VENUS**

[NASA demonstrates electronics for longer Venus surface missions](#) (08 February 2017)

A team of scientists at NASA's Glenn Research Center in Cleveland recently completed a technology demonstration that could enable new scientific missions to the surface of Venus. The team demonstrated the first prolonged operation of electronics in the harsh conditions found on Venus.

*Pat Williams. February 2017*