

INTERNATIONAL & BILATERAL**Oldest friends: India-Russia 13th summits**

The 19th India-Russia Annual Bilateral Summit was held between Prime Minister Narendra Modi and Russian President Vladimir Putin which comes against the backdrop of a complex dynamic that relates to the texture of their individual relations with the US.

Two countries has announced a number of agreements, including a \$5.43 billion S-400 Triumph missile system deal, a space cooperation arrangement to put an Indian in space, and an action plan for a new nuclear plant. Prime Minister Narendra Modi and Mr. Putin also addressed a business summit, in an attempt to diversify ties and increase bilateral trade, currently below \$10 billion.

Much of the fresh momentum in bilateral engagement will come from the energy sector. Though the two sides didn't announce an agreement between ONGC Videsh and Gazprom as expected, several billions of dollars worth of investment and energy deals are in the pipeline. Significantly, the agreements discussed during Mr. Putin's visit have geopolitical implications. The signing of the S-400 air defence system deal, for instance, is of far greater consequence than its size. It denotes India's desire to deepen defence cooperation with Russia; also that it is prepared to do this despite U.S. warnings that the deal could attract sanctions. That this deal comes just a month after India signed the Communications Compatibility and Security Agreement (COMCASA) for better interoperability with the U.S. military is a sign that India will not be forced or even persuaded into putting all its eggs in one strategic basket.

S-400 Triumph Missile System deal

After bilateral talks between Prime Minister Narendra Modi and Russian President Vladimir Putin, India and Russia signed the USD 5.43 billion deal for S-400 air defence system. The system is expected to be delivered by 2020.

What is S-400 missile system?

- An upgraded version of the S-300 systems, the S-400 is a surface-to-air missile system that can take down enemies' aircraft in the sky from the surface itself.
- Known as Russia's most advanced long-range surface-to-air missile defence system, S-400 is capable of destroying hostile bombers, jets, missiles and drones at a range of 380 km.
- The S-400 missile system was manufactured by Almaz-Antey and has been in service in Russia since 2007.

Fear of US Sanctions on India

- The procurement of the S-400 missile defence system deal could result in the US sanctions on India under the Countering America's Adversaries through Sanctions Act (CAATSA) instituted by the US Congress on arms purchases from Russia.
- Under the CAATSA, the United States can impose sanctions on any country that has "significant transactions" with Iran, North Korea or Russia. The CAATSA was framed to punish Russia for the 2014 capture of Crimea from Ukraine, for its involvement in the Syrian civil war and for meddling in the 2016 US presidential election.
- China was the first buyer to seal a government-to-government deal with Russia in 2014 to procure the lethal missile system and Moscow has already started delivery of the S-400 missile systems to Beijing.
- The US has urged its allies to decline transactions with Russia, warning that the S-400 missile defence system would be a 'focus area' for it to implement punitive sanctions against a nation undertaking 'significant' business deals with the Russians.
- However, American lawmakers have allowed the possibility of a presidential waiver.

Key highlights of the India-Russia Joint Statement:

- They reaffirmed that being multicultural, multilingual and multi-religious societies, India and Russia bring civilisation wisdom to address modern day challenges.
- Subsequent to the successful implementation of the Protocol on Foreign Office Consultations for the period 2017-18, they agreed to extend the period of Consultations for five more years (2019-2023) and signed a Protocol to this effect.
- They welcomed the agreements reached in November 2017 between their concerned authorities, for cooperation on internal security, drug trafficking and disaster management, including the Joint Action Plan for the period of 2018-2020.
- They showed their satisfaction with the implementation of the Cultural Exchange Programme for 2017-2019 signed in 2017.
- They reviewed the progress on the achievement of the goal to increase two-way investment to USD 30 billion by the year 2025.
- They called for the development of the International North-South Transport Corridor (INSTC) through intensified efforts by finalising pending issues.
- They stressed the importance of India-Russia cooperation in outer space and welcomed the activity on setting up measurement data collection ground stations of the Indian Regional Navigation Satellite System NavIC and the Russian Navigation Satellite System GLONASS.
- They affirmed "equality, mutual respect and non-interference as universally acknowledged norms of international law as reflected in the United Nations Charter and the 1970 Declaration on principles of international law concerning friendly relations and co-operation in accordance with the UN Charter."

