



ASTRO

NEWSLETTER

Volume 11, Issue 13

June 29, 2018

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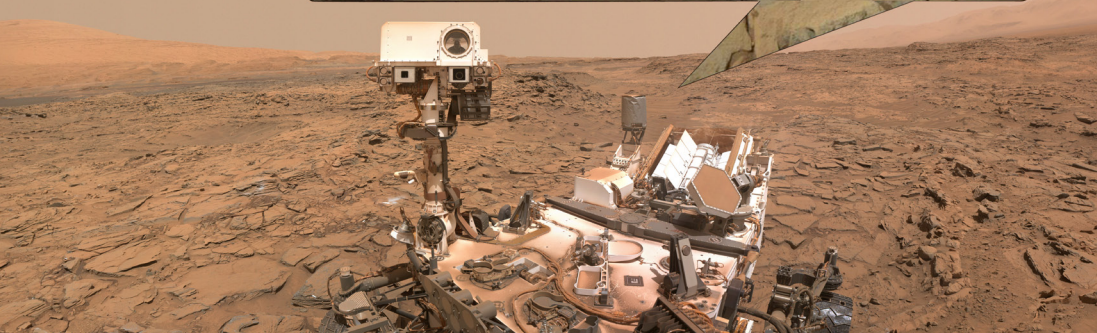
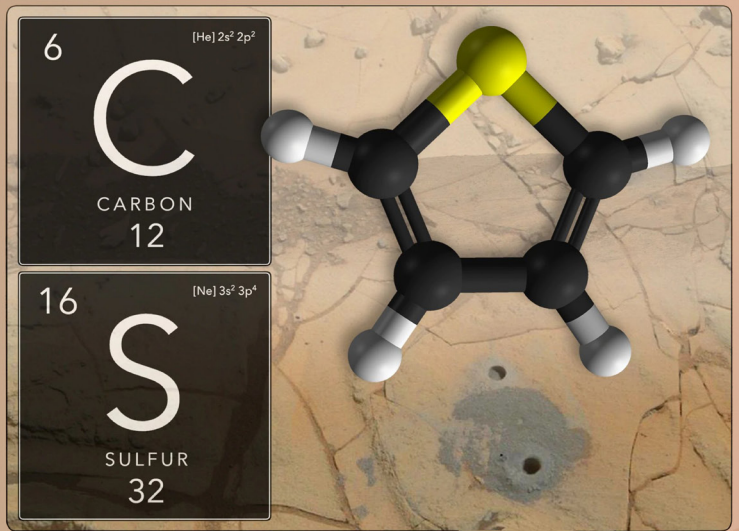
Saturn Moon Enceladus Is First Alien 'Water World' with Complex Organics

Complex organic molecules have been discovered for the first time coming from the depths of Saturn's moon Enceladus, a new study reported.

Spacecraft scheduled to launch soon could explore what this new discovery says about the chances of life within icy moons like Enceladus, the study's researchers said.

The sixth largest of Saturn's moons, Enceladus is only about 314 miles (505 kilometers) in diameter. This makes the moon small enough to fit inside the borders of Arizona. In 2005, NASA's Cassini spacecraft detected plumes of water vapor and icy particles erupting from Enceladus, revealing the existence of a giant ocean hidden under the moon's frozen shell. Because there is life virtually wherever there is water on Earth, these findings suggested that life might also exist on Enceladus.

space.com



NASA Finds Ancient Organic Material on Mars

NASA's Curiosity rover has found new evidence preserved in rocks on Mars that suggests the planet could have supported ancient life, as well as new evidence in the Martian atmosphere that relates to the search for current life on the Red Planet. While not necessarily evidence of life itself, these findings are a good sign for future missions exploring the planet's surface and subsurface.

