

India launches communication satellite GSAT-31 onboard European rocket

India launched its latest communication satellite GSAT-31 on a European launch services provider ArianeSpace rocket from French Guiana on Wednesday, local media reported.

"GSAT-31 has a unique configuration of providing flexible frequency segments and coverage. It will provide communication services to Indian mainland and island." Weighing about 2,535 kg,

such applications.

"It gives me great pleasure on the successful launch of GSAT-31 spacecraft on board Ariane-5, this is the third mission for ISRO in 2019.

Congratulations to ArianeSpace on the successful launch and precise injection of satellite into the orbit," the director of ISRO's Satish Dhawan Space Center (SDSC) S. Pandian was quoted as saying at Kourou soon after the launch.

According to media reports, GSAT-31 is the country's 40th communication satellite which is configured on ISRO's enhanced I-2K Bus, utilizing the maximum 'bus capabilities' of this type. This satellite will augment the Ku-band transponder capacity in Geostationary Orbit, ISRO said.

With a mission life of around 15 years, the satellite will provide wide beam coverage to facilitate communication over large oceanic region, comprising large parts of Arabian Sea, Bay of Bengal and Indian Ocean, using a wide band transponder.



business today.in

"The GSAT-31 successfully launched by Ariane5 from French Guiana. After a 42-minute flight, GSAT-31 separated from the Ariane 5 upper stage," the Indian Space Research Organization (ISRO) said in a statement. xinhuanet.com reported.

Commenting on the satellite launch, ISRO Chairman K. Sivan reportedly said,

the satellite will be used for supporting VSAT SAT (Very Small Aperture Terminal) networks, which is a satellite communications system that serves home and business users.

Besides, it will also help television uplinks, digital satellite news gathering, DTH (direct to home) television services, cellular back haul connectivity and many

Our Milky Way galaxy is truly warped, at least around edges

It turns out our Milky Way galaxy is truly warped, at least around the far edges.

Scientists in China and Australia released an updated 3D map of the Milky Way on Tuesday. They used 1,339 pulsating stars — young, newly

center, the more warping, or twisting, there is in the Milky Way's outer hydrogen gas disc.

Researchers said the warped, spiral pattern is likely caused by the spinning force of the massive inner disc of stars.



XIAODIAN CHEN/AP

catalogued stars bigger and brighter than our sun — to map the galaxy's shape, according to AP.

The farther from the

"We usually think of spiral galaxies as being quite flat, like Andromeda, which you can easily see through a telescope."

Macquarie University's Richard de Grijs, who took part in the study, said in a statement from Sydney.

Lead researcher Xiaodian Chen of the Chinese Academy of Sciences in Beijing said it's difficult to determine distances from the Sun to the Milky Way's fringes, "without having a clear idea of what that disc actually looks like".

The stars on which his team's map is based — known as classical Cepheids — provided substantial measuring accuracy.

At least a dozen other galaxies appear to have warped edges in a similar spiral pattern, so in that respect, we're hardly unique.

The study appears in the journal Nature Astronomy.

INIC secretary: Iran ranks fourth worldwide in field of nanotechnology

Science & Technology Desk

Iran has jumped 53 spots from the world's No. 57 — four decades ago — to No. 4 in the field of nanotechnology since the victory of the country's 1979 Islamic Revolution, said the secretary of Iran Nanotechnology Innovation Council (INIC).

This comes as the country has made tremendous advances in other fields as well such as medicine, military, agriculture, science and technology during the past forty years.

Speaking to IRNA on Tuesday, Saied Sarkar hailed the fast growth of nanotechnology in the country over the past four decades.

This as well as other scientific advances made in Iran since 1979 are all among the achievements of the Islamic Revolution, he added.

According to IRNA, in 1979, few people in Iran had heard terms and expressions pertaining to modern sciences and technologies such as nano, stem cells and space technologies.

This comes as today, not only these are quite familiar words to those involved in the fields of science and technology in Iran, but the country also ranks among top states in the region and world in these areas and is an exporter of a



IRNA

large number of technologies.

On the back of the country's technological achievements in the post-Islamic revolution era, domestic experts have managed to,

by relying on their own capabilities, launch satellites, manufacture airplane and ship and produce nano products in the fields of, among others, medicine and health.

Sarkar said at present, more than 30,000 specialized

workforce are involved in the field of nanotechnology in Iran, adding in the year to March 2018, Iran published over 9,000 articles pertaining to the field of nanotechnology to rank fourth in the world following China, the US and India.

He noted that by March 2019, the number of articles in this field is expected to surpass 10,500.

In the year to March 2018, Iran exported nano-based products

worth more than \$60 million to over 45 countries including South Korea, China, Australia, Malaysia, Russia, Turkey, Germany, the UK, France, Italy and Spain, Sarkar said.

Iran's overseas sales of nano products are expected to witness a 100-percent growth in the year to March 2019, compared to the figure for the same period last year, he added.

Scientists analyze mysterious origin of exoplanet made of iron

A new study by scientists from Italy's National Institute for Astrophysics (INAF) and the University of Bristol examines exoplanets in the Kepler-107 system in order to try and understand how planets in the same system and with similar sizes can have such a wide range of densities.

The scientists have been studying the exoplanetary system Kepler-107 through the Telescopio Nazionale Galileo in La Palma, Spain, sputniknews.com wrote.

