

## Centre releases Rs. 73 crore for Ramappa Temple development

Hyderabad: As part of the effort to develop Ramappa Temple, also known as Rudreshwara Temple, situated in Palampet village of Mulugu district, as a prominent tourist destination, the centre on Sunday released Rs. 73 crore. The union Tourism Ministry issued a GO in this regard. The temple will be developed under the Special Assistance to States for Capital Investment (SASKI) scheme. The SASKI is a programme that provides long-term, interest-free loans to States for developing tourist centers. The scheme aims to promote sustainable tourism projects, create employment opportunities, grow the local economy, and brand and market tourist centers globally. The 13th century Ramappa temple was inscribed as a UNESCO World Heritage Site in November, 2021. Recently, union Tourism Minister Gajendra Singh Sekhawat announced that the Centre approved 40 projects across 23 States under the Special

Assistance to States/Union Territories for Capital Investment (SASCI) scheme, to develop iconic tourist centres to global standards. Two of them are in Telangana. Interest-free loans for a period of 50 years are provided under the scheme.

The Telangana Tourism Development Corporation has already introduced a Hyderabad-Warangal-Ramappa Temple tour package every Saturday and Sunday to popularise the temple. Ramappa Temple which dates back to 1213 AD, was built by the patronage of the Kakatiya ruler Kakati Ganapathi Deva under the authority of his Chief Commander Rudra Samani at the place known as Ranakude in the Atakuru province. The Ramappa temple finds its hold on a 6 feet high platform on a cruciform plan. The temple's chamber is crowned with a shikharam and is surrounded by pradakshina patha. At the entrance of the temple, one can find a Nandi mandapam.



## Unruly crowds, unsafe streets: Why are Hyderabad's upscale areas turning into hotbeds of public hostility?



Hyderabad: The city of Hyderabad has time and again received praise from its visitors, locals, and settlers who have made it their home for being warm and welcoming in nature. The easy-going nature of the people here has prompted many to choose the city over other metropolitan cities in the country. However, there has been a spurt in grievances and complaints on platforms like Reddit, Facebook, and X (formerly Twitter), indicating a hostile environment being created in parts of the city.

Of late, people, including locals and settlers—mostly those living in the upscale areas of Hyderabad, like Jubilee Hills, Banjara Hills, Gachibowli, Kondapur, the IT Corridor, and parts of Madhapur—have been complaining about boisterous crowds pick-

ing arguments and getting into fights with them over petty issues in public spaces. Spats over parking, uncouth and unruly behavior towards women, name-calling, lewd gestures, dangerous driving that obstructs other vehicles, and performing hazardous stunts on busy roads have been some of the issues netizens have repeatedly complained about. In most cases, it has been observed that the people sharing their ordeals have mentioned calling the police for help or informing them about these situations but not receiving any assistance. It is rather surprising to see the police not taking any action to curb this menace, often caused by youths from other parts of the city who come to these areas for supposed recreational purposes. In one such post, a Reddit user

named Blackbeard10 shared his experience from a couple of months ago on DLF Road in Gachibowli, where a group of 3-4 people picked a fight with him after hitting and damaging his stationary car while some of the occupants were trying to get out of it. In the post, the user also mentioned calling the police on Dial 100 and not receiving any assistance, despite the closest police station being within half a kilometre away. While some comments under the post pointed out the failure of law and order in the city, others suggested that youths from other localities loitering around these areas have too much time on their hands and thus end up creating a ruckus. In a similar post, another Reddit user, who claims to be a local, opened up

about his partner from the North being eve-teased in the Raidurg area on several occasions. In his post, he mentioned how men made lewd gestures at her and spoke indecently to her. Given the alarming trend of people sharing their nightmarish experiences, one is forced to question their safety in Hyderabad. The sense of worry is even greater for women, considering the inaction of the city police in curbing the anti-social behavior of individuals. These incidents have occurred more often than one could imagine, and the people in our close circles—especially women—may have been victims. With far more than just the city's reputation at stake, it is now time to ask ourselves: "Is this city safe for its people?"

## NMC directs govt, pvt medical colleges to strengthen anti-ragging measures

Hyderabad: In a strongly worded letter to all government and private medical colleges, the National Medical Commission (NMC) directed the college managements to strengthen anti-ragging measures to curb instances of young doctors becoming victims of ragging.

Despite clear regulations, lapses in compliance have been observed in medical colleges across the country. The lapses include inadequate monitoring mechanisms, absence of anti-ragging squads, failure to submit annual anti-ragging reports and insufficient steps to eradicate ragging effectively, NMC on Monday said. Such non-compliance

undermines the regulatory framework and poses risk to the safety of young doctors and institutional integrity. "NMC strongly urges all medical colleges and institutions to implement robust anti-ragging mechanisms as outlined in the Regulations, 2021. Constitute and activate Anti-Ragging Squads to monitor and identify ragging activities. Ensure widespread awareness among faculty, staff, and students about anti-ragging policies. Submit annual anti-ragging reports in a timely manner. Establish a safe and conducive learning environment, free from any form of harassment," the NMC in its directives released on Monday said.

# Hand-held 'electric labs' can rapidly identify pathogens

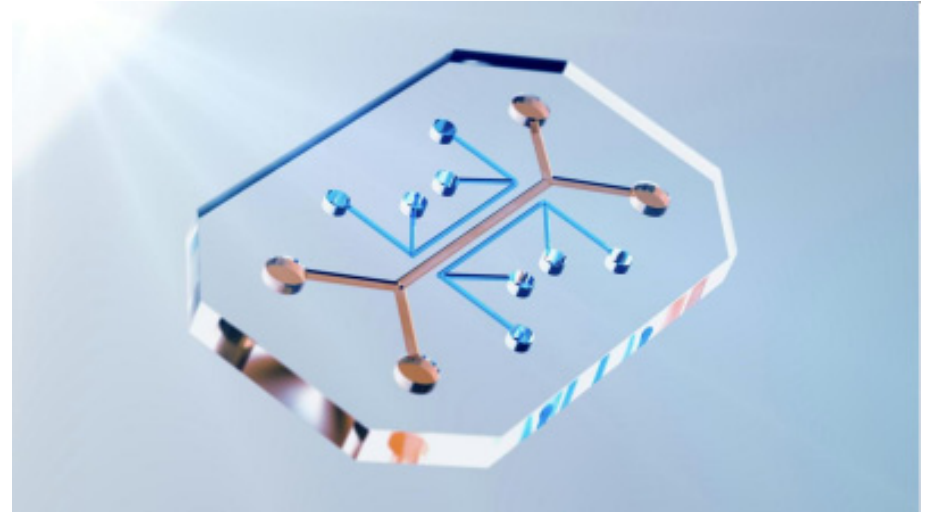
When you think of electric fields, you likely think of electricity – the stuff that makes modern life possible by powering everything from household appliances to cellphones. Researchers have been studying the principles of electricity since the 1600s. Benjamin Franklin, famous for his kite experiment, demonstrated that lightning was indeed electrical. Electricity has also enabled major advances in biology. A technique called electrophoresis allows scientists to analyse the molecules of life – DNA and proteins – by separating them by their electrical charge. Electrophoresis is not only commonly taught in high school biology, but it's also a workhorse of many clinical and research laboratories, including mine. I am a biomedical engineering professor who works with miniaturised electrophoretic systems. Together, my students and I develop portable versions of these devices that rapidly detect pathogens and help researchers fight against them.

What is electrophoresis?

