



बहुजन हिताय बहुजन सुखाय

Sahyadri Bahujan Vidya Prasarak Samaj's



सहकारमहर्षी स्व.भाऊसाहेब संतुजी थोरात

SAHAKAR MAHARSHI BHAUSAHEB SANTUJI THORAT COLLEGE OF ARTS,  
SCIENCE AND COMMERCE, SANGAMNER

Tal - Sangamner, Dist - Ahmednagar, (422605) **NAAC Accredited 'B' Grade**

# Science Galaxy.

January 2021





# About college



**Sahakar Maharshi Bhausahab  
Santuji Thorat College of Arts  
Science and Commerce, Sangamner,  
Affiliated to Savitribai Phule Pune  
University, recognized by UGC under  
section 2(f) and 12(B) run by  
Sahyadri Bahujan Vidya Prasarak  
Samaj,**

**established in 1965 under the leadership of veteran leader, freedom fighter, founder of the cooperative Sugar factory and an earnest social worker, Late. Shri. Bhausahab Santuji Thorat. S. B. V. P. Samaj presently runs 2 Primary, 21 High schools, 10 Junior Colleges, 2 Senior Colleges and is actively devoted to the noble cause of education un to the last. The Institution offers degree courses like B.B.A., B.C.A., B.Sc.(Computer Science), B.A., B.Com, B.Sc, post graduate courses in M.A.(Hindi, History, Economics, Politics) & Post Graduate Research center in Economics, M.C.A. (Commerce), M.Com (E-commerce), M.Sc.(Drug Chemistry) and certificate courses like Soft Skills Development Programme, Modilipi, Yoga and Account Writing. Most of the students in the Institution come from rural and hilly areas and they do not wish to pursue dual degree. The Institution has been Reaccredited with grade 'B' (CGPA : 2.57) by NAAC in the academic year 2013-14, when the Institution had to pass through the hard times because of the inadequate financial assistance and other material things. But after the accreditation by NAAC the Institution has emerged as one of the reputed Institutions in semi-urban area as such, imparting a quality education for all and led it to every door step in rural and hilly area in and around Sangamner. The Teaching fraternity is the real strength of our Institution engaged in curricular, co-curricular, extracurricular, research and extension activities. The Students Community coming from rural and hilly area, are availing all facilities like financial assistance, Physical**



*Infrastructure, Career Guidance, Health and Hygiene services, Sports, Competitive examinations, Educational Tours, and Visits to Industrial area provided by the Institution. The Institution promotes qualitative research culture amongst the teachers and students' community through eminent educationists, scholars, expertise and resource-persons' guidance in National, State Level and University level seminars, workshops and conferences organized by various departments. The extension activities have successfully been carried out throughout the year by the NSS and NCC (Boys & Girls) units. The Institution provides support services for the implementation of academic activities in a well discipline manner and healthy spirit.*





*From Principal's Desk.....*



***Dr. Dinanath D. Patil***

**' Wish You All Very Safe , Healthy , Prosperous New Year '**

As a matter fact S.B.V.P. Samaj needs no introduction for it has been functioning 2021 as a lighthouse in the field of education since 1965 under the guidance of the great visionary, veteran leader and the freedom fighter Late. Sahakar Maharshi Bhausahab Santuji Thorat (Dada) who had an earnest desire to impart education unto the last. SBVP Samaj and SMBST College, since its inception, has been contributing in the noble cause of education under the competent leadership guidance Hon'ble Ex Minister Shri. Balasaheb Thorat and Hon'ble MLC Dr. Sudhir Tambe, who consider education as the key to both individual and social aspirations, we all are striving to achieve the set goals. I believe that primary role of education is to equip people with the knowledge and confidence to make a difference in the transformation of society.



In addition to providing students with content knowledge, education helps instil values, attitudes and behaviours that align with those expected in a society. Education is considered the most powerful instrument of social change. It is through education that the society can bring the desirable changes and modernise itself. Various on-going activities on and off the college campus have revealed the role of college in bringing about social changes. Education is not only aid for individual development, but also for the all-round development of society and country. It helps for the development of the qualities of an individual such as mental and emotional makeup as well as his temperament and character. For the individual it provides rational and scientific thinking, reasoning, skills and capabilities to adjust new situations. I am proud say that in the academic year 2016-17, the institution has provided an ample opportunities to the students and teachers for serving the nation by actively involving in seminars, conferences, workshops, training sessions and social awareness programmes etc. round the year. While working on the same line, let us be committed to strive to promote modern values in social economic, political, technological and cultural fields. Therefore, Students and stakeholders' participation in decision- making bodies, adoption of scientific technology in industry, agriculture and other skill based professions will be our priorities for keeping pace with rapidly changing society. We look forward to the challenging responsibilities that lie ahead, in our efforts at all-round excellence in higher education for our students from diverse socio-economic groups.



As success comes to those, who work hard and stays with those who don't rest on the past achievements, we are prepared to undertake the endless journey with new vigour, strength and strong will "To strive, to seek, to find and not to yield" Education is not the learning of facts, It's rather the training of the mind to think...

We all believe that twenty first century is an age of Science and technology. Our entire life is surrounded by new scientific innovations and modern technologies. Science inventions have made our life more faster and easier. Nowadays, getting information is just a click away. The new inventions in the field of Chemical science, Physical Science , life science ,information technology , medicines ,agriculture , communication has change completely change the human life.

Curious minds always search new ideas. We are very much pleased that 'Science Galaxy January 2021 ' will cater the science learners and will prove the best science magazines among them . It is prospered with current news in all over the world. We are very sure that ..Science Galaxy will be an amazing experience for all.

Your valuable words of appreciation and kind suggestions are welcome....!

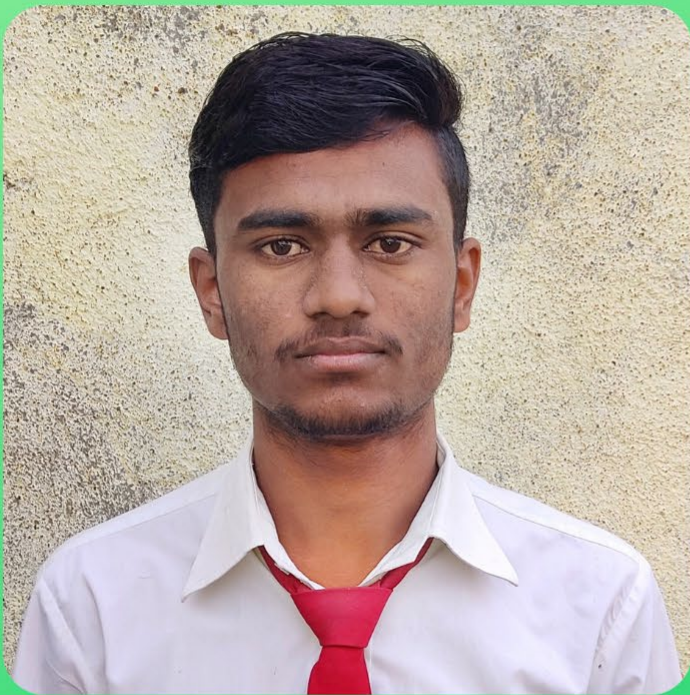




# **THE EDITORS**



***Smt. Lalita M. Mahale***



***Mr. Kadam Akshay Gangaram  
Chandrakala***  
( S.Y.B.Sc. Computer Science )



***Mr. Puri Ashutosh Laxman  
Jayshree***  
( S.Y.B.Sc. Computer Science )



# *From Editor's Desk.....*

Wishing everyone happy , safe and healthy new year !

It is a matter of an immense pleasure for me in bringing out the very First volume of Science News in form the of 'Science Galaxy - January 2021 ' successfully. The thought of extracting worldwide current affairs, new innovative ideas, new inventions, new emerging technologies in Sciences in the newsletter .... 'Science Galaxy - January 2021' made it possible with continuous and honest efforts of editorial board.

Science Galaxy will introduce you with new research , innovations from all over the world. As an Editor , I am sure it will develop keen interest in reading .





I express my sincere regards to Honourable Chairman of the institute –‘Sahyadri Bahujan Vidya Prasarak Samaj , Sangamner , and Member of Legislative council Hon. Dr. Sudhirji Tambe .Further I extend my sincere thanks to Honourable Principal of the college, Dr. Dinanath D. Patil to offer the appportunity as an Editor of Science Galaxy and encouraging us to work on the idea of monthly science magazine. I am thankful to IQAC co-ordinator Dr. Vilas Kolhe for the valuable suggestions. I also express sincere thanks to the Vice Principals Mr. G. J. Thorat and Mr. S. D. Navale . I should not forget the strong helping hands of my dear students Akshay Kadam and Ashutosh Puri to design Science Galaxy so elegantly in very less time.

Thanks and regards...