List of Agreements and MoUs exchanged between India and Russia

- Protocol for Consultations between the Russian Ministry of Foreign Affairs and Union Ministry of External Affairs during 2019-2023
- MoU between the Ministry of Economic Development of Russia and India's NITI Aayog
- MoU between Indian Space Research Organization (ISRO) and the Federal Space Agency of Russia 'ROSCOSMOS' on Joint Activities in the field of Human Spaceflight Programme
- Memorandum of Cooperation between the Indian and Russian Railways
- Action Plan for Prioritisation and Implementation of Cooperation Areas in the Nuclear Field
- MoU between the Russian Ministry of Transport and Indian Railways in the Development Cooperation in Transport Education
- MoU between the National Small Industries Corporation (NSIC) of India and the Russian Small and Medium Business Corporation (RSMB) on Cooperation in the field of Micro, Small and Medium Enterprises
- Cooperation Agreement in the Fertilizers Sector between the Russian Direct Investment Fund (RDIF); PJSC Phosagro (PhosAgro) and Indian Potash Limited (IPL)

SCIENCE & TECHNOLOGY

Parker Solar Probe

NASA's Parker Solar Probe has successfully completed flyby of Venus at distance of about 2,415 kilometres during its first gravity assist from planet. These gravity assists will help spacecraft tighten its orbit closer to Sun over course of the mission. The spacecraft in future will be carrying six Venus gravity assists over the course of the seven-year mission.

Parker Solar Probe mission

- The purpose of the launch will be to study Sun's outer atmosphere and to understand how Sun works. The name of the probe initially called the Solar Probe Plus has been renamed as the Parker Solar Probe in honor of astrophysicist Eugene Parker. This is the first time NASA has named a spacecraft after a living person.
- Astrophysicist Eugene Parker published a research paper predicting the existence of solar wind in 1958.
- Solar wind is the flow of charged gases from the sun. This is the NASA's first mission to the sun and its outermost atmosphere corona.
- The mission is scheduled to end in June 2025. It was successfully launched in August 2018 for unprecedented seven-year long journey to unlock mysteries of Sun's fiery outer atmosphere and its effects on space weather. It is designed and built by NASA's Johns Hopkins University Applied Physics Laboratory.



Scientific goals

- Determine structure and dynamics of magnetic fields at sources of solar wind.
- Trace flow of energy that heats corona and accelerates solar wind.
- Determine what mechanisms accelerate and transport energetic particles.
- Explore dusty plasma near Sun and its influence on solar wind and energetic particle formation.

The probe will be fitted with thermal protection system (TPS) or heat shield made of reinforced carbon-carbon composite that will allow it to survive temperatures in Sun's corona. Its main systems and scientific instruments are located in central portion of shield's shadow, where direct radiation from Sun is fully blocked.

The primary power for mission is dual system of solar panels (photovoltaic array). Secondary source consists of much smaller secondary array power that uses pumped-fluid cooling to maintain operating temperature.

It will use Venus' gravity during seven flybys over nearly seven years to gradually bring its orbit closer to Sun. These gravity assists will help the spacecraft tighten its orbit closer and closer to the Sun over the course of the mission. It will achieve velocity of up to 200 km/s, making it fastest spacecraft to date.

Why study corona?

➤ The corona is hotter than the surface of the sun. The corona gives rise to the solar wind, a continuous flow of charged particles that permeates the solar system. Unpredictable solar winds cause disturbances in our planet's magnetic field and can play havoc with communications technology on Earth. Nasa hopes the findings will enable scientists to forecast changes in Earth's space environment.

Why do we study the sun and the solar wind?