Researchers discovered electrophoresis in the 19th century by applying an electric voltage to clay particles and observing how they migrated through a layer of sand. After further advances during the 20th century, electrophoresis became standard in laboratories. To understand how electrophoresis works, we first need to explain electric fields. These are invisible forces that electrically charged particles, such as protons and electrons, exert on each other. A particle with a positive electrical charge, for example, would be attracted toward a particle with a negative charge. The law of "opposites attract" applies here. Molecules can also have a charge; whether it's more positive or negative depends on the types of atoms that make it up. In electrophoresis, an electric field is generated between two electrodes connected to a power supply. One electrode has a positive charge and the other has a negative charge. They are positioned on opposite sides of a container filled with water and a little bit of salt, which can conduct electricity. When charged molecules such as DNA and proteins are present in the water, the electrodes create a force field between them that pushes the charged particles toward the oppositely charged electrode. This process is called electrophoretic migration. Researchers like electrophoresis because it is fast and flexible. Electrophoresis can help analyse distinct types of particles, from molecules to microbes. Further, electrophoresis can be carried out with materials such as paper, gels and thin tubes. In 1972, physicist Stanislav Dukhin and his colleagues observed another type of electrophoretic migration called nonlinear electrophoresis that could separate particles not only by their electrical charge but also by their size and shape. Electric fields and pathogens. Further advancements in electrophoresis have made it a useful tool to fight pathogens. In particular, the microfluidics revolution made possible the tiny laboratories that allow researchers to rapidly detect pathogens.

In 1999, researchers found that these tiny electrophoresis systems could also separate intact pathogens by differences in their electrical charge. They placed a mixture of several types of bacteria in a very thin

glass capillary that was then exposed to an electric field. Some bacteria exited the device faster than others due to their distinct electrical charges, making it possible to separate the microbes by type. Measuring their migration speeds allowed scientists to identify each species of bacteria present in the sample through a process that took less than 20 minutes. Microfluidics improved this process even further. Microfluidic devices are small enough to fit in the palm of your hand. Their miniature size allows them to perform analyses much faster than conventional laboratory equipment because particles don't need to travel that far through the device to be analysed. This means the molecules or pathogens researchers are looking for are more easily detected and less likely to be lost during analysis. For example, samples analysed using conventional electrophoresis systems would need to travel through capillary tubes that are about 11 to 31 inches (30 to 80 centimeters) long. These can take 40 to 50 minutes to process and are not portable. In comparison, samples analysed with tiny electrophoresis systems migrate through microchannels that are only 0.4 to 2 inches (1 to 5 centimeters) long. This translates to small, portable devices with analysis times of about two to three minutes. Nonlinear electrophoresis has enabled more powerful devices by allowing researchers to separate and detect pathogens by their size and shape.



My lab colleagues and I showed that combining nonlinear electrophoresis with microfluidics can not only separate distinct types of bacterial cells but also live and dead bacterial cells.

Tiny electrophoresis systems in medicine. Microfluidic electrophoresis has the potential to be useful across industries. Primarily, these small systems can replace conventional analysis methods with faster results, greater convenience and lower cost. For example, when testing the efficacy

of antibiotics, these tiny devices could help researchers quickly tell whether pathogens are dead after treatment. It could also help doctors decide which drug is most appropriate for a patient by quickly distinguishing between normal bacteria and antibiotic-resistant bacteria. My lab is also working on developing microelectrophoresis systems for purifying bacteriophage viruses that can be used to treat bacterial infections. With further development, the power of electric fields and microfluidics can speed up how researchers detect and fight pathogens.

## Demystifying climate benefits of EV transition in India

Battery-driven electric vehicles (EVs) hold promise for decarbonising India's rapidly growing road transport sector. However, achieving significant emission reductions through widespread EV uptake is not a given. It hinges on the energy performance of EVs and cross-sector linkages, especially to the power sector. This paper examines the complexities of the climate impact of the transition to electric drivetrains based on a data-driven analysis that best reflects the real-world use of EVs. It offers actionable insights that call for interventions spanning policy to implementation levels to maximise the climate benefits of India's EV revolution. India's economic progress is intricately linked to the expansion of its road transport network. This sector, while vital, is a significant contributor to the nation's greenhouse gas (GHG) emissions and deteriorating air quality. EVs, heralded globally as a cornerstone of green transportation, offer a compelling solution to mitigate these environmental challenges. However, in a country where fossil fuels still dominate electricity generation, transitioning from petroleum to electrons in powering the vehicles does not automatically result in substantial emission reductions. This paper provides an in-depth analysis of the factors influencing the actual climate benefits of EV adoption in India. It moves beyond simplistic comparison of individual vehicle models and assumption of constant electricity supply mix across the country to examine the broader EV and energy landscape, considering:

By dissecting these linkages, the paper aims to provide policymakers, implement-

ing agencies, industry leaders, and investors with the insights needed to make informed decisions and unlock the full decarbonisation potential of electric mobility in India. Numerous studies have attempted to quantify the emission reduction potential of EVs. However, many rely on simplified methodologies that can misrepresent the true climate impact. These approaches often fall short in several critical aspects: Cherry-picking models for comparison: Focusing on comparisons between select EV and conventional vehicle models fails to capture the wide range of energy efficiencies that exist within vehicle segments. This can lead to misleading generalisations about the overall impact of EV adoption. Overlooking the dynamics of the grid electricity supply: Assuming a static national average grid electricity carbon dioxide (CO<sub>2</sub>) emission factor disregards the fluctuating nature of India's electricity supply mix. The share of RE, particularly solar and wind, varies significantly throughout the day, influencing the emissions associated with EV charging at different times. Ignoring variable charging patterns: EV charging is not a constant load. Factors like vehicle use-case, travel characteristics, and the availability of charging infrastructure influence when and where EVs are charged. Owing to the varying charging pattern, EVs may avoid GHG emissions significantly, deliver limited climate dividends, or even consume more carbon space depending on their charging alignment with periods of high RE availability. Analysis of a comprehensive dataset of vehicle models available in the

Indian market confirms the inherent efficiency advantage of EVs across nine distinct segments, including two-wheeled and three-wheeled vehicles, passenger cars, and buses. On average, EVs consistently demonstrate end-use energy consumption levels at least three times lower than their conventional counterparts. Moreover, advancements in battery technology and power electronics promise further improvements in EV efficiency, widening the gap in the years to come. When factoring in the annual average carbon emission factor of India's grid electricity at present, the emissions advantage of EVs diminishes. While still generally cleaner than internal combustion engine vehicles, their emissions are directly tied to the proportion of fossil fuels used for power generation. This highlights the critical need to accelerate the decarbonisation of the electricity grid to fully realise the emission reduction potential of EVs.

This study underscores the profound impact of aligning EV charging with periods of high RE supply on the grid. Charging during evening or over-night hours, characterised by increased reliance on coal-fired power plants, leads to significantly higher emissions compared to charging during the daytime when sunshine brings down the carbon load of grid electricity. The findings demonstrate that choosing the right time to charge can significantly alter the emissions profile of an EV. Charging during the day can avoid nearly 10% higher CO<sub>2</sub> emissions compared to charging during the evening.

