

My Notes....

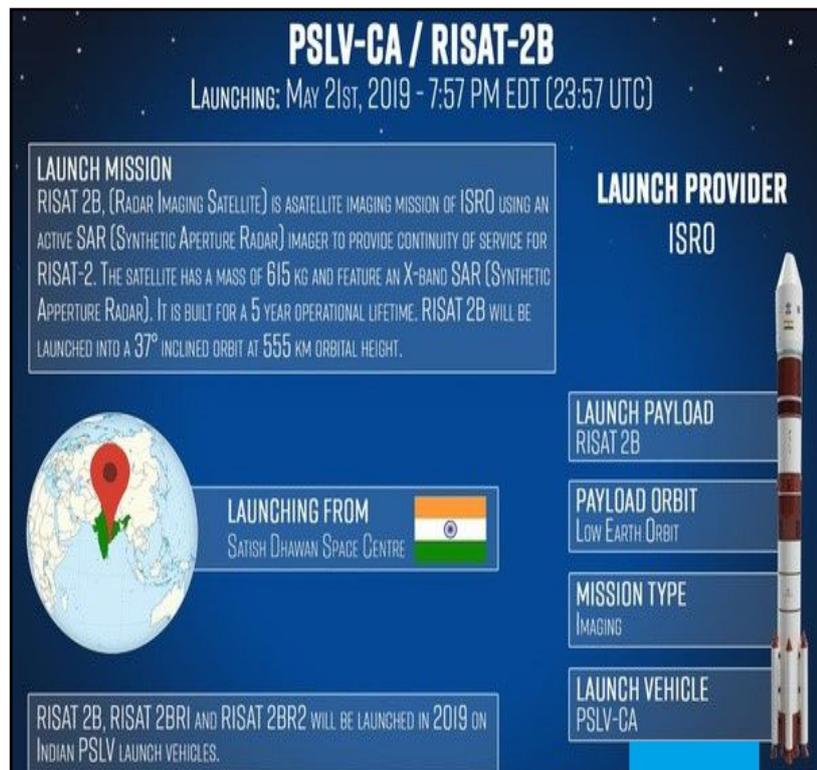
NATIONAL

RISAT-2B LAUNCHED

India's Polar Satellite Launch Vehicle (PSLV-C46) on 22 May 2019 successfully launched the **RISAT-2B** satellite from **Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota** in Andhra Pradesh. This was the **72nd launch vehicle mission** from SDSC SHAR, Sriharikota and **36th launch from the First Launch pad**. PSLV-C46 lifted-off from the First Launch Pad and injected **RISAT-2B into an orbit of 556 km**, about 15 minutes and 25 seconds after lift-off. After separation, **solar arrays of RISAT-2B were deployed automatically** and **ISRO Telemetry Tracking and Command Network (ISTRAC)** at Bengaluru assumed control of the satellite.

What

- RISAT-2B is radar imaging earth observation satellite** weighing about **615 kg**. The satellite is intended to provide services in the field of **Agriculture, Forestry and Disaster Management**.
- With this launch, **PSLV lofts 50 tonnes to space by launching 354 satellites**, including national, student and foreign satellites.
- The piggyback payload carried on board this mission namely, **Vikram processor and low cost MEMS based Inertial Navigation System (INS)** developed by **Semi-Conductor Laboratory (SCL), Chandigarh** and ISRO Inertial Systems Unit, Thiruvananthapuram respectively. "RISAT-2B is an advanced Earth Observation satellite with an advanced technology of 3.6m radial rib antenna.
- With a mission life of five years**, the satellite would also be used for military surveillance.
- It would replace the RISAT-2 that has been in use since 2009 to monitor activities in camps in Pakistan** and thwart infiltration bids by terrorists from across the border.



PSLV-CA / RISAT-2B
LAUNCHING: MAY 21ST, 2019 - 7:57 PM EDT (23:57 UTC)

LAUNCH MISSION
RISAT 2B (RADAR IMAGING SATELLITE) IS A SATELLITE IMAGING MISSION OF ISRO USING AN ACTIVE SAR (SYNTHETIC APERTURE RADAR) IMAGER TO PROVIDE CONTINUITY OF SERVICE FOR RISAT-2. THE SATELLITE HAS A MASS OF 615 KG AND FEATURE AN X-BAND SAR (SYNTHETIC APERTURE RADAR). IT IS BUILT FOR A 5 YEAR OPERATIONAL LIFETIME. RISAT 2B WILL BE LAUNCHED INTO A 37° INCLINED ORBIT AT 555 KM ORBITAL HEIGHT.

LAUNCH PROVIDER
ISRO

LAUNCH PAYLOAD
RISAT 2B

PAYLOAD ORBIT
LOW EARTH ORBIT

MISSION TYPE
IMAGING

LAUNCH VEHICLE
PSLV-CA

LAUNCHING FROM
SATISH DHAWAN SPACE CENTRE

RISAT 2B, RISAT 2BRI AND RISAT 2BR2 WILL BE LAUNCHED IN 2019 ON INDIAN PSLV LAUNCH VEHICLES.

6. The **RISAT-2B (Radar Imaging Satellite-2B)**, meant for application in fields such as surveillance, agriculture, forestry and disaster management support, was released into the orbit around 15 minutes after the lift-off.
7. The Polar satellite Launch Vehicle (PSLV-C46) was used in the pre-dawn launch at the Satish Dhawan Space Centre to carry the 615-kg indigenously developed satellite.
8. **It was the 14th flight of the PSLV in its core-alone configuration** sans the use of the solid strap-on motors.
9. It was also the 72nd launch vehicle mission from Sriharikota and also marked the 36th launch from the first launch pad.
10. **The PSLV also marked the third launch in 2019.** The other two were the **PSLV-C45/EMISAT mission**, which successfully injected the EMISAT and International customer satellites into their orbits on April 1, and the **PSLV-C44, which successfully placed the Microsat-R and the Kalamsat-V2 satellites** in designated orbits on January 24.
11. ISRO had launched **RISAT-1, a microwave remote sensing satellite**, on April 26, 2012 from Sriharikota.

What is ISRO's RISAT satellite series?

1. **Radar Imaging Satellite or RISAT** is a series of Indian radar imaging reconnaissance satellites built by ISRO. The latest RISAT satellite will be placed into an orbit of **555 km** at an inclination of **37 degrees**.
2. **India had in April 2009 launched RISAT-2**, the first of the series to reach orbit.
3. **It was bought from Israel for USD 110 million** largely for surveillance purposes. This Satellite enhanced ISRO's capability for Disaster Management applications.
4. In 2012, ISRO then launched what was **India's first indigenous all-weather radar imaging satellite, known as RISAT-1**. With a 160 x 4 Mbit/s data handling system and 50 Newton-meter-second reaction wheels, the satellite provides all-weather surveillance using synthetic aperture radars (SAR).
5. Till its launch, **India depended on images from a Canadian satellite** as existing domestic remote sensing spacecraft cannot take pictures of the earth during cloud cover.

DRAFT NATIONAL EDUCATION POLICY SUBMITTED

The **Committee led by the Chairman Dr. Kasturirangan** submitted the **Draft National Educational Policy** to the Union Human Resource Development Minister, **Shri Ramesh Pokhriyal 'Nishank'** and Minister of State for HRD, **Shri Sanjay Shamrao Dhotre** in New Delhi. The Government of India had initiated the **process of formulating a New Education Policy** to meet the changing dynamics of the requirements of the population with regard to quality education, innovation and research, aiming to make India a knowledge superpower by equipping its students with the necessary skills and knowledge and to eliminate the shortage of manpower in science, technology, academics and industry.

What

1. The **Draft National Education Policy, 2019 is built on the foundational pillars of Access, Equity, Quality, Affordability and Accountability**. The Committee has proposed to **rename MHRD as Ministry of Education (MoE)**.

2. In School Education, a major reconfiguration of curricular and pedagogical structure with **Early Childhood Care and Education (ECCE)** as an integral part of school education is proposed.

