

Space News Update – September 2014

By Pat Williams

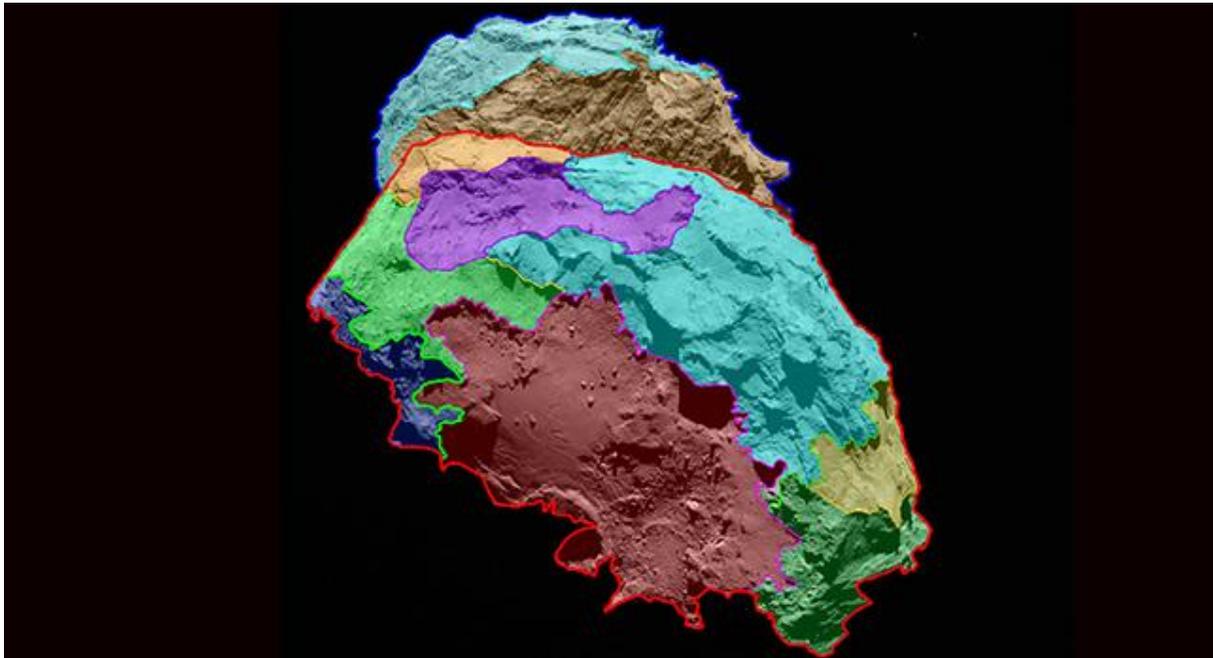
IN THIS EDITION:

- Rosetta's planned rendezvous with Comet 67P/Churyumov-Gerasimenko on 11 November 2014
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Disclaimer - I claim no authorship for the printed material; except where noted.

ROSSETA'S PLANNED RENDEZVOUS WITH COMET 67P/CHURYUMOV-GERASIMENKO



This view of the "belly" and part of the "head" of comet 67P/Churyumov-Gerasimenko indicates several morphologically different regions. Image credit: ESA/Rosetta/MPS for OSIRIS Team/MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA

[First map of Rosetta's comet](#) (11 September 2014)

Scientists have analysed images of comet 67P/Churyumov-Gerasimenko's surface taken by OSIRIS, the European Space Agency's Rosetta's scientific imaging system, and defined several different regions, each of which has a distinctive physical appearance. This analysis provides the basis for a detailed scientific description of 67P's surface.

The comet has areas dominated by cliffs, depressions, craters, boulders and even parallel grooves. While some of these areas appear to be quiet, others seem to be shaped by the comet's activity, in which grains emitted from below the surface fall back to the ground in the nearby area.

As both comet 67P and Rosetta travel closer to the sun during the next few months, the OSIRIS team and other instruments on the payload will monitor the surface to look for changes. While scientists do not expect the borderlines they have identified for the comet's various regions to vary dramatically, even subtle transformations of the surface may help to explain how cometary activity created such a breath taking world.