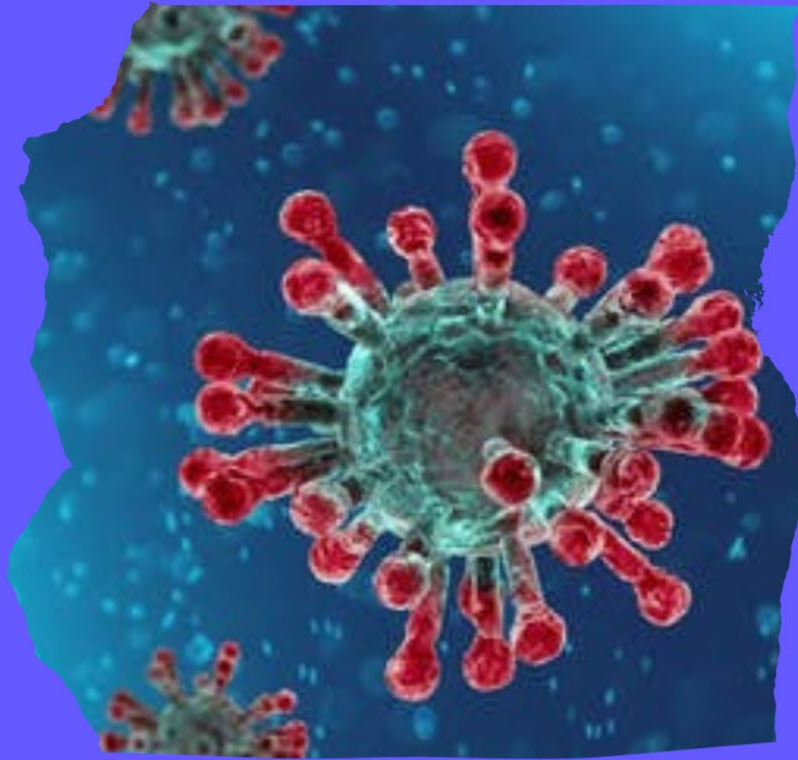
**CHEMICAL**

**SCIENCE**





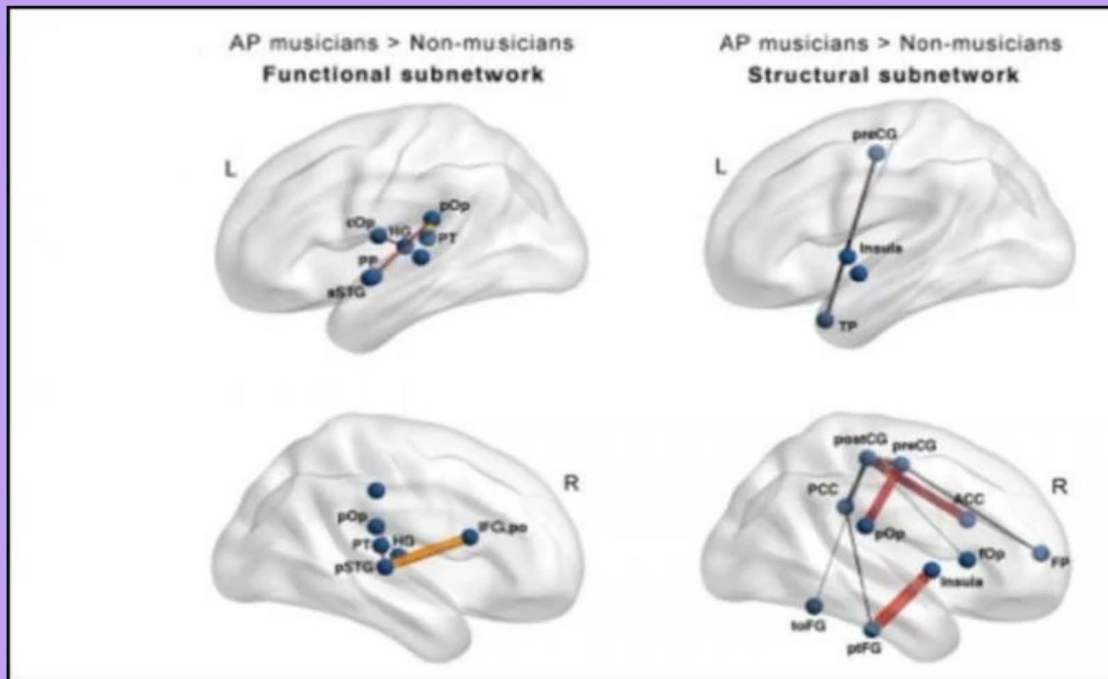
# Protective antibodies which fights against COVID 19 pass from mother to babies during pregnancy : study shows



The study suggests that women are not only transferring antibodies to their fetuses, but also transferring more antibodies to their babies if they are infected earlier in their pregnancies. This might have implications for when women should be vaccinated against Covid-19, Dr. Hensley said, adding that vaccinating women earlier in pregnancy might offer more protective benefits, “but studies actually analyzing vaccination among pregnant women need to be completed.”



# NEUROSCIENTISTS FIND MUSICIANS BRAIN HAVE STRONGER STRUCTURAL AND FUNCTIONAL CONNECTIONS COMPARED TO THOSE OF NON MUSICIANS



Years of musical training shape the brain in dramatic ways. A minority of musicians — with Mozart and Michael Jackson in their ranks — also possess absolute pitch, the ability to identify a tone without a reference. But, it remains unclear how this ability impacts the brain.



Musicians that began their training at a younger age had stronger structural connections than musicians with a later start.



These results demonstrate how experience shapes the brain, especially early in life, and how enhanced musical skills are represented in our brain.





## **RESEARCHERS USE ULTRASOUND TO JUMP - START THE BRAINS OF TWO PEOPLE WITH COMA AND REAWAKE CERTAIN FUNCTIONS IN THEIR BRAINS**

**BOTH PATIENTS HAD SEVERE BRAIN INJURIES AND HAD SHOWN ONLY LIMITED SIGNS OF CONSCIOUSNESS FOR MORE THAN A YEAR.**

**BUT AFTER RECEIVING THE TREATMENT – WHICH INVOLVED ULTRASOUND TO "EXCITE" CELLS IN A BRAIN REGION CALLED THE THALAMUS – THE PATIENTS SHOWED SUDDEN IMPROVEMENTS IN THEIR CONDITION, ACCORDING TO THE STUDY, PUBLISHED IN THE JOURNAL BRAIN STIMULATION. FOR EXAMPLE, AFTER TREATMENT, ONE PATIENT COULD MOVE THEIR HEAD TO INDICATE "YES" OR "NO" IN RESPONSE TO CERTAIN QUESTIONS.**



# **A quarter of all known bee species haven't been seen since the 1990s**



**About 25% of all known bee species of bee haven't been seen since 1990 : A global study show**

**The destruction of natural habitats, heavy use of pesticides and climate change could explain this decline in species richness**

**Read more: <https://www.newscientist.com/article/2265680-a-quarter-of-all-known-bee-species-havent-been-seen-since-the-1990s/#ixzz6IVBu6cFH>**



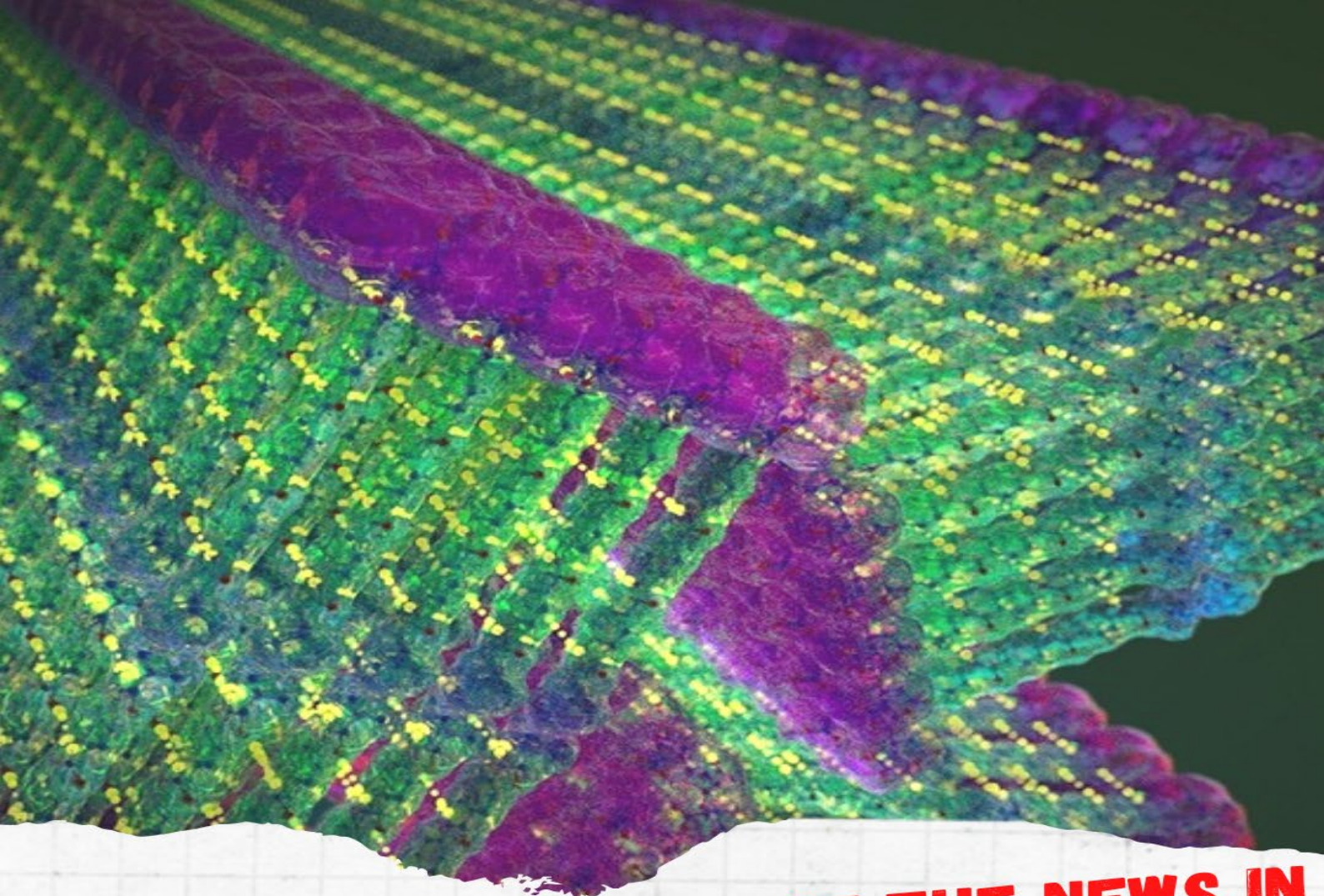
**USING MACHINE LEARNING AND BIOMARKERS FOUND IN THE MOTHERS BLOOD , RESEARCHERS CAN PREDICT THE RISK OF AUTISM WITH " 100% ACCURACY "**



Machine learning identifies patterns indicating likelihood and severity of autism

Using machine learning, researchers at the UC Davis MIND Institute have identified several patterns of maternal autoantibodies highly associated with the diagnosis and severity of autism.





## **DISPLAY THE HARDING OF THE NEWS IN STRAIGHT LINE IN BLACK**

**RESEARCHERS CONSTRUCT MOLECULAR  
NANO FIBERS THAT ARE STRONGER THAN  
STEEL , WHICH COULD INSPIRE A BROAD  
RANGE OF APPLICATIONS**

MIT researchers have designed small molecules that spontaneously form nanoribbons when water is added. These molecules include a Kevlar-inspired “aramid” domain in their design, in green, which fixes each molecule in place and leads to nanoribbons that are stronger than steel. Parts of the molecules attracted to or repulsed from water, shown in purple and blue respectively, orient and guide the molecules to form a nanostructure. This image depicts three Kevlar-inspired “aramid amphiphile” nanoribbons.