- As sun is the only star we can study, so by this project we learn more about stars throughout the universe.
- The mission hopes to shed light on why the atmosphere — or corona — is so much hotter than the sun's surface.
- The sun is a source of light and heat for life on Earth. The more we know about it, the more we can understand how life on Earth developed.
- The sun also affects Earth in less familiar ways. It is the source of the solar wind; a flow of ionized gases from the sun that streams past Earth at speeds of more than 500 km per second (a million miles per hour).

Gaganyaan: ISRO, ROSCOSMOS to work together for first Indian manned mission

➤ Indian Space Research Organisation (ISRO) and Russia's federal space agency Roscosmos State Corporation for Space Activities (ROSCOSMOS) have agreed to work together for first manned space mission Gaganyaan. Under MoU on Joint Activities in the field of Human Spaceflight Programme, ROSCOSMOS has offered ride to Indian astronaut short visit to International Space Station (ISS) on board Soyuz spacecraft for short training mission in 2022.

Gaganyaan Mission

- It is India's first manned space mission. Under it, India is planning to send three humans (Gaganyatris) into space i.e. in low earth orbit (LEO) by 2022 i.e. by 75th Independence Day for period of five to seven days.
- The mission was announced by Prime Minister Narendra Modi during his 72nd Independence Day speech.
- India plans to build a crew vehicle that can accommodate 2 or 3 astronauts and by its GLSV Mk-III launcher.
- This mission will make India fourth nation in the world after USA, Russia and China to launch human spaceflight mission. The entire cost of Gaganyaan mission will be less than Rs 10,000 crore.

<p>Moonstruck</p> <p>A look at the ISRO moon mission that will send a three-person crew to space for a period of 5-7 days</p> <ul style="list-style-type: none"> ▪ The spacecraft will be placed in a low earth orbit of 300-400km. ▪ Two unmanned missions will be undertaken prior to sending humans. The first manned flight will be sent in 30 months and a manned mission in 40 months <p>Budget: Around ₹10,000 crore</p> <ul style="list-style-type: none"> ▪ The crew module will splash in the Arabian sea closer to Ahmedabad 	 <p>A file photo of the GSLV, the launch vehicle for the moon mission. ■ AFP</p>	<ul style="list-style-type: none"> ▪ The crew module along with the service module, together called the orbital module, weighing seven tonnes will be mounted atop the GSLV launch vehicle ▪ The crew will reach low earth orbit in 16 minutes once launched and stay in the orbit for 5-7 days ▪ During the orbit, astronauts will carry out micro gravity experiments ▪ In the return phase, at 120km above earth, the crew module will separate from the service module and head towards the earth in a controlled manner
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Recent technological advancements:

- In what appears to be a preparation for the Gaganyaan mission, ISRO recently conducted its first 'pad abort' test that was successful.
- The 'pad abort' test or Crew Escape System is an emergency escape measure that helps pull the crew away from the launch vehicle when a mission has to be aborted. The test was conducted at the Satish Dhawan Space Centre, Sriharikota.
- The Pad Abort Test demonstrated the safe recovery of the crew module in case of any exigency at the launch pad.

India, France ink agreement to collaborate for Gaganyaan mission

- Under this agreement, ISRO and French space agency CNES will form working group to exchange expertise in fields of astronaut life support, radiation protection, space debris protection and personal hygiene systems among others.
- CNES will be sharing its expertise acquired from France first human spaceflights of Thomas Pesquet's Proxima mission in November 2016, when European Space Agency's (ESA) astronaut Pesquet was on six-month mission at International Space Station (ISS).
- Pesquet had conducted 50 scientific experiments for CNES and ESA.

World's first full-sized Hyperloop capsule unveiled in Spain

The world's first full-sized Hyperloop passenger capsule has been unveiled in Spain giving those in attendance a glimpse of the future. California based company Hyperloop Transportation Technologies (Hyperloop TT) revealed the slimline capsule, which can reach speeds of 1,220 kilometres per hour.

What is Hyperloop?

