

### NEWSPAPER HIGHLIGHT

Scientists from the Event Horizon Telescope (EHT) facility, at several centres around the world, revealed the first image of the black hole at the centre of the Milky Way. The image of Sagittarius A\* (SgrA\*) gave further support to the idea that the compact object at the centre of our galaxy is indeed a black hole, strengthening Einstein's general theory of relativity. In 2019, the Event Horizon Telescope facility, a collaboration of over 300 researchers, made history by releasing the first ever image of a black hole, M87\* — the black hole at the centre of a galaxy Messier 87, which is a supergiant elliptic galaxy.

The 12th meeting of Interpol's Match Fixing Task Force (IMFTF), in which the Central Bureau of Investigation was one of the participants, with a call for harmonised global efforts to curb competition manipulation. The participants discussed the emerging uses of technology, big data and social media given that criminal syndicates were increasingly operating across betting and sports markets.

Marital rape is still not criminalised in 34 countries. India is among them, as the Delhi High Court's split verdict on the issue, failed to strike down the alleged discriminatory clause under Section 375 of the Indian Penal Code. According to the National Family Health Survey 5, 32% of ever married Indian women have experienced spousal physical, sexual, or emotional violence. The UN Women report revealed that most countries where marital rape was not criminalised were developing nations.

13 digital health solutions successfully added to the Ayushman Bharat Digital Mission (ABDM) in the last three months, according to the National Health Authority (NHA). This takes the tally of ABDM integrated service applications to 40 since the national launch was announced on September 27, 2021. The ABDM scheme aims to develop the backbone necessary to support the integrated digital health infrastructure of India and bridge the existing gap in the healthcare ecosystem through digital highways.

75 number of Indian villages to be shaped with Israeli cooperation to mark India's 75th Independence

### TOMATO FLU

1. Tamil Nadu has ramped up surveillance at its borders in the wake of "tomato flu" cases being detected in Kerala. Tomato flu or fever is a viral disease. The flu gets its name because of the red blister it causes. The fever is affecting children below the age of five.

2. Symptoms include red rashes, skin irritation and dehydration. It also includes tiredness, joint pain, stomach cramps, nausea, vomiting, diarrhoea, coughing, sneezing, runny nose, high fever, and body ache. In some cases, it may also change the colour of the legs and the hands. Spread - Like other cases of flu, tomato fever is also contagious.

3. If someone is infected with this flu, they need to be kept in isolation as this could spread rapidly from one person to another. It is essential to prevent children from scratching the blisters caused by the flu. Proper rest and hygiene is also advised.

4. **Treatment - Tomato flu is a self-limiting one and there is no specific drug for this. This means that the symptoms will resolve overtime on their own if supportive care is given.** Fluid intake would also help counteract dehydration.

### CONJUGAL RIGHTS

1. Story behind - The Delhi High Court has declined to strike down the marital rape exception. It said that the Centre's concern on criminalising marital rape may destabilise the institution of marriage is a "legitimate". Criminalising marital rape may require spouses to draw up a detailed agreement before sex or invite a third party to act as witnesses.

2. Not a rape, but an abuse - The Court concluded that forced sexual intercourse between a husband and wife cannot be treated as rape. At worst, it can be treated as sexual abuse as is clear upon perusal of the definition of 'cruelty' found in Section 3 of the Protection of Women from Domestic Violence (DV) Act, 2005. The Section 3 of the DV Act, 2005 provides a definition for domestic violence, which includes physical, sexual, verbal and emotional abuse.

3. Conjugal Rights - These are the rights, especially to sexual relations, regarded as exercisable in law by each partner in a marriage. The Section 9 of the Hindu Marriage Act, 1955 provides for restitution of conjugal rights. It says that if either the husband or the wife, without reasonable excuses, withdraws from the society of the other, the aggrieved party may approach the Court for restitution of conjugal rights.

4. Remedy is available to both spouses and denial of sex by either spouse is construed as cruelty and, thus, is available as a ground for divorce. Referring to sado masochistic sex, the Court said that the signs of injury on a partner need not necessarily mean there has been non-consensual sex as 'in the age of sexual liberation' injuries could be a sign of 'passion'.

5. Conjugal Expectation - In a marriage, the conjugal expectation is a 2-way street, where consent is given as a part of spousal intimacy although the will to engage may be absent. If every such case was treated as marital rape, then the only way partners in a marriage may survive would be By drawing up a detailed written agreement and the steps to be observed for courtship or mating or, By creating a detailed evidentiary record of every act of intimacy and/or By inviting a third party to act as a witness - none of which is healthy for the survival of the institution of marriage.

### MAGNETIC REVERSALS

1. A new study says that a rare outburst from the 1ES 1927+654 galaxy over 236 million light-years away could have been caused by a spontaneous flip of the magnetic field surrounding its central black hole. Big galaxies often host supermassive black holes at their centre. When matter falls towards these black holes, it collects into a vast flattened structure called the accretion disk.

2. **The material slowly spirals inwards, heats up and emits visible, UV and lower-energy X-ray light. A cloud of**

anniversary, according to Union Agriculture Minister Narendra Singh Tomar. The Minister added that the step was taking the Indo-Israel cooperation to the “next level” in the field of agriculture. Mr. Tomar, who was in Israel on a fourday official visit from May 8, met with his Israeli counterpart, Oded Forer and discussed issues related to modern agro-techniques and transfer of knowledge in agriculture.

Sri Lankan President Gotabaya Rajapaksa appointed former Prime Minister Ranil Wickremesinghe as Premier, to restore stability in the island nation amid a political impasse and stifling economic crisis.

