

Bad weather can sometimes cause birds to become disoriented during their annual fall migrations, causing them to wind up in territory they are unaccustomed to. But even when weather is not a major factor, do birds travel far away from their usual routes? A new study by ecologists of the University of California, Los Angeles explores one reason: disturbances to Earth's magnetic field can lead birds astray — a phenomenon scientists call vagrancy — even in perfect weather, and especially during fall migration (Scientific Reports).

There is increasing evidence that birds can see geomagnetic fields. But birds' ability to navigate using geomagnetic fields can be impaired when those magnetic fields are disturbed. Such disturbances can come from the sun's magnetic field. As per a release, researchers found a strong correlation between birds that were captured far outside of their expected range and geomagnetic disturbances that occurred during both fall and spring migrations.

The domestic goat (*Capra hircus*) is a familiar presence in the rural landscape of India and in many developing countries. The goat has played an important economic role in human communities from the time it was domesticated about 10,000 years ago. It has even been argued that the domestication of goats was an important step in mankind's shift from a hunting gathering lifestyle to agricultural settlements.

The Food and Agriculture Organisation (FAO) estimates that the world has 830 million goats belonging to about 1,000 breeds. India has 150 million from over 20 prominent breeds. Rajasthan has the most number of goats — the Marwari goat found here is hardy and well adapted to the climate of deserts. Another hardy breed, found in the dry regions of Maharashtra, Telangana and North Karnataka is the Osmanabadi.

Work carried out by researchers from the Integrated Cancer Genomics Laboratory at the Advanced Centre for Training, Research, and Education in Cancer (ACTREC) in Mumbai's Tata Memorial Centre has shed more light on the molecular mechanism through which progesterone treatment prior to breast cancer surgery is quite likely to increase the survival rates of patients.

In 2018, a team led by Dr. Amit Dutt at the ACTREC found through in vitro studies that when breast cancer cell lines were treated with progesterone, two genes — SGK1 and NDRG1 — were produced in excess amount (overexpressed). They also found that the expression of a few microRNAs was reduced (down regulated) in response to the hormone treatment. Two particular micro RNAs that were down regulated were found to also regulate the expression of the SGK1 gene.

Researchers have uncovered 92 nesting sites containing a total of 256 fossil eggs in central India's Narmada Valley

IEEFA PROJECTS EXPONENTIAL GROWTH OF BATTERY STORAGE ASSETS IN INDIA

1. Study by Institute for Energy Economics and Financial Analysis (IEEFA), US-based think tank, has projected exponential growth in India's Battery Energy Storage System (BESS). BESS are rechargeable batteries that can store energy from different sources and discharge it when needed.
2. It consists of one or more batteries and can be used to balance the electric grid, provide backup power, and improve grid stability. Lithium-ion batteries, which are used in mobile phones and electric cars, are currently dominant storage technology for large scale plants to help electricity grids ensure a reliable supply of renewable energy.
3. **Significance of BESS**-Ensures peak-time power supply. Round-the-clock power to overcome intermittent nature of renewable energy. Less requirement of expensive transmission and distribution network upgrades. Faster responses for balancing grid (voltage and frequency regulation) than coal-fired power plants.
3. **Issues with BESS**-Absence of Time-of-Day (ToD) pricing structure in India hampering investment. Under ToD, cost of electricity depends on time of day (expensive power during peak demand and less expensive during off-peak). Low mineral reserve of Lithium cobalt.
4. **Initiatives to promote BESS**-National Mission on Transformative Mobility and Battery Storage promote clean, connected, shared, sustainable and holistic mobility initiatives. Production Linked Incentive scheme for domestic battery storage production. India's draft national electricity plan projects 51.5 GW of BESS installations by 2031-2032.

