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## करंट अफेयर

### सुपर-कंप्यूटर परम शक्ति लगा से मिलेगा त्वरित डाटा

नेशनल सुपर-कंप्यूटिंग मिशन के तहत आईआईटी खड़गपुर में पैटार्केल सुपर-कंप्यूटर परम शक्ति को राष्ट्र को समर्पित किया गया। यह इलेक्ट्रॉनिक्स एवं सूचना प्रौद्योगिकी तथा विज्ञान एवं प्रौद्योगिकी विभाग की संयुक्त पहल है। कंप्यूटेशनल और डाटा विज्ञान के बहुविध क्षेत्रों में अनुसंधान एवं विकास गतिविधियों में तेजी लाने के लिये परम शक्ति सुपर कंप्यूटर सुविधा उपलब्ध है। यह आईआईटी खड़गपुर तथा पड़ोसी अकादमिक अनुसंधान और विकास संस्थानों को बड़े पैमाने पर कंप्यूटिंग दक्ष बना रही है। उल्लेखनीय है कि 44 जीपीयू सहित 17680 सीपीयू कोर वाली उत्कृष्ट सुपर-कंप्यूटिंग सुविधा केंद्र स्थापित करने के लिये समझौता-ज्ञापन पर आईआईटी खड़गपुर तथा प्रगत संगणन विकास केंद्र के बीच मार्च 2019 को हस्ताक्षर किये गये थे। इस सुविधा केंद्र में आरडीएचएक्स आधारित दक्ष शीतन प्रणाली का इस्तेमाल होता है, ताकि उच्च उपादेयता क्षमता हासिल हो सके। इस प्रणाली को आईआईटी खड़गपुर और सी-डैक में वाणिज्यिक, मुक्त-स्रोत और घरेलू सॉफ्टवेयर के लिये जांचा गया है। यह जांच विविधतापूर्ण एप्लीकेशनों से जुड़ी है। आईआईटी खड़गपुर सुपर-कंप्यूटिंग प्लेटफार्मों के लिये कारगर सॉफ्टवेयर है।





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### TDB signs agreement for developing vaccines

Union Minister of State (IC) Science & Technology, Dr. Jitendra Singh called for equal stake participation by industry to sustain startups. The minister was speaking at the ceremony to sign an agreement between Technology Development Board (TDB) of the Ministry of Science & Technology and M/s Sapigen Biologix Private Limited, Hyderabad helmed by Dr. Krishna Ella of Bharat Biotech Ltd for development and commercialization of two novel vaccines - "Intranasal Covid-19 Vaccine and RTS, S Malaria Vaccine". Dr. Krishna Ella has agreed to support another initiative,



where he has agreed to give Rs 200 crores and TDB will contribute the matching Rs 200 crores to form a Rs 400 crores corpus fund which will be used exclusively to support startups. Through this fund, startups will be supported in different fields across India using services of professional agencies at relaxed terms and conditions.



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### Detecting solar storms



Coronal mass ejections (CME), commonly known as solar storms, are now in the news because they are entering a phase where their frequency is set to rise, peaking perhaps in 2025 – all of which could potentially

affect satellites and even power grids.

(Recently, many satellites belonging to SpaceX founder-CEO Elon Musk were damaged by CMEs.)

Now, Indian researchers have developed a simple technique to separate the constant background of the sun's corona to reveal the dynamic corona.

The simple approach of subtracting the constant background can help in better identification of CME events, where a large cloud of energetic and highly magnetised plasma erupts from the solar corona into space, causing radio and magnetic disturbances on earth. It can also make their study easier. CMEs are dynamic structures in the solar corona and are capable of driving the weather in the near-Earth space, says a press release from the Department of Science and Technology. It becomes imperative to separate such structures and visually or automatically identify CMEs through the radial distances in the images taken using coronagraphs.

The density of the corona – the outermost layer of the sun's atmosphere – decreases with distance radially outwards. As the intensity of the corona observed in white light depends on the density of particles in the atmosphere, it decreases exponentially. If the contrast between the constant corona and transient CMEs is not high, detection of CMEs becomes a challenge.

The 'simple radial gradient filter' (SiRGraF) – a new method developed by Ritesh Patel, Vaibhav Pant, and Dipankar Banerjee of the Aryabhata Research Institute of Observational Sciences (ARIES), Nainital, along with Satabdwa Majumdar from the Indian Institute of Astrophysics (IIA), Bengaluru – is capable of separating the background to reveal the dynamic corona.



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### Indigenous electrocatalyst



Scientists at the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) have developed a platinum-based electrocatalyst for use in fuel cells.

The indigenous electrocatalyst is as good as the imported ones in terms of performance in fuel cells, but is more durable and corrosion-resistant. At 20 per cent, it showed less than the acceptable limits of loss in the active surface area of a catalyst (40 per cent), says a press release from ARCI. This could enhance the lifetime of the fuel cell stack performance.

Las Engineers and Consultants Pvt Ltd (LECLP), a Mumbai-based company engaged in designing and building plants for the chemical, pharmaceutical, and allied industries, is in the process of acquiring ARCI know-how for manufacturing this electrocatalyst, the release says.



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## VISION INDIA More than 150 heads attend science leaders conclave at IITC

# 25-yr route map of science drafted

**TUSHAR KAUSHIK | DC HYDERABAD, MARCH 26**

In a first-of-its-kind event, heads of multiple scientific institutions came together to create a roadmap for the role of science for the next 25 years. At the end of their discussions, they presented roadmaps for five themes — climate change, one health, energy security, meeting sustainable development goals, and applications of AI.

The occasion was the first Vision India@2047 Science Leaders Conclave,

jointly organised by the Union ministry of science and technology (DST) and Vijnana Bharati (Vibha). The event was held at the Indian Institute of Chemical Technology (IICT) here and was attended by more than 150 heads of government scientific institutions.

Speaking on the occasion, secretary, department of biotechnology Dr Rajesh Gokhale, said the Covid-19 pandemic had transformed the way science was used to find solutions quickly, and it was commendable that vac-

cines had been developed in a short span of time.

Speaking on retaining local talent, secretary, DST, Dr Srivari Chandrasekhar said brain drain was a big issue but Indian start-ups and fellowships were encouraging talent to return to the country. He added that the DST was working on conversion of carbon dioxide to methanol so as to counter the global issue of climate change.

Dr Shekhar C. Mande, secretary, department of scientific and industrial research (DSIR) and

Director-General, Council for Scientific and Industrial Research (CSIR), said the perception that substantial research was not taking place at the university level was not true. Dr Shekhar said the DSIR was trying to connect national institutes with universities to improve research.