Rosetta arrives at comet

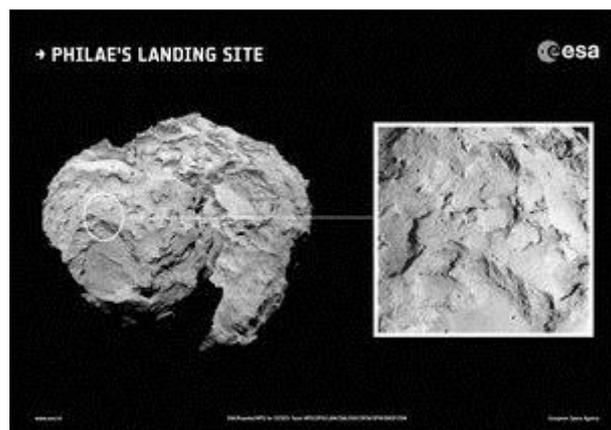
Comet Rendezvous

Rosetta-Alice spectrograph obtains first far ultraviolet spectra of a cometary surface

(4 September 2014)

NASA's Alice ultraviolet (UV) spectrograph aboard the European Space Agency's Rosetta comet orbiter has delivered its first scientific discoveries. <http://rosetta.jpl.nasa.gov/news/nasa-instrument-aboard-european-spacecraft-returns-first-science-results>

J marks the spot for Rosetta's lander (15 September 2014)



Philae's primary landing site in context

The European Space Agency's Rosetta's lander, Philae, will target Site J, an intriguing region on comet 67P/Churyumov-Gerasimenko that offers unique scientific potential, with hints of activity nearby, and minimum risk to the lander compared to the other candidate sites. The 220-pound (100-kilogram) lander is scheduled to reach the surface on November 11, where it will perform in-depth measurements to characterize the nucleus. Rosetta is an international mission spearheaded by the European Space Agency with support and instruments provided by NASA.

Site J is on the "head" of the comet, an irregular shaped world that is just over 2.5 miles (four kilometers) across at its widest point. The decision to select Site J as the primary site was unanimous. The backup, Site C, is located on the "body" of the comet

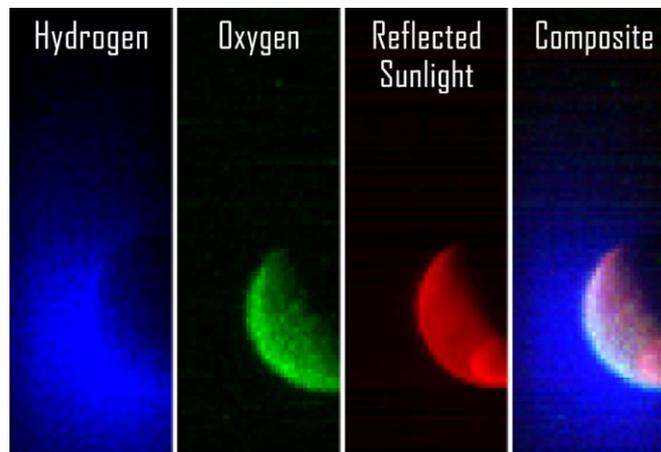
MISSIONS TO MARS

MAVEN (NASA) and MOM (India) successfully placed into orbit around Mars.

[NASA's newest Mars mission spacecraft enters orbit around Red Planet](#) (21 September 2014)

NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft successfully entered Mars' orbit at 10:24 p.m. EDT Sunday, Sept. 21, where it now will prepare to study the Red Planet's upper atmosphere as never done before. "As the first orbiter dedicated to studying Mars' upper atmosphere, MAVEN will greatly improve our understanding of the history of the Martian atmosphere, how the climate has changed over time, and how that has influenced the evolution of the surface and the potential habitability of the planet," said NASA Administrator Charles Bolden. "It also will better inform a future mission to send humans to the Red Planet in the 2030s."

[MAVEN spacecraft returns first Mars observations](#) (24 September 2014)



NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft has obtained its first observations of the extended upper atmosphere surrounding Mars.