3. The Committee also **recommends**

Extension of Right to Education Act 2009 to cover children of ages 3 to 18.

A 5+3+3+4 curricular and pedagogical structure based on cognitive and socio-emotional developmental stages of children: Foundational Stage (age 3-8 yrs): 3 years of pre-primary plus Grades 1-2; Preparatory Stage (8-11 years): Grades 3-5; Middle Stage (11-14 years): Grades 6-8; and Secondary Stage (14-18 years): Grades 9-12.

BREAKFAST AT SCHOOL

Key features of the draft National Education Policy

School education

- Three years of preschool instead of two, followed by 12 years of schooling
- Free and compulsory schooling under Right to Education from preschool till Grade (Class) XII, instead of the current Class I to VIII
- A nutritious breakfast — perhaps of milk and a banana — for preschool and primary school pupils in addition to the midday meal
- Children to be exposed to

multiple languages right from the “foundational stage”, made up of preschool and Grades (Classes) I and II

Higher Education

- Four-year honours programmes for undergraduate general-stream courses
- Multiple exit options: Students can leave with a diploma after two years or with a graduate degree (without honours) after three years

4. Schools will be re-organized into school complexes. It also seeks to reduce content load in school education curriculum. There will be no hard separation of learning areas in terms of curricular, co-curricular or extra-curricular areas and all subjects, including arts, music, crafts, sports, yoga, community service, etc. will be curricular.
5. It promotes active pedagogy that will focus on the development of core capacities: and life skills, including 21st century skills.

The Committee proposes

1. The **Committee proposes for massive transformation in Teacher Education** by shutting down sub-standard teacher education institutions and moving all teacher preparation/education programmes into large multidisciplinary universities/colleges.
2. The 4-year integrated stage-specific B.Ed. programme will eventually be the minimum degree qualification for teachers.
3. In higher education, a restructuring of higher education institutions with three types of higher education institutions is proposed- **Type 1: Focused on world-class research and high quality teaching; Type 2: Focused on high quality teaching** across disciplines with significant contribution to research; **Type 3: High quality teaching focused on undergraduate education.**
4. This will be driven by two Missions -**Mission Nalanda & Mission Takshashila**. There will be re-structuring of Undergraduate programs (e.g. BSc, BA, BCom, BVoc) of 3 or 4 years duration and having multiple exit and entry options.
5. A new apex body **Rashtriya Shiksha Ayog** is proposed to enable a holistic and integrated implementation of all educational initiatives and programmatic interventions, and to coordinate efforts between the Centre and States.

6. **The National Research Foundation, an apex body is proposed** for creating a strong research culture and building research capacity across higher education.
7. The **four functions** of Standard setting, Funding, Accreditation and Regulation to be separated and conducted by independent bodies: **National Higher Education Regulatory Authority** as the only regulator for all higher education including professional education; **Creation of accreditation eco-system led by revamped NAAC**; Professional Standard Setting Bodies for each area of professional education and **UGC to transform to Higher Education Grants Commission (HEGC)**. The private and public institutions will be treated on par and education will remain a 'not for profit' activity.
8. Promotion of Indian and Classical Languages and **setting up three new National Institutes for Pali, Persian and Prakrit** and an Indian Institute of Translation and Interpretation (IITI) has been recommended.

REDEFINED SI UNITS INTRODUCED

The world's scientific and technical community, in a landmark and historic decision taken in the recent **open session of the General Conference on Weights and Measures (CGPM) at BIPM** on 16 November 2018, has **unanimously adopted the resolution to redefine four of the seven base units**, the **kilogram (SI unit of weight)**, **Kelvin (SI unit of temperature)**, **mole (SI unit of amount of substance)**, and **ampere (SI unit of current)**. This decision has now enabled scientists and researchers to base the SI units entirely on fundamental properties of nature, which will ensure their ongoing refinement and improvement for years to come. The **fundamental constants are invariants of time and space** and successfully replaced the artifact based units, and aptly opened up the **new era for quantum world** by linking all seven base units to fundamental constants/quantum standards.

What

1. The **new SI is being implemented worldwide from 20th May 2019** i.e. the World Metrology Day. The World Metrology Day (WMD) is celebrated annually on this very day as the Metre Convention was signed by representatives of seventeen nations on **May 20, 1875**.
2. The Convention set the framework for global collaboration in the science of measurement and in its industrial, commercial and societal applications.
3. DG CSIR, Shri Shkehar C. Mande present on the occasion **congratulated the NPL in bringing out the new units** and said that **quantum computing, artificial intelligence (AI), Industry 4.0, space enabled communications**, are some of the international challenges of the near future and it is necessary for India, the fastest growing economy to make the triumphs to meet the above challenges with the support of quantum metrology based quality infrastructure.

THE SEVEN FUNDAMENTAL UNITS		
UNIT	QUANTITY	HOW IT IS/WILL BE DEFINED
Meter*	Distance	Based on speed of light
Kilogram**	Mass	To be based on Planck constant
Second*	Time	Based on radiation of caesium-133 atom
Ampere**	Current	To be based on an electron's charge
Kelvin**	Temperature	To be based on Boltzmann constant
Mole**	Amount of substance	To be based on Avogadro constant
Candela*	Luminous intensity	From efficacy of light of specific frequency

4. The whole metrology world, especially the **National Metrology Institutes (NMIs) are celebrating this year's WMD as mark for the new beginning of metrology**, based on constant of nature on a large scale.
5. CSIR-NPL, the NMI of India have kept the strides going in these fields and started the R&D efforts in establishing the new SI, alongside the international implementations from 20th May 2019.

INDIA IN COMPETITIVENESS RANKING

India has moved up one place to rank as the world's 43rd most competitive economy on the back of its **robust economic growth**, a large labour force and its huge market size, while **Singapore has topped** the US to grab the top position, a global study showed. Singapore has moved up to the top, from the third position last year, while the US has slipped to the third place in the 2019 edition of the **IMD World Competitiveness Rankings**. **Hong Kong SAR has held onto its second place**, helped by a benign tax and business policy environment and access to business finance. Economists regard competitiveness as vital for the long-term health of a country's economy as it empowers businesses to achieve sustainable growth, generate jobs and, ultimately, enhance the welfare of citizens.

What

1. **The IMD World Competitiveness Rankings**, established in **1989**, incorporate **235 indicators from each of the 63 ranked economies** to evaluate their **ability to foster an environment where enterprises can achieve sustainable growth**, generate jobs and increase welfare for its citizens.
2. The IMD Business School said it takes into account a wide range of statistics such as **unemployment, GDP and government spending on health and education**, as well as data from an executive opinion survey covering topics such as social cohesion, globalisation and corruption.
3. The study said the **Asia-Pacific region** has emerged as a global beacon with 11 out of 14 economies either improving or holding their ground.
4. India's ranking has improved by one place in past one year to 43rd, driven by a robust rate of growth in real GDP, improvements in business legislation and an increase in public expenditure on education. **India was ranked 45th in 2017**, but higher at 41st in 2016.
5. The IMD study said the challenges before India remain maintaining high growth with employment generation, digital literacy and internet bandwidth in rural areas, managing fiscal discipline, as also issues related to the implementation of Goods and Services Tax and resource mobilisation for infrastructure development.
6. In the 2019 rankings, **India has scored well on several economic parameters and tax policies** but has lagged in terms of public finance, societal framework, education infrastructure, health and environment.
7. In the top-five, **Switzerland has climbed to fourth place from fifth**, helped by economic growth, the stability of the Swiss franc and high-quality infrastructure. The Alpine economy ranked top for university and management education, health services and quality of life.
8. The United Arab Emirates – ranked 15th as recently as 2016 – entered the top five for the first time.

9. The effects of rising fuel prices influenced the ranking, with inflation reducing competitiveness in some countries. Stronger trade revenues helped oil and gas producers such as this year's biggest climber Saudi Arabia, which jumped 13 places to 26th, and Qatar, which entered the top 10 for the first time since 2013.