Hyperloop is a new form of ground transport currently in development by a number of companies, which could see passengers travelling at 700 miles an hour in floating pods within low-pressure tubes. a hyperloop is a system to "build a tube over or under the ground that contains a special environment." Cars would basically be propelled in this tube.

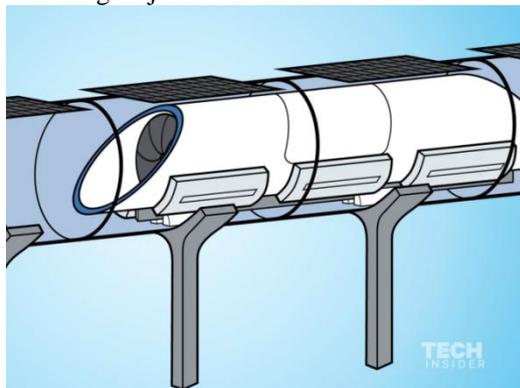
What makes Hyperloop different?

There are two big differences between Hyperloop and tradition rail. The pods carrying passengers travel through tubes or tunnels from which most of the air has been removed to reduce friction. This should allow the pods to travel at up to 750 miles per hour.

Rather than using wheels like a train or car, the pods are designed to float on air skis, using the same basic idea as an air hockey table, or use magnetic levitation to reduce friction. A number of different companies are working to turn the idea into a functioning commercial system.

What are the benefits of Hyperloop?

Supporters argue that Hyperloop could be cheaper and faster than trains and car travel, and cheaper and less polluting than air travel. They claim that it is quicker and cheaper to build than traditional high-speed rail; as such, Hyperloop could take the pressure off gridlocked roads, making travel between cities easier and potentially unlocking major economic benefits as a result.



In May, HyperloopTT had proposed to set up the Hyperloop transportation system in Andhra Pradesh, connecting Anantapur, Amaravati, Vijayawada and Visakhapatnam as part of 700-800-km-long integrated public transit system. The Maharashtra government too had signed a pact with the Richard Branson-led Virgin Group to build the Mumbai-Pune Hyperloop.

HyperloopTT is also set to build the first Hyperloop system in China as the company struck a deal in the country to build a test track in Guizhou province.

NATIONAL

India's and Asia's first Dolphin Research Centre to come up soon in Patna

National Dolphin Research Centre (NDRC) will be set up on the banks of the Ganga river in Patna University campus in Patna, capital of Bihar. It will be India's and Asia's first Dolphin research centre. The announcement for the centre was made on the occasion of Dolphin day (October 5), observed in Bihar for protection and conservation of Gangetic river dolphin to create awareness to save endangered species. NDRC will play important role in strengthening conservation efforts and research to save endangered mammal whose population is decreasing. Bihar is home to around half of the country's estimated 3,000 dolphin population.

Gangetic river dolphin

Gangetic river dolphin (scientific name: Platanista gangetica) is one of the four freshwater dolphin species in the world. The other three are found in Yangtze river, Indus river in Pakistan and Amazon river. Gangetic river dolphin species are found in India, Bangladesh and Nepal.

Gangetic river dolphin is India's national aquatic animal. It is almost completely blind and finds its way and prey using ultrasonic echoes, with sound being everything for them to navigate, feed, escape danger, find mates, breed, nurse babies and play.

Gangetic Dolphin's presence signals healthy river ecosystem. Dolphins prefer water that is at least 5-8 feet deep and are usually found in turbulent waters where there is enough fish for them to feed on. They prefer deep water with adjoining shallow water and live in zone where there is little or no current that helps them save energy.

Threats: Entanglement in fishing nets, hunting for their oil and meat, poisoning of water supply of river from industrial and agricultural chemicals. They are facing most significant threat from building of dams along the upper course of their habitable rivers. It causing the segregation of populations and has a narrowed gene pool in which dolphins can breed.

Protection Status: Gangetic river dolphins fall under Schedule I of the Indian Wildlife (Protection) Act and have been declared an endangered species by the International Union for Conservation of Nature (IUCN).