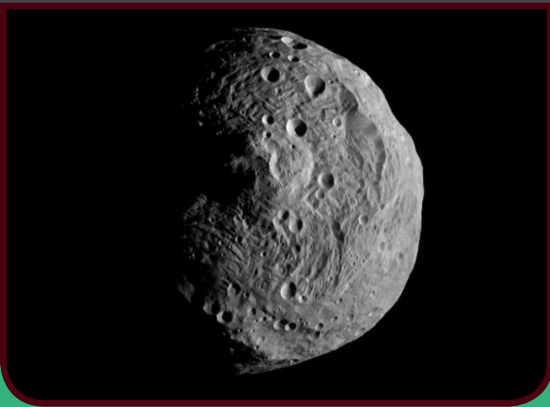
Organic molecules contain carbon and hydrogen, and also may include oxygen, nitrogen and other elements. While commonly associated with life, organic molecules also can be created by non-biological processes and are not necessarily indicators of life. To identify organic material in the Martian soil, Curiosity drilled into sedimentary rocks known as mudstone from four areas in Gale Crater. This mudstone gradually formed billions of years ago from silt that accumulated at the bottom of the ancient lake. The rock samples were analyzed by SAM,

which uses an oven to heat the samples (in excess of 900 degrees Fahrenheit, or 500 degrees Celsius) to release organic molecules from the powdered rock.

SAM measured small organic molecules that came off the mudstone sample – fragments of larger organic molecules that don't vaporize easily. Some of these fragments contain sulfur, which could have helped preserve them in the same way sulfur is used to make car tires more durable, according to Eigenbrode.

The results also indicate organic carbon concentrations on the order of 10 parts per million or more. This is close to the amount observed in Martian meteorites and about 100 times greater than prior detections of organic carbon on Mars' surface. Some of the molecules identified include thiophenes, benzene, toluene, and small carbon chains, such as propane or butene.

nasa.gov



Japan space probe reaches asteroid in search for origin of life

A Japanese probe has reached an asteroid 300 million kilometres away to collect information about the birth of the solar system and the origin of life after a more than three-year voyage through deep space.

The Hayabusa2 probe successfully settled into an observation position 20 kilometres (12 miles) above the Ryugu asteroid, officials from the Japan Aerospace Exploration Agency (JAXA) said Wednesday.

Researchers broke out into cheers when the probe arrived in place, a feat JAXA described as “shooting from Japan at a six centimetre target in Brazil”.

“Today, we are at the beginning of a space science exploration that is unprecedented for humankind,” project manager Yuichi Tsuda told reporters.

The successful mission came just days before the UN’s International Asteroid Day on June 30, a global event to raise awareness about the hazards of an asteroid impact and technological progress to counter such a threat.

Scientists hope to glean clues about what gave rise to life on Earth from samples taken from Ryugu, which is thought to contain relatively large amounts of organic matter and water.

spacedaily.com

NASA Delays Launch of James Webb Space Telescope Again — This Time to 2021

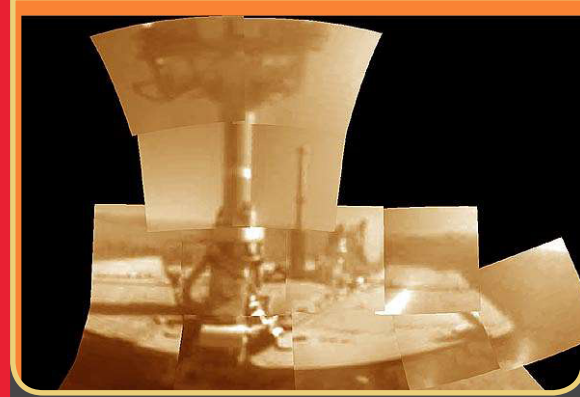
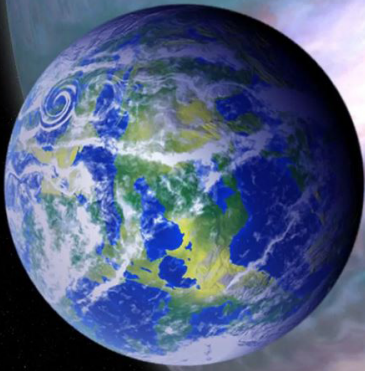
Despite its puny atmosphere, Pluto still musters enough wind to create dunes like those found on Earth. Of course, the dunes are made of methane, not sand. When NASA’s New Horizons spacecraft zipped by Pluto at 31,000 miles (50,000 kilometers) per hour in July 2015, it captured a plethora of breathtaking photos of the distant dwarf planet’s surface. Within these highly detailed images, researchers noticed what looked to be an extensive system of strange dunes stretching 75 miles along the boundary of Pluto’s massive Al-Idrisi Montes mountain range and Sputnik Planitia – a nitrogen-ice plain that forms the left lobe of the planet’s famous “heart.” According to the study, published May 31 in the journal *Science*, despite the vast differences between Pluto and Earth, the two worlds apparently form dunes in a very similar way. Specifically, Pluto’s atmosphere captures small particles of methane (instead of sand) from the base of a nearby mountain range before relatively strong winds carry the particles away. These particles eventually settle with a little help from gravity, ultimately forming wind-swept dunes comparable to those found on Earth.