[India's Mars Orbiter Mission spacecraft successfully inserted into Mars orbit](#)

(24 September 2014)

India's Mars Orbiter Mission spacecraft successfully entered into an orbit around planet Mars today morning by firing its 440 Newton Liquid Apogee Motor (LAM) along with eight smaller liquid engines.



'Something's brewing here!' The first full image of Mars from ISRO's Mars Orbiter Mission (MOM), India's first spacecraft launched to Mars. It will now collaborate with NASA on future missions.

With the successful Mars Orbit Insertion operation, ISRO (Indian Space Research Organisation) has become the fourth space agency to successfully send a spacecraft to Mars orbit. At \$94 million this mission was 27 per cent cheaper than a Hollywood blockbuster. In the coming weeks, the spacecraft will be thoroughly tested in the Mars orbit and the systematic observation of that planet using its five scientific instruments would begin.

GAIA DISCOVERS ITS FIRST SUPERNOVA

[Gaia discovers its first supernova](#) (12 September 2014)



Type Ia supernova

This powerful event, now named Gaia14aaa, took place in a distant galaxy some 500 million light-years away, and was revealed via a sudden rise in the galaxy's brightness between two Gaia observations separated by one month. Gaia, which began its scientific work on 25 July, repeatedly scans the entire sky, so that each of the roughly one billion stars in the final catalogue will be examined an average of 70 times over the next five years.

LAUNCH TO INTERNATIONAL SPACE STATION HERALDS IMPROVED WEATHER FORECASTING HERE ON EARTH

[NASA launches RapidScat wind watcher to space station](#) (20 September 2014)



Sept. 21, 2014 -- At Cape Canaveral Air Force Station's Space Launch Complex 40, the nine rocket engines roar to life on the Falcon launch vehicle. Image credit: NASA

A new NASA mission that will boost global monitoring of ocean winds for improved weather forecasting and climate studies is among about 5,000 pounds (2,270 kilograms) of NASA science investigations and cargo now on their way to the International Space Station aboard SpaceX's Dragon spacecraft. This space-based scatterometer, developed by NASA's Jet Propulsion Laboratory, Pasadena, California, is a remote sensing instrument that uses radar pulses reflected from the ocean's surface from different angles to calculate surface wind speed and direction.

GAMMA-RAY BURST



The blue dot in this image marks the spot of an energetic pulsar -- the magnetic, spinning core of star that blew up in a supernova explosion. Image Credit: NASA/JPL-Caltech/SAO

[Pulse of a dead star powers intense gamma rays](#) (16 September 2014)

When the most massive stars explode as supernovas, they don't fade into the night, but sometimes glow ferociously with high-energy gamma rays. What powers these energetic stellar remains? In recent years, the Max-Planck Institute for Astronomy's H.E.S.S. experiment has identified more than 80 incredibly powerful sites of gamma rays, called high-energy gamma-ray sources, in our Milky Way. Most of these have been associated with prior supernova explosions, but for many, the primary source of observed gamma rays remains unknown. The gamma-ray source pinpointed in this new study, called HESS J1640-465, is one of the most luminous discovered so far. It was already known to be linked with a supernova remnant, but the source of its power was unclear. While data from Chandra and the European Space Agency's XMM-Newton telescopes hinted that the power source was a pulsar, intervening clouds of gas blocked the view, making it difficult to see. NuSTAR complements Chandra and XMM-Newton in its capability to detect higher-energy range of X-rays that can, in fact, penetrate through this intervening gas. In addition, the NuSTAR telescope can measure rapid X-ray pulsations with fine precision. In this particular case, NuSTAR was able to capture high-energy X-rays coming at regular fast-paced pulses from HESS J1640-465. These data led to the discovery of PSR J1640-4631, a pulsar spinning five times per second -- and the ultimate power source of both the high-energy X-rays and gamma rays. How does the pulsar produce the high-energy rays? The pulsar's strong magnetic fields generate powerful electric fields that accelerate charged particles near the surface to incredible speeds approaching that of light. The fast-moving particles then interact with the magnetic fields to produce the powerful beams of high-energy gamma rays and X-rays.