FIRST CABINET MEETING

The Union Cabinet, chaired by the Prime Minister Narendra Modi has **approved a new Central Sector Scheme**, a historic decision that **will empower farmers across India**. This is a path breaking scheme that **will provide pension cover to our industrious farmers** who toil day and night to keep our nation fed. It is also for the first time since independence that such pension coverage has been envisioned for farmers. It is estimated that 5 crore small and marginal farmers will benefit in the first three years itself.

The salient features of this scheme are:

1. **A voluntary and contributory pension scheme for all Small and Marginal Farmers (SMF)** across the country.
2. Entry age of 18 to 40 years with a provision of minimum fixed pension of Rs.3,000/- on attaining the age of 60 years.
3. For example, a beneficiary farmer is required to contribute Rs 100/ - per month at median entry age of 29 years. The Central Government shall also contribute to the Pension Fund an equal amount as contributed by the eligible farmer.
4. After the subscriber's death, while receiving pension, the spouse of the SMF beneficiary shall be entitled to receive 50% of the pension received by the beneficiary as family pension, provided he/she is not already an SMF beneficiary of the Scheme. If, the death of the subscriber happens during the period of contribution, the spouse shall have the option of continuing the Scheme by paying regular contribution.
5. An interesting feature of the Scheme is that the farmers can opt to allow his/her monthly contribution to the Scheme to be made from the benefits drawn from the **Pradhan Mantri KisanSamman Nidhi (PM-KISAN) Scheme** directly.
6. Alternatively, a farmer can pay his monthly contribution by registering through Common Service Centres (CSCs) under MeitY.
7. For seventy years after Independence, such a coverage for farmers was never thought. It was in the run up to the 2019 Parliamentary elections that PM Narendra Modi first mooted such an idea, which gradually found resonance across the length and breadth of India.

INERTIALLY-GUIDED BOMB FIRED SUCCESSFULLY

The Defence Research and Development Organisation (DRDO) on 24 May 2019 successfully test fired an **indigenously-developed 500 kg inertially-guided bomb** at the Pokhran test firing range in Rajasthan. The bomb hit its **target at 30 km** with high precision. The test comes two weeks after the DRDO successfully conducted the **flight test of ABHYAS - High-speed Expendable Aerial Target (HEAT)** from a test range in Odisha.

What

1. **Fired from SU-30 MKI fighter aircraft**, the guided bomb achieved the desired range and hit the target at 30 km with high precision.

2. The DRDO this month has had several successful test firing trials. Last week, the India Navy and the DRDO had successfully test fired from the test range a **Man-Portable Anti-tank Guided Missile (MPATGM)** which has advanced features like an image infrared radar seeker with integrated avionics.
3. Earlier this week, **the Indian Air Force (IAF) had successfully tested BrahMos air version missile** from Su-30MKI fighter aircraft. The IAF had said that the launch from the aircraft was smooth and the missile followed the desired trajectory before directly hitting the land target.
4. The IAF has plans to have **40 Sukhoi Su-30MKI fighter planes** to be fitted with the **BrahMos (designated PJ-10) missiles** which will help it in carrying out strikes at the enemy targets. These missiles have been made lighter for being carried on the plane.
5. Before that, DRDO had also carried out the flight test of **ABHYAS – High-speed Expendable Aerial Target (HEAT)** from test range in Chandipur in Balasore, Odisha.
6. The ABHYAS missile has been designed on an in-line small gas turbine engine and it uses the indigenously developed MEMS-based navigation system.
7. In March, **the PINAKA-guided-missile from the Pokhran range was test fired**. This indigenous missile is a multiple rocket launcher produced by DRDO for the Indian Army.

Flashback

1. **DRDO was formed in 1958** from the amalgamation of the then already functioning **Technical Development Establishment (TDEs) of the Indian Army** and the **Directorate of Technical Development & Production (DTDP)** with the Defence Science Organisation (DSO).
2. Today, DRDO is a network of more than 50 laboratories engaged in developing defence technologies covering various disciplines, like aeronautics, armaments, electronics, combat vehicles, engineering systems, instrumentation, missiles, advanced computing and simulation, special materials, naval systems, life sciences, training, information systems and agriculture.
3. Several major projects for the development of missiles, armaments, light combat aircrafts, radars, electronic warfare systems etc are on hand and significant achievements have already been made in several such technologies.

BRAHMOS AIR LAUNCHED MISSILE FIRED

On 22 May 2019, **IAF successfully fired the BrahMos air version missile** from its **frontline Su-30 MKI fighter aircraft**. The launch from the aircraft was smooth and the missile followed the desired trajectory before directly hitting the land target. The **air launched BrahMos missile is a 2.5 ton supersonic air to surface cruise missile** with ranges of **close to 300 km**, designed and developed by BAPL.

What

1. **The IAF became the first Air Force in the world** to have successfully fired an air launched 2.8 Mach surface attack missile of this category on a sea target on 22 Nov 17.

2. Today's was the second such live launch of the weapon. The integration of the weapon on the aircraft was a very complex process involving mechanical, electrical and software modifications on aircraft.
3. The IAF has been involved in the activity from its inception. The software development of the aircraft was undertaken by the IAF engineers while HAL carried out mechanical and electrical modifications on the aircraft.
4. The dedicated and synergetic efforts of the IAF, DRDO, BAPL and HAL have proven the capability of the nation to undertake such complex integrations.
5. The firing could be successfully undertaken with dedicated support from Indian Navy by way of ensuring availability of a large number of monitoring ships to ensure range safety clearance.
6. The BrahMos missile provides Indian Air Force a much desired capability **to strike from large stand-off ranges on any target at sea** or on land with pinpoint accuracy by day or night and in all weather conditions.
7. The capability of the missile coupled with the **superlative performance of the Su-30MKI aircraft** gives the IAF the desired strategic reach.

SIMBEX-2019 CONCLUDED

The navies of India and Singapore on 22 May 2019 concluded their bilateral naval drill in the strategic **South China Sea**, where China is flexing its military muscles. The **Singapore-India Maritime Bilateral Exercise (SIMBEX-2019)** was conducted by the Indian Navy and the Republic of Singapore Navy from May 16 to May 22. One **Kolkata Class Destroyer (INS Kolkata)**, **One Fleet Tanker (INS Shakti)** and **one Poseidon-8I (PSI) Maritime Patrol Aircraft** of the Indian Navy participated in the exercise conducted mostly in waters off Singapore.

What

1. The Singapore Navy, as hosts, **deployed one Formidable Class Frigate (RSS Steadfast)** and one **Victory Class Corvette (RSS Valiant)** participated.
2. The air component from Singapore included one Fokker 50 (F-50) and four F-16 Fighter Aircraft of the Republic of Singapore Air Force.
3. After having enthused significant interest from **IMDEX-19 (International Maritime Defence Exhibition and Conference) participants**, as reflected in the quantum of high-profile visits, the Indian Navy ships continued at Singapore to prepare for the SIMBEX-19, alongside their Singaporean counterparts.
4. **The Harbour Phase, conducted from May 16 to 18**, not only included a series of planning meetings but also simulated tactical exercises and interactions between professional subject matter experts in various domains of Maritime Operations.
5. Ships' crews from both sides also visited all participating ships to familiarise themselves thoroughly with operational peculiarities of participating assets.
6. **The Sea Phase that followed from May 19 to 22** built upon the harmony achieved in harbour, albeit in a far more realistic environment.
7. It was indeed a matter of pride for both forces to have executed most demanding manoeuvres with great elan and a series of joint maritime exercises in perfect synchronisation.

8. **China claims almost all of the South China Sea** with Brunei, Indonesia, Malaysia, the Philippines, Taiwan and Vietnam pushing competing claims to parts of the resource-rich maritime region.
9. **The islands in the South China Sea - is an area which accounts for 12 per cent of global fishing** and through which 30 per cent of the world's trade passes, apart from housing possible oil and gas reserve.