# Canon India launches 10 new advanced printers for modern offices, providing users with excellent print speed, enhanced productivity and versatile connectivity

Hyderabad: Building on its legacy of innovation, Canon India, one of the leading digital imaging companies, today unveiled a new range of 10 printers across its PIXMA MegaTank and imageCLASS series. Designed to cater to diverse user needs for small and medium businesses (SMBs) small office/home office (SOHO), and enterprises, these printers are engineered to deliver exceptional print quality, enhanced productivity, and provide cost-effective solutions. For home and SOHO consumers: PIXMA G4780, PIXMA G3780 Canon's new PIXMA G3780 and G4780 printers, part of the refillable MegaTank series, are equipped with an automatic duplex printing feature designed to boost productivity for home offices and small businesses. This feature significantly reduces the time required for printing large volumes of documents. Additionally, the MegaTank G4780 includes an auto document feeder, enabling quick digitization of documents, making it an excellent choice for small enterprises with archival needs. For SMB and Enterprise customers: imageCLASS LBP171dn, LBP172dw, LBP811cx, LBP468x, LBP732cx, MF284dw, MF286dn, MF289dw

Specially designed to meet the needs of small offices and workgroups in large enterprises, the all-new imageCLASS laser printer lineup includes two monochrome printers – the imageCLASS LBP171dn and LBP172dw, three monochrome multifunction laser printers – the imageCLASS MF284dw (Print, Scan, Copy), MF286dn, and MF289dw (Print, Scan, Copy, Fax), as well as two A3 printers- color imageCLASS LBP811cx and the monochrome LBP468x and one high-end color single-function A4 printer- LBP732cx. With an impressive minimum print speed of 33 ppm, the printers are also designed with efficiency and eco-friendliness in mind through features such as duplex printing and On-Demand Fixing technology. Sharing his thoughts on the latest lineup, Mr. Toshiaki Nomura, President & CEO, Canon India said, "The shift towards hybrid work models has created a need for advanced, cost-efficient, and sustainable printing solutions. Fulfilling these demands, we are excited to introduce a new lineup of 10 state-of-the-art printers that combine higher print yields, robust security, and enhanced maintenance control—all powered by cutting-edge technology. These innovations not only simplify operations for users but also promote responsible printing practices, aligning with our commitment to sustainability. With this launch, we aim to empower businesses and individuals with tools that drive efficiency and value in the evolving work landscape." Speaking about the new lineup, Mr. C Sukumaran, Senior Director, Product & Communication at Canon India, said, "At Canon India, we are driven by a strong commitment to innovation and quality, to which our new line-up of printers stands as a testament. Adapting to today's hybrid and digital work environments across SOHOs, SMEs and enterprises, the new printers, are designed to streamline workflows and maximize ROI. In line with our sustainability goals, we have integrated features like automatic two-sided printing, low power consumption,



and high-yield consumables to reduce waste and lower operating costs. Additionally, these printers come equipped with robust data security and encryption,

addressing the increasing need for secure, scalable solutions in both small businesses and large enterprises. With this launch, we aim to redefine the future of printing by pro-

viding cutting-edge, efficient, and sustainable solutions that meet the evolving needs of businesses, while promoting responsible printing practices."

## "Youth must question corruption."



Kurnool: World Anti-Corruption Day was celebrated today under the aegis of Youth for Anti-Corruption (YAC) at Chand Vocational College in Kurnool. The event was graced by Chief Guest DSP Mahaboob Basha, Special Police, Kurnool, who addressed the gathering. He emphasized the role of youth in eradicating corruption, urging them to cultivate a questioning attitude

and drive systemic change.

Later, Rayalaseema Advisor K. Venugopal lauded the initiatives of YAC, stating that they are commendable and working towards bringing change in society. Following this, students and YAC Rayalaseema President B. Narayana inaugurated the Anti-Corruption Walk. The participants raised slogans against corruption and organized a

massive rally through Kurnool town. The program witnessed the active participation of YAC Advisor K. Venugopal, YAC Rayalaseema President B. Narayana, Kurnool District Secretary Vidya Pogu Sunkanna, Nandyal District Secretary Bollu Prasad, Dhone President Chandra, Kurnool YAC members Ismail, Ramanjaneyulu, Bennamma, and a large number of students.

# Gamepoint Telangana State Squash Championship 2024 winners Aryaa Dwivedi and Karan Vashisht

Hyderabad: The Gamepoint Telangana State Squash Championship 2024, held at the Gamepoint Hitec Arena from December 6-8, concluded on a high note, showcasing exceptional talent and thrilling matches. With 90 participants competing across eight categories, the championship reaffirmed its reputation as one of the most prestigious squash tournaments in the state. \*Organized by the Telangana Squash Rackets Association in collaboration with Gamepoint,\* the three-day event witnessed strong competition from players across the state. Junior players, including promising talents in the Boys U-13 and Girls U-15 categories, impressed the audience with their skill and determination. The men's and women's categories featured intense matches, with top players displaying exceptional athleticism. The event also celebrated inclusivity with competitive categories for men over 35, 40, and 45, encouraging veteran players to showcase their prowess. Speaking at the closing ceremony, \*Aditya Reddy, Chairman of the Gamepoint Telangana Squash Championship\*, said, "This year's tournament has been remarkable, with participants raising the bar of competition in every match. We are proud to provide a platform for squash players in Telangana to shine and grow, and we look forward to seeing these talented athletes achieve greater heights." The championship culminated with the finals on December 8, followed by an awards ceremony honoring the winners in each category.

\*Grand finale Results\*

\*Boys Under 13 (BU13)\*

Winner: Thanuj Reddy Puli



Runner-Up: Prabhaas Kondaparthi

\*Girls Under 15 (GU15)\*

Winner: Arnaa Dwivedi

Runner-Up: Dhriti Ganji

\*Boys Under 17 (BU17)\*

Winner: Rajveer Grover

Runner-Up: Rohan Arigala

\*Men's Category\*

Winner: Karan Vashisht

Runner-Up: Ranveer Grover

\*Women's Category\*

Winner: Arya Dwivedi

Runner-Up: Saanvi Shree

\*Men's Over 35 (MO35)\*

Winner: Survesh Chauhan

Runner-Up: Soli Colah

\*Men's Over 40 (MO40)\*

Winner: Priyatosh Dubey

Runner-Up: Mayank Malhan

\*Men's Over 45 (MO45)\*

Winner: Bharath Danam

Runner-Up: Ram Battula

The event provided not only a stage for budding squash talent but also a testament to Gamepoint's commitment to nurturing the sport in Telangana.

The prizes were presented by Mr. Babu Rao, President of the Telangana Boxing Association, and Mr. Srisailam, Vice President of the Telangana Squash Racquet Association, esteemed leaders in their respective sports domains.

## Why Sidhu's diet plan for wife with cancer garnered criticism

Apple cider, neem leaves, turmeric, lemon water were some of the things that Sidhu said on a television show recently that he claimed his wife added to her daily diet besides staying off 'cancer-feeding' foods such as sugar and dairy, which helped her in successfully fighting a metastatic breast cancer. The medical world was aghast thinking about the repercussions of such claims being made by a celebrity who has the power to influence his large fan following. Doctors of modern medicine think this might lead to cancer patients not going for evidence-based treatment, and instead explore options with no or limited scientific basis.

Statements after statements followed in quick succession from across the country highlighting the danger that following such a practice would pose. Close to 300 doctors—past and present—from Mumbai's Tata Memorial Hospital, which is a prominent hospital in India offering cancer treatment, issued a statement that essentially read, "...parts of the video imply that starving the cancer by not eating dairy products and sugar, consuming haldi (turmeric), and neem helped cure her 'incurable' cancer. These statements have no high quality evidence to support them. While research is

ongoing for some of these products, there is no clinical data currently to recommend their use as anti-cancer agents..." They urged the public to not delay their treatment by following unproven remedies. "Rather to consult a doctor, preferably a cancer specialist, if they have any symptoms of cancer. Cancer is curable if detected early and proven treatments for cancer include surgery, radiation therapy, and chemotherapy." Hepatologist, Dr Cyriac Abby Philips, put out a message on X through his handle—@theliverdr—"It is criminal to impose intermittent fasting or any fasting diets on cancer patients. It literally robs them of the nutrition they require for recovery, tolerate cancer meds and prevent infections looking to kill them. Just stop with this starving the cancer cells nonsense." He also through a series of texts on the micro-blogging site, rubbished the claims made by Sidhu about how the diet helped his wife get cured. Like others, he also endorsed the prominent role of surgery, chemo, and radiation in his wife's cancer remission. Days later, Sidhu put out an elaborate diet plan that his wife followed, and also held a press conference to address the criticism he met with where he also mentioned that surgery, chemo, and targeted therapy was part of the



treatment plan. "This war against cancer involved surgeries, chemotherapy, hormonal and targeted therapy, a strict diet plan and determination to fight cancer, together they worked as immunotherapy..." he said. As expected, the diet plan got reactions. Philip's post read, "...This has nothing to do with how a stage 4 metastatic breast cancer went into

remission... The diet plan is mostly a mish-mash of the great Indian kitchen featuring a lot of whole plants, stems, roots and leaves and potentially organ toxic herbs and blood thinning spices... People die not from cancer most times, but from the malnutrition and infections because of lack of high protein and adequate caloric diet.