“When we first saw the New Horizons images, we thought instantly that these were dunes, but it was really surprising because we know there is not much of an atmosphere,” said co-author Jani Radebaugh. “However, despite being 30 times farther away from the Sun as the Earth, it turns out Pluto still has Earth-like characteristics.”

To determine exactly how a frozen planet with an atmosphere just 1/1,000th as thick as Earth’s (and with 1/100,000th the pressure) could form wind-swept dunes, Telfer and his team carried out a detailed spatial analysis of the dunes, finding orthogonal wind streaks similar to those found seen in sand dunes on Earth. Furthermore, spectral and numerical models showed that Pluto’s dunes may form from a thin layer of methane that gets released into the air due to nitrogen ice below it sublimating – or turning directly from a solid to a gas. Alternatively, the methane may come directly from the bottom of the nearby mountain range, getting swept up in the winds that flow down the mountainous slopes at roughly 22 miles per hour (35 kilometers per hour). “On Earth, you need a certain strength of wind to maintain transport,” said co-author Eric Parteli. “The considerably lower gravity of Pluto, and the extremely low atmospheric pressure, means the winds needed to maintain sediment transport can be a hundred times lower.” In other words, Pluto’s winds are more than strong enough to carry tiny particles through a thin atmosphere on a world where gravity is 12 times weaker than it is on Earth.

Though New Horizons is now too far from Pluto to gather any more useful information about the dwarf planet, its mission is still far from complete. In just six short months, on New Year’s Day 2019, New Horizons will fly past the tiny trans-Neptunian object 2014 MU69, located about a billion miles (1.6 billion km) beyond Pluto. This will make 2014 MU69 the most distant object in the solar system ever visited by a spacecraft.

space.com



Opportunity sleeps during a planet-encircling dust storm

The dust storm on Mars is now a Planet-encircling Dust Event (PEDE).

It shows no indication of receding at this time. Since the last contact with the rover on Sol 5111 (June 10, 2018), it is likely that Opportunity has experienced a low-power fault, putting herself to sleep only to wake when the skies eventually clear.

If the atmospheric opacity or the solar array dust factor has gotten worse since the last telemetry, Opportunity could also experience a mission clock fault.

A clock fault will complicate the recovery, but not prevent it. An analysis of the rover's long-term temperature trends, conservatively assuming no solar array input, indicates that the rover's electronics and batteries will stay above their flight-allowable temperatures. There is a small concern with the health of the batteries if they discharge completely. The batteries might lose some of their capacity if the cell voltages drop to near zero.

The project is listening every day for the rover during both the time of low-power fault communication windows and listening over a broader range of times under mission clock fault.

