

NEWSPAPER HIGHLIGHT

The key findings of a study led by IIT Kharagpur researchers could help us understand the formation and evolution of the Earth. They have studied a meteorite that fell near the town of Katol in Nagpur District of Maharashtra on May 22, 2012, reporting for the first time, presence of veins of the mineral bridgmanite, which is the most abundant mineral in the interior of the Earth, within the Katol L6 Chondrite meteorite. This finding adds evidence to the Moon forming giant impact hypothesis. "Bridgmanite is the most volumetrically abundant mineral of the Earth's interior. It is present in the lower mantle (from 660 to 2700 km), and it is important to understand its formation mechanism to better comprehend the origin and evolution of planetary interiors.

A paper has appeared recently in Proceedings of the National Academy of Sciences USA (PNAS) titled: "Integrated farming with intercropping increases food production while reducing environmental footprint". This work found that (1) "relay planting" enhances yield, (2) within field rotation or "strip rotation", allowing strips for planting other plants (such as grass, fruits) besides the major crop was more fruitful, (3) "soil munching," that is, available means such as crop straw, in addition to the major crop such as wheat or rice, and (4) "no till" or a reduced tillage, which increases the annual crop yield up by 15.6% to 49.9%, and decreasing the environmental footprint by 17.3%, compared with traditional monoculture cropping. This led to the conclusion that small farm holders can grow more food and have reduced environmental footprint.

A large spider native to East Asia has spun its thick, golden web on power lines, porches and vegetable patches all over north Georgia this year — a proliferation that has driven some unnerved homeowners indoors and prompted a flood of anxious social media posts. The Joro spider, (*Trichonephila clavata*) is common in Japan, China, Korea and Taiwan, Joro females have colourful yellow, blue and red markings on their bodies.

Monitoring what polar bears eat can reveal facts about environmental shifts and distribution of marine

ARCTIC TERNS

1.The annual migration of birds including the Arctic Terns from the Arctic to the Gulf of Mannar Marine Biosphere Reserve has begun. The seasonal migration occurs every year over the Central Asian Flyway (CAF). Arctic Terns (*Sterna paradisaea*) are small water-loving birds with angular wings. They are well known for its long yearly migration. It migrates from pole to pole (Arctic to Antarctica); travelling 70,000 km each year.

2.The arctic tern hatches during summer in the Arctic Circle. During the unbearably cold arctic winter, the arctic tern flies south, following the summer season all the way to the Antarctic Circle. Arctic Terns are social birds, foraging in groups and nesting on the ground in colonies. They often rest on ice and fly on buoyant wings. Habitat - Shorelines. Nesting - Ground (This bird has a circumpolar breeding distribution.). IUCN Conservation - Least Concern.

3.Central Asian Flyway The Central Asian Flyway (CAF) is the shortest flyway out of the 9 flyways in the world. This flyway comprises 29 countries including Iraq, Kuwait, Qatar, Kyrgyzstan, Nepal, India, Bhutan, Myanmar and Maldives On this route, the migratory birds travelling on the east of CAF also halt at the adjoining sanctuary habitats in Dhanushkodi and other water bodies and inter-tidal shores.

4.**Journey in India-The Arctic birds take the long non-stop haul from the Arctic and European regions to winter in South Asia. They usually stopover in the coastal swamps of the Gulf of Mannar between October and December.** The birds begin their journey through India from the Bhitarkanika National Park, Odisha, and fly over to Kanniyakumari, the southern-most tip of coastal Tamil Nadu. The flocks again return in March on their way back.

MIGRATION OF BIRDS

1.Migration of bird species occurs annually when the birds live in places that get too cold during the winter, and food supply becomes sparse. Birds migrate from the breeding area to a wintering area. Breeding area is where they stay during the warmer seasons such as spring and summer. Wintering area is where they will spend the winter months, and return after the season ends.

2.Their route is set and generation after generation, follow the path. Birds use different techniques: Visual cues - Mountain ranges and rivers. Aural cues - Birds can hear low-frequency sounds, a skill that allows them to pick up sounds of waves or winds from the mountains and deserts from great distances away.

3.**Earth's magnetic field - Birds' eyes work like a magnetic compass, and direct them while detecting the angle and intensity of the magnetic field.**

SUGAR SURPLUS & EXPORTS MAY DROP

1.According to estimates by the Indian Sugar Mills Association (ISMA), there may be a drop in sugar production and exports this year. Production - The possible reasons for the drop in sugar production may include, Heavy unseasonal rains in Uttar Pradesh (Maharashtra may overtake U.P. as the highest sugar producing State this year, due to good monsoon rainfall & sufficient water in the reservoirs) and A higher diversion of sugarcane juice and B-molasses to ethanol production.

2.With average retail sugar prices also on the rise, a reduction in surplus sugar could help speed up cane payments by mills and reduce their pending arrears to farmers this season.

3.**There is an increase in the acreage, but it is unlikely to translate into higher production. Exports - Along with decrease in surplus, the export market for India would get squeezed because of higher exports expected from Thailand.**

REASONS FOR EXTREME WEATHER IN INDIA

1.Even as the southwest monsoon began to retreat from the subcontinent, Kerala and Uttarakhand received record rainfall in October, 2021. The rain-bearing 'low pressure system' that is active in the Arabian Sea contributed to the heavy rain in Kerala.

mammal prey. Researchers found by harvest-based sampling of polar bear in the Nunavut region that these were, in fact, flexible eaters, making them ideal as a monitoring tool to track environmental changes in the Arctic.