# **A physicist proposes a new type of rocket thruster that could take humankind to Mars and beyond**

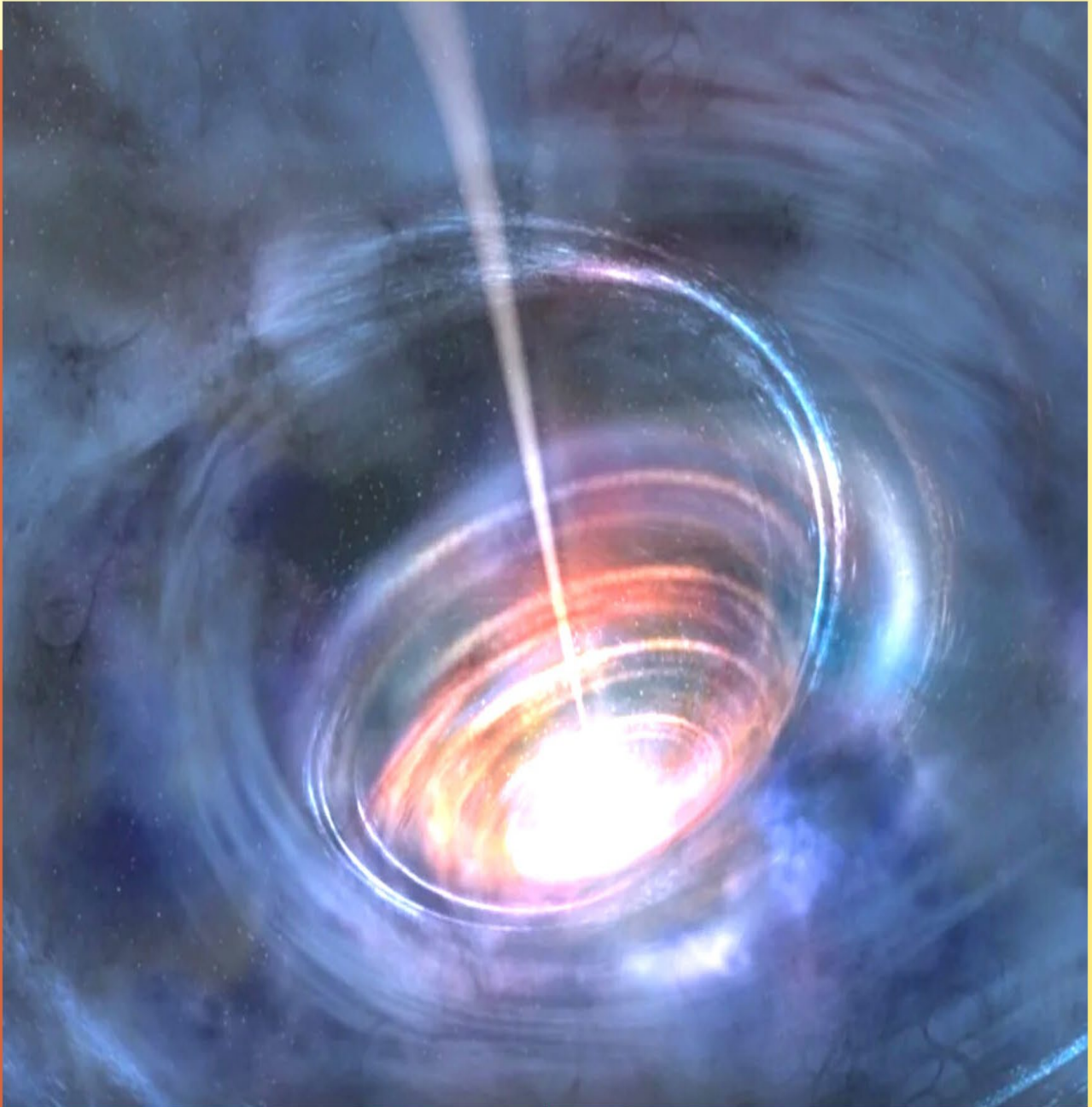


**Fatima Ebrahimi, a principal research physicist at Princeton Plasma Physics Laboratory (PPPL) in New Jersey, proposed the concept. The thruster would apply magnetic fields to cause particles of plasma to shoot out the back of the rocket, propelling it forward. Current space-proven plasma thrusters use electric fields to propel the particles**

*The new concept would accelerate the particles using magnetic reconnection – a process found throughout the universe, including the surface of the Sun – in which magnetic field lines converge, suddenly separate, and then join together again, generating lots of energy. Reconnection also occurs inside doughnut-shaped tokamak fusion devices.*



**A new study explains how to extract energy from black holes. The method utilizes a chaotic region just outside a black hole's event horizon**



**FOR DECADES, SCIENTISTS HAVE WONDERED WHETHER IT'S POSSIBLE TO EXTRACT ENERGY FROM BLACK HOLES, WHICH ARE THE MYSTERIOUS REGIONS OF SPACETIME THAT FORM WHEN STARS COLLAPSE INTO THEMSELVES. SIPHONING ENERGY FROM THESE AREAS OF ULTRA-CONDENSED MATTER COULD PROVIDE A VIRTUALLY ENDLESS POWER SUPPLY FOR DEEP-SPACE CIVILIZATIONS, IF PHYSICALLY AND PRACTICALLY POSSIBLE.**

**Bibliography : <https://bigthink.com/surprising-science/black-hole-energy>**



# More Than 108 Million Shots Given: Covid-19 Tracker



Add a little bit of body textThe biggest vaccination campaign in history is underway. More than 108 million doses have been administered across 67 countries, according to data collected by Bloomberg. The latest rate was roughly 4.25 million doses a day.

In the U.S., more Americans have now received at least one dose than have tested positive for the virus since the pandemic began. So far, 35 million doses have been given, according to a state-by-state tally. In the last week, an average of 1.34 million doses per day were administered.

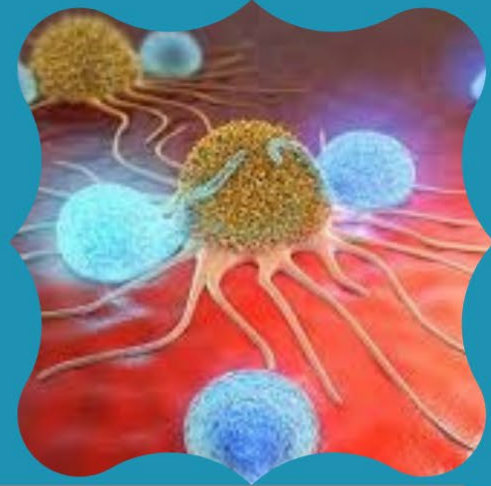


Bibliography : <https://economictimes.indiatimes.com/news/covid-19-vaccine>

Bibliography : <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines>



# Anti Diarrhea drug, known as Loperamide found to kill aggressive brain cancer cells inducing cell death : new study reveals

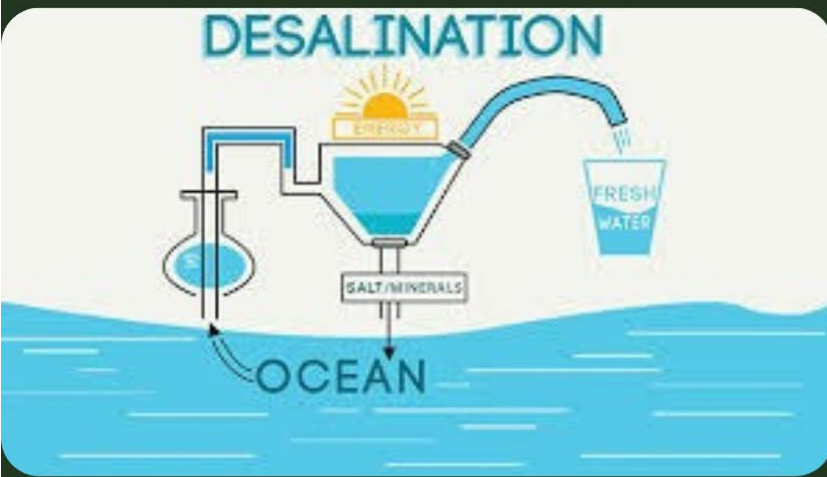


A common drug that is usually prescribed to treat diarrhoea may also be a powerful weapon against an aggressive type of brain cancer, suggests a new study published in the journal *Autophagy*. Loperamide, sold under the brand name Imodium, has previously been shown to induce cell death of glioblastoma cells, but the mechanism remained unknown until now.

In this latest study, the researchers found a pathway by which the drug induces the cells to self-destruct, called autophagy which means "self-eating". By upregulating a gene that promotes cell death of glioblastoma cell lines, loperamide may be a promising drug candidate, which they now hope will open up new avenues to combat the deadly form of cancer.



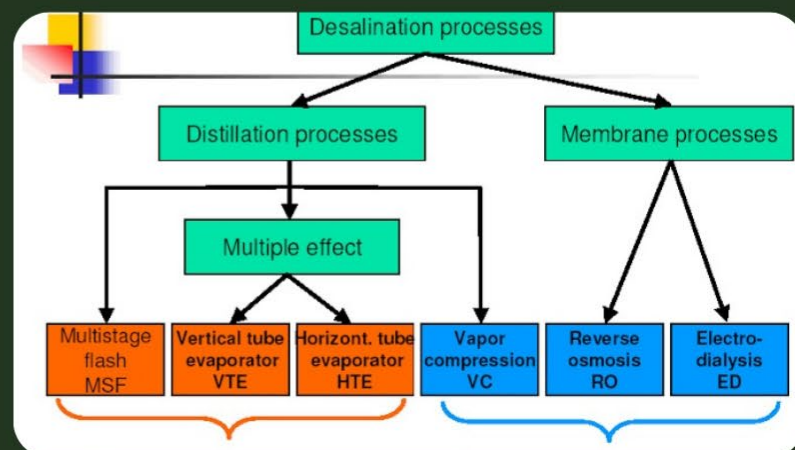
# NEW DESALINATION ( THE PROCESS OF REMOVING SALT FROM SEA WATER ) METHOD OFFERS LOW ENERGY ALTERNATIVE TO PURIFY SALTY WATER



Desalination is a process that takes away mineral components from saline water. More generally, desalination refers to the removal of salts and minerals from a target substance,[1] as in soil desalination, which is an issue for agriculture.[2]

Saltwater (especially sea water) is desalinated to produce water suitable for human consumption or irrigation. The by-product of the desalination process is brine. Desalination is used on many seagoing ships and submarines. Most of the modern interest in desalination is focused on cost-effective provision of fresh water for human use. Along with recycled wastewater, it is one of the few rainfall-independent water sources.

There are many ways to desalinate water, but one of the most effective is membrane desalination. In this method, water is pushed through a thin membrane with tiny holes. The water flows through the pores, but the salt ions can't, leaving only fresh water on the other side.





