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Thu, 11 April 2019

How Dhanush empowers the forces

At a recent ceremony organised at the Gun Carriage Factory, Jabalpur, the first six 'Dhanush' guns have been handed over to the Indian Army. The guns were flagged off by Saurabh Kumar, the director general of the Ordnance Factories and the chairman of the Ordnance Factory Board (OFB). Dr Ajay Kumar, the secretary of Defence Production to the Government of India was the chief guest, while Lt General PK Srivastava, PVSM, AVSM, VSM, the director general of Artillery, was the guest of honour. The ceremony also saw Lt General RS Salaria, VSM, Commandant School of Artillery, Major General Manmeet Singh, MG Artillery HQ Western Command Chandi Mandir, among others.

The 'Dhanush' 155mm x 45 calibre modern artillery gun system, developed jointly with the Indian Army and manufactured by the Ordnance Factories, received bulk production clearance in February and the initial order of 114 Guns was placed on the OFB. Significant contributions have also been made by the DRDO, public sector units such as SAIL and BEL and several private sector firms.

'Dhanush' incorporates the latest features such as an inertial navigation system, an on-board ballistic computer, direct day and night firing system, a modern target acquisition system and a communication system that makes the weapon compatible with the Army's project—'Shakti'.

Weighing less than 13 tonnes, with a high ground clearance of 400 mm, a range of elevation from -3° to 70° and an arc of traverse of 60°, 'Dhanush' is the most maneuverable artillery system and can be deployed in any terrain.

The gun has evolved as the most modern gun system in its own right, independent of its lineage. The gun weighs 700 kg more than the 155mm/39 calibre Bofors and has an 877mm longer barrel. It has a larger chamber volume of 23 liters as compared to 19 liters of the Bofors.

<https://www.dailypioneer.com/2019/vivacity/how-dhanush-empowers-the-forces.html>

Thu, 11 April 2019

Sail provides steel for indigenous artillery gun

The company has played a key role in the development of one home grown, state-of-the-art gun —Dhanush— for which it has supplied special quality forging steel from its Durgapur based alloy plants

The Steel Authority of India Limited (SAIL) has supplied steel for India's first indigenous and biggest artillery gun — 'Dhanush', which has been inducted into the Indian Army recently. With this, SAIL has once again established its commitment to fulfill the country's every requirement to strengthen India's defence systems.

SAIL's special alloy steel, produced by SAIL-Alloy Steels Plant based at Durgapur, has been used for making this artillery gun. 'Dhanush' has been indigenously designed and developed by the Gun Factory in Jabalpur where it was handed over to the Indian Army.

The organisation, which is in its 60th year of production, has contributed in creating a strong foundation for modern India and at the same time meeting every requirement of special quality steel for Indian defence. SAIL steel has been used in the country's various defence programs including the INS Vikrant, INS Kiltan, INS Kamorta, MBT Arju and so on.

The company's Rourkela Steel Plant has also been supplying special grade steel to Jabalpur's Gun Factory to meet its various technical requirements related to development and repair.

SAIL chairman, Anil Kumar Chaudhary said, "It is matter of great pride for us that SAIL steel is being used in India's various defence programs along with being used for building the country's infrastructure. The company is ready to meet and supply special grade steels for technical requirement of the country's defence programs."

In the financial year 2018-19, SAIL produced 16.3 Million Tonnes (MT) crude steel in FY19, registering a growth of eight per cent over the corresponding period last year and clocking the best ever saleable steel production during the year. The production from new mills of the company's plants recorded a marked improvement in FY19, giving an enriched product basket. The total steel despatch from SAIL was the highest ever at 14.86 MT during FY19 due to a dedicated logistics setup created by the organisation.

It is important to note that the FY19 ended with a robust performance during Q4 with a growth of 10 per cent, 8 per cent, 14 per cent and 13 per cent in respect of production of hot metal, crude steel, saleable steel and sales respectively. Also, SAIL had the highest ever production of 9.85 lakh tonnes of UTS 90 Rail. The production of Rails got momentum in the second half of FY19 with around 5.66 lakh tonnes of production and 35 per cent higher than the H1 figure. In line with this improved performance, the company has managed to improve its turnover by 16 per cent which now stands at Rs 66,100 crore.

However, he feels that the challenge for the next year is much higher with a plan of 21 per cent increase in production of crude steel and similar growth in sales to catch on with the fast growing domestic steel consumption backed by an increased demand from infrastructure and construction segments.

<https://www.dailypioneer.com/2019/vivacity/sail-provides-steel-for-indigenous-artillery-gun.html>



Thu, 11 April 2019

A growing threat

The latest drug-resistant microbe may not be a creation of overmedication, but of the overuse of fungicides in agriculture

There's a new superbug on the loose. *Candida auris* was first described as a pathogen in 2009, when it was found infesting a Japanese woman's ear (whence the auris) and in the decade since, it has been reported in 32 countries, including India and Pakistan. A hardy fungus, undeterred by antifungals, it may have killed a third of the several hundred people it has infected, and is at the new threat horizon of drug-resistant microorganisms. Sulpha drugs and penicillin liberated the human race from the tyranny of microbes, which used to casually cut short lives. Easily accessible antimicrobials made possible an era of improving public health, which changed the fortunes of nations and, arguably, altered the course of history. But now, an excess of access threatens to send us back to the dark times before penicillin, when ordinary micro-organisms — even soil bacteria — could slay the weak at will. *Candida auris* has gained infamy as a hospital-acquired infection, and like other resistant organisms, preys on people with poorly developed or compromised immune systems, including newborns, the elderly and diabetics. In a few decades, they could represent a greater threat to life than cancer.