# Trauma rewires the brain: what does the healing process look like?

Trauma changes the brain. It has impacts across cognition, thinking and problem solving, emotional regulation, memory formation and engagement in relationships. Is trauma the event, or how it is experienced by a person? Why do people react differently to traumatic events, and why do traumatised people react differently in various situations? How can trauma be treated, and how should the person who first hears the story react? Peter Choate, professor of social work at Mount Royal University in Canada, in an interview with Zubeda Hamid, demystifies the complex neurobiology of trauma.

What is the international understanding of trauma?

Is there a consensus around the world about trauma? I'm not sure there is. One area there probably would be consensus about is mass trauma that occurs in the world. For example, what's taking place between Israel and Hamas: the idea of what happens to the children on both sides of the conflict. So today, there's 144 wars taking place in the world. What is the story for the child? That's a trauma that we can easily find international agreement about. Then we come to the trauma of assault. That which occurs individually. And we can think of that as an event. So when we think of things that happen physiologically or directly in front of the child, we can probably get a common acceptance of trauma. Then we start to get into the more nuanced understandings of trauma. Is a divorce a trauma? It could be, as the child's structural understanding of the safety of family is gone. And as you get more nuanced, you start to have difficulties with agreement. Is a child who's been exposed to domestic violence between a mother and a father traumatised? I would argue the answer is yes. What happens with a child who discovers that their father was killed, in war, in another part of the world. Is the profound grief and loss that comes with having lost a father in that circumstance – is that trauma? And we're in that nuanced area where: what is the meaning of the loss to the child? And I think that's debatable territory: as to whether it is trauma or complex grief. I would suggest that when you lose somebody in a way that you can't quite make sense of, then you're into ambiguous grief. And so, I think, thus trauma and grief exist on a continuum. The other piece that is very important is what meaning does the person give to the event? [With some people who've been raped] the most common experience I have seen has been associated with: this is traumatic. I've been violated, I've been raped. But I've also met some who've had significant familial and social support, who have said this was an awful event in my life, but it is not my life story, it doesn't define me. And so they don't frame it as trauma whereas another [person], [who had] a similar event but lacking in those support systems and those resilient skills said this was life changing, and my identity is forever that of a victim. So the other piece that comes with it is how internally has the person come to understand it? Let's talk about the trauma of assault, something that occurs as an individual event

Think of a child, who has a trusted grandfather. And that grandfather has become central to how they have come to understand life. And their grandfather sexually

abuses them. The child then has this central character in their life who now both changes who they are but changes how they can understand the relationship.

How does this trauma play out in your body? What does it do to your brain, and to you physiologically?

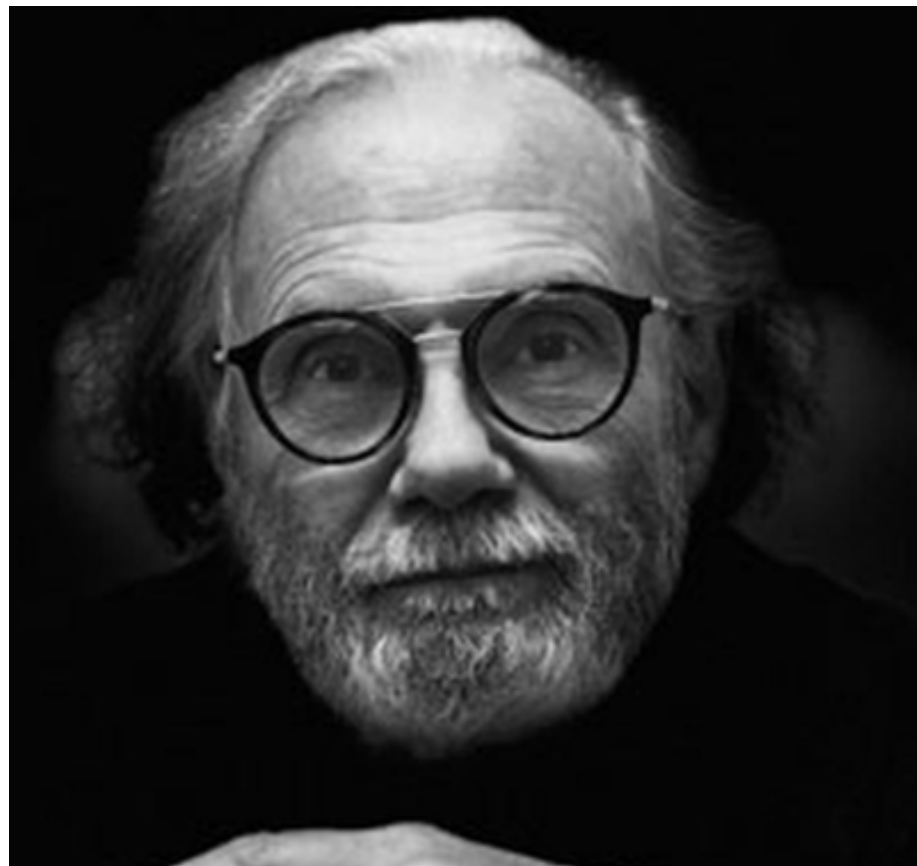
I'm going to do something very simple. I happened to have a little packet of something. I'm going to hand you this quickly. Did you notice how you reacted? Your brain said there's something coming at you that you should be cautious of. You should move back. And you should also put your hand up. Your brain did a very complicated series of things and you had no conscious awareness that your brain did all of that. And the wiring in your brain said: protect yourself. That's an example of how brain development protects us. We're born with way more neuronal pathways than we keep as we move on. But what if trauma is part of that neural development from the very beginning? So the brain is wired to perceive risk as dominantly occurring. If you were raised with insecurity, lack of safety, that's what your brain builds and your brain then starts to interpret the world from that risk perspective. Now, you've been safe [for a while] and then you're no longer safe and you've developed such a shift that your brain now wires to risk. And so your brain is now wired [for] certain signals that tell you this is not safe. So we think of a woman or a child who's raped. And there was a particular tone of voice or a particular touch that's now wired in the head. Traumatic events rewire the brain. We can't de-wire the brain. What we can do is, therapeutically, we can help people to become aware of those triggers and learn to respond differently.

How does the fight, flight, freeze reaction work?

If you watch children who have been traumatised, you can see how some of them get aggressive and you can see how some are trying to get away. But then you'll watch children who just freeze. 'Freeze' is one of the responses to danger. And you will have seen [stories of children not fighting back]. They don't run away. They're frozen. This happens to adults too. Logically, the child will be able to say to you, I should have fought or run away.

How much is the freeze response understood? Is it something that can lead to victim blaming?