**PHYSICAL**

**SCIENCE**





# INDIAN SCIENTISTS DISCOVER 'SARASWATI', A SUPERCLUSTER OF GALAXIES.....

*Its mass extends over the scale of 600 million light years, it said. Scientists of this institute were also involved in the path-breaking discovery of gravitational waves last year.*



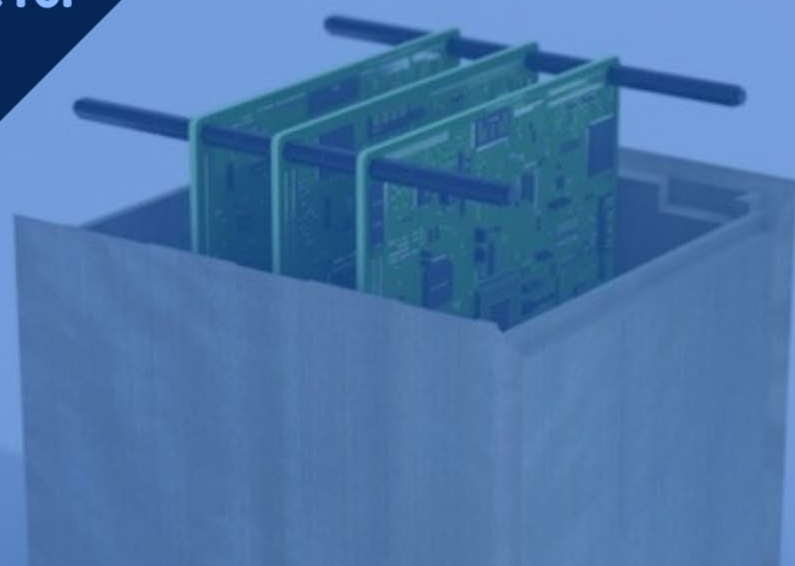
**A team of Indian astronomers has discovered an extremely large supercluster of galaxies -- as big as 20 million billion suns -- which they have named Saraswati, Pune-based Inter University Centre for Astronomy and Astrophysics (IUCAA) said today.**

*Its mass extends over the scale of 600 million light years, it said. Scientists of this institute were also involved in the path-breaking discovery of gravitational waves last year.*



# JAPAN LAUNCHES AN INITIATIVE TO DEVELOP THE WORLD'S FIRST SATELLITES THAT ARE MADE OUT OF WOOD, A STEP TOWARDS CUTTING SPACE JUNK

According to the European Space Agency (ESA) statistical model, there are more than 130 million pieces of anthropogenic space debris—waste residue due to human activities—smaller than a millimeter around our planet. The debris can travel at a speed of more than 22,300 mph and can impact other satellites. Further, a Japanese astronaut and a professor at the Kyoto University, Takao Doi, told the BBC that all types of satellites that re-enter the Earth's atmosphere gets burnt and release tiny alumina particles. These particles are capable of staying in the upper atmosphere for several years.





# Earth was spinning faster last year than any other time in the past 50 years . The 28 faster days were recorded in 2020

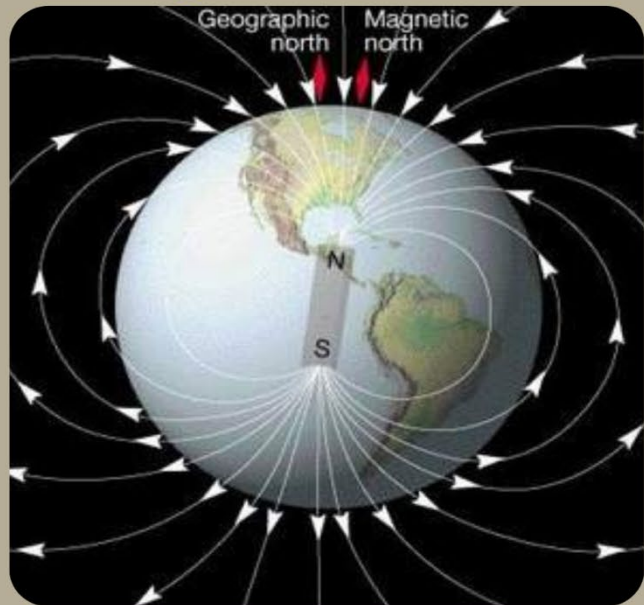
According to scientists, the days are on average about 0.5 seconds shorter than 24 hours. Though the time difference is noticed only at the atomic level, experts say its impact could be significant. World timekeepers are debating whether to delete a second from time — called a “negative leap second” — to account for the change and bring time passage back into line with the rotation of the Earth.

Scientists think days are getting shorter than 24 hours because the planet is spinning faster than it has in 50 years and a full day has been taking less than normal since last year. According to the Daily Mail, July 19, 2020, was the shortest day since scientists began keeping records in the 1960s - 1.4602 milliseconds shorter than the full 24 hours. It is a retreat from previous records showing that for decades, the Earth took slightly longer than 24 hours to complete a rotation.

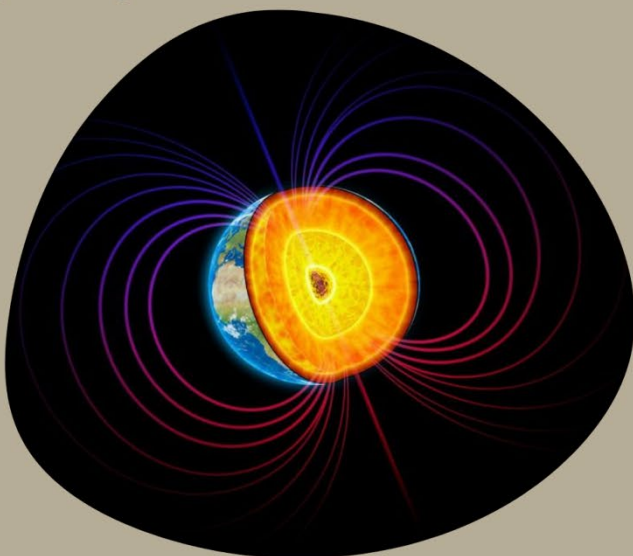




# Scientists observe live cell responding to magnetic field, a step towards understanding how animals navigate using earth's magnetic field



Many animals are known to navigate by sensing the Earth's magnetic field, including bacteria, birds, bats, eels and whales. Some observations suggests that even dogs and cows sense the Earth's magnetic field. But exactly how magnetoreception – the ability to detect magnetic fields – works remains a mystery. Some bacteria use magnetite crystals, a magnetic iron-oxide, like a compass needle to follow the magnetic field lines. However, vertebrates don't possess such structures inside their cells. Another leading hypothesis involves chemical reactions induced in cells by a magnetic field. If certain molecules are excited, electrons can jump between them to their neighbors. Magnetic fields can influence the speed of this exchange, affecting the chemical behavior of the molecule. This effect could slow down or speed up certain chemical reactions that change an animals' behavior.





HOW OLD OUR UNIVERSE IS ?-  
SCIENTISTS FIND THE UNIVERSE  
IS 13.77 BILLION YEARS OLD.....



**IN 2019, SCIENTISTS STUDYING THE MOVEMENT OF GALAXIES CONCLUDED THAT THE UNIVERSE IS HUNDREDS OF MILLIONS OF YEARS YOUNGER THAN PREVIOUSLY ESTIMATED BY THE PLANCK COLLABORATION, A GROUP OF SCIENTISTS WHO HAVE WORKED WITH THE EUROPEAN SPACE AGENCY'S PLANCK MISSION. USING DATA FROM THE PLANCK SPACE OBSERVATORY, THEY FOUND THE UNIVERSE TO BE APPROXIMATELY 13.8 BILLION YEARS OLD.**

**RESEARCHERS USED THE TELESCOPE TO EFFECTIVELY CREATE A TRIANGLE IN THE SKY, MEASURING DISTANCES BETWEEN THE EARTH AND TWO POINTS OF INTEREST IN THE CMB AND THEN EXTRAPOLATE THE DISTANCE BETWEEN THE TWO POINTS.**

THE UNIVERSE IS 13.77 BILLION YEARS OLD, ACCORDING TO A NEW MEASUREMENT TAKEN USING A POWERFUL TELESCOPE IN CHILE.

Bibliography : [www.space.com](http://www.space.com)

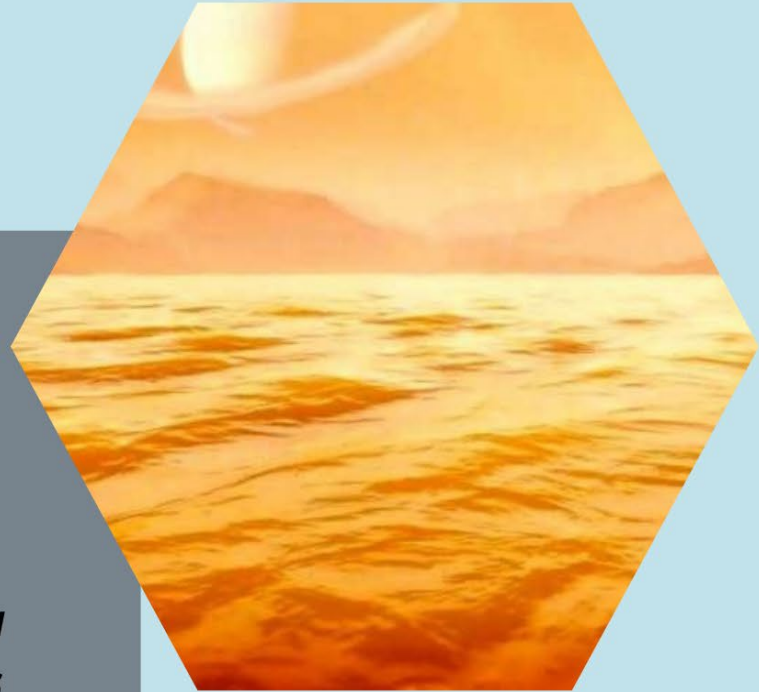


# **Astronomers estimates Titan's largest sea is 1000 ft (304m) deep**

***Far below the gaseous atmospheric shroud on Saturn's largest moon, Titan, lies Kraken Mare, a sea of liquid methane. Cornell University astronomers have estimated that sea to be at least 1,000-feet deep near its center—enough room for a potential robotic submarine to explore.***

***The depth and composition of each of Titan's seas had already been measured, except for Titan's largest sea, Kraken Mare—which not only has a great name, but also contains about 80% of the moon's surface liquids," said lead author Valerio Poggiali, research associate at the Cornell Center for Astrophysics and Planetary Science (CCAPS).***

***Beyond deep, Kraken Mare also is immense—nearly the size of all five Great Lakes combined.***





# ASTRONOMERS HAVE DISCOVERED AN ALIEN PLANET WITH THREE SUNS LOCATED 1800 LIGHT YEARS AWAY....

To us humans, a single Sun feels completely normal, but our Solar System is actually a weird outlier. Most stars in the Milky Way galaxy have at least one companion star. Now, in a system 1,800 light-years away, astronomers have finally confirmed a gas giant planet orbiting a star in a triple star system.

