

India's Scientists have reported finding only the third natural source of quasicrystals, a material once deemed impossible and whose unusual properties scientists are still unravelling. In a crystal, the atoms are arranged in a pattern that periodically repeats itself. A quasicrystal's atoms are arranged in a pattern that repeats itself at irregular intervals. Quasicrystals were discovered in the lab in 1982. In the late 1990s, scientists began looking for quasicrystals in nature. After a decadelong quest, Luca Bindi, Paul Steinhardt, and others reported finding the first natural quasicrystal in 2009 – as microscopic grains in a piece of the Khatyrka meteorite in the Koryak mountains of Russia.

This meteorite was involved in several collisions in space over millions of years, heating and pressurising it to a great degree and creating the quasicrystals. The discovery inspired a series of experiments in which physicists used 'shock synthesis' to create new varieties of quasicrystals in the lab.

Researchers at Nagoya University in Japan have developed an index to estimate how a bird uses its wings for flight or other locomotion by measuring the strength of the coracoid bone and the animal's body mass. The presence of a wing alone does not tell us whether an animal can fly. For example, penguins evolved wings to propel them through water whereas feathered dinosaurs may have used their wings for other purposes, such as thermoregulation and intraspecific display.

Therefore, to better understand how animals evolved the ability to fly, an index must take into account both the presence of wings and the ability to perform powerful wingbeats, says a release. The strength of the coracoid in relation to body mass may reflect the force exerted by the flight muscles, which counteract the lifting force on the wings. This helps to estimate how a bird uses propulsion. Soaring birds had increased coracoid strength, while non-flapping birds had lower coracoid strength (Journal of Anatomy).

Anna Gibbs, who was an intern at Science News, writes in the May 9, 2022 issue that "no matter how you slice it, climate change will alter what we eat in the future". Half of all calories consumed by humans come from maize, rice and wheat. We

## SUCCESSFUL FLIGHT OF SMALL SATELLITE LAUNCH VEHICLE (SSLV) BY ISRO

1. Second developmental flight of SSLV — SSLV-D2 — placed three satellites in its precise orbit. Earlier, first test flight of SSLV had marginally missed to place the satellites.
2. **SSLV-D2 carried:** EOS-07, an Earth Observation Satellite by ISRO. Janus-1, a technology demonstrator satellite built by United States-based Antaris and its Indian partners. AzaadiSAT-2 satellite, a combined effort of about 750 girl students across India guided by Space Kidz India.
3. **About SSLV-**It is a 3 stage Launch Vehicle configured with three Solid Propulsion Stages and liquid propulsion-based Velocity Trimming Module as a terminal stage. It is capable of launching Mini, Micro, or Nanosatellites (10 to 500 kg mass) to a 500 km orbit. Like Polar Satellite Launch Vehicle (PSLV) and Geosynchronous Satellite Launch vehicle (GSLV), SSLV can accommodate multiple satellites, albeit smaller ones.
4. Unlike PSLV and GSLV, SSLV can be assembled both vertically and horizontally. Other features: Low cost, low turn-around time, launch on demand feasibility, minimal launch infrastructure requirements etc. New Space India Limited (NSIL), under Department of Space and commercial arm of ISRO, is the sole nodal agency responsible for providing end-to-end SSLV Launch services for customer satellites.

## SUPREME COURT (SC) ON MARKETS: NEED TO PROTECT INVESTORS, STEP UP REGULATION

1. In the backdrop of stock manipulation charges on a business conglomerate, Supreme Court (SC) asked SEBI and government to produce the existing regulatory framework in place to protect Indian investors.
2. SC also stated that stock market is no longer a place for just high value investors and has seen rising presence of middle-class and called for forming a panel of experts in banking and securities along with a former judge. Stock market is regulated by SEBI under the SEBI Act 1992 with the prime mandate to protect interest of investors in securities.
3. **Initiatives taken for investor protection by SEBI-**Enhanced disclosure norms for IPO bounds companies. Framework for preventing insiders trading. New framework for credit rating agencies.
4. Allowed T+1 settlement for shorter trade settlement cycle. SCORES a web-based centralized grievance redress system. Others Investor Education and Protection Fund under Companies Act, 1956 which is funded by unclaimed funds on account of dividends, matured deposits, etc.

## USIBC PARTICIPATED IN INDO-PACIFIC ECONOMIC FRAMEWORK (IPEF) STAKEHOLDER DISCUSSIONS

1. US India Business Council (USIBC), premier business advocacy organization, aims to create an inclusive bilateral trade environment between India and US. IPEF is a U.S.-led economic grouping comprising 14 partners (including India) which represent 40% of global GDP and 28% of global goods and services trade.
2. Based on 4 pillars: Trade; Supply Chains; Clean Energy, Decarbonization, and Infrastructure; and Tax and Anti-Corruption. IPEF partners are not required to join all four pillars. During discussions, USIBC also focused on plans to promote a free, open, and prosperous Indo-Pacific region.
3. Indo-Pacific is a geopolitical construct which represents an integrated theatre that combines Indian Ocean and Pacific Ocean, and land masses that surround them. Indo-Pacific represents about 60% of World's GDP, dominates almost 50% of world's maritime trade and is rich in natural resources.
4. **India's Interest in Indo-Pacific-**Peace and Security in Indian Ocean. Expanding presence in the region especially Africa, Middle East, and Southeast Asia. Maintaining its role as net security provider and countering China. Others: Combating marine pollution, deep sea mineral exploration, regulating illegal, unreported and unregulated (IUU) fishing etc.

