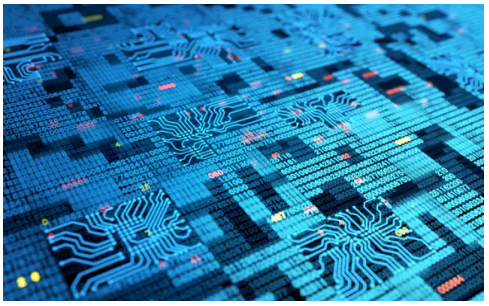
ATHARVA ROBOTICS CENTER

Daily News on Innovation & Technology

07th July, 2025

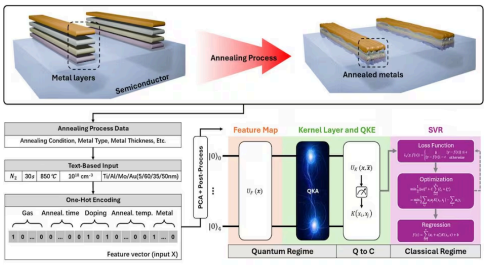
New memristor-based system by Chinese scientists boosts AI data sorting efficiency



By Bojan Stojkovski, July 06, 2025

In a bid to overcome shortcomings in scientific computing, Chinese scientists have unveiled a new approach to sorting data that promises both higher speed and lower energy consumption.

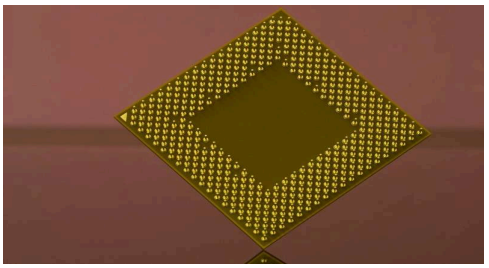
CSIRO Uses Quantum AI to Revolutionize Semiconductor Design



By Gadgets 360 Staff, July 05, 2025

Researchers at Australia's CSIRO have achieved a world-first demonstration of quantum machine learning in semiconductor fabrication.

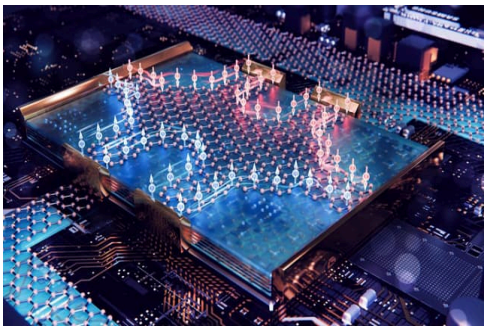
Robotic probe quickly measures semiconductor properties to accelerate solar panel development



By Massachusetts Institute of Technology, July 04, 2025

Scientists are striving to discover new semiconductor materials that could boost the efficiency of solar cells and other electronics.

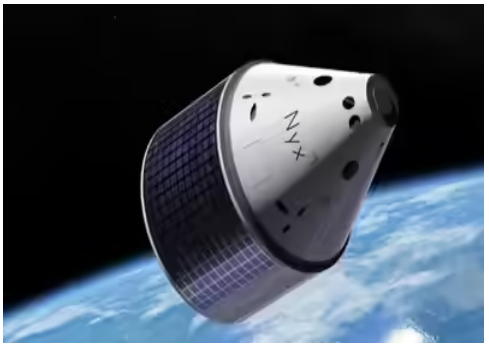
Quantum twist: In a first, magnet-free spin transport achieved in graphene



By Rupendra Brahambhatt, July 06, 2025

A team of researchers has managed to generate and detect spin currents in graphene without using any external magnetic fields for the very first time, successfully addressing a long-standing challenge in physics.

Space burial goes wrong: Capsule with remains of 166 people and cannabis seeds crashes into Pacific ocean



By Times of India, July 06, 2025

A space capsule carrying the ashes of 166 people, along with a collection of cannabis seeds, was lost after crashing into the Pacific Ocean during reentry.

World's largest solar-powered car vessel delivers 4,000 Chinese vehicles to Greece

By Bojan Stojkovski, July 05, 2025

Yuanhai Kou, the world's largest solar energy-powered vehicle carrier ship built by China COSCO Shipping Corporation, has successfully completed its maiden voyage after docking at the Piraeus Port car terminal in Greece with 4,000 Chinese-made cars on board.

