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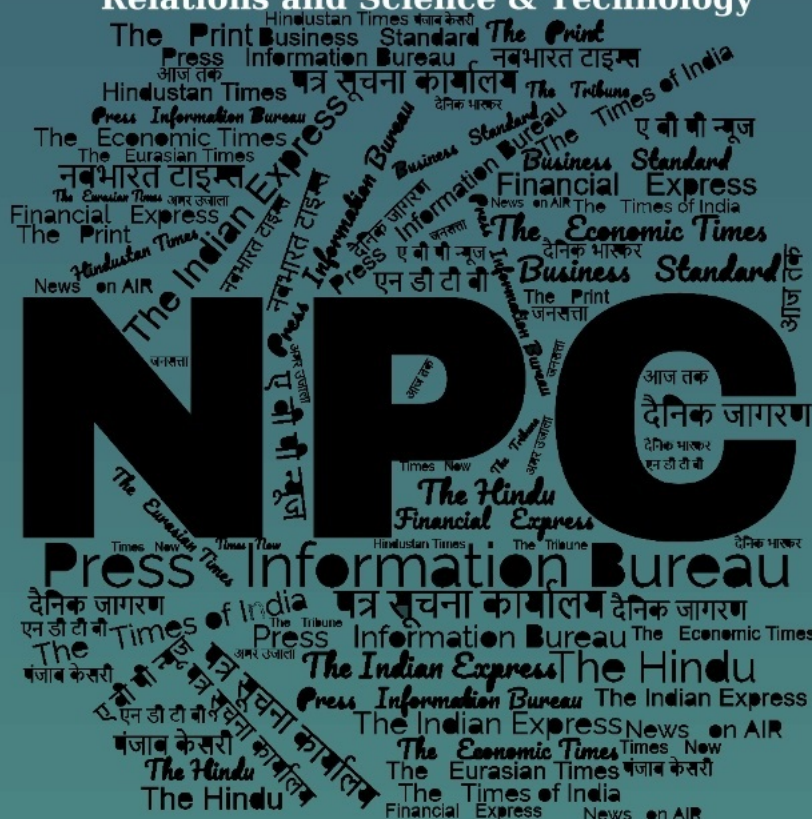
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Defence News

एंटी ड्रोन सिस्टम रोकेगा घुसपैठ, तस्करी पर लगेगी लगाम

Source: Indian Express , Dt. 05 Dec 2025

DEFENCE MINISTERS HOLD KEY TALKS

India seeks additional S-400 missile systems, Russia offers Su-57s

Press Trust of India
New Delhi, December 4

INDIA AND Russia on Thursday resolved to expand their bilateral defence cooperation with New Delhi showing its keen interest in procuring additional batches of S-400 missile systems from Moscow to bolster its combat prowess.

The two sides deliberated on ways to enhance the overall defence and strategic ties at a key delegation-level meeting between Defence Minister Rajnath Singh and his Russian counterpart Andrey Belousov that took place a day ahead of the 23rd India-Russia annual summit.

Russian President Vladimir Putin on Thursday night landed in New Delhi for the summit talks with Prime Minister Narendra Modi on Friday.

In the meeting with Belousov, Singh reaffirmed India's determination for capacity building of its indigenous defence industry for both local production and exports while highlighting new opportunities for enhancing India-Russia collaboration in niche technologies.

Both sides reiterated that the India-Russia relationship is based on a "deep sense of trust, common principles and mutual respect", said a Defence Ministry statement.

It is learnt that India conveyed its interest to the Russian side on procuring additional batches of S-400 surface-to-air missile systems from Russia as the weapons proved effective during Operation Sindoor.

In October 2018, India signed a \$5-billion deal with Russia to buy five units of the S-400 air defence missile systems, notwithstanding a warning by the US that going ahead with the contract may invite US sanctions under the provisions of Countering America's Adversaries Through Sanctions Act (CAATSA). Three squadrons have already been delivered.

India may also look at procuring the S-500 missile systems as well from Russia.

