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Ask the right questions, and nature will open the door to her secrets
- Dr. C.V. Raman, The Nobel Prize in Physics 1930

IISER Pune & IMS Chennai Developed Mathematical Model for Understanding Extreme Natural Events

Researchers at Indian Institute of Science Education and Research (IISER), Pune, and the Institute of Mathematical Sciences (IMS), Chennai developed a universal methodology to estimate record age statistics in a generic scenario with minimal assumptions. How long does it take for the price of a stock to cross its current all-time-high value? When will another human being cover 100 meters faster than Usain Bolt? All of these questions have one thing in common- the "age of records" (or record age), which reflects the time a record takes to be broken. To probe the “record ages”, the researchers used tools from probability theory to derive the connection between record-breaking events and the idea of search processes. Researchers also added that the study opened up new avenues and shed light on a seemingly unrelated problem of computing the lifetime statistics in the mass aggregation models.

IISc Bengaluru Designed Smart Gel-based Sheet from 3D Technology

Researchers at Indian Institute of Science (IISc) Bengaluru designed a smart gel-based sheet using three-dimensional (3D) printing technology that could self-roll into a tube during surgery to form a nerve conduit. Researchers added that the smart gel based sheet could also help reduce the complexity of surgeries and aid rapid healing of nerve injuries. Researchers engineered a bilayered gel sheet by 3D printing in pre-defined patterns from two gels. The gel formulations were selected to swell differently when the dried gel sheet was immersed in water, it rapidly swelled and curled.

IIT-Madras Developed Machine Learning Tool to Detect Tumour in Brain & Spinal Cord

Researchers at Indian Institute of Technology Madras (IIT-Madras) developed a Machine Learning-based computational tool called 'GBMDriver' (GlioBlastoma Mutiforme Drivers) for better detection of cancer-causing tumours in the brain and spinal cord. The GBMDriver was developed specifically to identify driver mutations and passenger mutations (passenger mutations are neutral mutations) in Glioblastoma. The tool is publicly available online. The Key Applications of this research includes:

- The methodology and features are portable to apply for other diseases.
- This method could serve as one of the important criteria for disease prognosis.
- Valuable resource to identify mutation-specific drug targets to design therapeutic strategies.

Researchers Designed Net Zero Heat Exchanger System

Electrical air conditioners/desert coolers/electric heaters are widely used to provide thermal comfort inside residential and commercial buildings, which consume significant energy. Therefore to control the temperature of a typical residential building, meet the thermal comfort inside the buildings, and offer sustainability, researchers at Department of Energy Engineering, Central University of Jharkhand, Ranchi, designed a solar photovoltaic-powered Earth Air Heat Exchanger (EAHE) system. An EAHE utilizes temperatures below 2-3 m from the Earth’s surface that remain consistent throughout the year irrespective of ambient air temperature variations.

Special update: ISRO Launched New Low-Cost Star Sensor Developed by IIA

Indian Space Research Organisation (ISRO), which is the the national space agency of India launched a new low-cost star sensor 'StarBerrySense' payload that was developed from off-the-shelf components by the Indian Institute of Astrophysics (IIA), an autonomous institute of the Department of Science and Technology (DST). ISRO also added that in its first-ever space test, the sensor, which is mounted on the PSLV Orbital Experimental Module (POEM), is performing well, and the initial data has now validated its design as well as its function. This novel low-cost sensor designed to quickly calculate where the satellite is pointing is being tested in space for the very first time. The astronomers from the Space Payloads Group at the institute have announced that not only has StarBerrySense withstood the harsh conditions in space and is functioning as expected, the initial data shows that it is able to calculate the pointing direction.