Terrifying Signal From Deep Space: New Detection Shows Traits Too Precise to Be Natural, Forcing Scientists to Reconsider Everything

By Avi COHEN, July 06, 2025

In the ever-evolving field of astronomy, unexpected discoveries often lead to significant advancements in our understanding of the universe.

News Articles

MONDAY, JULY 7, 2025

Vera C Rubin Observatory To Create Colossal Map Of Space With New Galaxies, Dangerous Asteroids; May Even See Signs Of Alien Life

Govind.Vijaykumar
@timesofindia.com

A top a mountain in Chile, where the days are dry and nights are clear, a team of scientists and engineers is preparing for one of the most important astronomical missions in recent times. Among them is Kshitija Kelkar, whose life has taken an interesting turn.

Twenty years ago in Pune, the city she's originally from, Kelkar sent a photo of a lunar eclipse she had taken with a digital camera to *Sky and Telescope*, a popular astronomy magazine. The publication accepted the photo and released it on its website under 'Photo of the Week'.

Inspired, Kelkar would turn astronomy into a career, and after degrees from Fergusson College, Pune University, University of Nottingham and doctoral work on how galaxies transform in their clusters, she arrived in

> This will be a game-changer. We're about to make a 10-year movie of the night sky, with the fastest telescope and the biggest camera ever made
> — **Kshitija Kelkar** | OBSERVING SPECIALIST, VERA C RUBIN OBSERVATORY

Chile on a grant to use telescopes for her research.

Today, years after that photo she took on a tiny camera, she's an observing specialist at the Vera C Rubin Observatory, looking at the sky through the largest digital camera ever assembled.

On June 23, that camera released a set of photos that stunned astronomers. Caught in unprecedented detail were galaxy clusters, distant stars and nebulae. In one photo, the camera — the size of a car — with a resolution of 3.2 gigapixels — snapped a nebula around 4,000 light years away.

The Rubin observatory could even save Earth. In May, within just 10 hours, it found 2,104 previously undetected asteroids. Since its telescope takes images in quick succession, it's able to catch moving objects from the crowd of stars in the background that tend to stay in place. If even one space rock is headed our way, chances are first alerts would come from Rubin.

Humanity does have other powerful telescopes. There's James Webb, for instance, 1.5 million kilometres away from Earth with its own very dark sky. But it's mainly for zooming into specific targets. There's James Webb's predecessor, Hubble, currently in orbit over 500km above Earth. In 1995, it took Hubble nearly a week of long exposure to generate the now-famous Hubble Deep Field image, which showed about 3,000 very distant galaxies.

The Rubin Observatory, during its first test run in April, generated an image that revealed 10 million galaxies, in a matter of hours.

Part of the reason why it could do that is its very mission. Unlike James Webb and Hubble, which take in small parts of the sky, Rubin is a survey telescope, which means it shows the entire big picture, not specific objects. An image it takes covers a swathe of sky equivalent to 40 full moons — Webb's cameras show a size lesser than a full moon. A single photo from Rubin is so large, one would need 400 ultra-HD TV screens to see it in its full glory.

Large is ideal, given Rubin's purpose. Its primary optical instrument, named Simonyi Survey Telescope, is set to embark on a 10-year project called the Legacy Survey of Space and Time (LSST), to map the visible sky in extraordinary detail. The telescope is more than 300 tonnes of steel and glass, which is regularly cleaned using CO_2.

Over the next decade, this telescope and the giant LSST camera will take photos of the southern hemisphere sky, every 3-4 nights, to create the largest time-lapse film of the Universe ever made.

Why time-lapse? Imagine you're on the terrace of your building with a camera pointed at your neighbourhood. Time-lapse would reveal the windows that opened, the lights that came on, the cars and curtains that moved and the doors that opened.

Rubin observatory will do that to the Universe, find new objects and previously unknown interactions between them. "We're going to be continuously taking 30-second images all night in different filters," said Kelkar. "And since we'll be observing the night sky every 30 seconds, in two back-to-back images of 15 seconds each, we'll catch any object that has changed its position or brightness."

These objects may be stars, asteroids, unnamed comets and even potential sources of gravitational waves. This is where Kelkar said it would be unfair to compare Earth's telescopes — they're meant to complement each other, not compete.

Scientists, amateur astronomers and space enthusiasts the world over can sink their teeth into this data. "People once thought the Earth was at the centre of the system. But then someone came along and said 'no, it's the Sun'. Similarly, we may find something absolutely mind-boggling, even evidence of life elsewhere," Arvind Paranjpye, director of Nehru Planetarium in Mumbai, said.