It is learnt that the Russian



Defence Minister Rajnath Singh with his Russian counterpart Andrey Belousov in New Delhi on Thursday. RENUKA PURI

The Singh-Belousov talks were held under the framework of India-Russia Inter-Governmental Commission on Military and Military Technical Co-operation.

"The India-Russia relationship is based on a deep sense of trust, common values and mutual respect, which are the defining principles of the special and privileged strategic partnership, between both countries," Singh said at the meeting.

The Russian defence minister emphasised deepening the relationship between both countries, which he said is based on mutual trust.

He said the bilateral relationship has a strategic character, and that Russia's partnership with India is a key factor for maintaining a balance in the South Asian region.

Belousov said Russia will cooperate in "full scale" with India in modernisation of In-

Indian , Russian Defence Ministers to meet today

Source: Jansatta, Dt. 25Dec 2025

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दोनों देशों के बीच रक्षा समेत कई समझौतों पर लगेगी मुहर

और सेवाएं खरीदता है, जबकि रूस भारत से लगभग पांच अरब डॉलर का आयात करता है। अधिकारियों ने कहा कि भारत उर्वरक क्षेत्र में सहयोग बढ़ाने पर भी विचार कर रहा है। रूस सालाना भारत को 30 से 40 लाख टन उर्वरक की आपूर्ति करता है। रूसी राष्ट्रपति की भारत यात्रा ऐसे समय में हो रही है जब भारत-अमेरिका संबंध पिछले दो दशकों में संभवतः सबसे खराब दौर से गुजर रहे हैं और अमेरिका भारतीय सामान पर भारी 50 प्रतिशत शुल्क लगाया है, जिसमें रूस से कच्चे तेल की खरीद पर 25 फीसद कर भी शामिल है।

शिखर वार्ता में भारत द्वारा रूस से कच्चा तेल खरीदने पर अमेरिकी प्रतिबंध के असर पर चर्चा होने की संभावना है। 'क्रेमलिन' (रूस के राष्ट्रपति का आधिकारिक आवास एवं कार्यालय) के प्रवक्ता दिमित्री पेसकोव ने एलवार को कहा था कि पश्चिमी देशों के प्रतिबंध के कारण भारत द्वारा रूस से कच्चे तेल की खरीद 'कुछ समय' के लिए कम हो सकती है। बैठक में उम्मीद है कि पुतिन मोदी को यूक्रेन

विवाद को खत्म करने के लिए अमेरिका की नई कोशिशों के बारे में बताएंगे। भारत लगातार यह कहता रहा है कि बातचीत और कूटनीति ही युद्ध खत्म करने का एकमात्र तरीका है।

भारतीय और रूसी पक्ष यूरेशियन आर्थिक संघ के साथ भारत के प्रस्तावित मुक्त व्यापार समझौते पर भी चर्चा कर सकते हैं। शिखर सम्मेलन से पहले दोनों देशों के रक्षा मंत्रियों ने बुधवार को व्यापक चर्चा की, जिसमें रूस से एस-400 मिसाइल प्रणालियों और अन्य महत्वपूर्ण सैन्य हार्डवेयर की अतिरिक्त खेप खरीदने की भारत की योजना पर फोकस रहा। अक्टूबर 2018 में भारत ने रूस के साथ एस-400 वायु रक्षा मिसाइल प्रणाली की पांच इकाइयों की खरीदने के लिए पांच अरब अमेरिकी डॉलर के समझौते पर हस्ताक्षर किए, जबकि अमेरिका ने चेतावनी दी थी कि अनुबंध पर आगे बढ़ने से कार्टेड्रिंग अमेरिकाज एडवर्सरीज थ्रू सैंक्शंस एक्ट (सीएएटीएसए) के प्रावधानों के तहत अमेरिकी प्रतिबंध लग सकते हैं।

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INDIA-MALAYSIA TO PARTICIPATE IN JOINT MILITARY TRAINING EXERCISE HARIMAU SHAKTI IN THE DESERTS OF RAJASTHAN

Source: PIB , Dt. 4 Dec 2025

The Fifth edition of Joint Military exercise "Exercise Harimau Shakti -2025" commenced today in Mahajan Field Firing Range, Rajasthan. The exercise is being conducted from 05 to 18 December 2025.