LINKS TO OTHER SPACE AND ASTRONOMY NEWS PUBLISHED IN SEPTEMBER 2014

ASTROPHYSICS

[Key step toward solving a major astrophysical mystery](#) (10 September 2014)

Magnetic reconnection can trigger geomagnetic storms that disrupt cell phone service, damage satellites and blackout power grids.

BLACK HOLES

[Smallest known galaxy with a supermassive black hole](#) (17 September 2014)

Astronomers have found an unlikely object in an improbable place: a monster black hole lurking inside one of the tiniest galaxies known.

BROWN DWARFS

[First evidence for water ice clouds found outside solar system](#) (9 September 2014)

A team of scientists led by Carnegie's Jacqueline Faherty has discovered the first evidence of water ice clouds on an object outside of our own Solar System.

COSMIC RAYS

[New measurements from the AMS experiment unveil new territories in the flux of cosmic rays](#)

(18 September 2014)

The Alpha Magnetic Spectrometer (AMS) collaboration has today presented its latest results.

[Turning the Moon into a cosmic ray detector](#) (26 September 2014)

Scientists from the University of Southampton are to turn the Moon into a giant particle detector to help understand the origin of Ultra-High-Energy (UHE) cosmic rays - the most energetic particles in the Universe.

DARK MATTER

[Interactive dark matter could explain Milky Way's missing satellite galaxies](#) (9 September 2014)

Scientists believe they have found a way to explain why there are not as many galaxies orbiting the Milky Way as expected.

EARTH

[New era of Earth science from Space Station](#) (8 September 2014)

The launch of a NASA ocean winds sensor to the International Space Station (ISS) this month inaugurates a new era of Earth observation that will leverage the space station's unique vantage point in space.

[SSTL demonstrates innovative method for measuring ocean winds and waves from space](#)

(25 September 2014)

Surrey Satellite Technology Ltd (SSTL) has successfully demonstrated an innovative method of measuring winds and waves from space, using GNSS Reflectometry.

[Earth's water is older than the Sun](#) (25 September 2014)

Water was crucial to the rise of life on Earth and is also important to evaluating the possibility of life on other planets.

EXOPLANETS

[Astronomer pinpoints 'Venus Zone' around stars](#) (10 September 2014)

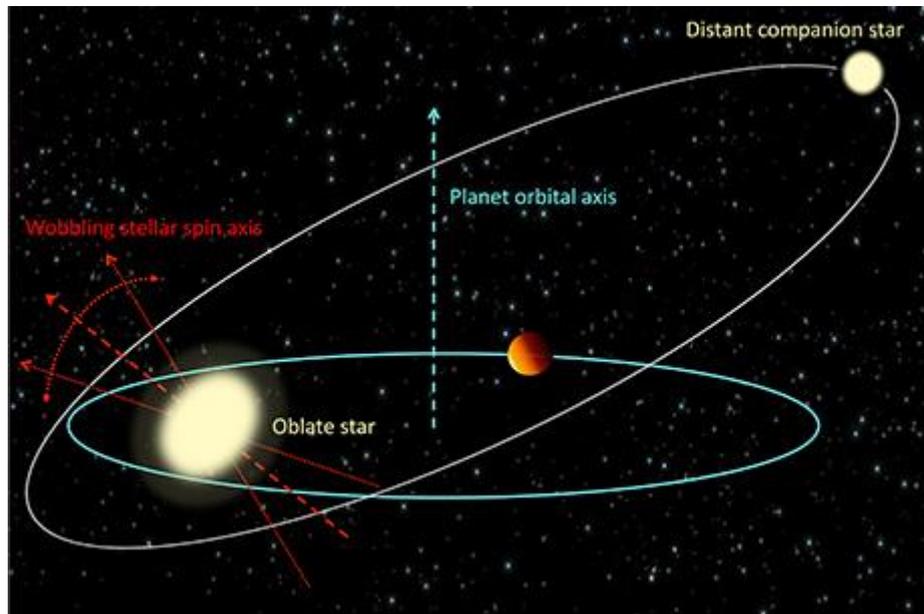
San Francisco State University astronomer Stephen Kane and a team of researchers presented today the definition of a "Venus Zone," the area around a star in which a planet is likely to exhibit the unliveable conditions found on the planet Venus.