INDIA'S FIRST SOLAR MISSION LIKELY TO BE LAUNCHED BY MID-2023: ISRO CHAIRMAN

1. Indian Institute of Astrophysics, Bengaluru handed over the primary payload i.e., Visible Emission Line Coronagraph (VELC) of Aditya L1 to ISRO for integration with other payloads. Aditya-L1 is first Indian space mission to observe Sun and solar corona.
2. It will be inserted in a halo orbit around Lagrangian point 1 (L1) of Sun-Earth system, which is about 1.5 million km from Earth. It will be propelled by Polar Satellite Launch Vehicle (PSLV) XL.
3. **Significance of Aditya L1**-Provide information to understand the problem of coronal heating, coronal mass ejection, etc. Observe in-situ particle and plasma environment providing data for study of particle dynamics from Sun.
4. Aid in studies on drivers of space weather, and measure magnetic field of corona. Other solar missions: NASA's Parker Solar Probe, European Space Agency's Solar and Heliospheric Observatory, China's Kuafu-1 solar probe etc.
5. **About Lagrange point(L1)**-At Lagrange points, gravitational pull of two large masses (like Sun and Earth) precisely equals centripetal force required for a small object to move with them. L1 has advantage of continuously viewing Sun without any occultation/ eclipses. There are five Lagrange points, three are unstable (L1, L2, L3- lie along the line connecting (two large masses) and two are stable(L4, L5).

MINISTRY OF TEXTILES CLEARED 15 R&D PROJECTS UNDER NATIONAL TECHNICAL TEXTILE MISSIONS (NTTM)

1. These 15 research & development projects include key strategic areas such as Speciality fibre, Protective textiles, High-Performance Textiles, Geotextiles, Medical Textiles, Sustainable Textiles, and Textiles for Building Materials. NTTM is being implemented over a period of four years (FY 2020-21 to 2023-24).
2. It has four components namely Research, Innovation and Development for development of protective fibre, application-based research in different Technical Textiles (TT) such as geotextiles, etc. Promotion and Market Development aim at taking domestic market size to \$40-50 billion by 2024.
3. Export Promotion ensures 10% average growth in exports upto 2024. Education, Training, Skill Development for Technical education related to TT at higher levels. TT are textiles materials and products manufactured primarily for technical performance and functional properties rather than aesthetic characteristics.
4. They are used individually or as a component/part of another product to enhance its functional properties. TT is a knowledge-based research-oriented industry. TT is broadly classified into 12 different categories.

CENTRE PREPARES RS. 41,000 CRORE INTERNATIONAL CONTAINER TRANSHIPMENT PORT (ICTT) IN GREAT NICOBAR ISLAND (GNI)

1. As part of holistic development of GNI, Ministry of Ports, Shipping, and Waterways (MoPSW) has invited Expression of Interest for building ICTT at Galathea Bay. In 2021, entire Galathea Bay Wildlife Sanctuary was denotified to make way for ICTT. It is India's nesting site for giant leatherback turtles.

belonging to titanosaurs, which were among the largest dinosaurs to have ever lived. The finding, published in the journal PLOS ONE, reveals intimate details about the lives of titanosaurs in the Indian subcontinent. The Lameta Formation, located in the Narmada Valley, is well known for fossils of dinosaur skeletons and eggs of the Late Cretaceous Period that lasted from about 145 to 66 million years ago, the researchers said.

An ancient terracotta temple in West Bengal's Sundarbans, which has survived the ravages of time for a millennium, is now facing a very modern threat. The impact of climate change, especially the increase in air salinity, is gradually eroding the outer wall of Jatar Deul, an 11th century Shiva temple, which is located at Raidighi in South 24 Parganas, only a few kilometres from the sea.

Researchers have found the oldest known fossil of a wormlike amphibian known as a caecilian (Nature). The findings extend the caecilian fossil record by 35 million years. The creature combines features found in the common ancestor of living caecilians with those of an extinct group of amphibians called the dissorophoid temnospondyls. It bridges the gap between modern caecilians and extinct tetrapods and confirms the position of caecilians within Lissamphibia, the group that contains frogs.

Carrying far too much weight, including a midriff bulge, from midlife onwards, is linked to a heightened risk of physical frailty in older age (BMJ Open). Frailty is often wrongly perceived as a purely wasting disorder, say the researchers, who emphasise the importance of keeping trim throughout adulthood to help minimise the risk. Mounting evidence suggests that obese older adults may be at increased risk because obesity aggravates the age-related decline in muscle strength, aerobic capacity, and physical function.