Additionally, for the near term, the project is also sending a command to elicit a beep if the rover happens to be awake. The Deep Space Network (DSN) Radio Science Receiver (RSR) team is using the RSR to listen in on any DSN pass pointed at Mars that corresponds to possible wake up times for the rover.

marsdaily.com

The rockets that are pushing the boundaries of space travel

Friday morning at 5:42 am (0942 GMT), a rocket owned by the US company SpaceX will blast off from Florida carrying two and a half tons of gear from NASA, only to dock three days later and 250 miles (400 kilometers) above Earth at the International Space Station. The rocket itself is not new. It launched a NASA satellite into orbit two months ago, then landed back on Earth—upright—on a barge in the Atlantic Ocean off Cape Canaveral. Even the Dragon capsule, carrying the cargo and affixed to the top of the rocket, was used before. It flew a mission to the ISS in 2016.

These missions may appear routine, but they represent a revolution in space travel. Friday's flight will be the 15th SpaceX mission for the US space agency since 2012, one of which exploded in flight. Another company, Orbital ATK, has completed nine supply trips, with one explosion as well. Before SpaceX, only national governments resupplied the space station. NASA is so dependent on the private sector that the US space agency has signed contracts with SpaceX and Boeing to send astronauts to space beginning next year, as soon as their capsules are ready. NASA has been unable to send people to space since the space shuttle program ended in 2011. Instead, the world's space agencies buy seats aboard Russia's Soyuz spaceships, which launch from Baikonur, Kazakhstan.

American resurgence

SpaceX, founded by Tesla CEO and space enthusiast Elon Musk, has shaken up the satellite launch sector, with more than 55 launches of its Falcon 9 rocket since 2010. Thanks to SpaceX, the United States has taken the global lead in launches once again, after losing ground for more than a decade to Russia and China. Miniature satellites weighing a few pounds (kilograms) can be made quickly and launched for tens of thousands of dollars.

Tourism, Moon and Mars

The age of space tourism is also approaching.

Virgin Galactic is ramping up tests for its piloted SpaceShipTwo VSS Unity, which is launched from an airplane. A seat will cost \$250,000.

And Blue Origin, founded by Amazon CEO Jeff Bezos, will sell tickets next year for a seat on its New Shepard spacecraft, which is designed to carry six people into space.

These two vehicles will not go into orbit around Earth, but will allow passengers to experience spaceflight and weightlessness for several minutes before returning to Earth.

NASA is building the Orion capsule and Space Launch System (SLS) rocket to send people around the Moon for the first time since 1972. The SLS will be the most powerful rocket ever built by the United States. Its first lunar orbit mission is planned for 2020, with astronauts on board by 2023.

E-Pal Week

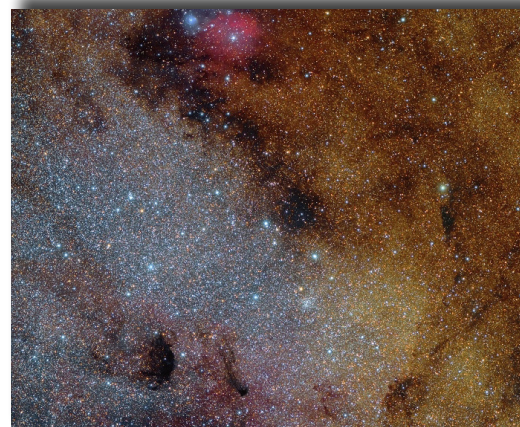
1-7 July 2018 is the E-Pal week! Some of you will be a participant of that week. You will learn and fun during the whole week! You will have chance to go to pool, and also participate the famous Space Camp BBQ night! It will be AWESOME! You may see some photos which taken from the E-Pal week!



Astronomy Picture of the Day

Messier 24: Sagittarius Star Cloud

Unlike most entries in Charles Messier's famous catalog of deep sky objects, M24 is not a bright galaxy, star cluster, or nebula. It's a gap in nearby, obscuring interstellar dust clouds that allows a view of the distant stars in the Sagittarius spiral arm of our Milky Way galaxy. Sometimes called the Small Sagittarius Star Cloud, M24's luminous stars fill the left side of this gorgeous starscape. Covering about 4 degrees or the width of 8 full moons in the constellation Sagittarius, the telescopic field of view contains many small, dense clouds of dust and nebulae toward the center of the Milky Way, including reddish emission from IC 1284 near the top of the frame.



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