[NASA research gives guideline for future alien life search](#) (11 September 2014)

Astronomers searching the atmospheres of alien worlds for gases that might be produced by life can't rely on the detection of just one type, such as oxygen, ozone, or methane, because in some cases

these gases can be produced non-biologically, according to extensive simulations by researchers in the NASA Astrobiology Institute's Virtual Planetary Laboratory.

[Hot Jupiters provoke their own host suns to wobble](#) (11 September 2014)



Provided

"Hot Jupiters," those large, gaseous planets outside our solar system, can make their suns wobble after they wend their way through their own solar systems.

These large, gaseous exoplanets (planets outside our solar system) can make their suns wobble when they wend their way through their own solar systems to snuggle up against their suns, according to new Cornell University research to be published in Science, Sept. 11.

[Chandra X-ray observatory finds planet that makes star act deceptively old](#)

(16 September 2014)

A planet may be causing the star it orbits to act much older than it actually is, according to new data from NASA's Chandra X-ray Observatory.

[NASA telescopes find clear skies and water vapour on exo-Neptune](#) (24 September 2014)

Astronomers using data from three of NASA's space telescopes — Hubble, Spitzer, and Kepler — have discovered clear skies and steamy water vapour on a gaseous planet outside our solar system.

[Keele astronomers find 'cousin' planets around twin stars](#) (30 September 2014)

Astronomers at Keele University have found two new Jupiter-sized extra-solar planets, each orbiting one star of a binary-star system.

FUTURE SPACE MISSIONS

[Scientists' work may lead to mission to find out what's inside asteroids](#) (2 September 2014)

Future asteroid mining operations and how we deal with an impending strike could be influenced by research on a potential NASA mission that's being done by team that includes a University of Alabama in Huntsville (UAH) scientist.

[RapidScat: some assembly required - in space](#) (4 September 2014)

NASA's ISS-RapidScat wind-watching scatterometer, which is scheduled to launch to the International Space Station no earlier than Sept. 19, will be the first science payload to be robotically assembled in space since the space station itself. <http://www.jpl.nasa.gov/missions/iss-rapidscat/>

[**New NASA probe will study Earth's forests in 3-D**](#) (8 September 2014)

A laser-based instrument being developed for the International Space Station will provide a unique 3-D view of Earth's forests, helping to fill in missing information about their role in the carbon cycle.

[**Remote-sensing instrument to blaze a trail on the International Space Station**](#)

(8 September 2014)

The Cloud-Aerosol Transport System (CATS), a new instrument that will measure the character and worldwide distribution of the tiny particles that make up haze, dust, air pollutants and smoke, will do more than gather data once it's deployed on the International Space Station this year.

[**NASA identifying candidate asteroids for redirect mission**](#) (9 September 2014)

NASA is on the hunt to add potential candidate target asteroids for the agency's Asteroid Redirect Mission (ARM).

[**NASA chooses American companies to transport US astronauts to International Space Station**](#)

(16 September 2014)

U.S. astronauts once again will travel to and from the International Space Station from the United States on American spacecraft under ground breaking contracts NASA announced Tuesday.

[**OHB plans Moon mission in memory of Manfred Fuchs**](#) (18 September 2014)

In memory of Prof. Dott.-Ing. h.c. Manfred Fuchs, the founder of OHB, who passed away on April 26, 2014, OHB will carry out a lunar mission at the end of October 2014.

[**NASA expands commercial space program**](#) (26 September 2014)

On the heels of awarding ground-breaking contracts to U.S. commercial space companies to ferry American astronauts to the International Space Station, NASA has released a request for proposals (RFP) for the next round of contracts for private-sector companies to deliver experiments and supplies to the orbiting laboratory.

[**Rosetta to deploy lander on 12 November**](#) (26 September 2014)

The European Space Agency's Rosetta mission will deploy its lander, Philae, to the surface of Comet 67P/Churyumov-Gerasimenko on 12 November.

GALAXIES

[**Newly identified galactic supercluster is home to the Milky Way**](#) (3 September 2014)

Astronomers using the National Science Foundation's Green Bank Telescope (GBT) -- among other telescopes -- have determined that our own Milky Way galaxy is part of a newly identified ginormous supercluster of galaxies, which they have dubbed "Laniakea," which means "immense heaven" in Hawaiian.