Conservation Program: Environment Ministry had launched Ganges River Dolphin Conservation Programme in 1997 to build scientific database of their population status and also study the habitat quality of the dolphins' distribution range. Vikramshila Gangetic Dolphin Sanctuary located in Bihar's Bhagalpur district of Bihar is India's only dolphin sanctuary is spread over 50 km along the Ganges

Fact for Prelim

NASSCOM unveils Centre of Excellence for IoT in Haryana

Indian IT industry's apex body National Association of Software and Services Companies (NASSCOM) has launched its Centre of Excellence for the Internet of Things (CoE – IoT) at Gurugram, Haryana. It aims to act as perfect collaboration for innovation and high-end technologies.

NASSCOM is global non-profit trade association (organisation) of Indian Information Technology (IT) and Business Process Outsourcing (BPO) industry.

NASSCOM-Chairperson: Rishad Premji, Headquarters: Noida

Internet of Things (IoT)

IoT is network of devices such as smartphones, wearable devices, home appliances and vehicles, connected to internet, which enables these objects to connect and exchange data. Blockchain technology has potential to address security risks to IoT as it provides a shield against data tampering by labelling each block of data.

Government launches Closing the Skills Gap Task Force

Union Ministry of Skill Development and Entrepreneurship has launched Closing the Skills Gap Task Force in India in collaboration with World Economic Forum (WEF). The goal of Task Force is to develop action plan to address skills gaps in India and make Indian workforce ready for jobs of future

World Economic Forum-Headquarters: Cologny, Switzerland. Founder: Klaus Schwab

Centre to release state rankings under Poshan Abhiyaan next year March

The government said that it will come up with 'Status of India Nutrition' report in March next year where states will be ranked according to their performance under the Poshan Abhiyaan. The National Institute on Nutrition (NIN) will come out with the report which deals with various parameters of nutrition. The government also took a loan of \$200 million from World Bank for implementing the scheme which will cover all districts across various states and union territories.

POSHAN Abhiyaan

- POSHAN Abhiyaan (Prime Minister's Overarching Scheme for Holistic Nutrition) was launched in Jhunjhunu, Rajasthan in March 2018. It aims to ensure holistic development and adequate nutrition for pregnant women, mothers and children.
- The Union Government has signed \$200 million loan agreement with World Bank for National Nutrition Mission (POSHAN Abhiyaan) for 315 districts across all states and union territories. The loan proceeds will be used for reducing stunting in children 0-6 years of age from 38.4% to 25% by 2022 under POSHAN Abhiyaan.
- It targets to reduce level of under-nutrition and other related problems by ensuring convergence of various nutrition related schemes. It also targets stunting, under-nutrition, anaemia (among young children, women and adolescent girls) and low birth rate. It will monitor and review implementation of all such schemes and utilize existing structural arrangements of line ministries wherever available.
- Its large component involves gradual scaling-up of the interventions supported by ongoing World Bank assisted Integrated Child Development Services (ICDS) Systems Strengthening and Nutrition Improvement Project (ISSNIP) to all districts in the country by 2022.
- The Ministry of Women and Child Development (MWCD) is implementing POSHAN Abhiyaan in 315 Districts in first year, 235 Districts in second year and remaining districts will be covered in the third year.
- The total budget for the POSHAN Abhiyaan is Rs.9046.17 crore with GoI share of Rs.2849.54 crore.
- Under POSHAN Abhiyaan, the Government has fixed targets to reduce stunting, under-nutrition, anemia (among young children, women and adolescent girls) and reduce low birth weight by 2%, 2%, 3% and 2% per annum respectively. Mission also strives to achieve reduction in Stunting from 38.4% (NFHS-4) to 25% by 2022 (Mission 25 by 2022).

India's 1st 'Methanol Cooking Fuel Program' Launched in Assam

Northeast and Assam Petro-chemicals, a state-owned company launched Asia's first cannister-based and India's first "Methanol Cooking Fuel Program". The programme was inaugurated by Dr V K Saraswat, Member, NITI Aayog and Chairman, Methanol Apex Committee at the Assam Petro-chemicals campus at Namrup, Assam.