Yes, I think that can happen. Not necessarily, but it can. It's hard for people to understand – you're in that situation where you're in danger and you didn't fight back. Why didn't you fight back? But I was so overcome with the fear, I didn't know what to do, so I didn't do anything. We frame this like the child is going through some kind of a conscious decision here. But it's not conscious. Is there a difference between this happening with, say, a member of the family versus a stranger? How does it work? It could be both. The event wires the brain. But then we also incorporate it into our understanding. But we also incorporate resilience in. So do I understand the event as something that I am capable of living with, sadly or not? Or do I incorporate it as something that "traumatises me". Now we begin to take the approach of: how do I come to understand what has gone



on to me and how do I frame it in my life? What is my story of that event?

Can that resilience only come with external supportive assistance?

No, interestingly enough, it can also come from an internal understanding. Here's how the internal understanding works: somehow in my life, I have come to understand from my role models, my family, my parents that bad things will happen in life, but bad things can be things can happen to everybody, and we all experience them and we learn to get over them. We learn to live with them because we can frame it as: this happens to everybody in some way or another. And everybody is capable of living with both joy and sadness simultaneously. And I'm in charge of my memory, of how I frame it, of how I experience it. So when a child learns that they can have an honest experience with something that's negative, but also place it within the story of resilience, within the story of what I'm capable of, within the story of 'this doesn't define me', then I'm less likely to engage in fight or flight or freeze. Because I now have another way to understand. How does trauma affect memory when you're trying to recall the event? And how important is the first person's reaction? That first person's reaction is very important. Because it's the signal: is it okay for me to tell the story or not? One of the huge mistakes that gets made though, is we require the child to tell the story many times. The abstract thinking of nuanced recall about something is something that happens to us around 12 or 13. There's an assumption that if something traumatic has happened to you that you've formed a memory – that you know the story exactly. And that's not true. And so pre-adolescent children cannot give you a concrete [story]. If we invite child to begin to tell the story and just let them tell it, we'll get the most accurate story. The prompts are, such things

as: Tell me some more. And, who was there? What room were you in? The other challenge is that how that first person reacts determines how the rest of the story will be told. Every time the story is told, the child will incorporate, confabulate, into their story the reaction of the person they first told the story to. The more often we ask a child to tell a story, the more they will confabulate it to include what happened when they told the story before. And so, if we interview a child four times, we're doing harm to the child, because we're insisting the child keep bringing this back, but also the child will add to the story because that's what the brain of the child does. So if a child makes a disclosure, let the child say what they have to say, and then if it has to involve a police officer, for example, wait for the police and the police should only ask the story once.

What happens if they're not believed in the first instance?

The reality is that the false accusation rate, depending upon where in the world you are, runs from between about 1.2 to about 8%. It is tiny. So you start with the expectation that given that number, there's an exceedingly high probability this child is telling me the truth. 90% of the time it is the truth. So that being the case I'm going to listen to the story. What are the medium- and long-term effects of trauma? You talked about the necessity of framing it right within you. But if you don't have that support or that internal understanding, then does it affect you, academically, job-wise, relationship-wise?

If you incorporate this into the identity: so my identity is partially or significantly impacted by the story of this event or these events, then I bring that into all of my other relationships, all of my other understandings of myself, it starts to become core. When we look at children who have experienced sexual abuse in childhood, they tend.

# When for-profit companies fund research, how is science affected?

In May 2024, Google DeepMind released AlphaFold 3, a tool that could predict protein structures. It used an artificial intelligence (AI) model to predict how different proteins were shaped, how they might interact with each other and with DNA, RNA, and other biomolecules of merit. Nobel laureates John Jumper and Demis Hassabis built the new model based on DeepMind's previous versions of the tool, namely AlphaFold and AlphaFold 2. Both those models were released open source, i.e. with their associated programming scripts and inner workings open and transparent to all. AlphaFold3 was different: its senior authors didn't release the full code when they published their findings in *Nature*. How exactly the model worked was unclear to scientists who wished to probe deeper. They also couldn't make full use of AlphaFold 3's new abilities because its protein-drug interactions simulator wasn't fully accessible. Google had a reason to withhold information in the paper. A DeepMind spinoff company called Isomorphic Labs was using AlphaFold 3 to develop its own drugs.

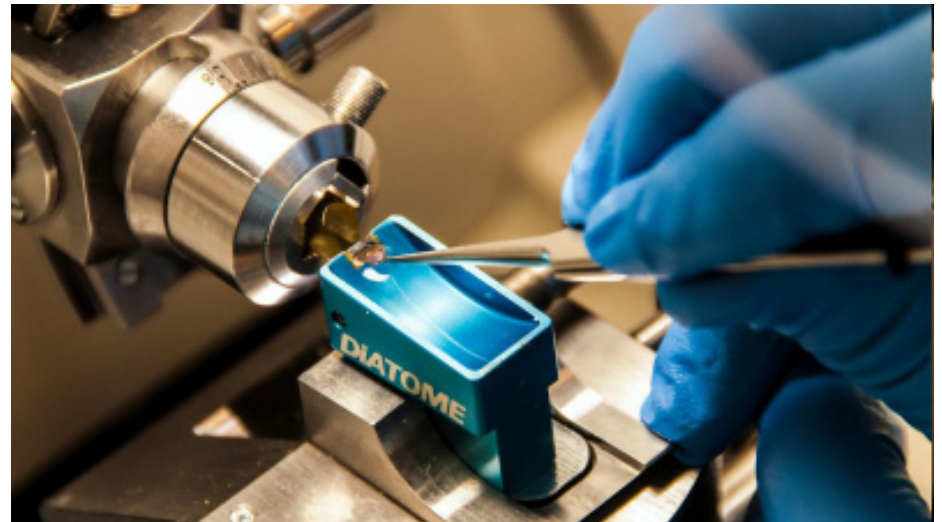
"We have to strike a balance between making sure this is accessible and has an impact in the scientific community as well as not compromising Isomorphic's ability to pursue commercial drug discovery," Pushmeet Kohli, DeepMind's head of AI science and a study co-author, told *Nature* in a news article earlier this year. But many scientists weren't convinced, leading them to sign an open letter saying publishing the paper without the code prevents scientific efforts to reproduce and verify the original findings. A fundamental tension The controversy brought a broader conundrum surrounding scientific research today, especially research with commercial potential. Commercialisation is driven by competition and profit, so the creators and/or owners invoke property and patent laws to protect their intellectual property (IP). The fundamental tension here is that IP necessitates secrecy whereas, historically, science isn't encouraged to stay behind closed doors. Science progresses when scientists are open and transparent about their work, and when their methods and results are reproducible and falsifiable. "If you make this fantastic discovery and you're the only person in the universe who can do it, nobody cares. It's not helpful for mankind," Benjamin Haibe-Kains, a professor using AI to study cancer at the University of Toronto, said. He openly advocates for scientists to be more open with their software and data when they publish papers based on AI. "How can you advance science if you keep everything closed source? Nobody can see your data. Nobody can see the algorithm. Nobody can see the model, right?" "As a scientist, there is fundamentally a major conflict between doing things in secret versus advancing science. Those things are incompatible," he added. Then again, hospitals, research institutes, and universities also need money to operate and hence bank on commercialisation for revenue. "Universities and research institutions are putting us [academics] in a very, very tricky spot," he said. "They actually want us to patent so that we can generate revenue and sustain this research enterprise."

Door half-closed or half-open?