[**Spitzer's SPLASH project dives deep for galaxies**](#) (9 September 2014)

A new survey of galaxies by NASA's Spitzer Space Telescope is taking a plunge into the deep and uncharted waters of our cosmos.

[**Violent origins of disc galaxies probed by ALMA**](#) (17 September 2014)

For decades scientists have believed that galaxy mergers usually result in the formation of elliptical galaxies.

[**Monster galaxies gain weight by eating smaller neighbours**](#) (19 September 2014)

Massive galaxies in the Universe have stopped making their own stars and are instead snacking on nearby galaxies, according to research by Australian scientists.

GRAVITATIONAL WAVES

[Finding hints of gravitational waves in the stars](#) (22 September 2014)

Scientists have shown how gravitational waves—invisible ripples in the fabric of space and time that propagate through the universe—might be "seen" by looking at the stars.

INTERNATIONAL SPACE STATION

[Space Station Expedition 40 crew returns to Earth, lands safely in Kazakhstan](#)

(10 September 2014)

Three crew members from the International Space Station (ISS) returned to Earth Wednesday after 169 days of science and technology research in space, including a record 82 hours of research in a single week, which happened in July.

[Where to grab space debris](#) (10 September 2014)

Objects in space tend to spin — and spin in a way that's totally different from the way they spin on earth.

[Bubble-free pumping of liquids in space](#) (10 September 2014)

Pumping fuel with no bubbles is no problem at the filling station around the corner, but it certainly is in the microgravity environment of space.

[NASA Ames to launch science experiments to space station on SpaceX rocket](#)

(16 September 2014)

NASA's Ames Research Center in Moffett Field, California, will launch four life science experiments to the International Space Station aboard NASA's next commercial cargo resupply flight of the SpaceX Dragon spacecraft.

[Everything in moderation: Micro-8 to study regulating pathogens in space](#) (17 September 2014)

Many active enzymes and bacteria are merely benign, and, in moderation, are beneficial to humans as an important part of our digestive system or can help regulate our immune system.

[NASA cargo launches to space station aboard SpaceX resupply mission](#) (21 September 2014)

About 5,000 pounds of NASA science investigations and cargo are on their way to the International Space Station aboard SpaceX's Dragon spacecraft.

[Fourth Dragon for commercial resupply services arrives at ISS](#) (23 September 2014)

The Dragon commercial cargo craft has completed a two day trip to the International Space Station after launching early Sunday morning.

[New crew launches to Space Station to continue scientific research](#) (25 September 2014)

Three crew members representing the United States and Russia are on their way to the International Space Station after launching from the Baikonur Cosmodrome in Kazakhstan at 4:25 p.m. EDT Thursday, Sept. 25 (2:25 a.m. on Sept. 26 in Baikonur).

INTERSTELLAR MEDIUM

[Interstellar molecules are branching out](#) (25 September 2014)

Scientists from the Max Planck Institute for Radio Astronomy (Bonn, Germany), Cornell University (USA), and the University of Cologne (Germany) have for the first time detected a carbon-bearing molecule with a "branched" structure in interstellar space.

JUPITER AND MOONS

[Evidence of 'diving' tectonic plates on Jupiter's moon Europa](#) (8 September 2014)

Scientists have found evidence of plate tectonics on Jupiter's moon Europa. This indicates the first sign of this type of surface-shifting geological activity on a world other than Earth.

MARS

[MAVEN spacecraft makes final preparations for Mars](#) (8 September 2014)

On Sept. 21, 2014, the Mars Atmosphere and Volatile Evolution spacecraft will complete roughly 10 months of travel and enter orbit around the Red Planet.

[Mars Curiosity Rover arrives at Martian mountain](#) (11 September 2014)

NASA's Mars Curiosity rover has reached the Red Planet's Mount Sharp, a Mount-Rainier-size mountain at the centre of the vast Gale Crater and the rover mission's long-term prime destination.