Overview

Ethanol and methanol are alcohol fuels which can be distilled from a wide variety of biomass feedstock. Therefore they are a renewable cooking energy alternative, which are highly convenient to use. The use of ethanol and methanol requires the establishment of a production and supply chain, which very much influences the price of the fuel.

Odisha CM launches Nirman Kusuma Yojana

Odisha Chief Minister Naveen Patnaik launched the "Nirman Kusuma Yojana" to provide financial assistance to children of construction workers for pursuing technical education. An ITI student will be entitled to get financial assistance of Rs 23,600, while a diploma student to get Rs 26,300 per annum. A total of 1878 students will get benefit from the programme.

- Attending the inaugural ceremony of the new welfare scheme CM Naveen provided financial aid to the children of over 500 construction workers registered under Odisha Building & Other Construction Workers Welfare Board.
- As per the provision under 'Nirman Kusuma' scheme a financial aid of total Rs 1.09 crore was deposited directly in the bank accounts of 1,878 beneficiaries for 2018-19 academic session.
- Similarly, Naveen also announced the hike of ex-gratia amount for registered construction workers in the state. While for natural death the compensation has been increased from Rs 1 lakh to Rs 2 lakh the same in case of unnatural death has been hiked from Rs 2 lakh to Rs 4 lakh.
- In another provision the financial assistance for the girl children of the registered workers for education and health has also been enhanced by 20%

ECONOMY**As rupee hits new lows, RBI eases overseas borrowing norms for oil firms**

- The Reserve Bank of India (RBI) on Wednesday allowed state-owned oil marketing companies (OMCs) to raise external commercial borrowings (ECBs) from lenders under the automatic route.
- OMCs, including Indian Oil Corp. Ltd, Bharat Petroleum Corp. Ltd and Hindustan Petroleum Corp. Ltd, may raise ECBs for working capital with a minimum average maturity of three to five years. The RBI decision comes on the back of a fast depreciating rupee and rising oil prices.
- Crude prices are expected to touch \$100 per barrel within the next few months, while the Indian rupee breached 73 against the US dollar for the first time on October 3.
- It has been decided, in consultation with the government of India, to liberalize the said provision and permit public sector OMCs to raise ECBs for working capital with a minimum average maturity period of 3/5 years from all recognised lenders under the automatic route.
- The Reserve Bank of India has capped the overall annual foreign currency borrowing under the new norms at \$10 billion with immediate effect
- The RBI has also waived off the individual limit of \$750 million or equivalent, and mandatory hedging requirements as per the ECB framework for borrowings.

What is External Commercial Borrowings?

ECB is basically a loan availed by an Indian entity from a nonresident lender. Most of these loans are provided by foreign commercial banks and other institutions. It is a loan availed of from non-resident lenders with a minimum average maturity of 3 years. ECBs have emerged a major form of foreign capital like FDI and FII. For infrastructure and greenfield projects, funding up to 50% (through ECB) is allowed. In telecom sector too, up to 50% funding through ECBs is allowed.

Nobel laureates Nadia, Mukwege nominated for Mother Teresa Award-2018

Anti-rape campaigners Nadia Murad and Dr Denis Mukwege, who were earlier declared as the Nobel Peace Prize winners for 2018, have been nominated for this year's "Mother Teresa Memorial Award" instituted by the city-based Harmony Foundation. The Harmony Foundation was launched in 2005 to foster communal and social harmony between various communities through the 'Mother Teresa Memorial Awards'.

Nobel Prize 2018: Nobel Prize In Economic Sciences Goes To William D. Nordhaus And Paul M. Romer

The Royal Swedish Academy of Sciences has decided to award the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2018 to William D. Nordhaus "for integrating climate change into long-run macroeconomic analysis" and Paul M. Romer "for integrating technological innovations into long-run macroeconomic analysis."