How can scientists toe the line between guarding their trade secrets in the current economy and advocating for transparency and reproducibility? One option Haibe-Kains suggested, especially for computational scientists, is to publish all the code and details of any algorithm they are working on — but hold on to a premium, ready-to-use version of a software that could be commercialised. With the help of software engineers in his lab, he works on bringing the software to a level that's accessible to a broader group of people, which he then sells. "Most of the discoveries have been disclosed already; it's just the packaging that I'm selling, right?" Haibe-Kains explained. "That's the way we do it in the lab — we do everything open source at the beginning and if there is commercial potential, we work on an enterprise version that's more robust and deployable. That added value we keep secret and that's what we would sell as a product." "I can do my mission as a scientist, but I can also commercialise and potentially generate revenue that way," he added. Thomas Hemmerling, MD, a professor in the Department of Anesthesiology at the same university, expressed a belief that divulging some of the basic algorithms but holding back some specific source code is a way to strike a balance between the "black box" that comes with full patent protection and scientific transparency. He also agreed there is always a risk in such cases, where someone else could commercialise the published work. But other scientists will at least be able to understand and potentially replicate the findings. Decency and deals Hemmerling and his team developed an anaesthesia robot in 2008 that they named "McSleepy" (after Patrick Dempsey's character Derek "McDreamy" Shepherd, in the popular medical TV drama 'Grey's Anatomy'). The robot could autonomously administer drugs to induce general anaesthesia and monitor the effects. The scientists decided to explain the algorithms at work in the robot in detail in their paper. "Because we described it quite well, certain parts were then put into other automated machines, but they referenced our method. So that that's then basically a matter of scientific integrity," Hemmerling said. "If you use somebody else's algorithm, you should at least quote them and say, 'that's based on that machine or on that technology or that finding'."

But not all scientists have access to large amounts of public funding, which can affect their inclination to be fully open about any research that can be patented. Based on the researchers' financial needs, Hemmerling said the closer they are to a commercial product, the fewer details they'd feel comfortable divulging in their paper. Collaborations with smaller start-ups or large corporations help some researchers get more money for their science. "These [large corporations] will fund your research, so you can move the research forward but on the other hand, they will obviously tighten your [research] much more into some kind of IP protection, probably more than you want to." That's the dilemma in front of many researchers around the world.

Some scientists strike deals with the companies: they study and develop a prod-



uct the way the company likes it. In exchange the company gives their lab unrestricted funds to continue other avenues of research (in which the company has no say). "All over the world, there's very little governmental funding to do research," Hemmerling said. "So researchers need to find creative ways to find funding." "I think it's human nature. More government funding is a way to circumvent the conflict between patented and open science, according to Hemmerling. "At the end of the day, it gives you a different head start. Whenever I have governmental funding, it has secured me funding for a certain time. I don't have to declare a conflict of interest. Science is just... science — you innovate and you're free to be creative, you're free to develop anything you want. Whereas if you have company funding, it might limit you to develop certain areas because the company might have a conflicting interest."

The government can also subsidise the costs of products made by companies such that the latter can still hold on to their IP even as the products are available for sale at a lower price. This is what happened with the COVID-19 vaccines made by Moderna and Pfizer. But according to Haibe-Kains, even with more public funding, universities will still want to continue commercialising some research. "I think it's human nature. If you think you're doing amazing research and you see those industries generating billions of dollars in revenue, you cannot stop universities

thinking 'oh, maybe I should generate revenue on my own stuff,' right?" He believes additional funding will help academic researchers breathe a little easier and invest in doing science the right way: by being as open as possible. "It's more a matter of creating the right paradigm, so that there is a healthy environment for researchers to do the right thing," Haibe-Kains said. "But also, there is a path to commercialisation so that we can generate revenue." At the end of the day for researchers working in a company, however, the primary objective is likelier to be to generate revenue, not necessarily to advance science, according to Haibe-Kains. Yet he also said it was unfair that sometimes big companies can blur the lines between industry and academia to their advantage, such as using academic tools like journals to advertise their science and also get away with withholding most of the data. Thus, to him, the manner of AlphaFold 3's release exposed a deep misalignment of incentives between researchers, journals, and the industry. Responding to criticism from the academic community, senior authors of the AlphaFold 3 paper had said they would publish their code within six months, and did so early in November. Haibe-Kains said publishing the paper first and fixing it six months later by releasing the full code is still a problematic move. "But look, at the end of the day, it's a good thing they published the code out there."

## Earth bids farewell to its temporary 'mini moon'

Florida: Planet Earth is parting company with an asteroid that's been tagging along as a "mini moon" for the past two months.

The harmless space rock will peel away on Monday, overcome by the stronger tug of the sun's gravity. But it will zip closer for a quick visit in January. NASA will use a radar antenna to observe the 33-foot (10-meter) asteroid then. That should deepen scientists' understanding of the object known as 2024 PT5, quite possibly a boulder that was blasted off the moon by an impacting, crater-forming asteroid. While not technically a moon — NASA stresses it was never captured by Earth's gravity and fully in orbit —

it's "an interesting object" worthy of study. The astrophysicist brothers who identified the asteroid's "mini moon behavior," Raul and Carlos de la Fuente Marcos of Complutense University of Madrid, have collaborated with telescopes in the Canary Islands for hundreds of observations so far. Currently more than 2 million miles (3.5 million kilometers) away, the object is too small and faint to see without a powerful telescope. It will pass as close as 1.1 million miles (1.8 million kilometers) of Earth in January, maintaining a safe distance before it zooms farther into the solar system while orbiting the sun, not to return until 2055. That's almost five times farther than the moon.

# Where does Intel go from here?

When nothing is going your way, absolutely nothing is going your way. Life's unwritten traditions don't have a bearing even if you are Intel, a Silicon Valley icon and a tech giant. A microcosm of Intel's last few years—a spurned chance to acquire 15% stake in OpenAI back in 2017; the AI company was looking for investment, to the tune of \$1 billion. Contrast this with Microsoft which has over time, invested \$14 billion in OpenAI, and reaped rewards which propelled it to the pack at the forefront of the AI race. Did Intel underestimate OpenAI's potential (now valued at around \$85 billion), or didn't foresee an AI era was upon us? Either or both, whatever the case may be, almost unforgivable mistakes from a business perspective. Whoever replaces outgoing CEO Pat Gelsinger (this has been a frenetic week for Intel), will have a lot of fixing to embark on. Intel hasn't been able to get a tune out of its recent generations of chips, at least to the extent Nvidia, Qualcomm, Apple, AMD and even Google have.

Financials make for dim reading, and customer outlook isn't very positive even though no PC makers have as yet announced anything akin to Apple closing the Intel chapter for their Macs, a few years ago. That moment in time, proved pivotal as a direction definer, despite the chipmaker's brave face. That strategy continues to date. A day after the announcement of Pat Gelsinger's exit as CEO of the company, the company announced the new Arc graphics chips. A discreet graphics solution from the

company, that only recently, made clear that there won't be many such updates in the future. Does that tack change, with Gelsinger gone? Intel is claiming that its new graphics have a performance advantage over Nvidia's comparative chip, but the caveat is the Arc B580 gains some of that when paired with a pricey Core i9-14900K CPU.