According to the study, the reason why two exoplanets could be so different in a very compact system of planets is that they were formed under very different conditions, or that something dramatic happened post-formation to alter their



ESO

densities so drastically. Kepler-107b and 107c have radii of 1.53 and 1.59 Earth radii, orbital periods of 3.18 and 4.9 days, but densities of 5.3 and 12.65 grams per cubic centimeter, respectively.

It is even more strange that Kepler-107c is an

outer planet — as in our Solar System outer planets like Jupiter, Saturn, Uranus and Neptune have much lower densities as they are formed from cold ices and gases, while inner planets are formed out of materials that survived the Sun's radiation, like silicates and iron.

The scientists believe that a catastrophic collision is responsible for the disparate densities. It might be the case that at some unknown time Kepler — 107 suffered a catastrophic collision that stripped off its silicate mantle, leaving only the 70 percent iron core.

"Giant impacts are thought to have had a fundamental role in shaping our current solar system,"

explained Bristol's Dr. Zoe Leinhardt, a computational astrophysicist and coauthor of the study's paper, in a press statement, cited by PopularMechanics.

"The Moon is most likely the result of such an impact, Mercury's high density may be also, and Pluto's large satellite Charon was likely captured after a giant

impact but until now, we hadn't found any evidence of giant impacts occurring in planetary systems outside of our own."

If our hypothesis is correct, it would connect the general model we have for the formation of our Solar System with a planetary system that is very different from our own," she added.

The origin of Kepler-107c could help with understanding the mysteries of our own Solar System — for example, it could provide an explanation of Mercury's metallic core that covers around 85 percent of its body. The origin of this core is still unknown yet scientists suspect that a giant collision could have been responsible.

Zika-resistant mosquitoes engineered by Australian researchers

Australian scientists made a major breakthrough in the fight against the Zika virus.

The Commonwealth Scientific and Industrial Research Organization (CSIRO) said on Wednesday that it has successfully engineered mosquitoes resistant to spreading the deadly virus, xinhuanet.com wrote.

Zika virus, named after Uganda's Zika Forest, is spread by daytime-active Aedes aegypti mosquitoes.

It caused more than 4,000 birth defects worldwide in 2015 alone and remains a major threat to millions of people.

Researchers from the CSIRO and University of California San Diego found that injecting mosquito embryos with a synthetic anti-Zika gene prevented them from carrying the virus as adults.

"Our study found the mosquitoes with an anti-Zika gene were unable to pick up Zika



SHANGHAI DAILY

when they fed, so they were incapable of spreading the virus to anybody else," CSIRO Senior Research Scientist and paper coauthor Prasad Paradkar said in a statement on Wednesday.

"With further investigation, this mosquito could potentially one day be used to replace populations of wild Aedes aegypti, adding to the arsenal of control strategies against this mosquito to halt the virus' spread around the world."

Zika has not spread to Australia but the invasive Aedes

aegypti has established itself in the nation's tropical north.

"Infection during pregnancy can cause life-threatening complications to a fetus or newborn baby, including birth defects such as microcephaly," Paradkar said.

"With increased globalization and international travel, the virus is capable of making it to Australian shores someday — so we're collaborating with international partners to find innovative ways to reduce the risk both to Australians and to people around the world."

When did the kangaroo hop?

Scientists discovered when the kangaroo learned to hop — and it's a lot earlier than previously thought.

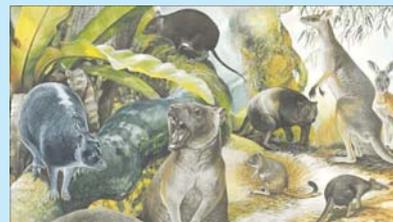
According to new fossils, the origin of the famous kangaroo gait goes back 20 million years, BBC reported.

Living kangaroos are the only large mammal to use hopping on two legs as their main form of locomotion.

The extinct cousins of modern kangaroos could also hop, according to a study of their fossilized foot bones, as well as moving on four legs and climbing trees.

The rare kangaroo fossils were found at Riversleigh in the northwest of Queensland in Australia.

The site is a treasure trove of animal remains, including marsupials, bats, lizards, snakes, crocodiles and birds.



PETER SHOUTEN/AUSTRALIAN GEOGRAPHIC

Reconstruction of ancient tree-climbing kangaroo (left)

"It's one of the few snapshots we have of the evolution of marsupials in Australia in deep time," said study researcher Dr. Benjamin Kear, of Uppsala University in Sweden.

Kangaroos can quickly cover large distances using their

distinctive gait, which is most effective in open habitats such as deserts and grasslands.

The long-held view has been that the animals evolved the ability to hop to take advantage of a change in the climate, which brought drier conditions and the

spread of grasslands.

However, the research, published in the journal Royal Society Open Science, suggests the story isn't that simple.

Geometric modelling shows the ancient extinct cousins of modern kangaroos could use the same range of gaits as living kangaroos.

Evidence, said the scientists, that the kangaroo has had the ability to hop for many millions of years.

"It all points towards an extremely successful animal, that's superbly adapted to its environment and a whole range of habitats and ecosystems and it's why kangaroos are so successful today," said Kear.

"It's one of the most biologically weird and wonderful animals you're likely to find."