MP'S ORCHHA IN UNESCO'S TENTATIVE LIST

The **architectural heritage of Orchha town in Madhya Pradesh** which depict **peculiar style of the Bundela dynasty** have been included in **UNESCO's tentative list of world heritage sites** following a proposal sent by the ASI to the UN body. The **Archaeological Survey of India (ASI)** had sent a proposal to the UNESCO on April 15, 2019 to include the sites in its list. According to the rules, to be a part of **UNESCO's World Heritage sites**, the heritage or any historical site first has to be on the tentative list. After it makes to the tentative list, another proposal is sent to the UNESCO. The ASI in its earlier proposal had requested to include **Orchha in the list of cultural heritage**.

What

1. **Orchha is situated on the banks of the Betwa river.** It is located around 80 km away from Tikamgarh district in Madhya Pradesh and 15 km from Jhansi of Uttar Pradesh.
2. **Orchha was built by king Rudra Pratap Singh of Bundela dynasty in the 16th century.** The ancient town is famous for its Chaturbhuj Temple, Orchha fort complex, Raja Mahal among others.
3. The Bundela architecture has Mughal influence since the two dynasties were very close. The famous King of Bundela dynasty **Veer Singh Dev** was a close friend of Mughal emperor Jahangir and fought wars as Akbar's aid.
4. **Orchha is also famous for its two elevated minaret called Saavan and Bhadon** and its four palaces -- Jahangir Palace, Raj Mahal, Sheesh Mahal and Rai

What is a tentative list?

1. **A tentative list is an inventory of properties** which a state party considers to be **cultural and/or natural heritage of outstanding universal value**, and therefore suitable for inscription on the World Heritage List.
2. The tentative list **provides a forecast of properties that a state party may decide to submit for world heritage inscription in the next five to ten years.**
3. A position on a country's tentative list does not automatically tender that site with world heritage status.
4. The tentative list simply provides a tool for planning and advocacy of a nation's outstanding natural and cultural heritage, and assists the World Heritage Committee to assess the context from which a country's particular nominations are made.
5. The tentative list is extremely important because the World Heritage Committee cannot consider a nomination for inscription on the World Heritage List unless the property has already been included on the state party's tentative list.

Praveen Mahal -- and for its concept of open bungalows, stone work windows, animal statues depicting the culture of Bundelkhand.

5. **It is the only place in India where Lord Ram is worshipped as a king with a dedicated temple in his name called Sri Ram Raja Mandir.**

NEW VERSION OF AKASH AIR DEFENCE MISSILE

DRDO successfully tests fired the new version of the **Akash surface to air defence missile system** with a new indigenously-developed seeker. The missile was test-fired in Balasore off the Odisha coast. This is the second successful test of the missile in last two days as a successful test was done also. **This is a new version of the missile** fitted with an indigenous seeker. **Akash missile is a medium range Surface to Air Missile** with multi-target engagement capability.

What

1. The missile was developed as part of **Integrated Guided-Missile Development Programme (IGMDP)** other than Nag, Agni, Trishul, and Prithvi missiles.
2. The **supersonic Akash missile has a range of around 25 km** and up to the altitude of 18,000m.
3. The missile uses **high-energy solid propellant** for the booster and **ramjet-rocket propulsion** for the sustainer phase. The missile system is said to be highly mobile.
4. Several variants of the missile- **Akash MK1, Akash-MK2** with improved accuracy and higher ranges are under development by the Defence Research and Development Organisation (DRDO).
5. The **Akash missile system was formally inducted into the Indian Air Force on July 10, 2015**, and in Indian Army on May 5, 2015. In September that year, the Defence Acquisition Council cleared seven additional squadrons of the missile for the Air Force.
6. However, the missile system has been bogged in controversies with a Comptroller and Auditor General (CAG) report in 2017 stating that as many as 30 per cent of the missiles failed when tested.
7. The Indian Army too had said in 2017 that the missile does not meet its operational requirements due to higher reaction time.
8. **India is slowly plugging holes in its air-defence elements** by developing advanced surface-to-air missile named MRSAM- Medium Range Surface to Air Missile in collaboration with Israel.

8TH IMCOR

Myanmar Navy Ship UMS King TabinShweHtee (773) and UMS Inlay (OPV-54) have arrived Port Blair on 20 May for the 'Opening Ceremony' of the **8th Indo-Myanmar coordinated patrol (IMCOR)**, at Andaman and Nicobar Command. The Myanmar delegation led by Commodore Htein Win, Commander, Ayeyarwady Naval Command, called on Cmde Ashutosh Ridhorkar, VSM, Naval Component Commander on 20 May 19.

What

1. **The CORPAT initiative between the two navies** is meant to address issues of terrorism, illegal fishing, drug trafficking, human trafficking, poaching and other illegal activities inimical to interest of both nations.

2. **Started in Mar 2013**, the CORPAT series has enhanced the mutual understanding and fostered improved professional interaction between the two navies for maritime interoperability.
3. Myanmar ships UMS King TabinShweHtee and UMS Inlay would undertake a coordinated patrol with Indian Naval Ship Saryu from 20 – 28 May 19.
4. The patrolling effort will be augmented by Maritime Patrol Aircraft from both the navies. The ships would patrol along the **International Maritime Boundary Line (IMBL)** between the two countries covering a distance of approximately 725 Kms over a period of four days.
5. The ships will also undertake joint manoeuvres and drills during the sea phase of coordinated patrol (CORPAT) prior ‘Closing Ceremony’ of the CORPAT onboard Myanmar Naval Ship.

INTERNATIONAL

IN A FIRST FOR ASIA

Taiwan became the first place in Asia to legalise same-sex marriage on 17 May 2019, as thousands of demonstrators outside parliament cheered and waved rainbow flags, despite deep divisions over marriage equality. Lawmakers from the majority **Democratic Progressive Party (DPP)** backed the bill, which passed 66 to 27, though the measure could complicate President Tsai Ing-wen’s bid to win a second term in presidential elections next year.

What

1. The bill, which offers same-sex couples similar legal protections for marriage as heterosexuals, will take effect after Tsai signs it into law.
2. It was not immediately clear, however, if same-sex couples are entitled to key rights, such as adoption and cross-national marriage, with parliament continuing to discuss the measure on 17 May 2019.
3. The vote followed a **years-long tussle over marriage equality** that culminated in a 2017 declaration by the democratic island’s constitutional court giving same-sex couples the right to marry, and setting a deadline of May 24 for legislation.
4. **Taipei’s colourful gay pride parade, one of Asia’s largest**, puts on display every year the vibrancy of the island’s lesbian, gay, bisexual and transgender (LGBT) community.
5. Late last year, **Taiwan voters opposed same-sex marriage in a series of referendums**, defining marriage as being between a man and a woman, while seeking a special law for such unions.
6. **Australia passed laws allowing same-sex marriage in 2017**, but such unions are not recognised by Hong Kong and neighbouring China, which regards Taiwan as a wayward province to be brought back into the fold by force if necessary.

PAKISTAN SUCCESSFULLY TESTS BALLISTIC MISSILE

Pakistan 24 May 2019 successfully test-fired **surface-to-surface ballistic missile Shaheen-II**, capable of hitting targets as far as **1,500 kilometers away**, bringing major Indian cities under its range. The Pakistan Army said in a statement that the launch was aimed at ensuring operational readiness of the **Army Strategic Forces Command**.

What

1. **Shaheen-II Missile is capable of carrying both conventional and nuclear warheads** upto a range of **1,500 kilometers**.
2. Shaheen-II is a highly capable missile which fully meets Pakistan's strategic needs towards maintenance of desired deterrence stability in the region.
3. Having its impact point in the Arabian Sea, was witnessed by Director General Strategic Plans Division, Commander Army Strategic Forces Command, senior officers from the Army Strategic Forces Command, scientists and engineers of the strategic organisations.
4. Chairman Joint Chiefs of Staff Committee and Services Chiefs congratulated the scientists and engineers on conduct of successful launch.
5. **President Arif Alvi** and Prime Minister Imran Khan have also congratulated scientists on their achievement.