It's anthropogenic Darwinism at work. Drug-resistant strains of microorganisms commonly develop from flawed prescription regimes, a matter of concern for decades. In affluent populations, they may be caused when patients demand overmedication. But slums in poor countries probably yield a richer crop, with patients buying antimicrobials over the counter from untrained shopkeepers. The method is

hit-or-miss, a full course of medicines is rarely taken, and the bugs that survive are those resistant to medication. Over time, the efficacy of the antimicrobial can only diminish. But the cause for the *Candida auris* rampage lies deeper, in the over-use of antifungals in agriculture and animal husbandry. This has wiped out whole species, giving hitherto fringe species room to flourish. The new superbug is a country cousin of the well-known *Candida albicans*, which causes the oral infection called thrush. But the hitherto obscure organism now represents a far greater threat to humans.

Whether resistance is of medical or agricultural origin, the solution is the same: Public education against the arbitrary use of antimicrobial drugs. It did not work earlier, when it was a largely theoretical issue. But now that organisms like *Candida auris* are actually killing patients and contaminating entire hospital wards, as it has done in the US, UK and Spain, audiences will be more receptive.

<https://indianexpress.com/article/opinion/editorials/superbug-drug-resistance-antibiotics-candida-auris-a-growing-threat-5669419/>



Thu, 11 April 2019

Astronomers unveil first photo of a black hole

Paris: Astronomers on Wednesday unveiled the first photo of a black hole, one of the star-devouring monsters scattered throughout the Universe and obscured by impenetrable shields of gravity.

The image of a dark core encircled by a flame-orange halo of white-hot gas and plasma looks like any number of artists' renderings over the last 30 years.

But this time, it's the real deal.

Scientists have been puzzling over invisible "dark stars" since the 18th century, but never has one been spied by a telescope, much less photographed.

The supermassive black hole now immortalised by a far-flung network of radio telescopes is 50 million light years away in a galaxy known as M87.

"It's a distance that we could have barely imagined," Frederic Gueth, an astronomer at France's National Centre for Scientific Research (CNRS) and co-author of studies detailing the findings, told AFP.

Most speculation had centred on the other candidate targeted by the Event Horizon Telescope — Sagittarius A* , the black hole at the centre of our own galaxy, the Milky Way.

By comparison, Sag A* is only 26,000 light years from Earth.

Locking down an image of M87's supermassive black hole at such distance is comparable to photographing a pebble on the Moon.

European Space Agency astrophysicist Paul McNamara called it an "outstanding technical achievement" .

It was also a team effort.

"Instead of constructing a giant telescope that would collapse under its own weight, we combined many observatories," Michael Bremer, an astronomer at the Institute for Millimetric Radio Astronomy (IRAM) in Grenoble, told AFP.

Over several days in April 2017, eight radio telescopes in Hawaii, Arizona, Spain, Mexico, Chile, and the South Pole zeroed in on Sag A* and M87.

Knit together "like fragments of a giant mirror," in Bremer's words, they formed a virtual observatory some 12,000 kilometres across — roughly the diameter of Earth.

In the end, M87 was more photogenic. Like a fidgety child, Sag A* was too "active" to capture a clear picture, the researchers said.

"The telescope is not looking at the black hole per se, but the material it has captured, " a luminous disk of white-hot gas and plasma known as an accretion disk, said McNamara, who was not part of the team.

"The light from behind the black hole gets bent like a lens. "

The unprecedented image — so often imagined in science and science fiction — has been analysed in six studies co-authored by 200 experts from 60-odd institutions and published Wednesday in *Astrophysical Journal Letters*.

"I never thought that I would see a real one in my lifetime, " said CNRS astrophysicist Jean-Pierre Luminet, author in 1979 of the first digital simulation of a black hole.

Coined in the mid-60s by American physicist John Archibald Wheeler, the term "black hole" refers to a point in space where matter is so compressed as to create a gravity field from which even light cannot escape.

The more mass, the bigger the hole.

At the same scale of compression, Earth would fit inside a thimble. The Sun would measure a mere six kilometres edge-to- edge.

A successful outcome depended in part on the vagaries of weather during the April 2017 observation period.

"For everything to work, we needed to have clear visibility at every [telescope] location worldwide" , said IRAM scientist Pablo Torne, recalling collective tension, fatigue and, finally, relief.

Torne was at the controls of the Pico Veleta telescope in Spain's Sierra Madre mountains.

After that, it was eight months of nail-biting while scientists at MIT Haystack Observatory in Massachusetts and the Max Planck Institute for Radio Astronomy in Bonn crunched the data.

The Universe is filled with electromagnetic "noise" , and there was no guarantee M87's faint signals could be extracted from a mountain of data so voluminous it could not be delivered via the Internet.

There was at least one glitch.

"We were desperately waiting for the data from the South Pole Telescope, which — due to extreme weather conditions during the southern hemisphere winter — didn't arrive until six months later, " recalled Helger Rottmann from the Max Planck Institute.

It arrived, to be precise, on December 23, 2017.

"When, a few hours later, we saw that everything was there, it was one hell of a Christmas present, " Rottmann said.

It would take another year, however, to piece together the data into an image.

"To be absolutely sure, we did the work four times with four different teams, " said Gueth.

Each team came up with exactly the same spectacular, history-making picture of a dark circle encased in a flaming-red halo.

<https://timesofindia.indiatimes.com/home/science/astronomers-unveil-first-photo-of-a-black-hole/articleshow/68816823.cms>