Dr Mande said some topics on which research was currently going on at CSIR institutes were green hydrogen mission, tuberculosis, water issues and sustainable agriculture.

Regarding climate change, he said the solution to climate change issues was based on a combination of mitigation and prevention.

At the event, organising secretary Vibha, Jayant Sahasrabudhe spoke on the contribution of scientists to the freedom movement, while Dr G. Satheesh Reddy, secretary, department of defence R&D and Chairman, DRDO, Dr Mande and Dr Gokhale highlighted achievements in science and technology since independence.

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## बिना छुए ही अब संचालित हो सकेंगे एटीएम और कियोस्क

जागरण ब्यूरो, नई दिल्ली : भारतीय विज्ञानियों ने एटीएम व कियोस्क जैसी टच स्क्रीन मशीनों को बगैर स्पर्श किए ही संचालित करने की एक नई तकनीक विकसित की है। इसमें बिना टच किए ही वह नो सेंटीमीटर की दूरी से ही आसपास मंडराने वाली किसी छाया या वस्तु के आभास को स्वीकार कर लेगा।

विज्ञान एवं प्रौद्योगिकी मंत्रालय की मदद से भारतीय विज्ञानियों ने यह सफलता हासिल की है। कहा है कि यदि इस तकनीक को अपनाया जाता है, तो भविष्य में संक्रमण से खतरों से बचाव में मदद मिलेगी। मंत्रालय के मुताबिक यह पहल कोरोना संकटकाल में संक्रमण से बचाव को लेकर खोजे जा रहे उपायों के बीच ही शुरू की गई थी। इनमें ऐसे सेंसर लगाए गए हैं, जो दूर से ही किसी चीज के स्पर्श को महसूस कर लेते हैं। मौजूदा समय में इस्तेमाल में लिए जा रहे एटीएम और कियोस्क को संचालित करने के लिए उसको टच करना जरूरी होता है।

प्रोजेक्ट की अगुवाई कर रहे विज्ञान एवं प्रौद्योगिकी मंत्रालय से जुड़े जवाहर लाल नेहरू सेंटर फॉर एडवेंस साइंटिफिक रिसर्च (जेएनसीएसआर) के वरिष्ठ वैज्ञानिक प्रोफेसर जीवू कुलकर्णी के मुताबिक इसमें पैटर्निंग तकनीक से

### सफलता



- विज्ञान एवं प्रौद्योगिकी मंत्रालय की मदद से खोजी गई नई टच-लेस स्क्रीन तकनीक
- नौ सेमी की दूर से ही टच स्क्रीन करेगा काम, संक्रमण से बचाव में मददगार बनेगी

एक ऐसी लचीली एथिलीन टैरेफ्थैलेट (पीईटी) सबस्ट्रेट पर इंटरडिजिटेटेड इलेक्ट्रोड (आईडीई) विकसित की है जो नजदीक आने पर स्पर्श संवेदन क्षमता के जुड़े सेंसर को सतर्क कर देती है। इस प्रोजेक्ट में बंगलुरु स्थित नैनो एवं साफ्ट मैटर साइंसेज ने भी सहयोग किया है। दोनों संस्थानों ने मिलकर एक अर्ध स्वचालित उत्पादन संयंत्र भी स्थापित किया है, जो किफायती प्रिंटिंग एडेड पैटर्न के तहत पारदर्शी इलेक्ट्रोड का उत्पादन करने में सक्षम है। दोनों ही संस्थान अब इन डिवाइसों के कुछ प्रोटोटाइप भी बनाने में जुटे हैं। यह शोध कार्य हाल ही में एक वैश्विक शोध पत्रिका में भी प्रकाशित हुआ है।



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# New technology for touchless touchscreen to check virus spread

TIMES NEWS NETWORK

**Bengaluru:** Scientists from Bengaluru have reported an affordable solution to develop a low-cost touch-cum-proximity sensor — popularly called touchless touch sensor — through a printing technique.

Pointing out how Covid-19 has triggered efforts to make lifestyle more adaptable to pandemic scenarios, the researchers said their actions were driven to reduce the risk of viruses spreading, particularly in public places where touchscreens on self-service kiosks, ATMs and vending machines are inevitable.

This work by a team led by Prof GU Kulkarni of Jawaharlal Nehru Centre for Advanced and Scientific Research and co-workers, was funded by DST-Nanomission at the Centre for Nano and Soft Matter Sciences (CeNS). The findings were recently published in the journal 'Materials Letters'. Both JNCASR and CeNS are autonomous institutions of the department of science and technology (DST). "...Scientists from CeNS and JNCASR have set up a semi-automated plant for the production of printing-aided patterned (resolution of around 300 µm) transparent

**The team fabricated a touch sensor which senses a proximal or hover touch even from a distance of 9cm from the device**

electrodes, which have the potential for being utilised in advanced touchless screen technologies," DST said.

Dr Ashutosh K Singh, a scientist working on this project, said the team fabricated a touch sensor which senses a proximal or hover touch even from a distance of 9cm from the device. "We are making a few more prototypes using our patterned electrodes to prove their feasibility for other smart electronic applications. These patterned electrodes can be made available to industries and R&D labs on a request basis to explore collaborative projects," said Indrajit Mondal, a co-author in the research.

DST said the novel low-cost patterned transparent electrodes have tremendous potential to be used in advanced smart electronic devices like touchless screens and sensors and assist in preventing the spread of viruses through contact.



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**SCHOLARSHIPS**

**DRDO Scholarship Scheme for Girls 2022**

This is an opportunity for women students through Aeronautics Research and Development Board (AR&DB), DRDO HQ.

**ELIGIBILITY:** Open to female Indian nationals pursuing UG/PG courses in Aerospace Engineering/ Aeronautical Engineering/Space Engineering and Rocketry/ Aircraft Engineering/ Avionics and have taken admission in the first year of the current academic year (2021-22).

**PRIZES AND REWARDS:** Up to ₹1,86,000 per annum

**DEADLINE:** March 31  
**APPLICATION:** Online  
b4s.in/edge/RDO1

**Teachers Associateship for Research Excellence (TARE) 2022**

This is an opportunity offered by Science and Engineering Research Board (SERB) to faculty members.

**ELIGIBILITY:** Open to Indian citizens below 45 years of age at the time of submission of application and hold a Ph.D. in Science **OR** M.S./ M.D. in Medicine **OR** M.E./ M.Tech. degree in Engineering/ Technology. Age relaxation of five years will be given to SC, ST, OBC, physically challenged and women candidates.