Nvidia's chips don't need such a foundation, before embarking on performance dominance. AMD too has upped their game with the latest generation chips, and Apple as well as Google and Microsoft are betting big on their own hardware pursuits. The landscape is only getting tougher for Intel. The bigger worry, which they must fix on priority (if at all that can be fixed, in benchmarks and in perception) is that their PC chips have fallen down the pecking order. I keep repeating this, Apple didn't take the decision to replace Intel's chips across the entire Mac portfolio, lightly. It has now been four generations of Apple's own silicon efforts, and every year, the M-series chips set a performance per watt benchmark. That must have hurt. Intel's worries don't end there. Qualcomm's first generation chips for PCs, which made a rather solid first showing with the Snapdragon X chips—these have, albeit unintentionally, become the experiential baseline for the 'AI PC' or Copilot+ PC era for the Microsoft Windows 11 ecosystem. For first generation chips, Qualcomm has done something Apple-esque. Ideally, this shouldn't have been a worry for Intel. Yet, it is. For years now, Intel's chip generations



have been in a bizarre situation. They aren't failures, but they aren't exactly competing either. The 13th and 14th generation Core processors, had quality issues too—elevated operating voltage led to instability, often unfixable hardware-wise. Could it be because Intel prioritized business, spreadsheets and financials, over engineering? That may well have been the subtle internal shift, which translated into the slide we witness now. In the next year, Intel's course correction will not come easy. The lapses over the years (in cricketing terms, will be called howlers) will resonate at a louder pitch than ever before—partly as a warning, and in equal measure as a threat. Turning down Apple's invi-

tation to make chips for iPhones in the early days (Intel thought the phone market was unprofitable), trying to create a niche within a niche with Atom PC chips (remember those netbooks?) and a less than ideal attempt at making 5G modems for portables, simply make one wonder—what were Intel's well paid (one would assume that'd be the case) advisors really doing? A litany of blunders dot Intel's recent history. No surprise it finds itself in a predicament that wouldn't be easy to iron out. Vishal Mathur is the technology editor for HT. Tech Tonic is a weekly column that looks at the impact of personal technology on the way we live, and vice-versa. The views expressed are personal.

## Genetic enigma: two new studies reveal why some cats are orange

Garfield, star of the eponymous comic strip created by Jim Davis in 1978, is, like many of the cats that roam our homes, orange. He is orange in the same way that some people are redheaded, some horses are brown, or some dogs are Irish setters, but there is one important difference. For all other animals, including redheaded humans, we know what causes this characteristic colour, but surprisingly, we didn't know what causes it in cats – and felines in general – until now. Two papers have just been published on bioRxiv – one of the most popular pre-publication repositories of unreviewed articles – that explain the genetics behind orange cats. One comes from Greg Barsh's lab at Stanford University, California. The other is from Hiroyuki Sasaki's lab at Kyushu University, Japan.

The two mammal pigments Mammals have only two pigments, which are two colours of melanin: eumelanin (dark brown, blackish) and pheomelanin (yellowish, reddish or orange). Redheads only produce pheomelanin, while dark-skinned people accumulate mainly eumelanin. All other skin and hair colours fall somewhere in between, thanks to as many as 700 genes that regulate pigmentation in animals. In primates, horses, rodents, dogs, cows and many other animals, melanin production and the decision to produce eumelanin or pheomelanin is in the hands of a membrane protein called MC1R. This controls the skin cells known as melanocytes that release melanin. If a

melanocyte-stimulating hormone (alpha-MSH) is released, melanocytes start producing eumelanin. If an antagonist, such as agouti-signalling protein or beta-defensin in dogs, comes into play, the production of dark eumelanin stops, and melanocytes produce orange pheomelanin instead. Three-colour pigmentation patterns in calico cats.

Three-colour pigmentation patterns in calico cats. | Photo Credit: Lluís Montoliu/The Conversation However, cats are another matter altogether. Anyone who keeps a cat around the house knows that they are very peculiar animals, very special in every way, and this extends to their pigmentation. In cats, eumelanin or pheomelanin production is not controlled by the MC1R receptor. Instead, it is in the hands of a locus (whose gene was, until now, unknown) called "orange". A locus is a physical location in the genome whose effects are known (e. g. black or orange coat), but not the details of the precise DNA sequence it contains, nor the gene to which it belongs.

For this reason, we usually first identify the locus and then, over time, we discover and describe the associated gene in detail. The orange locus in cats can come in two versions: an 'O' variant that supports the production of pheomelanin (orange), and an 'o' variant that is responsible for producing eumelanin (black). One detail to note is that the orange locus is on the X chromosome. Female cats are XX and male cats are XY, like all other mammals. And as with all fe-



male mammals, all cells throughout development will randomly inactivate one of the two copies of the X chromosome. Oo female cats – carrying the O variant on one X chromosome and the o variant on the other – will generate areas of their body that are orange (in areas where they have inactivated the 'o' allele) and others that are black (when inactivating the 'O' allele). This means that when we see a bicolor (black/orange) or tricolor (black/orange/white) cat, or one of its more diluted versions, we know that it must be a female, and its pigmentation pattern will be completely unique. Male cats are either orange or black (they have only one X chro-

mosome), but cannot be bicoloured or tricoloured, unless they carry a chromosomal alteration equivalent to Klinefelter's syndrome in humans (where males are born with an extra X chromosome).

Females can therefore have the unique mosaic patterns so prized by cat lovers. When coinciding with another mutation that affects the proliferation and differentiation of melanocytes (producing white patches, without pigmentation), this generates a tricolor cat, commonly known as a calico. Each calico is unique, as the inactivation of one of the X chromosomes in each pigment cell occurs randomly during development.

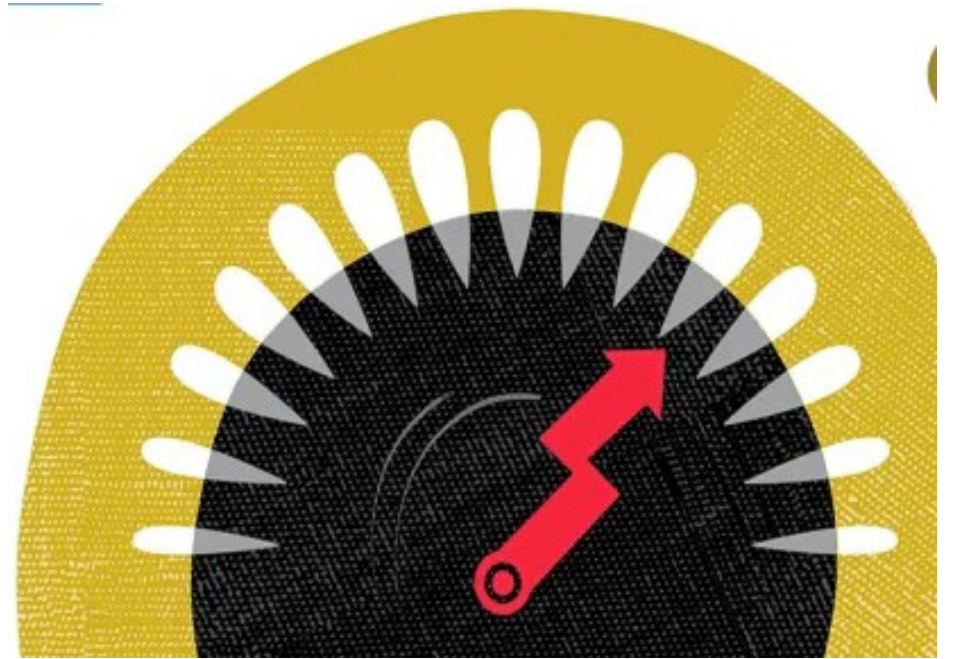
# When dreams of Viksit Bharat stumble over Nehruvian impulses

Failure has many fathers. Even when most of the contemporaneous macroeconomic data were available for the second quarter of the financial year, RBI Governor Shaktikanta Das was confidently predicting 7 per cent growth. The actual estimate came in at 5.4 per cent. What economic calculations caused this big miss, and what does it mean for India's march towards Viksit Bharat 2047? On the latter question, not much at present. Growth rates are not cast in stone, long-term or otherwise. For most economists, macro growth rates are a function of policy — if it was all a random walk, economists and other policy makers would be redundant. Policy may not affect outcomes over the very short-term, but over a few quarters definitely so. Does a competitive exchange rate matter? Can tariffs affect growth? Can MSPs, with import controls, affect food inflation? We could go on but you get the drift — policies affect outcomes. Over the last two years we have been confident that India's path towards a high-income country status by 2047 was reasonably possible. Many others felt that was a 23-year pipe dream given that the long-term GDP growth in India had averaged just 6.1 per cent. These same experts now claim that they are not surprised by the close to 3 percentage point decline in GDP growth from the 8 per cent plus peaks five quarters ago. We are not surprised either. As recently as the IEG-Ministry of Finance Kautilya Economic Conclave in September, we had flagged the possible derailment of the Indian growth story due to two mega road-blocks — high rates of taxation and tax collection, and the rapid decline in foreign investment. On a short-term basis, with possible consequences for mid-term health, the level of real interest rates also do matter.