Kelkar has been at Rubin for over a year, living in the town of La Serena — a two-hour drive away. Her commute to work is through scenic valleys and along the 'El Camino de las Estrellas', or the 'Route to the Stars', because of the number of astronomical observatories along the way.

The route also needs light discipline, which means those driving there after dark cannot really use full-beam headlights. "We usually have our hazard lights up," said Kelkar.

At the observatory, work begins shortly before sunset. After a check of all systems, by Kelkar and the rest of the observing specialists, they open Rubin's massive dome for night operations.

The observatory's placement atop the Cerro Pachón mountain puts it well above the localised turbulent layer where warm air mixes with cooler air from above, offering a clear view of the stars.

Right now, trials are on as crews perform final checks before Rubin, 20 years in the making with $800 million in construction costs, formally begins its survey later in 2025.

The Legacy Survey of Space and Time will be of unprecedented scale.

Remember that image Rubin released of 10 million galaxies? Well, they make up just 0.05% of nearly 20 billion galaxies the observatory will have imaged when LSST ends in a decade. Rubin may see millions of distant stars ending in supernovae and into new reaches of our own Milky Way galaxy.

Some 10 million alerts to scientists are expected from the observatory every night — whenever a change is detected in the series of photos it takes. Software will automatically compare new images with the stack of older ones. If an object has moved in those photos, flashed, exploded or streaked past, the software will detect the changes and dispatch an alert, all within minutes.

There's no other telescope that can do these things — detect real-time changes in the immediate sky and flashes of light from distant objects, and at such scale. In just one year, Rubin observatory will have detected more asteroids than all other telescopes combined.

There's more. The Simonyi Survey Telescope, set up on a special mount, is also fast. It can quickly swivel from one wide area of sky to another — within five seconds.

Nothing will miss this all-seeing eye. Kelkar said word has already been sent out to experts worldwide to investigate the 2,104 newly detected asteroids. "The telescope will be a game-changer," she added, "because we're giving a common dataset for all kinds of science at once. We don't need specialised observations. It's one data for all."

Kelkar was in the control room at La Serena when the first images landed.

"Twenty years of people's professional lives had come down to that moment. We're about to make a 10-year movie of the night sky, with the fastest telescope and the biggest camera ever made. It's going to be fantastic," she said.

Earth's Largest Camera Will Sweep The Sky Like Never Before

40bn OBJECTS That's how many cosmic objects Rubin observatory will catalogue in **10 years**, the most astronomical data we've ever had

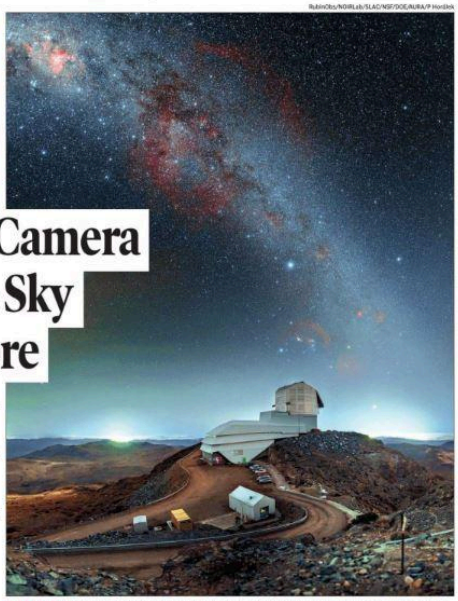
The LSST camera has **3 lenses**; the largest is **over 5 feet in diameter**

40 full moons can fit in the camera's field of view

Rubin's camera **3,200** megapixels

Regular cameras **12-50** megapixels

Illustration shows the LSST camera inside Rubin observatory's Simonyi Survey Telescope



WIDE ANGLE: The Vera C Rubin Observatory will generate over 2 million images during its survey. Each night, it will transmit 20 TB of data — the equivalent of 50 years of all digital music, 1 lakh hi-res artworks, or 7.7 million e-books

Source: The Times of India Newspaper, 07-07-2025
Times Science Page

Link: https://drive.google.com/file/d/11FYHP4Bc6CI-Ug7rZMbfncl87aEDpaug/view

The Coder 'Village' at Heart of China's Latest AI Frenzy

NYT

Hangzhou: It was a sunny Saturday afternoon, and dozens of people sat in the grass around a backyard stage where aspiring founders of tech startups talked about their ideas. People in the crowd slouched over laptops, vaping and drinking strawberry Frappuccinos. A drone buzzed overhead. Inside the house, investors took pitches in the kitchen.