**PRIZES AND REWARDS:** ₹60,000 per annum and other benefits  
**DEADLINE:** March 15  
**APPLICATION:** Online  
b4s.in/edge/ARE1

**Nikon Scholarship Programme 2022-23**

Nikon India Private Limited aims to support students from underprivileged sections.

**ELIGIBILITY:** Open to students (Class 12 passed onwards) pursuing photography courses with a duration of three months or more. Annual family income should be less than ₹6 lakh.

**PRIZES AND REWARDS:** Up to ₹1 lakh  
**DEADLINE:** March 31  
**APPLICATION:** Online  
b4s.in/edge/NSP8

Courtesy: buddy4study.com

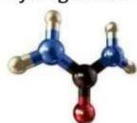


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## FROM THE LABS

### Hydrogen from electrolysis of urea



Scientists at the Centre for Nano and Soft Matter Sciences (CeNS) have developed a nickel oxide-based urea. Urea electrolysis is helpful in urea-based waste treatment with low-cost hydrogen production, which, in turn, can be used for energy production.

The energy requirement for hydrogen production through water electrolysis can be reduced by 70 per cent through urea electrolysis. The energy-intensive counterpart of water splitting, oxygen evolution, can be replaced with urea oxidation in urea electrolysis. The low-cost, earth-abundant nickel-based catalysts are widely applied for this process. The main challenge associated with urea oxidation is ensuring the sustained activity of the catalyst as the strong adsorption of the reactive intermediate, referred to as catalyst poisoning, causes activity loss.

CeNS researchers Alex C, Gaurav Shukla, Muhammed Safer and Neena S John explored electrocatalysts and used high-energy electron beams to produce surface defective unsaturated nickel sites in nickel oxide.

They say this is an effective way to produce a large number of coordinatively unsaturated active sites on electrocatalysts. It was observed that these generated sites effectively adsorb urea and this favours the direct urea electro-oxidation mechanism.

India is one of the top countries by urea production – 244.55 lakh tonnes in 2019-20. The nitrogenous fertiliser industries generate a high concentration of ammonia and urea as effluents. This can be utilised for energy production.



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## ENERGY MATTERS

# Slick use of silica in ester oil to keep power supply going

IIT-M research shows how silica and a surfactant could help reduce transformer size by a quarter, leading to cost savings

K BHARAT KUMAR

As power demand rises over the years, power systems, too, have to keep pace. An important part of the power system is the transformer.

Heat is generated by the energy losses in the transformer core, as well as in the current-carrying windings. The insulating oil used in the transformer acts as a coolant. If the oil does not provide proper insulation, it can lead to the failure of the transformer and a power shutdown. A temperature rise to 200 degrees C in the transformer could lead to a catastrophic fire breakout. Traditional transformer oils are also not biodegradable.

Ester oils have been gradually replacing traditional oils in transformers as they exhibit better insulation characteristics and are also biodegradable. Ester oils have a high fire point – that is, they can handle temperatures as high as 300 degrees C. However, as the size of the transformer increases, the amount of oil required also increases. Keeping large volumes of oil pure becomes a challenge. Even a thin fibre or conducting material contaminat-

ing the oil can lead to major problems over time, says Prof R Sarathi, who is with the High Voltage Division of IIT-Madras's Dept of Electrical Engineering.

He and his team of researchers, including members from the KTH Royal Institute of Technology, Sweden, explored the potential application of nanofillers to improve the 'dielectric performance' of synthetic ester oils. (Dielectric materials, while not exactly insulators, can be made to function as insulation. A material is said to have a high dielectric strength if it does not allow current to pass through – in other words, it acts as good as an insulator.)

The project was financially supported through the 'Nano Mission' of the Department of Science and Technology, Government of India.

The team introduced nanofillers into ester oil. As desired, the introduction did not change the basic electrical or thermal properties of the oil; and the fillers were also able to enhance the required insulation.

Explains Prof Sarathi: "Nanoparticles in a liquid can provide higher withstanding capability in terms of electrical, thermal and



mechanical properties. So, when a local electrical discharge occurs inside the transformer, nanoparticles act as a barrier. They will not allow the discharge to propagate further, even at higher voltages." Nanoparticles also have a high surface area, as a result of which heat too gets dissipated quickly.

The team chose silica as the material for the nanofiller. Silica not only has good dielectric properties but is also cost-effective.

However, nanofillers need to be dispersed uniformly to avoid clustering in the fluid to achieve the de-

sired insulation. For this, the team experimented with multiple surfactants (which are chemicals like detergents that increase the 'wetting' property of a liquid) to ensure uniform dispersion. Between CTAB, oleic acid and SPAN 80, the last was found most suitable.

The team also found that the 'rheological' properties were ideal for their objective.

"The idea was to use material that enhances the efficiency of the system without compromising on the electrical and thermal properties," says Prof Ramesh Gardas of the De-

partment of Chemistry, IIT-M.

Rheological studies (on the flow and deformation of material under stress or strain) were conducted to check how the electrical and thermal properties of the system changed on the application of stresses such as temperature and voltage. The objective was to choose material that did not undergo permanent changes. The combination of silica and SPAN 80 showed resilience.

"Dispersion of the nanofiller is important. The surfactant helps to disperse the silica evenly and acts as a pillar, lending stability to the nanofiller, so that it stays in position in the base liquid," says Prof Sarathi, adding that the oil the team designed passed muster.

How exactly does this combination lead to savings for manufacturers, in terms of design? The selected nano fluid could potentially help reduce the volume of oil required for insulation. As a result, the size of the transformer could also reduce by nearly 25 per cent.

The transformer includes optical fibre as part of the design. The researchers have received sponsorship from Easun MR Tap Changers, Chennai.



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# In search of the first cosmic light

Scientists at the Raman Research Institute continue the decade-long quest

**JAOB KOSHY**  
NEW DELHI

In a country of a billion phones, hungry for every bit of radio signal, is a group of scientists looking for spots where one can escape them.

This continuing decade-long quest, led by scientists at the Raman Research Institute (RRI), Bengaluru has taken them multiple times to Ladakh, to a place aptly named the Timbuktu Collective in Andhra Pradesh, and to lakes in northern Karnataka, with their radio telescope SARAS (Shaped Antenna Measurement of the Background Radio Spectrum), which hopes to catch the trace of an extremely elusive sign from space – that of the birth of the first stars or what's called “the cosmic dawn”.

Reverberations of the Big Bang that birthed our universe 13.8 billion years ago continue to linger in a swathe of radiation called the cosmic microwave background (CMB). At a very



The SARAS 3 team near a lake. ■SPECIAL ARRANGEMENT

specific region in this spectrum, current cosmological models of the universe say, there is a point where the microwave radiation is a little dim and this, these models say, is because light from the first stars may have made hydrogen extra opaque at specific radio wavelengths.