Given that the RBI gives its decision on policy rates today, let us discuss real policy rates first. There are two issues that merit a discussion: Should RBI be looking at real policy rates based on core inflation or headline inflation? Regardless, India has been running an unduly tight monetary policy for the last two post-Covid years. The median real repo rate for core inflation in non-advanced economies is 1.2 per cent, for India it is 2 per cent. The median real repo rate for headline inflation in non-advanced economies is 0.9 per cent, for India it is 1.4 per cent. Real policy rates during the much-touted growth success story 2004-2011 were minus 1 per cent. It is well accepted that India had contractionary monetary policy over the last eight quarters and in the process, MPC has slowed the economy much more than their projections.

In 2023, all tax revenue (Centre, state, local) to GDP ratio approached 19 per cent. Most critics of Viksit Bharat dreams allude to the fact that we are way behind our competitors in East Asia with unusually high import tariffs damaging our competitiveness, efficiency and growth. Yet they turn a blind eye to the data on the low all-tax revenue rates in East Asia of 17 per cent, China 16 per cent and Vietnam 13 per cent. Needless to mention that tax revenues rise with GDP and East Asia has a much higher level of per capita income than India. Wrong assessments often result in misguided policy calls. An example of such policies would be on

foreign direct investment. It has been recognised by all development institutions that these two components are critical for the Viksit path — infrastructure investment and FDI. The importance of both is intuitively obvious. On the former, full marks to the two big-infrastructure-enthusiast prime ministers — Atal Bihari Vajpayee and Narendra Modi. On the latter, the withdrawal from Bilateral Investment Treaties (BITs) was a significant error in judgement on part of policymakers. There is sufficient evidence to warrant an urgent rethink on this issue in light of the sharp decline in foreign investments. Foreign investors are less likely to invest without enforceability of contract, timely resolution of conflicts and predictability in judicial principles and actions. Investors would search for the best place to park their funds and withdrawing from BITs increases foreign investor risks without increasing returns. Slower growth over coming years may even result in a re-examination of the returns that may further dampen investor sentiment — both domestic and foreign. The Economic Survey 2024 wants India to play third fiddle to the China infrastructure BRI (Belt and Road Initiative) monopoly and that we should invite and welcome Chinese foreign investment. Yet, the Survey is coy about, if not out of sync with, India's misguided policy of "banning" BITs. Another unresolved issue is the retrospective changes in tax policies such as the removal of indexation benefits on real estate assets. The ghost of retrospective tax continues to haunt India's economic prospects. The issue should have been settled by legislative restrictions on such changes, but all three branches of the government regularly make retrospective changes against the spirit of improving "Ease of Living".



Recent policy changes such as retrospective tax changes, restrictions on certain kinds of expenditures through credit cards and withdrawal from BITs are signs of a gradual reversion to the command-and-control type of economy. The state — or the empire — wants to strike back in defiance of the Prime Minister's repeated advice on limiting the role of the state in the lives of citizens. The sooner we get rid of the remaining shackles of Nehruvian socialism that continue to influence statist impulses within the government, the sooner we can avoid making policy errors that dampen our growth prospects. There is a deep divide between the Prime Minister's vision of limiting the role of the state and the bureaucracy

and the reality of Nehruvian impulses in recent policies. More countries have lost the growth momentum by taking good growth to be their right. No country is entitled to a 6 or a 7 per cent growth rate. India's growth challenge is partly driven by the large divergence between its per-capita income levels and the aggregate size of its economy.

The expectation is that institutions and policy making will lead the world's soon-to-be-fourth-largest economy on the road to becoming Viksit Bharat, yet we have to contend with policies and standards of an economy with a sub \$3,000 per-capita income. We aspire to be a developed economy; we should begin to act on our ambition.

## Why oil prices are not rising despite the war in West Asia

In an apparent turn of events defying historical precedent, the escalating conflict West Asia—a region synonymous with global oil supply shocks—has not driven oil prices into the stratosphere. Instead, prices are on a downward trajectory, fuelled by a combination of weak global demand, diversified supply chains, and measured military responses. Brent crude recently fell by over \$2 to settle at \$73.01 per barrel, a level often viewed as indicative of market stability, with healthy crude supply and moderate demand. What explains this anomaly in the energy markets? Historically, wars in West Asia have caused oil prices to surge. The Yom Kippur War of 1973 quadrupled crude prices, and even recent tensions in the Gulf have sparked fears of supply disruptions. However, today's energy landscape is markedly different. The United States (US), now the world's largest oil producer, has significantly reduced its reliance on West Asian oil. According to the US Energy Information Administration (EIA), American daily crude production stands at an unprecedented 13.2 million barrels, with further growth projected for 2025. Moreover, Iran, despite being the seventh-largest oil producer, plays a diminished role in global oil exports. This reduced share,

coupled with Israel's decision to avoid targeting Iran's oil facilities during its recent retaliatory strikes, has alleviated fears of a catastrophic supply shock. Since Iran's missile attack on Israel on October 1, Brent crude dropped to \$72.56 per barrel and West Texas Intermediate (WTI) fell to \$68.63. These figures represent the lowest levels amid a series of escalating tensions, highlighting the limited impact of the conflict on global oil markets. At the heart of the current price slump is weak global demand, particularly from China. Once the world's primary engine for crude consumption growth, China's economy is now faltering. Beijing's reported Gross Domestic Product (GDP) growth of 4.6% for Q3 2024 fell short of its 5% target, with industrial profits plunging by 27.1% in September — the steepest decline since the pandemic. This slowdown has rippled through global energy markets. The International Energy Agency (IEA) projects oil demand growth in 2024 and 2025 to be half that of 2022 and 2023, citing China's transition to green energy as a key factor. "China accounted for nearly 70% of global oil demand growth in 2023; this has dropped to around 20%," the IEA noted. The slowdown in demand has allowed supply to outpace

consumption, tipping the balance toward a bearish market. The Organization of Petroleum Exporting Countries (OPEC)+, which includes major producers like Saudi Arabia and Russia, has struggled to maintain price floors despite coordinated production cuts. The group's planned output hike of 180,000 barrels per day from December underscores the market's oversupply, even amid ongoing geopolitical turmoil. Meanwhile, India's renewable energy capacity has surged by 165% over the past decade, reaching 203.1 GW in 2024 and accounting for 43.12% of the total installed capacity, as the nation steadily transitions away from a fossil fuel-dominated energy mix. One factor tempering oil prices is the measured nature of military responses in the region. While Iran's missile attack on Israel on October 1 briefly pushed prices above \$80 per barrel, subsequent Israeli strikes avoided critical oil and nuclear infrastructure, easing fears of widespread disruptions.

The Israeli military's focus on targeting Iranian missile production sites rather than oilfields demonstrated a measured counterstrike, contrasting with past conflicts where energy infrastructure often suffered significant damage.