The Indian contingent is being represented mainly by troops from the DOGRA Regiment. The Malaysian side is being represented by troops from the 25th Battalion Royal Malaysian Army.

The aim of the exercise is to jointly rehearse conduct of Sub Conventional Operations under Chapter VII of United Nations Mandate. The scope of the exercise includes synergising joint responses during counter-terrorist operations. Both sides will practice tactical actions such as cordon, search and destroy missions, heliborne operations, etc. In addition, Army Martial Arts Routine (AMAR), combat reflex shooting and Yoga will also form part of the exercise curriculum.

In the Exercise Harimau Shakti – 2025, both sides will rehearse drills to secure helipads and undertake casualty evacuation during counter-terrorist operations. Collective efforts will focus on achieving an enhanced level of interoperability amongst the troops and reduce the risk of life and property while keeping the interests and agenda of the UN at the forefront during peace keeping operations.

Both sides will exchange views and practices of joint drills on a wide spectrum of combat skills that will facilitate the participants to mutually learn from each other. Sharing of best practices will further enhance the level of defence cooperation between Indian Army and Royal Malaysian Army. The exercise will also foster strong bilateral relations between the two nations.

India, Russia set to deepen space ties; Finalise deal for semi-cryo engine

Source: The Economic Times , Dt. 4 Dec 2025

India, Russia Set to Deepen Space Ties; Finalise Deal For Semi-Cryo Engine

Dipanjan Roy Chaudhury

New Delhi: India and Russia at Friday's annual summit are set to elevate cooperation in the space sector building on decades-long partnership including possible transfer of technology for semi-cryogenic rocket engines.

The plan of space cooperation in future covers several joint areas, including engine development, crewed missions, orbital stations, personnel training, and rocket fuel, ET has learnt.

It is learnt that Russia had agreed to 100% transfer of technology for RD-191M semi-cryogenic rocket engines to the Indian Space Research Organisation.



Crewed flights and an orbital station among the next phases of joint India-Russia space coop

Roscosmos chief Dmitry Bakanov told Russian newspaper Izvestia on Wednesday that an announcement on space cooperation would be made as soon as "literally the day after tomorrow". He said the plan covers several joint areas, including engine development, crewed missions, orbital stations, personnel training, and rocket fuel.

Bakanov said the partnership would focus on "mutually beneficial cooperation".

Russia and India are also working on the mutual deployment of ground stations for their navigation satellite systems, GLONASS and NavIC for enhanced accuracy.

"Work is underway on the mutual parity placement of ground stations for collecting measurements of the Russian global navigation satellite system GLONASS and the Indian regional navigation satellite system NavIC," Russian Ambassador to India Denis Alipov was recently quoted as saying by state-run TASS news agency.

Alipov said space cooperation continues to be one of the strongest pillars of India-Russia partnership, covering manned missions like India's Gaganyaan programme, propulsion technologies, and satellite navigation.

He also highlighted the steady growth in bilateral scientific and technological collaboration across sectors such as biomedicine, physics, chemistry, healthcare, and material sciences.

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India Russia deepens defence ties with focus on niche technologies

Source: The Tribune, Dt. 04Dec 2025



Defence Minister Rajnath Singh with his Russian counterpart Andrey Belousov in New Delhi on Thursday.

India, Russia deepen defence ties with focus on niche technologies

AJAY BANERJEE
TRIBUNE NEWS SERVICE

NEW DELHI, DECEMBER 4

Defence Minister Rajnath Singh, during a meeting with his Russian counterpart Andrei Belousov today, emphasised the need to create new opportunities for collaboration between the two countries in niche defence technologies.

A statement from the Ministry of Defence said Singh "stressed on new opportunities for enhancing collaboration between both countries across niche technologies". He reiterated India's commitment to strengthening the capacity of its indigenous defence industry, both for domestic production and exports, under the vision of Aatmanirbhar Bharat.