Several groups around the world have designed custom-made, highly sensitive radio telescopes and are placing them in regions as remote as deserts in Australia to an island in the Antarctic Ocean and, if a proposal

comes through, in the lunar orbit.

The EDGES (Experiment to Detect the Global Epoch of Reionization Signature) telescope, placed in an Australian desert, recorded an unusual signal that the group claims is the sign of the cosmic dawn.

However the signal's pattern wasn't shaped in the way cosmological models predicted and since 2018, when the EDGES result was published, there's a flurry of interpretation on whether the instrument actually de-

tected the signal, and if it did, what explained its unusual structure.

To test this, the RRI group made an updated version of SARAS, called SARAS-3. Its chief distinguishing characteristic is that, unlike other radio telescopes, it can be deployed on water bodies. Water – being of uniform layers – would be an ideal medium, the group reckoned, to make such a sensitive measurement.

Following weeks of observations and months of statistical analysis by Saurabh Singh, research scientist at the RRI, SARAS 3 did not find any evidence of the signal claimed by the EDGES experiment.

Dr. Singh told *The Hindu* that the quest for the signature was still on. Following the measurements on the lake, the group is planning to revisit Ladakh and place the telescope in one of the lakes there in the hope of improving their odds of detecting the signal.





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Dr. Singh told *The Hindu* that the quest for the signature was still on. Following the measurements on the lake, the group is planning to revisit Ladakh and place the telescope in one of the lakes there in the hope of improving their odds of detecting the signal.



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Journalist:	Jaob Koshy	Page No:	10

# In search of the first cosmic light

Scientists at the Raman Research Institute continue the decade-long quest

**JAOB KOSHY**  
NEW DELHI

In a country of a billion phones, hungry for every bit of radio signal, is a group of scientists looking for spots where one can escape them.

This continuing decade-long quest, led by scientists at the Raman Research Institute (RRI), Bengaluru has taken them multiple times to Ladakh, to a place aptly named the Timbuktu Collective in Andhra Pradesh, and to lakes in northern Karnataka, with their radio telescope SARAS (Shaped Antenna Measurement of the Background Radio Spectrum), which hopes to catch the trace of an extremely elusive sign from space – that of the birth of the first stars or what’s called “the cosmic dawn”.

Reverberations of the Big Bang that birthed our universe 13.8 billion years ago continue to linger in a swathe of radiation called the cosmic microwave background (CMB). At a very



The SARAS 3 team near a lake. \*SPECIAL ARRANGEMENT

specific region in this spectrum, current cosmological models of the universe say, there is a point where the microwave radiation is a little dim and this, these models say, is because light from the first stars may have made hydrogen extra opaque at specific radio wavelengths.

Several groups around the world have designed custom-made, highly sensitive radio telescopes and are placing them in regions as remote as deserts in Australia to an island in the Antarctic Ocean and, if a proposal

comes through, in the lunar orbit.

The EDGES (Experiment to Detect the Global Epoch of Reionization Signature) telescope, placed in an Australian desert, recorded an unusual signal that the group claims is the sign of the cosmic dawn.

However the signal’s pattern wasn’t shaped in the way cosmological models predicted and since 2018, when the EDGES result was published, there’s a flurry of interpretation on whether the instrument actually de-

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To test this, the RRI group made an updated version of SARAS, called SARAS-3. Its chief distinguishing characteristic is that, unlike other radio telescopes, it can be deployed on water bodies. Water – being of uniform layers – would be an ideal medium, the group reckoned, to make such a sensitive measurement.

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Journalist:	Shubashree Desikan	Page No:	16

# A home-made analogy that helps study solar spicules in the lab

Paint poured on the mouth of the speaker, when fed music, breaks out in spicule-like jets

SHUBASHREE DESIKAN

A team of interdisciplinary researchers from India and the U.K. led by astronomers from the Indian Institute of Astrophysics, Bengaluru, have explained the origin of 'spicules' on the Sun, using laboratory experiments as an analogy.

The Sun, our closest star, continues to present us with numerous puzzles. One problem concerning the Sun that our astronomers are keen to study has to do with solar spicules. These are jets of plasma, shooting out from the Sun's outermost layer - the Chromosphere - and making incursions into its atmosphere.

## Modelling spicules

Many modellers have tried, but unsuccessfully, to match the size and abundance of these features, which play important roles in at least two deep problems in solar physics. Now, in the study, published in *Nature Physics*, these researchers have found a way to study spicules in the lab using an analogous system - paint is poured on the mouth of a speaker which is fed the music that causes it to break



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The researchers found an analogous system in the most unlikely of places - a blob of paint dancing on the surface of the mouth of an audio speaker. Normally, if

you place a liquid in a petri dish on the mouth of a speaker and turn up the frequency of the sound passing through it, at some frequency, the liquid's free surface becomes unstable and starts vibrating. If the liquid is like paint or shampoo, instead of forming droplets, it will form long jets. This is because the fluid's long polymeric chains give it a directionality.

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When asked about the fundamental questions that this method can answer, Dr. Chatterjee says the following: Trying to understand the origin and nature of solar spicules is of fundamental importance for not just coronal heating but also mass supply to solar wind. The spicules are believed to act like channels to transport mass, momentum and energy to the Corona of the Sun.

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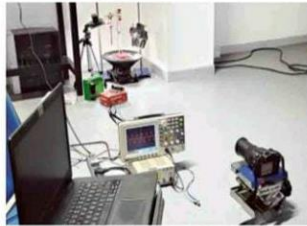
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**अवधान** पतली घास जैसी है इनकी संरचना, तीन से चार किमी गहरी होती हैं तीन परतें  
**सूरज से निकलने वाली लपटों के रहस्य से वैज्ञानिकों ने उठाया पर्दा**

नई दिल्ली: वैज्ञानिकों ने सूरज की सतह से लगातार निकलने वाली लपटों (फ्लेमिंग पेंट) के विज्ञान का एक लक्षण है। पतली और टूटने के कोणवर्ती की एक टीम के मुताबिक, ये फ्लेमिंग के पेंट (लपटें) का निष्कर्षण, पतली घास जैसी संरचना संरचनाओं के रूप में दिखाई देते हैं जो सतह से लगातार ऊपर उठती रहती हैं और मुख्यकरणीय द्वारा कीये जाते हैं।