SRI LANKA, JAPAN, INDIA SIGN DEAL

Sri Lanka, Japan and India on 28 May 2019 **signed an agreement** to jointly **develop the East Container Terminal at the Colombo Port**. The signing of the **Memorandum of Cooperation (MoC)** is significant, given that India and Sri Lanka were negotiating a potential partnership on the project, although with little success. New Delhi's interest in partnering the project is well known. Over 70% of the transshipment business at the strategically located East Container Terminal is linked to India.

What

1. However, **India's possible role in developing the terminal had become a major flashpoint** within the government. President Maithripala Sirisena had opposed any Indian involvement in the project, as roping in foreign actors for developing "national assets" remains a politically sensitive call in the island.
2. Mr. Sirisena and Prime Minister Ranil Wickremesinghe had a heated argument on the matter during a cabinet meeting last year, with the Sri Lankan PM apparently more inclined towards allowing an Indian role in the project.
3. Negotiations seemed to have hit a roadblock until Japan stepped in more recently. The new dynamic altered the prospects for India, allowing it to play a part in upgrading the terminal.
4. **Japan has been a long-standing partner of Sri Lanka**, and one of Sri Lanka's biggest donors in the past decades. The terms of the agreement will soon be finalised at a joint working group meeting.

AUSTRALIA'S NEW PRIME MINISTER SWORN IN

Scott Morrison was sworn in as **Australia's prime minister** on 29 May 2019 along with a "hungry, committed and united" team of ministers after the ruling Conservative Coalition led by him staged a surprise victory defying exit polls in the general elections. The new Coalition ministry for the **46th Australian parliament** was sworn in at the Government House in Canberra with Morrison taking the oath as a new Prime Minister and Michael McCormack as the Deputy Prime Minister.

What

1. **A record number of seven women were sworn into the new Cabinet** with Nationals deputy leader Bridget McKenzie becoming Australia's first female agriculture minister.
2. The Cabinet includes Australia's first Aboriginal federal cabinet minister, West Australian MP Ken Wyatt, who will be in charge of indigenous affairs.
3. Morrison, 51, and Deputy Prime Minister McCormack were the first to be sworn in by the Governor General Peter Cosgrove at the ceremony, accompanied by their families.
4. The 46th Parliament is expected to open in the first week of July.
5. Defying exit polls, the ruling Conservative Coalition led by Morrison staged a miraculous victory in the general election, devastating the opposition Labor Party, forcing its leader Bill Shorten to resign.
6. The result defied long-term polls that had predicted a Labor Party win for the first time in six years.

ECONOMY

TOP INDIA FDI SOURCES ON TAX HAVEN LIST

The first ever 'Corporate Tax Haven Index', released by the **Tax Justice Network (TJN)**, has identified the **UK with its network of British overseas territories** — such as British Virgin Islands, Bermuda and Cayman Islands — as the **largest enabler of corporate tax avoidance**. These three island countries topped the index, while the UK itself was ranked at 13. Netherlands and Switzerland were placed at 4 and 5 respectively.

What

1. **TJN, an independent research based international network**, estimates that \$500 billion is dodged each year in tax by multinationals by use of a network of favourable tax countries.
2. **The index covers 64 countries**, which are ranked based on a '**corporate tax haven' score**. Some of the popular countries, through which FDI is routed into India, featured among the top 25 countries in this index.
3. Other countries included in the index were **Singapore (rank 8), UAE (12)**, Mauritius (14) and Cyprus (18). According to TJN, 52% of the world's corporate tax avoidance risks can be attributed to the top 10 countries in the index.
4. Based on the 'corporate tax haven' score, the **index reflects how aggressively countries (tax havens) use low or nil corporate taxes**, loopholes, secrecy, lax anti-abuse provisions and aggressive tax treaties (which provide benefits to stakeholders). Through these, they attract MNCs and enable them to escape or undermine tax regulations in other countries.
5. It has a ripple effect as other countries, to claw back foreign investments, resort to tax competitiveness. The index also factors in a global scale weight, which measures the presence of a country in cross-border transactions.
6. Tax consultants state that MNCs ensure that there is substance in their global tax-planning strategy in terms of carrying out operations across countries or investment transactions, so as to not fall foul of **anti-avoidance provisions**.
7. The recently released **draft report by a CBDT committee** that discarded the common transfer pricing approach for attribution of profits of a foreign enterprise having a

permanent establishment in India is also a step towards curbing profit shifting, said a government official.

8. The committee has recommended a formula-based approach by applying the global operational profit margin to the revenue from India, with adjustment for various factors such as manpower and assets.

INDIA'S PER-CAPITA INCOME RISES

The **country's per-capita income is estimated to have risen by 10 per cent** to Rs 10,534 a month during the financial year ended March 2019, government data on national income showed on 31 May 2019. In 2017-18, the monthly per-capita income had stood at Rs 9,580.

What

1. The per-capita income at current prices during 2018-19 is estimated to have attained a level of Rs 1,26,406 (Rs 10,533.83 monthly) as compared to the estimated for the year 2017-18 of Rs 1,14,958 (Rs 9,579.83 a month), showing a rise of 10 per cent," according to the annual national income and GDP 2018-19 data released by the Ministry of Statistics and Programme Implementation (MoSPI).
2. The **per-capita income is a crude indicator of the prosperity of a country. The gross national income (GNI) at current prices is estimated at Rs 188.17 lakh crore** during 2018-19, as compared to Rs 169.10 lakh crore during 2017-18, rising by 11.3 per cent.
3. India's gross domestic product is estimated to have slowed to a five-year low of 5.8 per cent in the last quarter of fiscal ended March 2018-19, mainly due to poor show in the farm and manufacturing sectors. The growth in gross domestic product (GDP) was slowest since 2014-15.
4. The previous low was 6.4 per cent in 2013-14. For full year 2018-19, the economic growth is estimated at 6.8 per cent, compared 7.2 per cent in the previous year.

HLC SUBMITS ITS REPORT

The **High-Level Committee (HLC)** constituted by the Government of India to **examine the issues relating to preparation of action plan to create synergy among R&D Centres of Oil & Gas PSUs; tax issues** and ways to benefit from GST by the Oil & Gas PSUs on 21 May 2019 submitted its report to the Minister of Petroleum & Natural Gas and Skill Development & Entrepreneurship Sh Dharmendra Pradhan.

What

1. The HLC, consisting of Dr. Anil Kakodkar, eminent Scientist and Shri Sidharth Pradhan, an expert on financial and tax issues, also **looked into merger, acquisition and consolidation of Oil & Gas PSUs** and the Joint Ventures; **explored the need and possibility of formation of new entity** dealing with oil services and supply of qualified manpower to Oil & Gas sector around the world.
2. **Energy security is a key strategic priority for India.** During 2018, India consumed 204.92 MMT petroleum products and 58.64 BCM natural gas whereas the domestic production of crude oil and natural gas has almost stagnated.
3. The import dependency of crude oil and LNG during the year was **82.59% and 45.89% respectively** which is likely to increase in days to come. During 2018,

- petroleum import (₹7028.37 billion) was 23.42% of total gross import (₹30010.2 billion) of the nation.
4. **India's projected oil demand is going to grow at CAGR 4%** during 2016-2030 against the world average of 1% though the projected oil demand will be much lower as compared to the US and China.
 5. India is thus at very precarious situation and to secure its energy needs in sustainable manner, out-of-box solutions are needed. R&D is going to play an important role in the process.
 6. The HLC, in the process visited, different R&D and training institutes of different oil & gas PSUs. It also engaged with CMDs/ senior executives of the Oil sector to understand the business, challenges and opportunities in the sector before writing its recommendations.
 7. The Committee has recommended short term, medium term and long term strategies in the report, clearly bringing out the strategy to reduce the import dependency of the nation.
 8. Ministry of Petroleum & Natural Gas will consider the recommendations submitted by the Committee while formulating policies in the said matter.