The planet, KOI-5Ab, is probably a gas giant about half the mass of Saturn and 7 times the size of Earth, on a very close five-day orbit around KOI-5A. KOI-5A and KOI-5B, both around the same mass as the Sun, form a relatively close binary, with an orbital period of about 30 years.

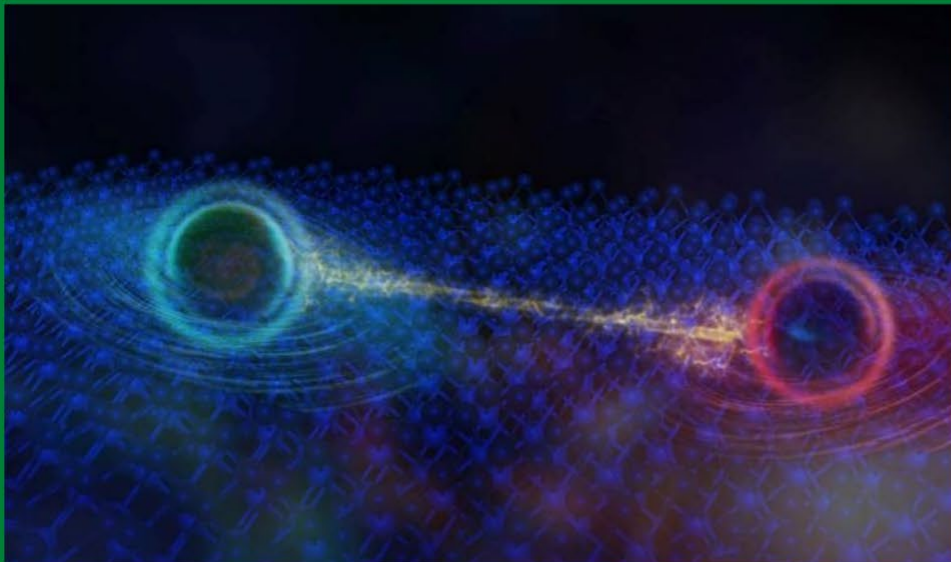


The third star, KOI-5C, orbits the binary at a much larger distance, with a period of about 400 years - a bit larger than Pluto's 248-year orbit.



# DISCOVERY OF QUANTUM BEHAVIOR IN INSULATORS SUGGESTS POSSIBLE NEW PARTICLE

Princeton physicists have observed an unexpected quantum behavior in an insulator made from a material called tungsten ditelluride. This phenomenon, known as quantum oscillation, is typically observed in metals rather than insulators, and its discovery offers new insights into our understanding of the quantum world. The findings also hint at the existence of an entirely new type of quantum particle.



The observation of quantum oscillations has long been considered a hallmark of the difference between metals and insulators. In metals, electrons are highly mobile, and resistivity — the resistance to electrical conduction — is weak. Nearly a century ago, researchers observed that a magnetic field, coupled with very low temperatures, can cause electrons to shift from a "classical" state to a quantum state, causing oscillations in the metal's resistivity. In insulators, by contrast, electrons cannot move and the materials have very high resistivity, so quantum oscillations of this sort are not expected to occur, no matter the strength of magnetic field applied.

Bibliography : [www.princeton.edu/news](http://www.princeton.edu/news)

The discovery was made when the researchers were studying a material called tungsten ditelluride, which they made into a two-dimensional material. They prepared the material by using standard scotch tape to increasingly exfoliate, or "shave," the layers down to what is called a monolayer — a single atom-thin layer. Thick tungsten ditelluride behaves like a metal. But once it is converted to a monolayer, it becomes a very strong insulator.



# SCIENTISTS CLAIM BLACK HOLES ARE MADE OF COLLAPSED UNIVERSES IN THIS THEORY, EACH TINY BLACK HOLE WOULD CONTAIN ITS OWN UNIVERSE.



A strange new theory suggests that tiny primordial black holes — the ones that formed at the very beginning of our universe — could make up dark matter and, bizarrely, contain tiny collapsed universes of their own.



Scientists have long struggled to identify dark matter, the invisible stuff that is theorized to make up most of the universe's mass and which clumps galaxies together. Various physicists have proposed that it's made of yet-undetected particles, that it was formed by boiling plasma, and even that it might not exist at all. But these bizarre primordial black holes could account for all of the dark matter scientists suspect is somewhere in the universe, according to the study.





**BIOLOGICAL**

**SCIENCE**







The platypus (*Ornithorhynchus anatinus*), sometimes referred to as the duck-billed platypus, is a semiaquatic, egg-laying mammal endemic to eastern Australia, including Tasmania. The platypus is the sole living representative of its family (Ornithorhynchidae) and genus (*Ornithorhynchus*), though a number of related species appear in the fossil record.

## ***PLATYPUS GENES ARE JUST AS ODD AS THE CREATURE ITSELF***

***THESE ARE EGG-LAYING, LACTATING ANIMALS HAVE GENES IN COMMON WITH MAMMALS AS WELL AS BIRDS***

The unique features of the platypus make it an important subject in the study of evolutionary biology, and a recognisable and iconic symbol of Australia. It is culturally significant to several Aboriginal peoples of Australia, who also used to hunt the animal for food. It has appeared as a mascot at national events and features on the reverse of the Australian twenty-cent coin, and the platypus is the animal emblem of the state of New South Wales. Until the early 20th century, humans hunted the platypus for its fur, but it is now protected throughout its range. Although captive-breeding programs have had only limited success, and the platypus is vulnerable to the effects of pollution, it is not under any immediate threat.





# INCREDIBLE' GENE-EDITING RESULT IN MICE INSPIRES PLANS TO TREAT PREMATURE-AGING SYNDROME IN CHILDREN



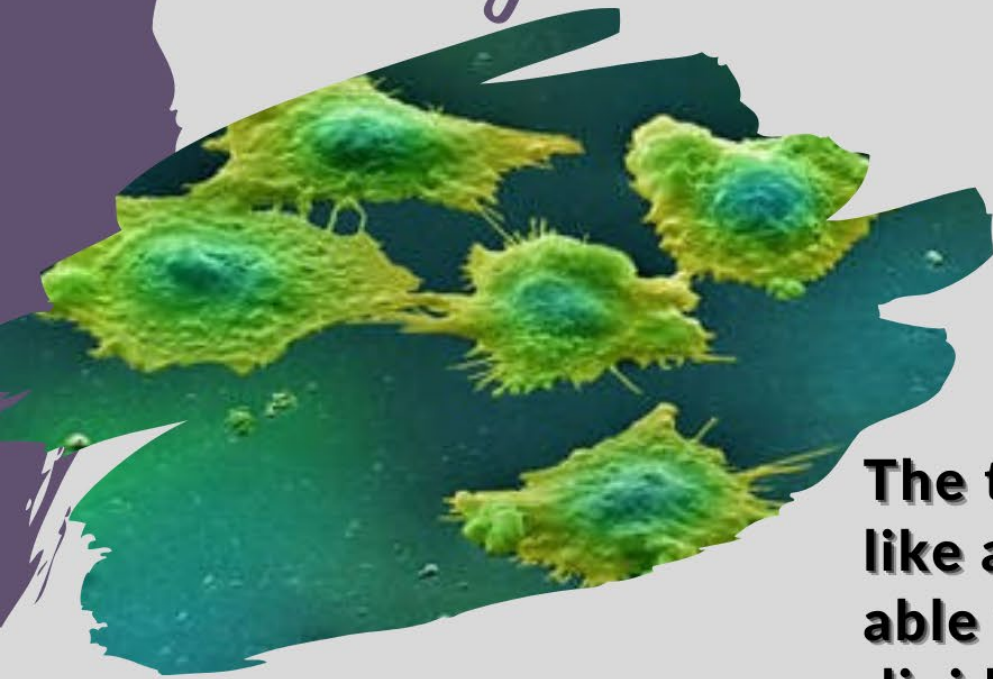
Teen with progeria condition

One mouse is hunched over, graying, and barely moves at 7 months old. Others, at 11 months, have sleek black coats and run around. The videos and other results from a new study have inspired hope for treating children born with progeria, a rare, fatal, genetic disease that causes symptoms much like early aging. In mice with a progeria-causing mutation, a cousin of the celebrated genome editor known as CRISPR corrected the DNA mistake, preventing the heart damage typical of the disease, a research team reports today in Nature. Treated mice lived about 500 days, more than twice as long as untreated animals.





# Cancer cells 'hibernate like bears' to dodge (avoid) chemotherapy: Study shows



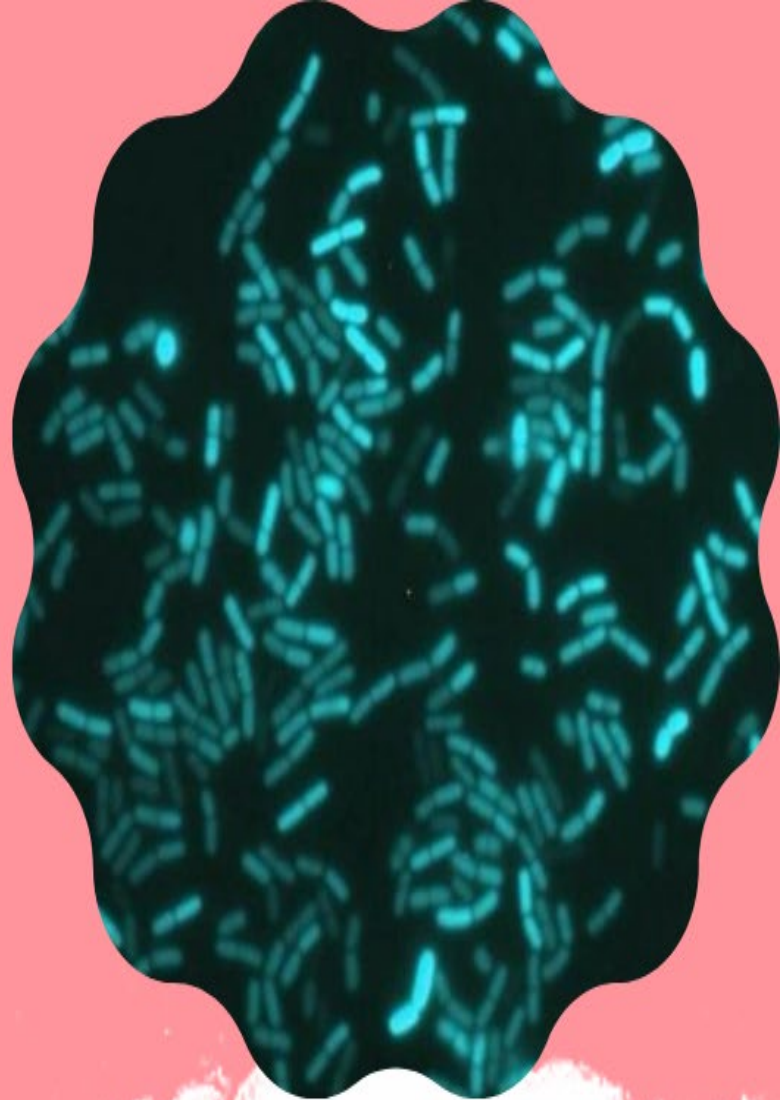
**A new study has found that the cancer cells present in the body have the ability to hibernate like “bears in winter” in order to evade chemotherapy treatment.**