भारतीय खनिज भौतिकी संस्थान में भारतीयों के नेतृत्व में भारत और होलैंड के कोणवर्ती की टीम ने सूर्य के 'विषकृपा' को इस्तेमाल की व्याख्या की है। टीम ने भारत में तीन सूर्य संचयन या इस्तेमाल किया, जिससे व्यापक समझना वैज्ञानिकों को बताया जा सकता है। विश्व एन प्रोसेसिंग विभाग (टीएसटी) के मुताबिक, इन प्रक्रियाओं के अर्थों को हम को फ्लेमिंग को अनुभव को

**ऑडियो स्पीकर के जरिये सुनी गई आवाज**



विश्वभारत इन्फॉर्मेशन के पीछे को समझने सार टीम ने एक ऑडियो स्पीकर को सार को। इसके अर्थों विज्ञान में सुनाई देने वाले पारंपारिक को आवाज को यह काम अनुभवों का एक होने वाले विचार का प्रदर्शन का प्रदर्शन को है। इसे स्पीकर का एक बॉक्स लाने पर यह जाह है और अंतर चयन किया जाह है, जो सूर्य को सुना सार अर्थों को जानें है और अंतर कारण एक कर लेते हैं। 'अन वैज्ञानिक' विज्ञान में प्रदर्शित टीम में वैज्ञानिकों ने सूर्य फ्लेमिंग के अल्ट्रावैलक संश्लेषण विज्ञान का इस्तेमाल का सूर्य का चुम्बकीय क्षेत्र की बुझकों को जाह को। इसके समकाल वैज्ञानिक फ्लेमिंग में फोटो सार का अर्थों को वैज्ञानिकों का उल्लेख करने वैज्ञानिकों को सुनिश्चित का भी सार लक्षण का।

**उबलते हुए पानी की तरह लगता है फ्लेमिंग**

वैज्ञानिकों ने बताया कि सूर्य सतह (फोटोस्फीयर) के ठीक नीचे फ्लेमिंग संश्लेषण को मिलते हैं और फ्लेमिंग सतह का उबलते हुए पानी की तरह लगता है। यह गर्म पानी को फ्लेमिंग ऊपर उठाया जासूस होता है। यह संश्लेषण विज्ञान सार के लिए होता है, संश्लेषण का सूर्य को फ्लेमिंग से पदार्थ को वसूली से जाह जाह है। फोटोस्फीयर में फ्लेमिंग को सुना में क्रोमोस्फीयर 500 किलोमीटर तक है। इसी तरह से जाह जाह है वसूली उल्लेख फ्लेमिंग (विषकृपा) के रूप में अनुभवों को सूर्य में क्रोमोस्फीयर फ्लेमिंग को सार को और फ्लेमिंग है।

जाहें है और सूर्य संचयन पर विज्ञान विज्ञान विज्ञान तक का हो जाह है। फ्लेमिंग पदार्थ को फ्लेमिंग अर्थों को है, विज्ञान विज्ञान का सूर्य से अर्थों का सूर्य को है और सूर्य के क्रोमोस्फीयर (सूर्य को दिखाई देने वाली सतह के ठीक ऊपर की परत) में हा जाह जाह है। सूर्य के संचयन को सूर्य सूर्य पदार्थ में सूर्य क्रोमोस्फीयर होते हैं, जो कि 3 से 5 हजार किमी गहरी होती हैं। यह सतह का को दिखाई देते हैं। ताप



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**TDB to promote Daylight Harvesting Tech start-up**

Union Minister of State (IC) Science & Technology; MoS (IC) Earth Sciences; MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space, Dr. Jitendra Singh announced that the Ministry of Science & Technology will promote a unique start-up in latest Daylight Harvesting Technology in order to reduce carbon footprint and improve the building energy efficiency. The only start-up company based in Hyderabad signed an MoU with Technology Development Board, a statutory body of Department of Science & Technology in presence of Dr. Jitendra Singh. On the occasion, Dr. Singh said that Technology Development Board will give Rs 5 crore of the Rs 10 crore project to the company for developing new technologies for basement illumination on 24x7 basis.





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Journalist:	Abhijit Ahaskar	Page No:	8

## Petascale computer deployed at IIT Roorkee

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The government's National Supercomputer Mission (NSM) has deployed a supercomputer system with 1.66 petaFLOPS (PFLOPS) of computing power at the Indian Institute of Technology (IIT), Roorkee.

Designed, developed, and commissioned by the Centre for Development of Advanced Computing (C-DAC), the supercomputer called PARAM-Ganga has components manufactured and assembled in India, the ministry of electronics and information technology (MeitY) said. The software stack used in the system has been developed by C-DAC.

NSM is a joint mission of MeitY and the Department of

**TECHCIRCLE** Science and Technology, which aims to deploy 24 facilities with a combined computing power of more than 64 petaFLOPS. The computing power of supercomputers is measured in floating-point operations per second or FLOPS. One petaFLOP is equal to 1,000,000,000,000,000 (one quadrillion) FLOPS, or one thousand teraFLOPS.

Modern-day research need heavy simulations, requiring a lot of computing power. C-DAC has so far deployed 11 such systems at Indian Institute of Science (IISc), IITs, Indian Institute of Science Education and Research in Pune, the Jawaharlal Nehru Centre for Advanced Scientific Research, and the National Agri-Food Biotechnology Institute.

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## प्रौद्योगिकी क्षेत्र में भारत का आत्मनिर्भर होना जरूरी : मोदी कहा, 5जी के लिए इसी साल स्पेक्ट्रम की नीलामी

नई दिल्ली। प्रधानमंत्री नरेंद्र मोदी ने बुधवार को कहा कि भारत को प्रौद्योगिकी क्षेत्र में आत्मनिर्भर होना बहुत ही आवश्यक है। प्रौद्योगिकी न केवल सेवाओं की अंतिम सिरे तक पहुंच में अहम भूमिका निभाती है बल्कि इसमें जीव सृजन की भी अपार संभावनाएं हैं।

'प्रौद्योगिकी सक्षम विकास' पर एक वेबिनार में उन्होंने कहा कि विज्ञान और प्रौद्योगिकी कोई अलग-थलग क्षेत्र नहीं है बल्कि यह डिजिटल अर्थव्यवस्था और आधुनिक प्रौद्योगिकी से काफी करीब से जुड़ा हुआ है। इसका सारा फोकस अब सेवाओं की तेज गति से पहुंच और लोगों का सशक्तीकरण है। उन्होंने कहा कि इस बार के आम बजट में विज्ञान और प्रौद्योगिकी के लिए जो प्रावधान किए गए हैं, वह बहुत महत्वपूर्ण हैं और इनका तेजी से क्रियान्वयन बहुत जरूरी है। उन्होंने कहा कि आमतौर पर दूरसंचार, खासकर 5जी प्रौद्योगिकी विकास और नौकरी देने की संभावनाएं उत्पन्न कर सकता है। उन्होंने कहा कि 2022-23 में लोगों को 5जी मोबाइल सेवाएं उपलब्ध कराने के लिए इस साल ही आवश्यक स्पेक्ट्रम की नीलामी की जाएगी। भारतीय स्टार्टअप को हर चरण में मुहैया कराई जाएगी मदद...पीएम ने चिकित्सा उपकरणों के देश में ही निर्माण पर ध्यान देने पर जोर दिया। कहा कि मांग और