[NASA Mars spacecraft ready for Sept. 21 orbit insertion](#) (17 September 2014)

NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft is nearing its scheduled Sept. 21 insertion into Martian orbit after completing a 10-month interplanetary journey of 442 million miles.

[Lockheed Martin-built MAVEN successfully placed into orbit around Mars](#) (22 September 2014)

NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft, built by Lockheed Martin, was successfully placed in orbit around Mars this evening.

[Rover drill pulls first taste from Mars mountain](#) (26 September 2014)

NASA's Curiosity Mars rover has collected its first taste of the layered mountain whose scientific allure drew the mission to choose this part of Mars as a landing site.

[Glaciers in the Grand Canyon of Mars?](#) (29 September 2014)

For decades, planetary geologists have speculated that glaciers might once have crept through Valles Marineris, the 2000-mile-long chasm that constitutes the Grand Canyon of Mars.

METEORITES

[Martian meteorite yields more evidence of the possibility of life on Mars](#) (15 September 2014)

A tiny fragment of Martian meteorite 1.3 billion years old is helping to make the case for the possibility of life on Mars, say scientists.

MILKY WAY

[219 million stars: a detailed catalogue of the visible Milky Way](#) (16 September 2014)

A new catalogue of the visible part of the northern part of our home Galaxy, the Milky Way, includes no fewer than 219 million stars.

MISCELLANEOUS

[How much gravity is enough?](#) (3 September 2014)

Keeping upright in a low-gravity environment is not easy, and NASA documents abound with examples of astronauts falling on the lunar surface.

QUASARS

[Mysterious quasar sequence explained](#) (10 September 2014)

Quasars are supermassive black holes that live at the centre of distant massive galaxies.

SATURN AND MOONS

[Titan's subsurface reservoirs modify methane rainfall](#) (1 September 2014)

A recent study probed the hydrological cycle of Titan by examining how Titan's methane rainfall would interact with icy materials within underground reservoirs. They found that the formation of materials called clathrates changes the chemical composition of the rainfall runoff that fills these hydrocarbon reservoirs, leading to the formation of reservoirs of propane and ethane that may feed into some rivers and lakes. The Cassini Solstice mission, an extension of Cassini that runs until 2017, will give scientists a chance to explore Titan's surface lakes even more closely by performing an additional 54 close flybys of the Saturnian moon.

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[Bright clumps in Saturn ring now mysteriously scarce](#) (8 September 2014)

Compared to the age of the solar system -- about four-and-a-half billion years -- a couple of decades are next to nothing.

[Cassini watches mysterious feature evolve in Titan sea](#) (29 September 2014)

NASA's Cassini spacecraft is monitoring the evolution of a mysterious feature in a large hydrocarbon sea on Saturn's moon Titan.

SOLAR SYSTEM

[Mysteries of space dust revealed](#) (8 September 2014)

The first analysis of space dust collected by a special collector on board NASA's Stardust mission and sent back to Earth for study in 2006 suggests the tiny specks open a door to studying the origins of the solar system and possibly the origin of life itself.

SPACE

[Where is that spacecraft? Statistically measuring uncertainty for space surveillance](#)

(22 September 2014)

Space surveillance is inherently challenging when compared to other tracking environments due to various reasons, not least of which is the long-time gap between surveillance updates.

SPACE MISSIONS

[Dawn operating normally after safe mode triggered](#) (16 September 2014)

The Dawn spacecraft has resumed normal ion thrusting after the thrusting unexpectedly stopped and the spacecraft entered safe mode on September 11.

STARS AND STAR CLUSTERS

[Most metal-poor star hints at universe's first supernovae](#) (19 September 2014)

A team of researchers, led by Miho N. Ishigaki, at the Kavli IPMU, The University of Tokyo, pointed out that the elemental abundance of the most iron-poor star can be explained by elements ejected from supernova explosions of the universe's first stars.

[Infant solar system shows signs of windy weather](#) (22 September 2014)

Astronomers using the Atacama Large Millimeter/submillimeter Array (ALMA) have observed what may be the first-ever signs of windy weather around a T Tauri star, an infant analogue of our own Sun.