People who live together tend to harbour the same microbes in their guts and mouths, according to a global study. Mothers provide their children with a 'starter kit' of microbes when they are infants. But that microbiome shifts over time to incorporate microbial strains from family members and unrelated housemates. The finding raises the spectre that diseases linked to microbiome dysfunction such as cancer, diabetes and obesity could be partly transmissible.

2. Kolkata-based Syama Prasad Mookerjee Port is nodal agency for implementation. Transshipment port is a hub that handles voluminous cargo between multiple vessels. Cargo at these ports is transported away to another port, rather than being shipped inland via rail, road or waterway.
3. **Salient features of ICTT**-Strategic location in terms of proximity (40 nautical miles from Malacca Strait) to International Trade Route (Singapore, Colombo). Availability of natural water depth of more than 20 meters. Potential to capture transshipment cargo from all ports in proximity including domestic ones.
4. Significance of ICTT Reduce logistics inefficiencies and push to allied businesses such as ship supplies and repair, warehousing etc. Save US \$200-220 million a year on transshipment cargo. Create an opportunity to become a large hub for Asia-Africa, Asia-US/Europe container traffic trade. GNI is southernmost of Andaman and Nicobar Islands. Indira Point on southern tip of this Island is India's southernmost point.
5. **Additionally, MoPSW has inaugurated National Logistics Portal**-Marine, Single Window Logistics Portal, to improve efficiency and transparency by reducing logistics costs. It was envisaged by MoPSW and Ministry of Commerce & Industry. NLP covers all modes of transport in waterways, roadways, and airways along with an E-marketplace.

COAL INDIA LTD (CIL) TO LAUNCH MANUFACTURED SAND (M-SAND) PROJECTS

1. CIL facilitates processing of waste overburden at its open cast mines under overburden (OB) rocks-to- M-Sand initiative. During opencast mining, overlying soil and rocks are removed as waste to extract coal and OB is layered in dumps. OB rocks are used in levelling up land for the construction of roads and railway tracks.
2. M sand is produced by crushing rocks, and quarry stones to a stipulated size of 150 microns. It is different from River Sand. Sand Mining Framework (2018) prepared by Ministry of Mine envisages M-Sand from crushed rock fines (crusher dust), sand from OB of coal mines.
3. Benefits of M- Sand-More cost-effective than using natural sand. Reduce the need for mining natural sand, which can have negative environmental impacts. Reduce the amount of water required for construction projects, as it does not require washing before use. Help maintaining water table. Sand is classified as a 'minor mineral' under Mines and Minerals (Development and Regulations) Act, 1957, and administrative control vests with State Governments.

INDIA ISSUES NOTICE TO PAKISTAN SEEKING MODIFICATION TO INDUS WATERS TREATY (IWT)

1. India issued the notice in view of Pakistan's non compliance in resolving disputes over Kishenganga (on Kishenganga River, tributary of Jhelum) and Ratle hydropower projects (on Chenab River), both in Jammu and Kashmir. India is allowed to construct hydroelectric power facilities on tributaries of Jhelum and Chenab rivers with certain restrictions under IWT, 1960.
2. Dispute redressal mechanism provided under Article IX of IWT is a graded mechanism. It is a 3-level mechanism. (See infographic) World Bank's (WB) role is largely procedural and limited to designating neutral experts (NE) or chair of court of arbitration (CoA). India has invoked Article XII (3) of treaty i.e., a provision to amend Treaty. Treaty can be amended or terminated only with duly ratified treaty between two countries.
3. Development of dispute-2015: Pakistan sought appointment of NE to examine technical objections to Kishanganga and Ratle HEPs. 2016: Pakistan approached WB for CoA constitution. Whereas, India asked for appointment of NE and argued that Pakistan's request for CoA violated graded mechanism of dispute resolution in Treaty. 2022: WB resume process of appointing NE and Chairman for CoA.



"If you are chasing your dream, remember, like, in a dream, you alone are the witness."

DR. KHAN
(KSG)