**नई व्यवस्था में आत्मनिर्भरता जरूरी**  
उन्होंने कहा, अमेरिका के राष्ट्रपति ने भी अपने भाषण में अमेरिका को आत्मनिर्भर बनाने की बात कही और उन्होंने भी 'मेड इन अमेरिका' पर बहुत जोर दिया।

■ पीएम ने कहा, दुनिया में जो नई व्यवस्थाएं बन रही हैं, उसमें हमारे लिए भी बहुत आवश्यक है कि हम आत्मनिर्भर बनें। इस बजट में उन चीजों पर बल दिया गया है। संचार के क्षेत्र में विदेशों पर निर्भरता को भी कम करने का आख्यान किया और कहा कि देश का अपना मजबूत डाटा सुरक्षा ढांचा बहुत जरूरी है।

आपूर्ति के बीच अंतर कम करने में प्रौद्योगिकी अहम भूमिका निभाएगी। साथ ही उन्होंने भारतीय स्टार्टअप इंडस्ट्री को आश्वासन दिया कि मेक इन इंडिया प्रोजेक्ट के तहत स्थित डेवलपमेंट से निर्माण तक विभिन्न चरणों में सरकार उनकी हरसंभव मदद करेगी। एजेसी



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# National Science Week 2022 concludes at KiiT International School



As a part of the Azadi Ka Amrit Mahotsav, grand programmes and exhibitions to showcase indigenous science, technology, and innovations were held at 75 locations across the country, including KiiT International School, Bhubaneswar, from February 22 to 28. The week-long celebrations themed 'Vigyan Sarvate Pujyate' and jointly organised by the Ministry of Culture, Government of India, Office of the principal scientific officer to the Government of India, and Vigyan Prasar and supported by DST, DBT, CSIR, MoES, DAE, DOS, ICMR, AICTE, and DRDO, concluded on 28th February, on the occasion of National Science Day.

The festival at Bhubaneswar was organised under the aegis of Science and Technology Department, Government of Odisha in association with Odisha Vigyan Academy, Bhubaneswar City Knowledge Innovation Cluster, KiiT Deemed to be

University and Regional Science Centre, Bhubaneswar.

The valedictory ceremony at KiiT International School was graced by Dr K K Nanda, director, Institute of Physics; Mr Laxmi Narayan Padhi, senior scientist, Science and Technology Department, Government of Odisha; Dr P. C. Padhi, chief manager, CIPET-IPT; Dr S Hajra, DRDO coordinator for ITR, Chandipur; Dr S Dutta, coordinator, "Proof and Experimental Establishment (PXE)" DRDO, Chandipur; Dr Bibhuti Bhusan Mishra, president, Odisha Vigyan Academy; Dr Mrutyunjay Suar, director general-R&D, KiiT-DU and chairman, BGKIC; Dr Mona Lisa Bal, chairperson, KiiT International School and Dr Sanjay Suar, principal.

They addressed the students highlighting the capabilities of Indian Science and Technology, achievements and excellent work undertaken by Govt. of Odisha to



popularise the science among the students and researchers.

The defence pavilion by DRDO-ITR and DRDO-PXE was a major attraction. It included Arjuna Tank, guns, mortars and different miniaturised missile models, depicting the true missiles. Space on Wheels was an innova-

tive display by ISRO where multiple miniature models of indigenously developed space launched vehicles along with satellite including India's first satellite Aryabhata was showcased.

The festival featured world-class researchers, scientists and technocrats in a variety of talks,

panel discussions and expositions. A series of competitions for students were organised including essay writing, poems, debate, drama and poster making. In addition, students presented their ideas, inventions and science projects focused on societal and industrial benefits. The winners of the competitions were awarded on the occasion. The science week had a participation of more than 15,000 students from different schools of the state visiting innovation booths showcased by premier organisations, including CSIR-Institute of Minerals and Materials Technology, DBT-Institute of Life Sciences, Odisha Space Application Center, National Innovation Foundation, Odisha Vigyan Academy, Experiential Learning Booth by KiiT, Booth on Vaidik Mathematics by Institute of Mathematics and Applications, and innovations by SROSTI to highlight a few.



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## प्रौद्योगिकी आधारित विकास पर वेबिनार को संबोधित करेंगे मोदी

नई दिल्ली (भाषा)। प्रधानमंत्री नरेंद्र मोदी बुधवार को 'प्रौद्योगिकी आधारित विकास' विषय पर एक वेबिनार को संबोधित करेंगे, जिसमें केंद्रीय बजट में इस क्षेत्र के बारे में किए गए प्रावधानों को लागू करने के लिए कार्य बिंदुओं की रूपरेखा तैयार की जाएगी।

मोदी के संबोधन के बाद दूरसंचार विभाग, वैज्ञानिक और औद्योगिक अनुसंधान विभाग, विज्ञान एवं प्रौद्योगिकी विभाग तथा इलेक्ट्रॉनिक्स एवं सूचना प्रौद्योगिकी मंत्रालय द्वारा चार विषय आधारित उपसत्र आयोजित किए जाएंगे। वेबिनार केंद्रीय बजट में की गई घोषणाओं के कुशल कार्यान्वयन की सुविधा के लिए विभिन्न क्षेत्रों में सरकार द्वारा आयोजित श्रृंखला का एक हिस्सा है। वेबिनार के तीसरे भाग में उपरोक्त विभागों के सचिव और मंत्री, उपसत्रों के कार्यबिंदुओं पर चर्चा करेंगे तथा कार्यान्वयन की दिशा में आगे की रणनीति को अंतिम रूप देंगे। वेबिनार का आयोजन विज्ञान क्षेत्र से जुड़े विभिन्न मंत्रालयों और विभागों के साथ प्रधान वैज्ञानिक सलाहकार के कार्यालय द्वारा किया जा रहा है।



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## राष्ट्रीय विज्ञान दिवस संगोष्ठी का आयोजन किया गया