Finland’s leaders came out in favour of applying to join NATO, and Sweden could do the same within days, in a historic realignment on the continent two and a half months after the Russian President’s invasion of Ukraine. The Kremlin reacted by warning it will be forced to take retaliatory “military technical” steps.

The UN Human Rights Council will decide whether to launch an investigation into alleged abuses by Russian troops in the Kyiv area that Ukraine says amount to war crimes. A resolution brought by Ukraine and supported by more than 50 other countries would mandate a newly - formed Commission of Inquiry to investigate events in the regions around Kyiv that were temporarily held by Russian troops. It would prepare a report by early next year.

The Health Ministry may launch medical facilitation centres at Indian embassies around the world for people wishing to travel to India for treatment. Health Minister Mansukh Mandaviya announced this as part of building Brand India, at a roundtable conference with senior IFS officers.

In an important verdict safeguarding the interest of woman victims of domestic violence, the Supreme Court gave a wide interpretation to the term ‘right to reside in a shared household’ under the law, holding it cannot be restricted to only actual matrimonial residence, but can be extended to other homes irrespective of the right over the property.

India’s food production could drop 16% and the number of those at risk for hunger could increase 23% by 2030 due to climate change, says a report by the International Food Policy Research Institute (IFPRI) on climate change and food systems. These projections are part of a model that was used to evaluate the

**extremely hot particles near the black hole, called the corona, produces higher-energy X-rays.** The brightness of these emissions from the black hole depends on how much material streams towards it. Magnetic reversal is where the North Pole becomes South and vice versa.

3.The field initially weakens, leading to greater heating and brightening in visible and UV light. As the reversal happens, the magnetic field becomes weak at the outskirts of the accretion disk. It becomes so weak that the black hole can no longer support the corona, leading to the X-ray emissions vanishing. Slowly, the magnetic field begins strengthening in its new orientation.

4.Commonality - Magnetic reversals are common events in the universe as geological records show that the Earth’s field flips unpredictable, reversing a few times every million years in the recent past. The Sun undergoes a magnetic reversal much more often as part of its normal cycle of activity. It switches its north and south poles roughly every 11 years.

5.Magnetic Excursion Sometimes, rather than a reversal, the magnetic field may only undergo an ‘excursion’. Here, it suffers a large decrease in its overall strength, that is, the force that moves the compass needle. During an excursion the field does not reverse, but later regenerates itself with the same polarity, that is, North remains North and South remains South.

### BLACK WIDOW BINARY

1.Astronomers have spotted a “black widow binary”, which has the shortest orbital period yet identified. Black widow binary is a unique system that consists of a pulsar (rapidly spinning neutron star) that is circling and slowly consuming a smaller companion star. The system derives its name from the “black widow” spiders, in which the female eats the male after mating. Named ZTF J1406+1222, the newly discovered black widow binary in a wide hierarchical triple has a 62-minute orbital period.

2.The system has a pulsar and a companion star that circle each other every 62 minutes. It seems to host a third far-flung star that orbits the other two every 10,000 years. This could possibly be a ‘triple black widow’. Theory on triple black widow - A “triple black widow” system is a pair of stars that rapidly circle each other before one is consumed by the other. Just like with most black widow binaries, the triple system likely arose from a dense constellation of old stars known as a globular cluster.

3.The particular cluster from which this system formed may have drifted towards the supermassive black hole at the centre of the Milky Way. The gravity of this central black hole must have been enough to pull the cluster apart while leaving the triple black widow intact. This system has probably been floating around in the Milky Way for longer than the sun has been around.

4.**Discovery - Every black widow binary discovered to date was detected due to the gamma and X-ray flashes from the pulsar. But for this system, the optical flashing of the companion star was used.** This was possible because the companion star’s dayside (the side always facing the pulsar) can be many times hotter than the night side due to the radiation it receives from the pulsar. A star whose brightness was changing periodically by a huge amount, it would be a strong signal that it was a binary with a pulsar.

### NATIONAL TECHNOLOGY DAY

1.Since 1999, May 11 is celebrated as National Technology Day to mark India’s technological advancements. The theme of Year 2022 is: “Integrated Approach in Science and Technology for a Sustainable Future”.

2.**Significance of the day: On May 11, 1998, India detonated three nuclear bombs in the Indian Army’s Pokhran Test Range. Dr APJ Abdul Kalam lead the Indian team of scientists to successfully test-fire the Shakti-1 nuclear missile at Rajasthan’s Pokhran test range.** Two days later, the country successfully tested two more nuclear weapons as a part of the same Pokhran-II/Operation Shakti initiative.

3.After these tests Prime Minister Atal Bihari Vajpayee declared India a nuclear state, making it the sixth country to join the ‘nuclear club’ of nations. Hansa 3, India’s first indigenous aircraft was first tested on the same day in 1998 in Bangalore. Successful test firing of Trishul, a short range missile made in India, was also done on the same day.

4.Technology Development Board India: On the occasion of National Technology day, TDB hosts scientific-technology based

**impact of climate change on aggregate food production, food consumption (kilocalories per person per day), net trade of major food commodity groups, and the population at risk of going hungry. IMPACT, as the model is called, simulates national and international agricultural markets.**

**A week after the government denied the World Health Organisation's figures for deaths in India linked to COVID-19, Prime Minister Narendra Modi called for a reform of the UN health body, and a review of its processes on vaccine approvals. The Prime Minister was speaking at the second global COVID-19 summit co-hosted by the United States.**

webinars and felicitate individuals for excellent works in the field of Science and Technology every year.

**5.**Established in 1996, TDB is a statutory body that works under the Department of Science and Technology, GOI. It also provides financial assistance for concerns of Indian industries and other agencies for commercialization of indigenized technologies or adoption of imported technologies for wider domestic applications.