SCIENCE AND TECHNOLOGY

A NEW STUDY ON INDIAN MONSOON

There are a growing teleconnection between Indian summer monsoon rainfall and Atlantic sea surface temperature anomalies, said a new study which is likely to brighten the prospect of a more accurate monsoon prediction in India. The unusual warming or cooling of the Atlantic Ocean, known as the **Atlantic Zonal Mode (AZM)** or the **Atlantic Nino**, is known to influence the weather in Africa.

What

1. According to the study led by Abu Dhabi-based Indian climate scientist Ajaya Ravindran, **there is a growing teleconnection in a warming world** between the Indian summer monsoon rainfall, which affects millions of people in India, and the AZM.
2. The study, conducted by the **Centre for Prototype Climate Modelling of the New York University Abu Dhabi (NYUAD)**, found a robust increase in the inter-annual variability of the sea surface temperature over the eastern tropical Atlantic Ocean as a result of global warming.
3. This increase in variability implies an increase in the number of AZM events, inducing strong Kelvin waves — disturbances seen near the earth's equatorial atmosphere — into the Indian Ocean. The phenomenon leads to the **strengthening of the teleconnection between the AZM and the Indian summer monsoon rainfall**.
4. Consequently, the cold phases of the AZM enhance the monsoon rains, whereas the warm phases weaken it, said the study, the findings of which were featured in the Geophysical Research Letters. The discovery brightens the prospect monsoon prediction.

FIRST PROFILE OF ULTIMA THULE

NASA has found evidence for a **unique mixture of methanol, water ice, and organic molecules on Ultima Thule's surface** — the farthest world ever explored by mankind. The US space agency has published the first profile of Ultima Thule — **an ancient relic from the era of planet formation** — revealing details about the complex space object. Analysing just the first sets of data gathered during the New Horizons spacecraft's New Year's 2019 flyby of the **Kuiper Belt object 2014 MU69 — nicknamed Ultima Thule** — unveils much about the object's development, geology and composition.

What

1. Researchers are also investigating a range of surface features on **Ultima Thule**, such as bright spots and patches, hills and troughs, and craters and pits on Ultima Thule.
2. The largest depression is an 8-kilometre-wide feature the team has nicknamed Maryland crater — which likely formed from an impact.
3. **Some smaller pits on the Kuiper Belt object**, however, may have been created by material falling into underground spaces, or due to exotic ices going from a solid to a gas and leaving pits in its place.
4. In colour and composition, **Ultima Thule resembles many other objects found in its area of the Kuiper Belt**. Its reddish hue is believed to be caused by modification of the organic materials on its surface.
5. The team found evidence for methanol, water ice, and organic molecules on Ultima Thule's surface — a mixture very different from most icy objects explored previously by spacecraft.
6. Ultima Thule is a contact binary, with two distinctly differently shaped lobes. At **about 36 kilometres long, Ultima Thule consists of a large, strangely flat lobe — nicknamed "Ultima"** — connected to a smaller, somewhat rounder lobe — dubbed "Thule" — at a juncture.
7. **The New Horizons spacecraft is now 6.6 billion kilometres from Earth**, operating normally and speeding deeper into the Kuiper Belt at nearly 53,000 kilometres per hour.

SPACEX LAUNCHES 60 LITTLE SATELLITES

SpaceX has launched 60 little satellites, the first of thousands that founder Elon Musk plans to put in orbit for global internet coverage. The **recycled Falcon rocket blasted off** late 24 May 2019 night. The first-stage booster landed on an ocean platform following liftoff, as the tightly packed cluster of satellites continued upward. Musk said all **60 flat-panel satellites** were deployed and online a few hundred miles (kilometers) above Earth.

What

1. **Each weighs 500 pounds (227 kilograms)** and has a single solar panel and a **Krypton-powered thruster** for raising and maintaining altitude.
2. The satellites have the **capability of automatically dodging sizable pieces of space junk**. The orbiting constellation — **named Starlink** — will grow in the next few years.
3. Twelve launches of 60 satellites each will provide reliable and affordable internet coverage throughout the US. Twenty-four launches will serve most of the populated world and 30 launches the entire world. That will be 1,800 satellites in total, with more planned after that.

4. **Twenty-four launches will serve most of the populated world** and 30 launches the entire world. That will be 1,800 satellites in total, with more planned after that.
5. Musk told reporters last week there's "a fundamental goodness" to giving people in all corners of the globe choices in broadband internet service.
6. Other companies have similar plans, including Project Kuiper from Jeff Bezos' Amazon and OneWeb. According to Musk, California-based SpaceX can use Starlink revenue to develop more advanced rockets and spacecraft to achieve his ultimate goal of establishing a city on Mars.
7. **The Starlink satellites are designed to re-enter the atmosphere after four or five years in orbit**, burning up harmlessly over the Pacific. Musk stressed there will be no safety issues on the ground from falling chunks of debris.
8. The launch was delayed twice last week, first by high wind and then for software updates. **It was the third flight for this booster.**

CLAY CACHE ON RED PLANET

NASA's Curiosity Mars rover has found the **highest amounts of clay minerals** ever found during its mission on the **Red Planet**. The rover recently drilled two samples at rock targets called "**Aberlady**" and "**Kilmarie**" in a region of Mars called the "**clay-bearing unit**". Both drill targets were unveiled in a new selfie taken by the rover on May 12, the 2,405th Martian day, or sol, of the mission.

What

1. **This clay-enriched region**, located on the side of lower Mount Sharp, stood out to NASA orbiters before Curiosity landed in 2012, the US space agency said.
2. Curiosity is exploring Mount Sharp to see if it had the conditions to support life billions of years ago.
3. **Clay often forms in water, which is essential for life.** The rover's mineralogy instrument, called **CheMin (Chemistry and Mineralogy)**, provided the first analyses of rock samples drilled in the clay-bearing unit.
4. **CheMin also found very little hematite**, an iron oxide mineral that was abundant just to the north, on Vera Rubin Ridge.
5. Other than proof that there was a significant amount of water once in **Gale Crater**, what these new findings mean for the region is still up for debate.
6. It is likely that the rocks in the area formed as layers of mud in ancient lakes — something Curiosity also found lower on Mount Sharp.
7. Water interacted with sediment over time, leaving an abundance of clay in the rocks there.

Flashback

1. **Curiosity is a car-sized rover** designed to explore the crater Gale on Mars as part of **NASA's Mars Science Laboratory mission (MSL)**.
2. Curiosity was launched from Cape Canaveral on November 26, 2011 and landed on **Aeolis Palus inside Gale on Mars** on August 6, 2012.

SILICON FOR QUANTUM COMPUTING

For the first time, researchers have measured the accuracy of **two-qubit logic operations in silicon**, an advance that may help develop full-scale quantum processor. **All quantum computations can be made up of one-qubit operations and two-qubit operations**, which are the central building blocks of quantum computing. In 2015, researchers at the University of New South Wales (UNSW) in Australia were the **first to build a quantum logic gate in silicon**, making calculations between two qubits of information possible. The advance cleared a crucial hurdle to making silicon quantum computers a reality.