नई दिल्ली। राष्ट्रीय विज्ञान दिवस -2022 के अवसर पर 28-02-2022 को राष्ट्रीय विज्ञान दिवस संगोष्ठी (एनएसडीएस) का आयोजन किया गया। इस कार्यक्रम का योजना और क्रियान्वयन जेपी युनिवर्सिटी ऑफ इंफॉर्मेशन टेक्नोलॉजी, वाकनाघाट, सोलन द्वारा हिमकोस्ट, हिमाचल प्रदेश सरकार की वित्तीय सहायता से किया गया है और विज्ञान और प्रौद्योगिकी विभाग (डीएसटी), भारत सरकार द्वारा उद्वेगित किया गया है। इस वर्ष के राष्ट्रीय विज्ञान दिवस का विषय 'स्थायी भविष्य के लिए विज्ञान और प्रौद्योगिकी का एकीकृत दृष्टिकोण' है। विज्ञान के इस पर्व पर जेपी युनिवर्सिटी ऑफ इंफॉर्मेशन टेक्नोलॉजी, वाकनाघाट, सोलन ने विभिन्न स्कूलों में छात्रों के लिए ऑफलाइन के साथ-साथ ऑनलाइन मोड में भी कुछ कार्यक्रम आयोजित किए हैं। इन आयोजनों में विद्यार्थियों ने उत्साहपूर्वक भाग लिया। हिमाचल प्रदेश के कुछ स्कूलों में ऑफलाइन विज्ञान प्रतियोगिता का आयोजन किया गया। राज्य के बाहर के छात्रों के लिए भी पोस्टर प्रतियोगिता सभी छात्रों के लिए खुली थी। हमें छात्रों से उच्च गुणवत्ता वाले पोस्टर मिले हैं। कार्यक्रम के दौरान प्रगोत्सरी और पोस्टर प्रतियोगिताओं में विजेताओं को घोषणा की गई।



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## 11 scientists honoured on National Science Day

**CHANDIGARH, FEBRUARY 28**

Haryana Governor Bandaru Dattatreya honoured 11 scientists during the Haryana Vigyan Ratna and Haryana Yuva Vigyan Ratna award distribution function at Raj Bhavan on the National Science Day today. This was the first time in the history of Haryana that two women have been conferred with the award.

In the Haryana Vigyan Ratna award category, Prof Neeraj Jain and Prof Mukesh Jain for 2019; Prof Motilal Madan and Dr Sushila Mann for 2020 and Dr Chetan Prakash Kaushik and Dr Illora Sen for 2021 were honoured. A cash award of ₹4 lakh was also given to them on the occasion.

Dr Pooja Devi and Dr Ram Jiwari were honoured with the Haryana Yuva Vigyan Ratna award for the year 2019. In the same category, Dr Pawan Kumar and Satish Khurana for 2020 and Dr Kalpana Nagpal for 2021 were chosen. A cash award of ₹1 lakh was given to them. — TNS



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## राष्ट्रीय विज्ञान दिवस संगोष्ठी का आयोजन किया गया



नई दिल्ली। राष्ट्रीय विज्ञान दिवस -2022 के अवसर पर 28-02-2022 को राष्ट्रीय विज्ञान दिवस संगोष्ठी (एनएसडीएस) का आयोजन किया गया। इस कार्यक्रम की योजना और क्रियान्वयन जेपी यूनिवर्सिटी ऑफ इफॉर्मेशन टेक्नोलॉजी, वाकनाघाट, सोलन द्वारा हिमकोस्टे, हिमाचल प्रदेश सरकार की वित्तीय सहायता से किया गया है और विज्ञान और प्रौद्योगिकी विभाग (डीएस्टी), भारत सरकार द्वारा उत्प्रेरित किया गया है। इस वर्ष के राष्ट्रीय विज्ञान दिवस का विषय 'स्थायी भविष्य के लिए विज्ञान और प्रौद्योगिकी का एकिकृत दृष्टिकोण' है। विज्ञान के इस पर्व पर जेपी यूनिवर्सिटी ऑफ इफॉर्मेशन टेक्नोलॉजी, वाकनाघाट, सोलन ने विभिन्न स्कूलों में छात्रों के लिए ऑफलाइन के साथ-साथ ऑनलाइन मोड में भी कुछ कार्यक्रम आयोजित किए हैं। इन आयोजनों में विद्यार्थियों ने उत्साहपूर्वक भाग लिया। हिमाचल प्रदेश के कुछ स्कूलों में ऑफलाइन किचन प्रतियोगिता का आयोजन किया गया। राज्य के बाहर के छात्रों के लिए भी पोस्टर प्रतियोगिता सभी छात्रों के लिए खुली थी। हमें छात्रों से उच्च गुणवत्ता वाले पोस्टर मिले हैं। कार्यक्रम के दौरान प्रश्नोत्तरी और पोस्टर प्रतियोगिताओं में विजेताओं की घोषणा की गई।



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## 11 scientists honoured on National Science Day

CHANDIGARH, FEBRUARY 28

Haryana Governor Bandaru Dattatreya honoured 11 scientists during the Haryana Vigyan Ratna and Haryana Yuva Vigyan Ratna award distribution function at Raj Bhavan on the National Science Day today. This was the first time in the history of Haryana that two women have been conferred with the award.

In the Haryana Vigyan Ratna award category, Prof Neeraj Jain and Prof Mukesh Jain for 2019; Prof Motilal Madan and Dr Sushila Mann for 2020 and Dr Chetan Prakash Kaushik and Dr Illora Sen for 2021 were honoured. A cash award of ₹4 lakh was also given to them on the occasion.

Dr Pooja Devi and Dr Ram Jiware were honoured with the Haryana Yuva Vigyan Ratna award for the year 2019. In the same category, Dr Pawan Kumar and Satish Khurana for 2020 and Dr Kalpana Nagpal for 2021 were chosen. A cash award of ₹1 lakh was given to them. — TNS



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# Bengaluru institute refutes claim of cosmic dawn signal discovery

Over 10 experiments across the world have been trying to cross verify the 2018 discovery of ASU and MIT; RRI presents findings to the press

**K.V. ADITYA BHARADWAJ**  
BENGALURU

The excitement over 2018 claims of discovery of light from the universe's first stars (cosmic dawn) seems to have hit a roadblock in Bengaluru.

City-based Raman Research Institute (RRI) on Monday claimed their experiments have refuted claims by Arizona State University (ASU) and Massachusetts Institute of Technology (MIT) that they discovered the elusive radio signals from the cosmic dawn.

The findings were published in the journal *Nature Astronomy* on Monday night, which had also published the earlier claims of discovery in 2018.

The elusive radio signal is a theoretical prediction of a

dip in the brightness of the spectrum due to the interaction of hydrogen gas and Cosmic Microwave Background radiation at different temperatures at cosmic dawn. For decades now, scientists have been experimentally trying to observe and capture this signal, to hopefully reverse engineer and study the formation of the first stars after the big bang, a phase about which very little is known.