Belousov assured Singh that "both countries are united by many years of friendship and strategic cooperation", adding that the Russian defence industry is prepared

ROSATOM DELIVERS NUCLEAR FUEL

Russia's state-run nuclear corporation on Thursday said it has delivered the first consignment of nuclear fuel for initial loading of the third reactor at the Kudankulam nuclear power plant in Tamil Nadu. A cargo flight operated by the Nuclear Fuel Division of Rosatom delivered fuel assemblies manufactured by the Novosibirsk Chemical Concentrates Plant, the corporation said.

to support India's drive towards self-reliance in defence manufacturing.

Both sides are examining multiple military platforms for cooperation. Russia has offered the fifth-generation Sukhoi-57 fighter jets, while India is seeking the quick upgrade of its existing fleet of 270 Sukhoi-30MKI aircraft. New Delhi also wants Moscow to complete the delivery of the two remaining S-

400 air defence missile systems, whose supply has been delayed. The two nations already have a logistics support arrangement that allows their militaries to exchange fuel and spares, and access maintenance facilities, airbases and naval ports.

The defence ministers co-chaired the 22nd session of the India-Russia Inter-Governmental Commission on Military & Military Technical Cooperation at the Manekshaw Centre in Delhi. Belousov underlined the depth of the bilateral relationship, rooted in mutual trust. Both sides reaffirmed that India-Russia ties rest on shared principles and mutual respect, the ministry said.

Despite India's growing security cooperation with western partners through frameworks such as the Quad, Russia remains an indispensable defence ally. More than half of India's military equipment is of Russian origin.

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India Russia deepens defence ties with focus on niche technologies

Source: The Economic Times , Dt. 04 Dec 2025

STRETCHING BACK NEARLY 25 YEARS



In 2001, PM Narendra Modi, the then Gujarat chief minister, had accompanied Prime Minister Atal Bihari Vajpayee to Moscow, a reminder of a relationship that now spans nearly 25 years

India Seeks Stronger Russia Backing For Indigenous Tech

Rajnath, Russian Defence Minister Andrei Belousov discuss technology upgrade and supplies

Manu Pubby

New Delhi: Defence minister Rajnath Singh on Thursday stressed on enhancing the collaboration across niche technologies in a meeting with his Russian counterpart Andrei Belousov, even as the two countries discussed upgrades of existing weapon systems and replenishment supplies.

The 22nd India-Russia Inter-Governmental Commission on Military and Military Technical Cooperation also took place as President Vladimir Putin landed in New Delhi on a state visit.

Officials said that both sides reiterated that the bilateral relationship is based on a deep sense of trust, common principles and mutual respect. The meeting took place at Manekshaw Centre in the national capital. "Rajnath Singh voiced the Government of India's determination for capacity building of its indigenous defence industry for both local production and exports, under the vision of 'Aatmanirbhar Bharat'. He also stressed on new opportunities for enhancing collaboration between both countries across niche technologies," officials said.

They added that the Russian defence minister highlighted that both countries



Defence Minister Rajnath Singh (R) during the 22nd India-Russia Inter-Governmental Commission on Military and Military Technical Coop ministerial meeting, in New Delhi—PTI

UPGRADES DISCUSSED



Inter-governmental panel meeting reviews S-400 needs, BrahMos upgrade plans and joint projects

AFTER OP SINDOOR SUCCESS



India has begun the process of acquiring missiles worth around ₹10,000 crore for the S-400 systems

ted that the Russian defence industry is ready to support India towards becoming self-reliant in the field of defence production," officials said.

Sources added that discussions took place on ongoing projects, training exercises and exchanges. This included talks on supplies of replenishments for Russian-origin equipment in service with Indian armed forces, like the S-400 air defence system. India has initiated a case for purchasing missiles worth close to ₹10,000 crore for the S-400 systems that were used during Operation Sindoor.