**The tumour is acting like a whole organism, able to go into a slow-dividing state, conserving energy to help it survive’**

**This finding also buttresses the fact that the disease often returns after staying dormant or disappears for several years after the treatment.**







## **Biological punctuality: Study finds even bacteria has an internal clock, can 'tell time'**

Humans, animals, and plants all have an internal clock, or circadian rhythm. This internal timer is why people tire at night and wake up in the morning. Now, a fascinating new study reports even microscopic bacteria have an internal clock that aligns with the planet's 24-hour cycle.

Each organism's molecular rhythms use external cues like sunlight and temperature to synchronize biological clocks with living environments. For example, this is why people often experience jet lag after traveling between time zones. Their bodies haven't adapted and aligned to the new location's light/dark cycle.

Meanwhile, circadian rhythms in plants are essential to processes like photosynthesis and water regulation.





Dubbed KPro, the artificial implant can replace a deformed or opaque cornea. It's designed with a non-degradable synthetic nano-tissue that's placed under the conjunctiva, a thin membrane that covers the surface of the eyelid and the white part of the eyeball, the sclera.

Dr. Gilad Litvin, chief medical officer of CorNeat Vision and inventor of the device, told Israel Hayom that the procedure was "relatively simple" and the operation took under an hour.

CorNeat selected 10 trial patients who suffered from corneal blindness and who had either experienced failed corneal transplants in the past or weren't suitable candidates for transplants.

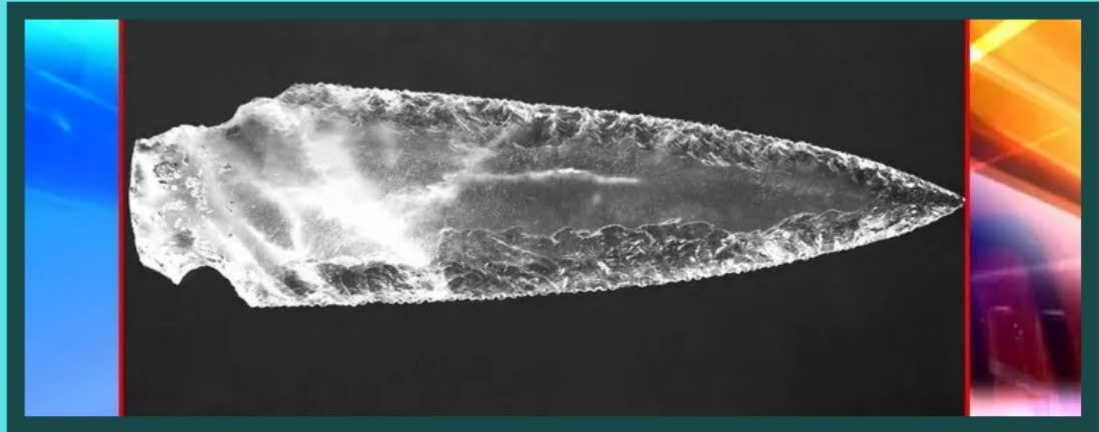
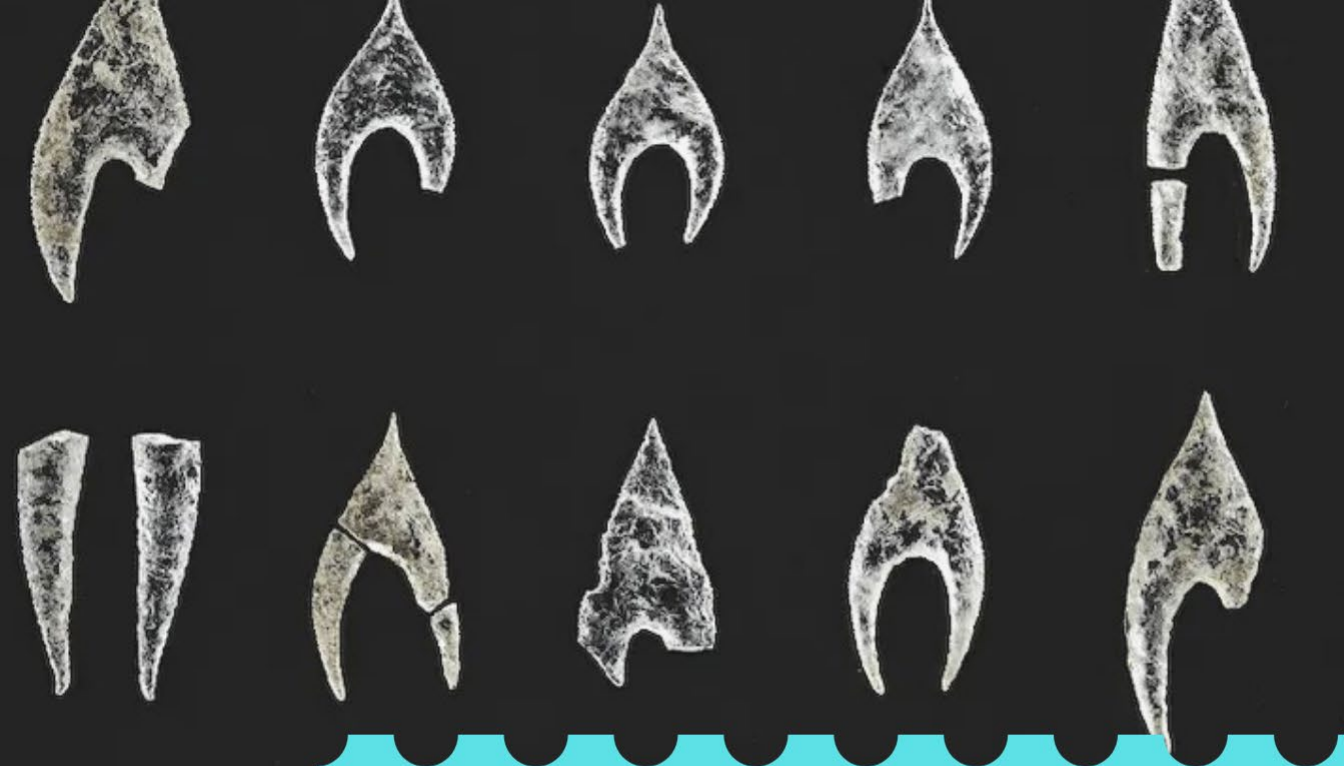
## **The world's first successful artificial cornea transplant restored the vision of a man who had been blind for 10 years**

Dubbed KPro, the artificial implant can replace a deformed or opaque cornea. It's designed with a non-degradable synthetic nano-tissue that's placed under the conjunctiva, a thin membrane that covers the surface of the eyelid and the white part of the eyeball, the sclera.



The world's first successful artificial cornea transplant was carried out on January 11 at the Beilinson Hospital in Israel, also known as the Rabin Medical Center





## OVER 5,000-YEAR-OLD RARE AND AMAZING CRYSTAL DAGGER UNCOVERED IN SPAIN

IN THEIR LATEST VENTURE, RESEARCHERS WHO HAD PREVIOUSLY EXCAVATED MEGALITHIC TOMB OF MONTELIRIO THOLOS, HAVE UNEARTHED A 5,000-YEAR-OLD CRYSTAL DAGGER. THE TRANSLUCENT WEAPON, THEY SAY IS THE “MOST TECHNICALLY SOPHISTICATED WEAPON” EVER TO BE FOUND IN PREHISTORIC IBERIA, LOCATED IN SOUTHWESTERN SPAIN AND REQUIRED IMMENSE SKILL TO CARVE. THE STUDY WAS CONDUCTED BY RESEARCHERS FROM THE UNIVERSITY OF GRANADA, THE UNIVERSITY OF SEVILLE AND THE SPANISH HIGHER RESEARCH COUNCIL AND HAS BEEN PUBLISHED IN QUATERNARY INTERNATIONAL.





## Dinosaur fossils found in Argentina could be of the largest animal ever lived on Earth

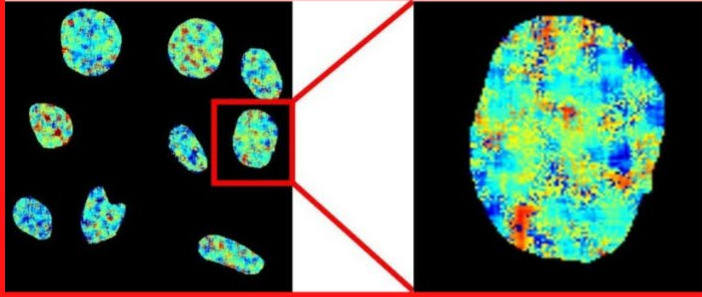
The animal is believed to have been 122 feet long and weighed around 90,000 kg. Its partial remains were discovered in Patagonian region of Argentina.

THESE DINOSAURS LIVED IN THE LATE JURASSIC PERIOD (150 MILLION YEARS AGO). BY THE LATE CRETACEOUS (ABOUT 70 MILLION YEARS AGO) PERIOD, THE TITANOSAURS DOMINATED. JUST LIKE MOST NON-AVIAN DINOSAURS, THEY WERE WIPED OUT IN THE CRETACEOUS-PALEOGENE MASS EXTINCTION 66 MILLION YEARS AGO, WHEN A LARGE ASTEROID STRUCK THE EARTH.