It looked like Silicon Valley, but it was Liangzhu, a quiet suburb of the southern Chinese city of Hangzhou, which is a hot spot for entrepreneurs and tech talent lured by low rents and proximity to tech companies like Alibaba and DeepSeek.

"People come here to explore their own possibilities," said Felix Tao, 36, a former Facebook and Alibaba employee who hosted the event.

Virtually all of those possibilities involve artificial intelligence. As China faces off with the United States over tech primacy, Hangzhou has become the center of China's AI frenzy. A decade ago, the provincial and local governments started offering subsidies and tax breaks to new companies in Hangzhou, a policy that has helped incubate hundreds of startups. On weekends, people fly in from Beijing, Shanghai and Shenzhen to hire programmers.

Lately, many of them have ended up in Tao's backyard. He helped found an AI research lab at Alibaba before leaving to start his own company, Mindverse, in 2022. Now Tao's home is a hub for coders who have settled in Liangzhu, many in their 20s and 30s. They call themselves "villagers," writing code in coffee shops during the day and gaming together at night, hoping to harness AI to create their own companies.

Hangzhou has already birthed tech powerhouses, not only Alibaba and DeepSeek but also NetEase and Hikvision. In January, DeepSeek shook the tech world when it released an AI system that it said it had made for a small fraction of the cost that Silicon Valley companies had spent on their own. Since then, systems made by DeepSeek and Alibaba have ranked among the top-performing open source AI models in the world, meaning they are available for anyone to build on. Graduates from Hangzhou's Zhejiang University, where DeepSeek's founder studied, have become sought-after employees at Chinese tech companies.

Chinese media closely followed the poaching of a core member of DeepSeek's team by the electronics company Xiaomi. In Liangzhu, many engineers said they were killing time until they could create their own startups, waiting out noncompete agreements they had signed at bigger companies like ByteDance. DeepSeek is one of six AI and robotics startups from the city that Chinese media calls the "six tigers of Hangzhou."

Source: The Economic Times Newspaper, 07-07-2025
Page No 05

Link: https://drive.google.com/file/d/19p5yBMWSfpaoMMAx62YvBbRyhxfkEyUW/view

AI Boom may be Harming Our Brains, Dulling Critical Thinking

Hidden mental health costs of GenAI warrant closer scrutiny from lawmakers and tech firms

Bloomberg

New York: Something troubling is happening to our brains as artificial intelligence platforms become more popular. Studies are showing that professional workers, who use ChatGPT to carry out tasks, might lose critical thinking skills and motivation.

People are forming strong emotional bonds with chatbots, sometimes exacerbating feelings of loneliness. And others are having psychotic episodes after talking to chatbots for hours each day. The mental health impact of generative AI is difficult to quantify in part because it is used so privately, but anecdotal evidence is growing to suggest a broader cost that deserves more attention from both lawmakers and tech companies who design the underlying models.

Meetali Jain, a lawyer and founder of the Tech Justice Law project, has heard from more than a dozen people in the past month who have "experienced some sort of psychotic break or delusional episode because of engagement with ChatGPT and now also with Google Gemini."

Jain is lead counsel in a lawsuit against Character. AI that alleges its chatbot manipulated a 14-year-old boy through deceptive, addictive and sexually explicit interactions, ultimately contributing to his suicide. The suit, which seeks unspecified damages, also alleges that Alphabet's Google played a key role in funding and supporting the technology interactions with its foundation models and technical infrastructure.

Google has denied that it played a key role in making Character.AI's technology. It didn't respond to a request for comment on the more recent complaints of delusional episodes, made by Jain.

OpenAI said it was "developing automated tools to more effectively detect when someone may be experiencing mental or emotional distress so that ChatGPT can respond appropriately."

But Sam Altman, chief executive officer of OpenAI, also said last week that the company hadn't yet figured out how to warn users "that are on the edge of a psychotic break," explaining that whenever ChatGPT has cautioned people in the past, people would write to the company to complain.

Still, such warnings would be worthwhile when the manipulation can be so difficult to spot. ChatGPT in particular often flatters its users, in such effective ways that conversations can lead people down rabbit holes of conspiratorial thinking or reinforce ideas they'd only toyed with in the past. The tactics are subtle.