Discussions on Friday are also expected to take place on future projects like upgrade of the Brahmos ground attack missiles by giving them an enhanced range. India is also looking for longer range air-to-air missiles for its fleet of Russian-origin fighters like the Su-30 MKI and MiG-29. Other programs include extended range versions of the Igla anti-air missile and an extended range version of the S-400.

es are united by many years of friendship and strategic cooperation. "He sta-

Science & Technology News

Indian space station to be fully operational by 2035, says minister

Source: The Tribune, Dt. 4 Dec 2025

Indian space station to be fully operational by 2035, says minister

Overall configuration reviewed by panel

AKSHEEV THAKUR
TRIBUNE NEWS SERVICE

NEW DELHI, DECEMBER 3

India's space station is set to be fully operational by 2035, and its overall configuration has already been reviewed by a National-Level Review Committee, Science Minister Jitendra Singh informed the Lok Sabha on Wednesday.

He was responding to a query by BJP MP Bhartruhari Mahtab. Singh said ISRO has worked out the overall configuration of the Bharatiya Antariksh Station, the indigenous space station which will consist of five modules and is expected to be fully operational by 2035.

In September 2024, the Cabinet had approved the development and launch of the first module of Bharatiya Antariksh Station (BAS-01) by 2028. The minister said overall system engineering of the BAS-01 module and technology development activities of various subsystems was progressing well.

On a specific question about budgetary support, the minister said the allocation towards

A RARE FEAT

So far, only three nations — the United States, Russia, and China — have independently operated their own space stations. Although Russia's last one, Mir, was decommissioned in 2001.

various precursor missions, development and launch of BAS-1 were included in the revised scope of the Gaganyaan programme, which has been enhanced with an additional funding in the already approved Gaganyaan programme to Rs 20,193 crore based on the approval from the Cabinet in September-2024.

"Development and launch of the first module of the Space Station base module (BAS-01) is targeted by 2028 and fully operational BAS with five modules is expected by 2035. ISRO is incorporating necessary international standards in the design of BAS-01 subsystems that would ensure interoperability of BAS-01 with systems provided by other international agencies," said the government.

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IIA Celebrates 10 Years of Operation of the UltraViolet Imaging Telescope on board AstroSat

Source: PIB, Dt. 5 Dec 2025

In a landmark moment, the Indian Institute of Astrophysics celebrated 10 years of operation of the highly successful UltraViolet Imaging Telescope (UVIT) on board AstroSat.

UIVT is the primary payload on board AstroSat, India's first dedicated space observatory, launched on September, 28, 2015 by ISRO. AstroSat carries five payloads capable of observing simultaneously from the ultraviolet to soft X-rays and hard X-rays.

UIVT was designed, assembled, tested, and delivered by the Indian Institute of Astrophysics (IIA), an autonomous institute of the Department of Science and Technology (DST), from its campus in Hosakote. To commemorate this achievement and to plan for future space UV telescopes, IIA organised a one-day academic workshop on 4 December 2025, to mark 10 years since the opening of the doors of UVIT on 30 November 2015.

"Since UV rays are absorbed by our atmosphere, it can only be observed using space telescopes. The UVIT is India's first UV space telescope, and is the only operational telescope capable of observing in the far-UV apart from the Hubble Space Telescope", Explained Annapurni Subramaniam, Director of IIA and Calibration Scientist of UVIT.

UVIT has led to a number of important discoveries, and is being used by astronomers in India and abroad to this day. It is unique in the world in combining a large field of view and a superior spatial resolution of the sky.

Recalling the contribution of Prof. K. Kasturirangan, former Chairman ISRO Shri A.S. Kiran Kumar, former Chairman, ISRO said "Our ability to understand the Universe improves whenever we discover new ways of observing and measuring the cosmos, and I complement IIA in bring us all together today to tell the story of how AstroSat and UVIT was designed, fabricated, and successfully flown in space".

"The UVIT is a twin telescope system. One of them observes the Universe in the near-ultraviolet (NUV; 200-300 nanometres) and visual bands (vis: 320-550 nanometres), and the other observes in the far-ultraviolet (FUV; 130-180 nanometres)", explains C.S. Stalin, the in-charge of UVIT Payloads Operation Centre.