IT HAS BEEN FOUND THAT TITANOSAURS, THE LARGEST AMONG SAUROPODS, HAD REPLACED ALL OTHER SAUROPODS BEFORE THE EXTINCTION. THE LARGEST TITANOSAURS FOSSILS, FROM ANIMALS ESTIMATED TO HAVE WEIGHED ANYWHERE BETWEEN 40,000 KG AND 90,000 KG, HAVE ALL COME FROM PATAGONIA, WHERE THE NEWEST ONE WAS FOUND.





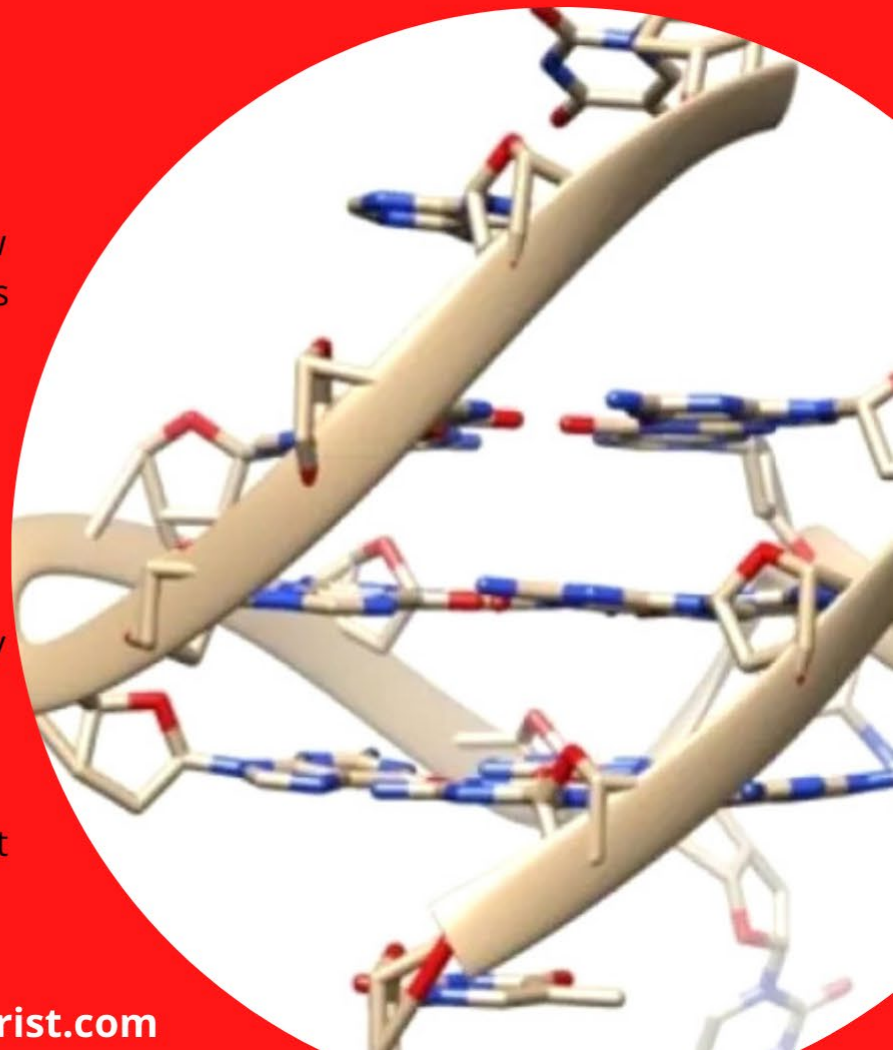


The structure of DNA is called a double helix, which looks like a twisted staircase. While DNA can form some more exotic shapes in test tubes, few are seen in real living cells.

# SCIENTISTS DISCOVER A RARE FOUR STANDARD DNA IN LIVING HUMAN CELLS AND OBSERVED ITS INTERACTION WITH OTHER MOLECULES INSIDE LIVING CELLS

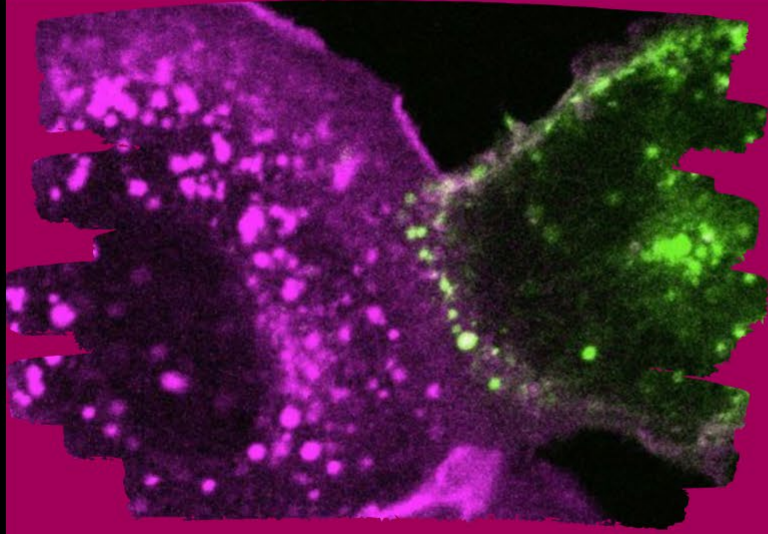
Recently, scientists at the Imperial College London have discovered the formation of four-stranded DNA in human cells. Scientists have created new probes that can see how G-quadruplexes are interacting with other molecules inside living cells.

Four-stranded DNA, known as G-quadruplex, is usually found in higher concentrations in cancer cells; hence scientists think that G-quadruplexes play a role in the disease. Further examination reveals that G-quadruplexes are 'unwound' by specific proteins and help identify molecules that bind to G-quadruplexes, leading to potential new drug targets that can disrupt their activity.





# *SARS-CoV-2 Needs Cholesterol to Invade Cells and Form Mega Cells*



People taking cholesterol-lowering drugs may fare better than others if they catch the novel coronavirus. A new study hints at why: the virus relies on the fatty molecule to get past the cell's protective membrane.

To cause COVID-19, the SARS-CoV-2 virus must force its way into people's cells – and it needs an accomplice. Cholesterol, the waxy compound better known for clogging arteries, helps the virus open cells up and slip inside, Howard Hughes Medical Institute Investigator Clifford Brangwynne's lab reports.

Without cholesterol, the virus cannot sneak past a cell's protective barrier and cause infection, the team writes in a preprint posted to bioRxiv.org on December 14, 2020. The work, which recreated the early stage of infection in lab-grown cells, has not yet undergone the scientific vetting process of peer review.

“Cholesterol is an integral part of the membranes that surround cells and some viruses, including SARS-CoV-2. It makes sense that it should be so important for infection,” says Brangwynne, a biophysical engineer at Princeton University.

Bibliography : <https://scitechdaily.com>





**Western Monarch Butterflies are heading towards extension. Their number fell to 1914 after ones being in the millions.**

Scientists say the butterflies are at critically low levels because of destruction to their milkweed habitat along their migratory route as housing expands into their territory and use of pesticides and herbicides increases

Western monarch butterflies head south from the Pacific Northwest to California each winter, returning to the same places and even the same trees, where they cluster to keep warm. The monarchs generally arrive in California at the beginning of November and spread across the country once warmer weather arrives in March.

On the eastern side of the Rocky Mountains, another monarch population travels from southern Canada and the northeastern United States across thousands of miles to spend the winter in central Mexico. Scientists estimate the monarch population in the eastern U.S. has fallen about 80% since the mid-1990s, but the drop-off in the western U.S. has been even steeper.



# Paralyzed mice walk again after just 2 weeks of breakthrough gene therapy that regenerates damaged spinal cord nerves

THE VIRUSES WERE ALSO CUSTOMIZED FOR GENE THERAPY AND INCLUDED BLUEPRINTS TO MAKE THE PROTEIN TO GUIDE THE NERVE CELLS, WHICH IS KNOWN AS MOTONEURONS.

SINCE THESE CELLS ARE ALSO LINKED VIA AXONAL SIDE BRANCHES TO OTHER NERVE CELLS IN OTHER BRAIN AREAS THAT ARE IMPORTANT FOR MOVEMENT PROCESSES SUCH AS WALKING, THE HYPER-INTERLEUKIN-6 WAS ALSO TRANSPORTED DIRECTLY TO THESE OTHERWISE DIFFICULT TO ACCESS ESSENTIAL NERVE CELLS AND RELEASED THERE IN A CONTROLLED MANNER.UTE