## PRIVILEGES POWERS OF MEMBERS OF PARLIAMENT(MPs)

1. Protesting against expunction of parts of his speech, Leader of Opposition in Rajya Sabha cited Article 105 arguing that MPs have freedom of speech. Article 105 deals with "powers, privileges, etc of Houses of Parliament and of members and committees thereof". They are necessary to secure independence and effectiveness of their actions.
2. Without these privileges, Houses can neither maintain their authority, dignity and honour nor can protect their members from any

depend on 13 crops for 80% of our nutritional needs. Their inventories will dwindle as climate change leads to erratic rainfall and weather extremes. There is a need for growing hardier species to help secure our needs, which is why millets are gaining significance.

Millets are grown in warm regions with poor soil and yield large crops of small seeds which are used to make flour. Some examples of millets are pearl millet or bajra, sorghum or jowar, finger millet or ragi. The minor millets are foxtail millet or thenai, little millet or samai, and barnyard millet or sanwa, which is used in bread and biscuits.

India's gross direct tax collections had risen 24.1% to touch ₹15.67 lakh crore by Friday, with personal income tax collections rising 29.6%, much faster than corporate income tax inflows, which are up 19.3% so far this year. Net of refunds, total tax collections are ₹12.98 lakh crore, 18.4% higher than a year ago and constitute 91.4% of the Budget targets for 2022-23 and 78.65% of the revised estimates.

A major drought that occurred in central Anatolia between around 1198 BC and 1196 BC may have had a key role in the collapse of the Hittite Empire (Nature). The findings suggest that extreme climate change can push populations beyond their limits. Researchers created a high resolution dryness record using stable isotope records and measurements from tree rings of juniper trees in central Anatolia. They identified an unusually severe dry period around 1198 BC and 1196 BC causing severe drought.

obstruction in discharge of their parliamentary responsibilities. Parliamentary privileges can be classified into two broad categories: those enjoyed by each House collectively and those enjoyed by members individually.

3. Parliament has not made any special law to exhaustively codify all privileges. These rights are also given to those individuals who speak and participate in any committee of Parliament, which includes Attorney General of India and Union Ministers.
4. However, parliamentary privileges do not extend to President. Supreme Court in Tej Kiran Jain v N Sanjiva Reddy (1970) and P V Narasimha Rao vs. State case (1998) gave a wider ambit to protection accorded under Article 105.

### STUDY WEBS OF ACTIVE LEARNING FOR YOUNG ASPIRING MINDS (SWAYAM) TOPS OTHER E-LEARNING PLATFORMS

1. With 2.4 crore enrolments, government-run SWAYAM has outperformed any other e-Learning platform. SWAYAM is a repository of more than 300 high quality Massive Open Online Courses (MOOC) that are developed by academicians from top ranked institutions and are offered free of cost. A learning system based on formalised teaching but with help of electronic resources is known as E-learning. India is one of the biggest markets for e-learning with revenue projected to reach US\$ 4.73bn in 2023.
2. Factors driving eLearning platform COVID-19 pandemic has accelerated adoption of online learning. Demand for remote and flexible learning options. Advancements in technology and growing trend towards personalized and adaptive learning.
3. Challenges faced: Ensuring quality and accuracy of content, Digital divide, unequal access to technology and internet connectivity etc.
4. **Key initiatives to promote e-learning E-Pathshala:** Provides E-textbooks with 3500+ curriculum content in English, Urdu, and Hindi. Education 4.0 India initiative: To address learning gaps and make education accessible to all. PM e-VIDYA: It unifies all efforts related to digital/online/on-air education.
5. DIKSHA (Digital Infrastructure for Knowledge Sharing): To offer school curriculum-based engaging learning materials to students, teachers, and parents.

### WTO: INDIA MOOTS ALTERNATIVE PARADIGM ON CONSUMER PROTECTION IN E-COMMERCE, DIGITAL PUBLIC INFRASTRUCTURE (DPI)

1. India has submitted two papers on e-commerce to push for broader discussions on rule-making in e-commerce. Discussions are currently dominated by a group of countries in a plurilateral mode (includes some but not all WTO members). India has argued that since e-commerce sector has implications on developing and poor nations, it should be discussed in a multilateral setting.
2. In 1998, WTO established work programme on e-commerce to comprehensively examine all trade-related issues relating to this. It instructed WTO bodies (including Council on Trade in Goods, Council on Trade in Services etc) to explore relationship between existing WTO agreements and e-commerce.
3. It also agreed for a moratorium on e-commerce which entails that members should not impose customs duties on electronic transmissions (encompasses software, emails, digital music, movies, videogames etc).
4. **Two papers submitted by India:** Consumer protection paper: emphasised on need to jointly address several new challenges and issues relating to misleading advertising, online payment security, data protection, dispute resolution etc. DPI paper: outlined key challenges which limit adoption of e-commerce and presented an approach to overcome the challenge of digital divide.



“Your success is the tip of the iceberg visible to others.”

**DR. KHAN**  
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