Its combination of a large field of view and high spatial resolution better than 1.5 arcseconds (better than GALEX/NASA) makes it a unique instrument for astronomy related discoveries.

UVIT's design and fabrication involved several institutions, and the entire project was led by the IIA, with a national consortium including support from IUCAA in Pune, TIFR in Mumbai, many centres of ISRO playing crucial roles, including ISAC/URSC, LEOS, IISU, and SAC and the Canadian Space Agency.

"We had to set up a special laboratory with 'Clean Rooms' for handling sensitive components to prevent any contamination that will degrade them. This MGK Menon Laboratory was installed at our CREST campus in Hosakote, which has since been used for other space missions as well", Subramaniam pointed out. An international collaboration was set up with Canada to utilise their experience with UV astronomy as well, she added. Following the launch, the UVIT Payload Operation Centre (POC) was set up at IIA, which is responsible for the production of science-ready data for astronomers, regular monitoring of UVIT, technical evaluation of proposals, and upgrading software on the telescope.

The workshop also highlighted some of the key discoveries and science highlights from the UVIT observations, which include discovery of hot compact companion stars of Be stars and Blue Straggler Stars

in clusters, feedback effects in active galactic nuclei traced by star formation, novae in the Andromeda galaxy, discovery of extended UV disks in dwarf galaxies and planetary nebulae, detection of emission from distant galaxies at redshift of 1.42, correlations between UV and X-ray emission from active galactic nuclei, and characteristics of young star formation in galaxies.

It was also highlighted that UVIT has observed a total of 1451 targets in the sky and in the last 10 years of operation, it has led to about 300 research articles and 19 Ph.D. thesis. Many more students both in India and outside the country are using data from UVIT for their thesis work as well.

The improved version of the final science ready images is being uploaded by the UVIT POC to the PRADAN archive of ISRO's ISSDC for archiving and dissemination, for the use of all astronomers in the years to come for their research.

Finally, the assembled astronomers also discussed how, by building on more than two decades of experience in UVIT, a larger next generation space facility, viz., INSIST (Indian Spectroscopic and Imaging Space Telescope), can be made possible.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2198713®=3&lang=1>

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Nanoplastics from single-use PET bottles harm gut bacteria and human Cells

Source: PIB, Dt. 4 Dec 2025

A new study provides the first clear evidence that nanoplastics derived from single-use PET bottles can directly disrupt key biological systems that are vital for human health.

Nano-plastics are a global concern and are increasingly being detected inside the human body. But their exact effects remain poorly understood. While many studies had focused on how plastics pollute the environment or damage host tissues, almost nothing was known about their direct impact on beneficial gut microbes that are central to human health.

Gut microbes are key to protecting our health as they regulate immunity, metabolism, and even mental well-being and hence it is crucial to understand what happens when they themselves are exposed to nano-plastics.

A team from Institute of Nano Science and Technology, Mohali (INST), an autonomous institute of the Department of Science and Technology (DST) conducted a multi-system investigation, looking not only at gut bacteria but also at red blood cells and human epithelial cells, aiming to connect environmental plastic pollution with its hidden but potentially profound consequences for human health.

They recreated Nano-plastics from PET bottles in the laboratory and tested them across three key biological models. A beneficial gut bacterium *Lactobacillus rhamnosus*, was used to see how nano-plastics affect the microbiome. The researchers found that long-term exposure reduced bacterial growth, colonization, and protective functions, while increasing stress responses and sensitivity to antibiotics.

Red blood cells were examined to test blood compatibility. At higher concentrations, nanoplastics disrupted cell membranes and caused hemolytic changes. Human epithelial cells were also studied to represent general cellular responses. Here, prolonged exposure led to DNA damage, oxidative stress, apoptosis, and inflammatory signalling, alongside shifts in energy and nutrient metabolism.