ASU and MIT, using data from their EDGES radio telescope mounted in Western Australia, claimed to have finally discovered the elusive signal in February 2018. However, the observed dip was twice over what was theoretically predicted, disrupting the widely accepted cosmo-

logical model of the universe. Hailed by many as revolutionary, this claim led to several new theories like early galaxies before cosmic dawn and dark matter interactions in an attempt to explain this variation. Since then, over 10 experiments across the world have been trying to cross verify this discovery.

In an initiative led by former RRI director Prof. Ravi Subrahmanyan and Prof. N. Udaya Shankar, CMB Distortion Laboratory, RRI-developed highly sensitive radio telescope SARAS has been trying to detect the elusive cosmic dawn signal for nearly 15 years now, without success. Post the 2018 claim of its discovery, SARAS 3 was deployed at Dandiganahalli



SARAS 3 radio telescope developed by the RRI did not find any evidence of the signal claimed by the EDGES experiment.

Lake near Bengaluru and the Sharavathi backwaters in January and March 2020 to cross verify these claims. "For the first time, we deployed the radio telescope on a water surface to cut out

nals emanating from the ground and had very good results," said research scientist Dr. Saurabh Singh, who presented the findings to the press on Monday. "After a rigorous statistical analysis, SARAS 3 did not

find any evidence of the signal claimed by the EDGES experiment. The presence of the signal is decisively rejected after a careful assessment.", said a statement from the RRI. It further said this finding implied that the detection reported by EDGES was likely a contamination of their measurement and not a signal from the depth of space and time, RRI said. Dr. Singh said RRI could refute the EDGES signal with "95% accuracy".

Detecting the elusive cosmic dawn signal is a herculean effort as the "faint signal is buried in the sky radio waves coming from our own galaxy Milky Way, which are a million times brighter and are in the same wavelength band by terrestrial commu-

nication equipment", making removing contamination the cornerstone of the experiment.

The findings of SARAS 3 "re-establishes the prevailing cosmological model of the cosmos", RRI said in its statement.

Prof. Udaya Shankar said RRI now intends to deploy SARAS 3 in the relatively less radio wave contaminated Ladakh, Himalayas for a longer period of time in an attempt to detect the radio signal from cosmic dawn. A project to deploy the telescope in the moon's orbit in an attempt to detect the radio signal from the far side of the moon, one of the most uncontaminated zones in the universe, is in its initial stages.



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## IHBAS director receives award at National Science Day

**PIONEER NEWS SERVICE ■  
NEW DELHI**

Young scientists with 25 active years ahead have a crucial role to play in the roadmap for the next 25 years when India celebrates 100 years of independence, Dr Jitendra Singh, Union Minister of Science & Technology said here on Monday.

He was speaking at the concluding day of the National Science Week on the National Science Day to mark "Vigyan Sarvatra Pujate, a pan-India program to celebrate the essence and magnificence of our scientific achievements.

During the event, the Minister also presented Science Communication Awards to stimulate, encourage and recognize outstanding efforts in the area of science and tech-



Dr Jitendra Singh, Union Minister of Science and Technology giving away award to Dr RK Dhamija, IHBAS Director at the National Science Day at an event on Monday in Delhi  
Pioneer Photo

nology communication and popularisation as well as inculcate scientific temper among masses. These awards are presented every year on National

Science Day.

Among those who were conferred with the award included Dr RK Dhamija, Director of Institute of Human

Behaviour and Allied Sciences (IHBAS), the country's well-known mental health and neurosciences research institute based in Delhi.

Prior to joining IHBAS, Dhamija who is an advisor for Royal College of Physicians (London) and Chair of Movement Disorders at World Federation of Neurorehabilitation and health talks host, was heading the Neurology Department at Lady Hardinge Medical College in Delhi. An WHO expert in Parkinson's Disease Rehabilitation, Dr Dhamija has a string of publications and prestigious awards to his credit with 33rd S Radhakrishnan Memorial National Medical Teacher Award in 2017, Dr B C Bansal, Uma Bansal Oration in 2019 being a few of them.



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## Bengaluru astronomers claim to disprove findings on first stars formed after Big Bang

**BENGALURU, DHNS**

Researchers at the city-based Raman Research Institute (RRI) say they have conclusively refuted the claims of a signal being discovered by American researchers from the first stars found while studying the 'cosmic dawn'.

Theories about the birth of the first stars a few hundred million years after the big bang had created a stir in the global astronomical fraternity. The findings, published in the latest *Nature Astronomy* journal, restored confidence in the existing cosmological model of the universe.

RRI astronomers who worked for close to four years inventing and building SARAS 3 radio telescope have refuted the findings of Arizona State University (ASU) and MIT scientists in the US.

The birth of the universe has always been a subject of curiosity among astrophysicists, many of whom have put out theories to explain



Saurabh Singh, from Raman Research Institute, explains the SARAS 3 radio telescope on Monday. DH PHOTO/SHIVAKUMAR

the phenomenon. However, the ASU/MIT team's discovery had created a buzz and was hailed by many as worthy of the Nobel prize and called for confirmation by the independent observatories.

The RRI's SARAS 3 radio telescope is the first device in the world to reach the required sensitivity and conclusively refute the earlier findings. The experiment to design and build a precision radio telescope to detect extremely faint radio wave sig-

nals has been initiated and led by Prof Ravi Subrahmanyan and Prof N Udaya Shankar.

The telescope has been designed to detect even the faint cosmological signals, particularly radiation emitted by hydrogen atoms at the 21-cm wavelength arising from the depths of the cosmos.

"Earlier versions of SARAS were deployed initially at Timbaktu collective in Anantapur and subsequently in Ladakh," explained Dr Saurabh Singh, a research scientist at RRI who

led the data analysis.

"SARAS 3 was floated on Dandiganahalli Lake and Sharavati backwaters in North Karnataka for data collection. The telescope did not find any evidence of the signal claimed by the ASU/MIT researchers.

"The presence of the signal was rejected after a careful assessment of the measurement uncertainties. The findings further implied that the detection of ASU/MIT researchers was likely contamination of their measurement and not a signal from the depths of space and time," Dr Singh clarified.

Astronomers still do not know what the actual signal looks like. "SARAS 3 is now geared towards discovering the true nature of the cosmic dawn. The team at RRI is planning more observations on remote lakes in India. These expeditions will allow us to detect the 21-cm signal from the cosmic dawn and unravel the last remaining gap in the history of the universe," a scientist said.



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