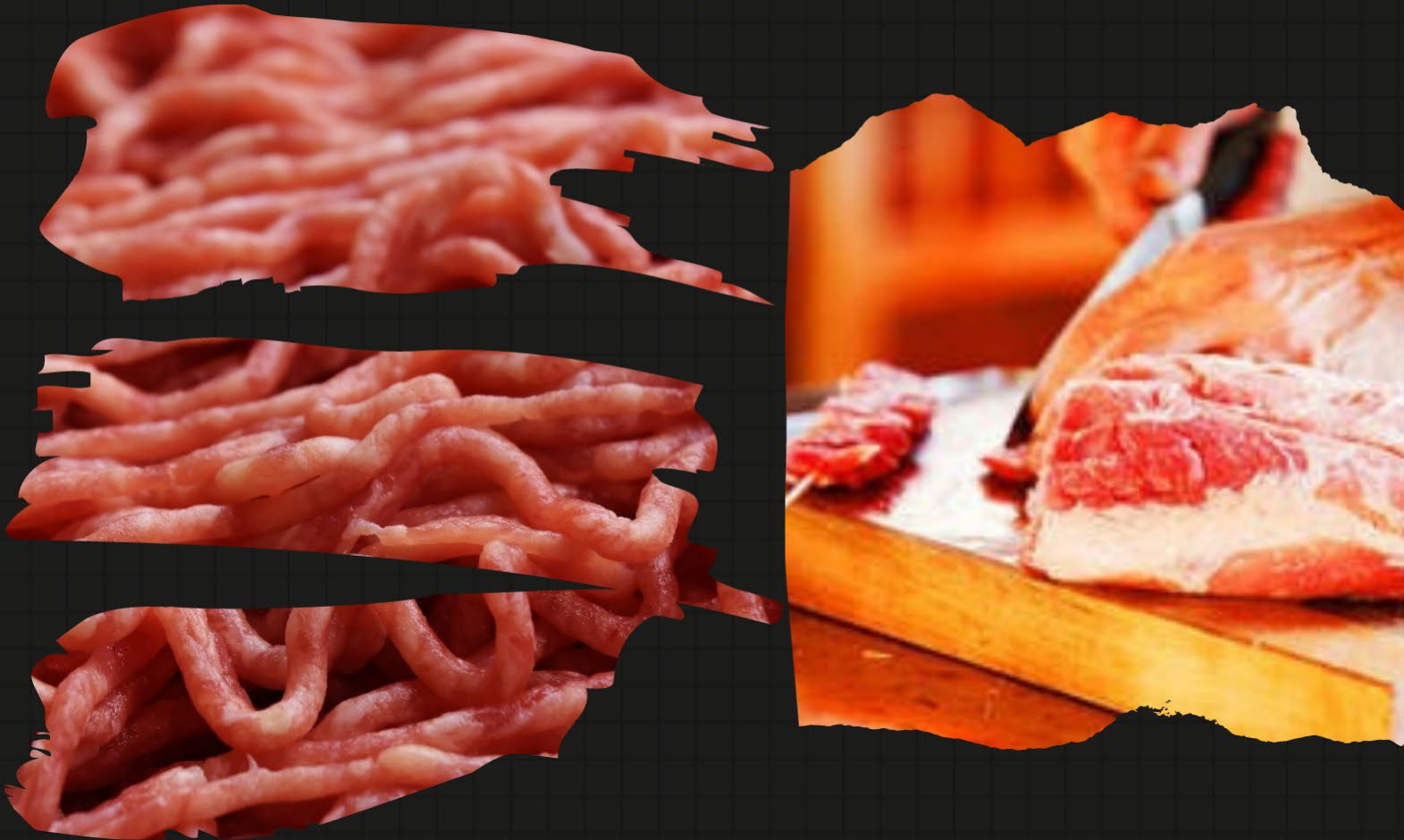
The scientists are also exploring whether hyper-interleukin-6 still has positive effects in mice, even if the injury occurred several weeks previously and whether this aspect would be particularly relevant for application in human.

Bibliography : [www.sciencetech.com](http://www.sciencetech.com)





# *Organic meats found to have approximately the same greenhouse impact as regular meats*



The data revealed little difference in greenhouse gas emissions from conventional meat production and that grown organically. The scientists found that emission reductions by organically grown animals (in which fertilizer is not used to produce feed) were often offset by increases in methane released due to slower growth rates and the need to raise more animals, as organically fed animals tend to produce less meat. More specifically, they found very little difference in emissions between conventionally produced beef and beef grown organically. They also found that organically grown chickens produced slightly more emissions than those grown conventionally, and that organic pork produced fewer emissions than conventional pork.

The researchers suggest the need for meat taxes that reflect the environmental cost of their production. The scientists calculated such a tax for conventional beef would raise its price by approximately 40% while organic beef would see a price increase of just 25% (because it is already more expensive than regular beef). Prices for animal-related products, such as cheese or milk, would also rise. Prices for food plants, on the other hand, would remain nearly the same.



# Tiny bits of micro plastics have been found on the snow of the highest mountain Everest

**Researchers found plastic in snow scooped from a spot 8,440 meters (27,690 feet) high, near Everest's summit.**

**In the spring of 2019, Napper's team collected snow and stream water samples from several areas on the mountain. The researchers brought those samples back to the lab and tallied the number and type of microplastics each contained. Microplastics are plastic shreds smaller than 5 millimeters (0.2 inch). They come from bags, bottles and other items that have broken down into pieces.**



**Perhaps the findings should not have been surprising. Each year hundreds of climbers attempt to reach the mountain's summit. They discard so much junk along their treks that the mountain has been called "the highest trash dump in the world." Most of the microplastics the team found were fibers made of a plastic called polyester. The plastic pieces likely come from climbers' equipment and clothes.**

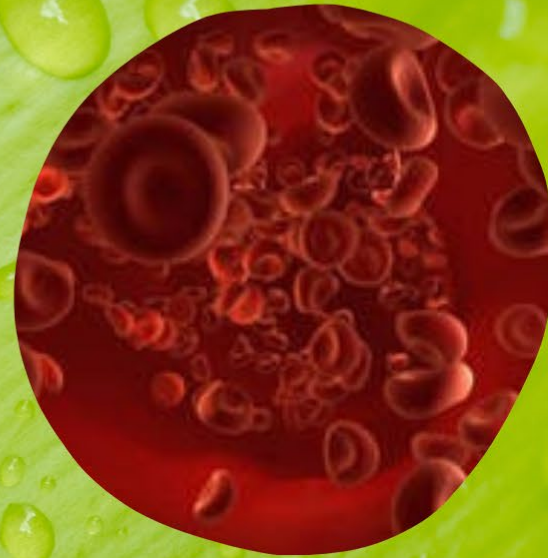




# **BLOOD IRON LEVEL COULD PLAY A VITAL ROLE IN INFLUENCING THE LIFE SPAN OF PERSON: A STUDY SHOW**

**The international study using genetic data from more than a million people suggests that maintaining healthy levels of iron in the blood could be a key to ageing better and living longer.**

**The findings could accelerate the development of drugs to reduce age-related diseases, extend healthy years of life and increase the chances of living to old age free of disease, the researchers say.**



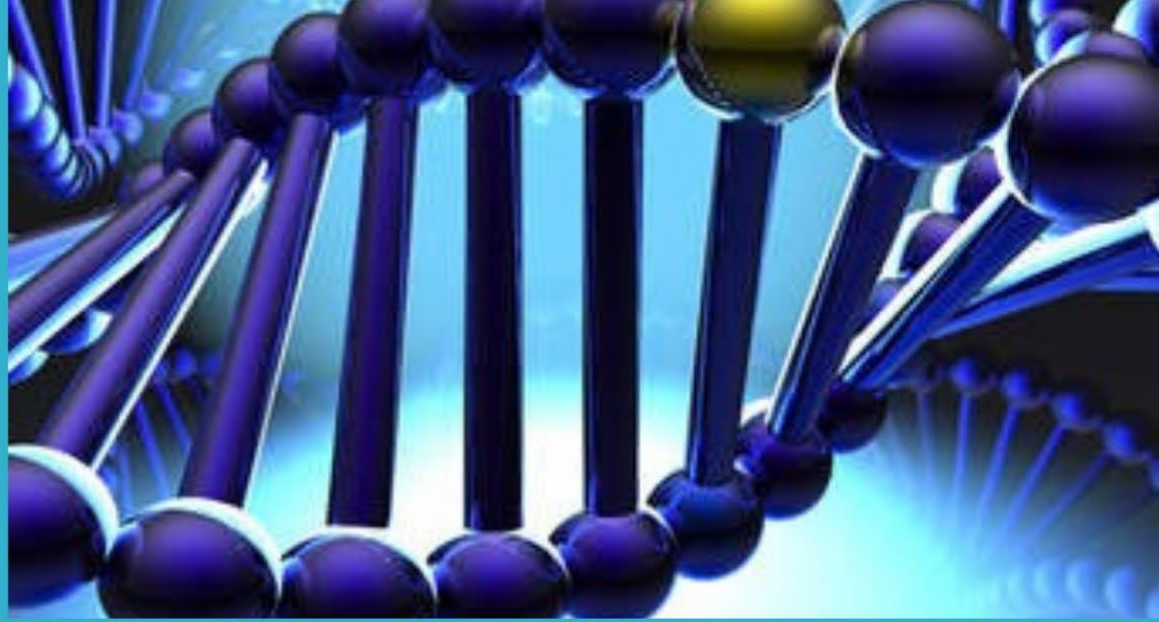
**The researchers confirmed this using a statistical method – known as Mendelian randomisation – that suggested that genes involved in metabolising iron in the blood are partly responsible for a healthy long life.**



**Blood iron is affected by diet and abnormally high or low levels are linked to age-related conditions such as Parkinson's disease, liver disease and a decline in the body's ability to fight infection in older age.**

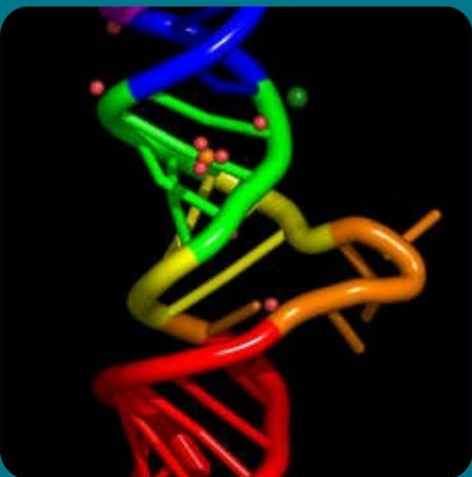


**Life on the earth originated from a mixture of RNA and DNA both :A study reveals**



*How life originated on Earth continues to fascinate scientists, but it's not easy peering back billions of years into the past. Now, evidence is growing for a relatively new hypothesis of how life began: with a very precise mix of RNA and DNA.*

**RNA and DNA both determine the genetic make-up of all biological life, with DNA acting as a genetic blueprint and RNA as a blueprint reader or decoder. For a long time, it was thought that RNA developed on Earth first, with DNA evolving afterwards - but mounting evidence suggests they may have emerged at the same time and both been involved in originating life on the planet.**



*The findings add credence to the idea that both DNA and RNA developed together from the same sort of chemical reactions at the beginning of life on our planet, and that the first self-replicating molecules could have been mixes of both these nucleic acids - not just RNA, as suggested in the more established 'RNA world' hypothesis.*



## **MOST IDENTICAL TWINS THAT COME FROM SINGLE FERTILIZED EGG DON'T HAVE 100 % IDENTICAL GENES :NEW STUDY CONCLUDES**



**Identical twins may not be exact copies at the DNA level after all. On average, identical twins differ by 5.2 genetic changes. Researchers shared their new finding January 7 in Nature Genetics.**

**Identical twins are also called monozygotic (MON-oh-zy-GAH-tik) twins. They come from a single fertilized egg, or zygote. That egg replicates and forms an embryo. Then, it splits into two clusters of cells. Each of these embryos will go on to become a baby. (Fraternal twins develop from two separate fertilized eggs. That's why they're known as dizygotic twins.)**

Identical twins have long been thought to have the exact same genes. That's why some scientific studies recruit these twins. Such studies try to determine whether particular traits, diseases or conditions are due to genes or instead reflect environmental influences. Any differences in the health of identical twins were thought to be due to different environmental exposures. The new findings, though, suggest that genetic changes might also explain why identical twins aren't truly identical.





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