What

1. **Fidelity (accuracy) is a critical parameter** which determines how viable a qubit technology is — you can only tap into the tremendous power of quantum computing if the qubit operations are near perfect, with only tiny errors allowed.
2. The team used a technique that can assess qubit accuracy across all technology platforms — demonstrating an average two-qubit gate fidelity, or accuracy, of 98 per cent.
3. Quantum computers will have a wide range of important applications in the future thanks to their ability to perform far more complex calculations at much greater speeds, including solving problems that are simply beyond the ability of today's computers.
4. **Quantum computing applies the properties of quantum physics** to process information.
5. Operating with **nanoscale components at temperatures colder than intergalactic space**, quantum computing has the potential to solve some of the world's toughest challenges.
6. Taking only days or hours to solve problems that would take billions of years using today's computers, quantum computers will enable new discoveries in the areas of healthcare, energy, environmental systems, smart materials, and beyond.
7. In quantum computing, **a qubit (short for quantum bit) is a unit of quantum information**—similar to a classical bit.
8. Where **classical bits hold a single binary value such as a 0 or 1**, a **qubit can hold both values at the same time in what's known as a superposition state**.

MOON CRATER THEORY CONFIRMED

China's Chang'e-4 was the **first mission to land on the far side of the Moon**. The lunar probe collected new evidence from a crater on the Moon, which is also the **largest crater in the solar system**. Li Chunlai, a professor of the National Astronomical Observatories of Chinese Academy of Sciences (NAOC), and his team landed the **fourth Chang'e probe (CE-4)** in the Moon's 180km-wide impact bowl called **Von Kármán crater inside the South Pole-Aitken (SPA) basin**, which stretches about 2,500 kilometers and covers nearly a quarter of the Moon's circumference. The probe collected **spectral data samples from the flat stretches of the basin** and as well as the deep impacts within the basin.

What

1. The findings from the CE-4 were published on May 16, 2019 in the journal Nature, clarifying how the **Moon may have evolved**. According to Chunlai, the evolution of

- the Moon may provide a window into the evolution of the Earth and other terrestrial planets, given the lunar surface is relatively untouched.
- In the 1970s, it was theorised that in the Moon's infancy**, an ocean made of magma covered its surface. As the molten ocean began to calm and cool, heavier components sank, while the lighter minerals floated to the top, which crusted over in a sheet of mare basalt such as **olivine and pyroxene**. Asteroids crashed into the lunar surface, cracked through the crust kicking up pieces of the lunar mantle.
 - So, the researchers expected to find excavated mantle material on the floor of the SPA basin. Instead, the early results from the rover's **Visible and Near Infrared Spectrometer (VNIS)** suggest the rocks contain minerals known as low-calcium (ortho) pyroxene and olivine, which is also the primary component of the earth's upper mantle.
 - The authors of the paper want to continue their examination of lunar rocks. The CE-4 needs to explore more to better understand the geology of its landing site on the Moon.
 - It also needs to collect more spectral data to validate its initial findings and to fully understand the composition of the lunar mantle.
 - The researchers have also raised the possibility of sending another mission to the moon to deliver some of these rocks to Earth for study in laboratories.

MISCELLANEOUS

INDIAN WINS AWARD AT CANNES FILM FESTIVAL

An Indian filmmaker, **Achyutanand Dwivedi**, made amends for his nation's disappointing no-show in the **72nd Cannes Film Festival**. His three-minute film, "**Seed Mother**", won the **third prize in the international section of Nespresso Talents 2019** in Cannes. Held annually as part of the Cannes Critics' Week to encourage new perspectives in filmmaking, **Nespresso Talents is now in its fourth year**. It is a contest limited to films shot in a vertical 9/16 video format.

What

- This year's theme was 'We Are What We Eat'**, aimed at exploring the world, experiencing diversity, and sharing experiences and knowledge through food.
- It received 371 videos from 47 countries in three broad categories: Farming and Biodiversity, Food

Flashback

- The **Cannes Festival until 2002 called the International Film Festival** (Festival international du film) and known in English as the **Cannes Film Festival**, is an **annual film festival held in Cannes, France**, which previews new films of all genres, including documentaries from all around the world.
- Founded in 1946**, the invitation-only festival is held annually (usually in May) at the Palais des Festivals et des Congrès. It is one of the "Big Three" alongside the Venice Film Festival and Berlin International Film Festival.
- The 2019 Cannes Film Festival takes place between 14 and 25 May 2019. **Mexican filmmaker Alejandro González Iñárritu** has been named the jury president.

Heritage and the Value Chain and Food in Popular Cultures.

3. **“Seed Mother” celebrates the exceptional spirit of Rahibai Soma Popere**, a woman who champions the use of local seeds and **traditional methods of farming in villages of Maharashtra**.
4. The **Nespresso 2019 first prize in the international section** was won by New Zealand’s Josh Morrice for “Subak”, **about rice cultivation in Bali**, while the **second prize went to Mexican filmmaker Marco Aurelio Celis’ “Ruffo”**.
5. Dwivedi, born and raised in Mumbai, now lives in Pondicherry. He discovered the work of Rahibai Soma Popere when he went looking for good seeds for his kitchen garden, a central part of a sustainable model of living that he is developing for himself and his friends.
6. In 2016, he won a prize sponsored by Getty Images during the Cannes Lions for the 90-second film **“Internal Fight”**, about the struggles of Mumbai-based mixed martial arts fighter Farhan Siddiqui.

CDAC DEVELOPS INSTRUMENT TO TRACE DIRECTION OF GUNFIRE

A team of researchers at the **Centre for Development for Advanced Computing (CDAC)** is developing an advanced instrument capable of tracking the precise direction of gunfire. While a **pilot model of the Acoustic Gunshot Detector** was developed and **handed to city-based Armament Research and Development Establishment (ARDE)**, a lab of **Defence Research and Development Organisation (DRDO)** in 2015, its advanced model with larger geographical range is currently under development.

What

1. **This instrument is based on the acoustics principle** and is capable of filtering gunshots from all other surround sounds.
2. **This is achieved within 20 milliseconds** from the time the gunshot is fired and can reveal the direction of its origin.
3. The instrument is **mainly being developed for Indian soldiers**, particularly those in combat roles and operations. Besides, it can also be deployed by various law enforcing agencies to find the location of gunfire incidents.
4. The current version of the instrument offers a range of up to 300 metres. It will particularly come handy for soldiers involved in on-field operations, in combat roles or for those posted at strategic locations where exchange of gunfire and retaliatory fire are initiated while engaging with the enemy.
5. The team is currently developing an advanced version that will offer a range of up to 400 metres, and at the same time, efforts are on to make the instrument lighter to enable swifter mobility.
6. The team has developed the instrument in three variants — stationary, mobile (mounted on vehicles) and manned (mounted on soldiers out for operations).
7. The weight of the instrument will be crucial for the versions that will be mounted either physically on the soldier or on the vehicle used during operations.
8. Besides ARDE, testing is being **carried out at firing ranges in Coimbatore and Kerala**.

IAF'S AN-32 CERTIFIED TO OPERATE BIO-JET FUEL

On 25 May 2019, **IAF's formidable workhorse, Russian made AN-32 aircraft** was formally fleet certified to fly on blended aviation fuel containing up to **10% of indigenous bio-jet fuel**. The approval certificate was received at the **aero-engine test facilities** at Chandigarh.

What

1. **The IAF has undertaken a series of evaluation tests** and trials with this green aviation fuel for the last one year.
2. The scope of these checks was in consonance with the international aviation standards. Today's approval is an acknowledgement of the meticulous testing using the indigenous bio-jet fuel by the IAF.
3. **The indigenous bio-jet fuel was first produced by the CSIR-IIP lab at Dehradun in 2013**, but could not be tested or certified for commercial use on aircraft due to lack of test facilities in the civil aviation sector.
4. Since then, IAF's flight test crew and engineers have been evaluating the performance of this fuel against international standards.
5. This is a huge step in promoting the **'Make in India' mission** as this bio-fuel would be produced from **Tree Borne Oils (TBOs)** sourced from tribal areas and farmers, augmenting their income substantially.
6. In 2018, Chief of Air Staff, Air Chief Marshal BS Dhanoa, had announced IAF's intention to permit the use of all its resources for testing and certifying the indigenous fuel.
7. Since then, IAF's flight test crew and engineers have been evaluating the performance of this fuel against international standards.