[Most stars are born in clusters; some leave "home"](#) (24 September 2014)

New modelling studies from Carnegie's Alan Boss demonstrate that most of the stars we see were formed when unstable clusters of newly formed protostars broke up.

[Simulations reveal an unusual death for ancient stars](#) (29 September 2014)

Certain primordial stars—those between 55,000 and 56,000 times the mass of our Sun, or solar masses—may have died unusually.

[Swift observes mega flares from a mini star](#) (30 September 2014)

On April 23, NASA's Swift satellite detected the strongest, hottest, and longest-lasting sequence of stellar flares ever seen from a nearby red dwarf star.

SUN**[New clues to determining the solar cycle](#)** (3 September 2014)

Approximately every 11 years, the sun undergoes a complete personality change from quiet and calm to violently active.

[Solar explosions inside a computer](#) (23 September 2014)

Strong solar flares can bring down communications and power grids on Earth. By demonstrating how these gigantic eruptions are caused, ETH physicists are laying the foundations for future predictions.

[Solar disturbances and their impact on satellite navigation systems](#) (29 September 2014)

Scientists know that weather in space impacts activity here on Earth, so Dr Brian Wood, at the U.S. Naval Research Laboratory (NRL) Space Science Division, is analysing ionospheric disturbances to determine their effect on ground-based satellite navigation systems.

[Nitrogen fingerprint in biomolecules and extraterrestrial objects could be from early Sun](#)

(29 September 2014)

Chemical fingerprints of the element nitrogen vary by extremes in materials from the molecules of life to the solar wind to interstellar dust.

[Six minutes to study solar heating](#) (29 September 2014)

On Sept. 30, 2014, a sounding rocket will fly up into the sky – past Earth's atmosphere that obscures certain wavelengths of light from the sun -- for a 15-minute journey to study what heats up the sun's atmosphere.

SUPERNOVA**[Magnetar discovered close to supernova remnant Kesteven 79](#)** (1 September 2014)

Massive stars end their life with a bang, exploding as supernovas and releasing massive amounts of energy and matter.

[Hubble finds companion star hidden for 21 years in a supernova's glare](#) (9 September 2014)

Astronomers using NASA's Hubble Space Telescope have discovered a companion star to a rare type of supernova. (Type 11b)

[Lurking bright blue star caught! - the last piece of a supernova puzzle](#) (11 September 2014)

A team led by Gastón Folatelli at the Kavli IPMU, the University of Tokyo, has found evidence of a hot binary companion star to a yellow supergiant star, which had become a bright supernova.

TECHNOLOGY AND TECHNOLOGY TRANSFER**[Not just cool – it's a gas](#)** (12 September 2014)

In space, a new way of producing gas is being tested for steering satellites. On Earth, it is now fighting fires without harming the environment – and business insiders say it could be revolutionary.

[Shrink-wrapping spacesuits](#) (18 September 2014)

For future astronauts, the process of suiting up may go something like this: Instead of climbing into a

conventional, bulky, gas-pressurized suit, an astronaut may don a lightweight, stretchy garment, lined with tiny, muscle-like coils.

[UK to build unique intergalactic GPS instrument to map the stars](#) (26 September 2014)

A €9M contract is announced today for UK-based engineers and designers to build a unique and powerful instrument that aims to tackle some of the most compelling astronomical puzzles – such as how stars and galaxies form and evolve, and probing the structure of our own Milky Way.

UNIVERSE

[ALMA achieves new observing capabilities](#) (10 September 2014)

The Atacama Large Millimeter/submillimeter Array (ALMA) has reached a major milestone by extending its vision fully into the realm of the submillimeter, the wavelengths of cosmic light that hold intriguing information about the cold, dark, and distant Universe.

URANUS

[Miranda: an icy moon deformed by tidal heating](#) (18 September 2014)

Miranda, a small, icy moon of Uranus, is one of the most visually striking and enigmatic bodies in the solar system.

VENUS

[Unravelling the mysteries of the Venusian atmosphere](#) (11 September 2014)

Underscoring the vast differences between Earth and its neighbour Venus, new research shows a glimpse of giant holes in the electrically charged layer of the Venusian atmosphere, called the ionosphere.

Pat Williams. September 2014