The olfactory organ network helps humans distinguish between millions of smells. A study by the Karolinska Institutet of Sweden, has for the first time enabled measurement of the signals from the olfactory bulb and observe what happens in the brain when a person encounters unpleasant smells. Researchers found that negative smells are processed earlier than positive smells.

Jupiter is known for its banded appearance – white strips known as zones and darker, reddish ones, belts. Using microwave radiometers, Juno probe discovered that the appearance (brightness) of Jupiter's belts and zones inverts near the base of the clouds. Since the brightness relates to either warmth of the atmosphere or presence of ammonia, researchers believe either of these parameters inverts as you go deep into the atmosphere of Jupiter.

New research, led by University of Cambridge researchers, published in Science Advances, finds a different route to Alzheimer's. Rather than originating in a single point and spreading as a chain and killing brain cells, they found that the disease reaches different points early on. The progress of the disease depends on how quickly it kills these cells. The researchers used post mortem brain samples and also PET scans of living patients.

Pakistan has quietly allowed the Taliban appointed "diplomats" to take charge of the Afghan Embassy and consulates in the country, a media report said on Saturday. Although Pakistan does not recognise the Taliban as the legitimate government in Kabul, it still issued visas to the appointed "diplomats".

Addressing the first session of the G20 summit on "Global Economy and Global Health" in Rome, Prime Minister Narendra Modi spoke about the need for a collaborative approach to fight the COVID19 pandemic. At the summit of the leaders of world's major economies, Mr. Modi highlighted India's contribution during the COVID19 pandemic as it ensured medical supplies to over 150 countries. Highlighting the need for resilient global supply chains, Mr. Modi invited G20 countries to invest in India for supply chain diversification and global recovery from the pandemic. "Prime Minister spoke for the resilient global supply chains

Western disturbances are what caused the rain in northern India. Western disturbances are periodic influxes of moisture-laden clouds from the Mediterranean that are common during winter.

2.As the Bay of Bengal is still warm, strong winds from there are reaching as far as Uttarakhand and will cause rainfall in north-eastern India. Global Warming - Both low pressures, and the western disturbances, are tangentially connected to the larger pattern of global warming. The Bay of Bengal is historically the warmer ocean that seeds low pressures and cyclones that bring rain to India.

3.In recent years, however, the Arabian Sea, too, has been warmer than normal, leading to significant cyclonic activity. Overall elevated temperatures are contributing to warmer waters in the Arctic Ocean & drawing colder air from the poles with greater intensity. This has added to the increased moisture, thereby seeding more intense western disturbance activity over north India.

POLYCYSTIC OVARY SYNDROME

1.Polycystic Ovary Syndrome (PCOS) or Polycystic Ovary Disorder (PCOD) is a health problem caused by an imbalance of reproductive hormones. It creates problems in the ovaries. The ovaries may develop numerous small collections of fluid (follicles) and fail to regularly release eggs. PCOS can happen at any age after puberty. Mostly, women between the age of 15 and 44, or during the years they can have children, have PCOS.

2.Causes - The exact cause of PCOS is not known. But experts think that several factors play a role, including genetics, high levels of androgens (male hormones) and high levels of insulin. Symptoms - PCOS can cause missed or irregular menstrual periods, which can lead to, Infertility (inability to get pregnant). Development of cysts (small fluid-filled sacs) in the ovaries.

3.Other symptoms such as hirsutism (excess facial and body hair), weight gain, insulin resistance, and hair loss. In India, PCOS is a tabooed disorder; the discourse around it being more.

FISCAL DATA FROM CGA

1.The Controller General of Accounts (CGA) has released certain financial data of the Union Government. Fiscal deficit or gap between expenditure and revenue of the Union Government worked out to be Rs. 5.26 lakh crore at the end of September, 2021. It has touched 35% of annual budget target. The deficit figures in the current fiscal appear better than the previous financial year when it had soared to 114.8% of the estimates mainly due to a jump in expenditure to deal with the Covid-19 pandemic. For the current fiscal, the government expects deficit at 6.8% of GDP.

2.Total receipts of the Centre stood at 55.6% of corresponding budget estimates (BE) FY22 up to September. It was 25.2% of BE a year earlier. Of the total receipts, tax revenue was 59.6% of BE, compared with 28% a year earlier.

3.Expenditure - The Centre's total expenditure (i.e., revenue account and capital account) at the end of the first half stood at 46.7% of the current fiscal's BE. It also includes Interest payments and subsidies.

THE EVERGRANDE CRISIS IN CHINA

1.China's construction giant, the Evergrande Group, recently ran out of money, had no options to get more loans or overdrafts. Click here to know more. The political and social outlook of the Communist Party of China (CPC) has had a significant influence in such recent crises and changes.

2.What led to the Evergrande crisis? In January 2021, regulators in China changed lending regulations. It came with an aim to strengthen the anti-monopoly push and prevent disorderly expansion of capital. The moves brought in more curbs in lending to big private businesses. While this was a delayed structural reform, it also marked the beginning of the end for Evergrande. Evergrande has the distinction of being the world's most debt-saddled property developer. Evergrande is faced with more than \$300 billion in debt, hundreds of unfinished residential buildings and angry suppliers who have shut down construction sites.

3.What are the implications? At least since 2014, China's housing sector has been labelled as a "bubble waiting to burst". The Evergrande crisis is a significant recent development that has struck the country's ruling elites.

and mentioned India's bold economic reforms and lowering of the cost of doing business in India.

China consumes 50% of the global steel and cement production. So the Evergrande crisis does have global implications.