TENTH SPECIES OF VINE SNAKE

A group of researchers has discovered a tenth species of the vine snake of genus Ahaetulla after a gap of more than a century. Before this discovery, **there were nine species of vine snakes reported from the country**. The **Ahaetulla laudankia**, the newly-discovered snake, was first spotted by researchers in **Simlipal Biosphere Reserve** near Lulung in Odisha.

What

1. According to researchers, **Odisha is home to three species**: the common Indian vine snake, variable-coloured vine snake and the third being the recently-named Laudankia vine snake.
2. This rare snake has been reported from Mayurbhanj, Balasore and Boudh districts of Odisha and other states such as Maharashtra and Rajasthan. It has ochre brown dorsal body with an

Flashback

1. **Ahaetulla laudankia**, known as the **Laudankia vine snake**, is a species of snake in the family **Colubridae**.
2. **It is endemic to India** and while being a rare species, it has a relatively large range, extending from the Eastern Ghats through Central India west to eastern Rajasthan.
3. Its name derives from the Odia term laudanka, which translates to "dried stems of bottle gourd, as the snake closely resembles them with its thin body and brownish color.

orange-red belly.

3. It was in January 2009, when Prof. Sushil Dutta, a renowned herpetologist, and I first spotted this snake in Simlipal Biosphere Reserve near Lulung while the snake was crossing the forest road around noon.
4. Although we could identify it as a new variety being recorded in the State, it was after we studied two other individuals of the same variety from **Boudh and Balasore of Odisha**, that we realised it could possibly be a new species we are dealing with.
5. Dr. Mohapatra said, “Our search for similar-looking vine snakes across India yielded two more specimens at the National Zoological Collection of Zoological Survey of India, Kolkata, collected from Mount Abu in Rajasthan.”

SIKKIM'S NEW CHIEF MINISTER

Sikkim Krantikari Morcha (SKM) president Prem Singh Tamang, popularly known as **P S Golay**, on 27 May 2019 **took oath as the chief minister of Sikkim**. Eleven SKM MLAs were also administered the oath by Governor Ganga Prasad at Paljor Stadium. Golay, who is not a member of the state assembly at present as he did not contest the polls, was elected as the SKM Legislature Party leader.

What

1. **Hundreds of SKM supporters** who were at the stadium cheered the 51-year-old party chief when he was taking the oath in Nepali language.
2. Former chief minister **Pawan Kumar Chamling and senior Sikkim Democratic Front (SDF) leaders** were conspicuous by their absence at the swearing-in.
3. The **SKM, founded in 2013**, won a slender majority in the 32-member Sikkim Legislative Assembly by bagging 17 seats against 15 won by the SDF. The Chamling government was ousted by the SKM after over 24 years.
4. **Sikkim can have a maximum of 12 ministers**, including the chief minister.

WORLD'S RIVERS ARE CONTAMINATED WITH ANTIBIOTICS

Rivers around the world are contaminated with dangerous levels of antibiotics, according to a major new study. **Concentrations of antibiotics** in some waterways exceed safe levels by 300 times, a global team of scientists led by the University of York found. The Thames was contaminated with **five antibiotics**, including levels of **ciprofloxacin** — used to **treat skin and urinary tract infections** — that were three times what is considered safe. Researchers looked at **14 commonly used antibiotics** in rivers flowing through **72 countries** and found antibiotics were in two-thirds of samples.

What

1. Scientists fear antibiotics in rivers cause bacteria to develop resistance meaning they can no longer be used in medicines for humans. The UN estimates that the rise in antibiotic resistance could kill 10 million people by 2050.
2. A lot of the resistance genes we see in human pathogens originated from environmental bacteria,” Professor William Gaze, a microbial ecologist at the University of Exeter who was not involved in the study.
3. **Drugs get into rivers via human and animal waste**, as well as **leaks from wastewater treatment and drug manufacturing sources**.

4. In one site in Bangladesh, levels of metronidazole — which is used to treat mouth and skin infections — were 300 times greater than what is considered safe. The most common antibiotic was a urinary tract infection antibiotic called **trimethoprim**, which was present in 307 of 711 sites tested.
5. Researchers found **Bangladesh, Kenya, Ghana, Pakistan and Nigeria** were home to the most contaminated rivers.

PATNAIK TAKES OATH FOR 5TH TERM

Naveen Patnaik on 29 May 2019 took oath as the **Chief Minister of Odisha for a record fifth time**. The **only political leader to be the chief minister of Odisha five times**, Patnaik joined an exclusive club of continuous fifth-term **CMs Sikkim's Pawan Chamling and West Bengal's Jyoti Basu**. Governor Ganeshi Lal also administered oath of office to 11 ministers and nine ministers of state.

What

1. As part of BJD's commitment to farmers, in the first Cabinet meeting on 29 May 2019 the state government **raised the number of KALIA beneficiaries to 75 lakh farm families** — 33 lakh more than the existing 42 lakh families.
2. The government said that fund release began within hours after the swearing-in and that nearly 25 lakh additional families will be assisted in a week's time.
3. The Cabinet also approved Rs 1,000 crore worth of government businesses to be done by women SHGs through **Mission Shakti**.
4. With these two resolutions, the promise I have made about **KALIA and Mission Shakti** to be implemented on the day we take office is honoured, Chief Minister Naveen Patnaik said.

'FORBIDDEN' PLANET DISCOVERED IN NEPTUNIAN DESERT

Astronomers say they have discovered a **rogue exoplanet with its own atmosphere** in the **Neptunian Desert**. **NGTS-4b, nick-named 'The Forbidden Planet'** is smaller than Neptune but **three times the size of Earth**, said researchers led by the University of Warwick in the UK. The exoplanet, described in the journal Monthly Notices of the Royal Astronomical Society, has a mass of 20 Earth masses, a radius 20 per cent smaller than Neptune, and temperature of 1000 degrees Celsius.

What

1. **It orbits around the star in only 1.3 days** — the equivalent of Earth's orbit around the Sun of one year. It is the first exoplanet of its kind to have been found in the Neptunian Desert. **The Neptunian Desert** is the region close to stars where no Neptune-sized planets are found.
2. This area receives strong irradiation from the star, meaning the planets do not retain their gaseous atmosphere as they evaporate leaving just a rocky core.
3. However NGTS-4b still has its atmosphere of gas. When looking for new planets, astronomers look for a dip in the light of a star — with the planet orbiting it and blocking the light.
4. Usually only dips of one percent and more are picked up by ground-based searches. However, the NGTS telescopes, situated in the **Atacama Desert, Chile**, can pick up a dip of just 0.2 per cent.

5. Researchers believe the planet may have moved into the Neptunian Desert recently, in the last one million years, or it was very big and the atmosphere is still evaporating.
6. This planet must be tough — it is right in the zone where we expected Neptune-sized planets could not survive, said Richard West, from the University of Warwick.
7. It is truly remarkable that we found a transiting planet via a star dimming by less than 0.2% — this has never been done before by telescopes on the ground, and it was great to find after working on this project for a year.

WHO AWARD FOR RAJASTHAN HEALTH DEPT.

The **World Health Organization** has selected the **Rajasthan government's Medical & Health Department for its award this year** in recognition of its achievements in the field of tobacco control. The department's Additional Chief Secretary, Rohit Kumar Singh, will receive the award at a function **to mark World No Tobacco Day in New Delhi** on 31 May 2019. The **Health Department of the State is the only government body in the country** which will be awarded for its tobacco-free initiatives.

What

1. **World Health Organisation (WHO) has selected five organisations from the South-East Asian region** for the prestigious award.
2. Individuals and institutions in each of the six WHO regions were recognised every year for their accomplishments in the area of tobacco control.
3. Three other organisations in the South-East Asian region have been selected from Thailand and Indonesia, while the **Vallabhbhai Patel Chest Institute, New Delhi, is also among the recipients of the award.**
4. The Medical & Health Department launched several campaigns against tobacco consumption at places such as schools, colleges, police stations and government offices during 2018-19.