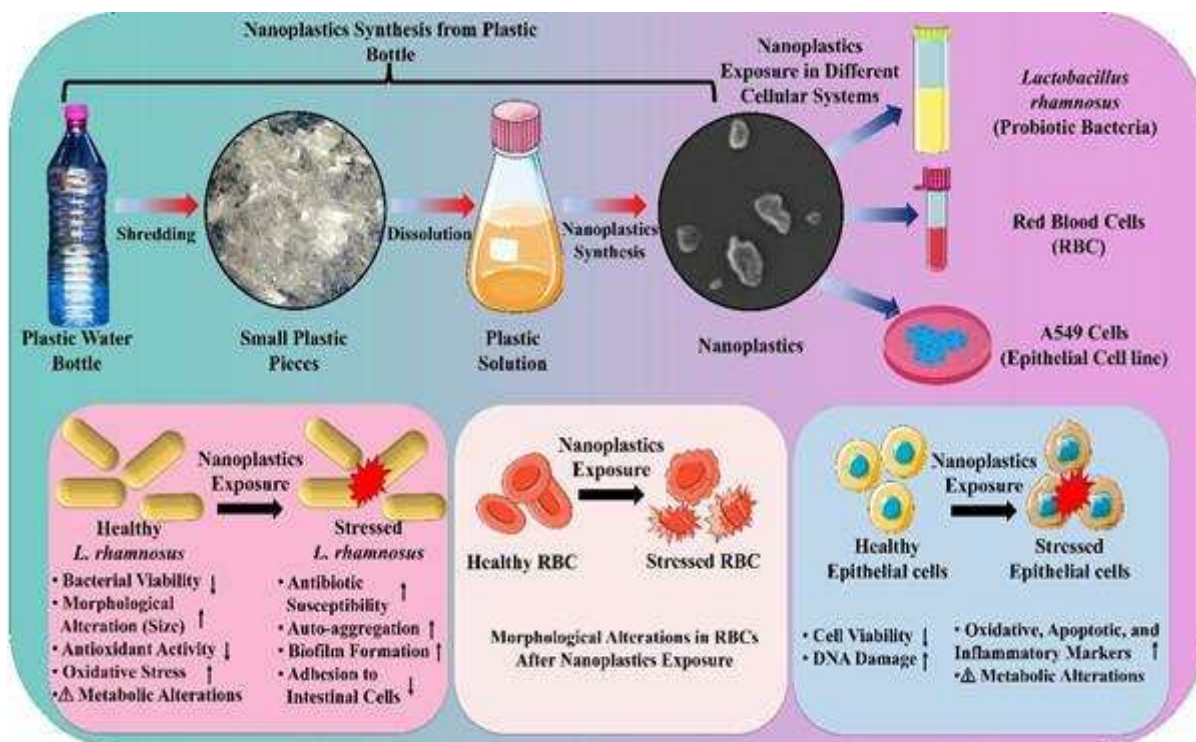


Fig: Schematic illustration of nanoplastics synthesis from plastic bottles and their biological effects. The process involves shredding, dissolving, and synthesizing nanoplastics, followed by exposure studies in *Lactobacillus rhamnosus*, red blood cells, and A549 epithelial cells. Exposure to nanoplastics caused oxidative, morphological, and metabolic changes across the tested models systems.

Together, these findings explain that nano-plastics from everyday plastics are biologically active particles that can interfere with gut health, blood stability, and cellular function. They induce DNA damage, oxidative stress, and inflammatory responses in human epithelial cells during prolonged exposure, posing risks to human health that were previously unrecognized.

This work published in the journal *Nanoscale Adv.* uncovers the hidden health risks of nano-plastics, which are increasingly found in food, water, and even the human body and could push industry and policy towards a healthier, more sustainable future.

Beyond human health, the insights can extend to agriculture, nutrition, and ecosystem studies, where microbial balance and plastic pollution intersect.

Link to paper: <https://pubs.rsc.org/en/content/articlehtml/2025/na/d5na00613a>

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2198608®=3&lang=1>

The Tribune
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