The private and personalised nature of AI use makes its mental health impact difficult to track, but the evidence of potential harms is mounting, from professional apathy to attachments to new forms of delusion. The cost might be different from the rise of anxiety and polarisation that we've seen from social media and instead involve relationships both with people and with reality.

This sophisticated form of ego-stroking can put people in the same kinds of bubbles that, ironically, drive some tech billionaires toward erratic behavior. Unlike the broad and more public validation that social media provides from getting likes, one-on-one conversations with chatbots can feel more intimate and potentially more convincing — not unlike the yes-men who surround the most powerful tech bros.

If relationships with AI feel so real, the responsibility to safeguard those bonds should be real too. But AI developers are operating in a regulatory vacuum. Without oversight, AI's subtle manipulation could become an invisible public health issue.

Source: The Economic Times Newspaper, 07-07-2025
Page No 14

Link: https://drive.google.com/file/d/19p5yBMWSfpaoMMAx62YvBbRyhxfkEyUW/view

AI-based warfare in the 'agentic' age & energy as big constraining factor

ANIL SASI
New Delhi, July 6

EVEN BEFORE CHINA'S DeepSeek model triggered a frenzy in the AI (artificial intelligence) world, its People's Liberation Army had started to deploy AI across its major warfighting functions under a somewhat gawky banner called "intelligentised warfare". Beijing is learnt to be taking a graded approach by starting with applying AI to improve the performance of battlefield equipment such as artillery systems by cutting the interval needed between each shot while improving accuracy, as well as integrating generative AI with military drones to automatically target opponents' radars with better precision as soon as they come on. The DeepSeek advances could only help China build on its military AI diffusions. Should that be a cause for worry for India? Yes, say experts, considering that the Chinese are actively aiding Pakistan with its Centre of Artificial Intelligence and Computing of the Pakistan Air Force that was established in 2020, which now has an elaborate Cognitive Electronic Warfare programme aiming to use AI and machine learning for "effective analytical and tactical decision-making". During the Operation Sindoor, some of this could have been used by that country, given that it was backed by China behind the scenes, as testified to by Lt General Rahul R Singh, Deputy Chief of Army Staff (Capability Development and Sustenance). Pakistan, he said, was aware of vectors being primed on a real-time basis, which meant it was likely getting live satellite updates from China, with some data crunching likely happening at the backend to enable all of this. Gen Singh's emphasis on the importance of C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) and the need for civil-military fusion translates into the need for a certain expertise on the virtual domains, including the electromagnetic spectrum, and the domains of space and cyberspace. China is clearly a leader here, and a lot to be done in this area by India to catch up. Lt Gen Amardeep Singh Aujla, the Army's Master General Sustenance, said wars are becoming "increasingly intense and complex" due to evolving geopolitical dynamics and rapid technological advancements, which are transforming war-fighting practices and the control over new age technologies. This is being read as a recognition of the multi-domain approach being put into practice by China, and implemented in part by Pakistan.

"Modern armed forces must analyse large volumes of data from even more domains — land, air, sea, space and cyberspace — to decode enemy movements and devise deterrence strategies," according to Alexandr Wang, Founder CEO at Scale AI. The volume of information is all but impossible to handle with current technologies, and the ability to harness data and AI could mean the big difference in the next engagement. And while AI advances are important, there is another limiting factor in all this: energy.

Fields such as Big Data analysis, machine learning, predictive analysis, and natural language processing need a lot of energy, including vast spinning reserves of grid power. The electricity grid needs new electricity sources to support AI technologies and countries are increasingly turning to nuclear sources of energy to supply the electricity used by the huge data centres that drive AI. "At this point, India is clearly short of nuclear power, with (an installed capacity of) only about seven and a half gigawatts... South Korea, a much smaller country that has around three times India's installed nuclear capacity. So while opening up the sector to private participation is the only way to bring in new technologies into sectors such as nuclear, I think that there is a defence dimension too. Ten years from now, think of the next war... If it were to occur, it will be fought by robots and AI... That means you must have AI; you must have data crunching capability, and the ability to run big data centres... So, the investment in AI data centres and robotics is going to underpin the future defence posture of the country. And for that, the single most important ingredient is enormous amounts of electricity generation. If you don't generate power, all this would not be possible," Kris P Singh, the Indian-American promoter and CEO of Holtec International said.

Source: The Financial Express Newspaper, 07-07-2025
Page No 03

Link: https://epaper.financialexpress.com/4030211/Mumbai/July-07-2025#page/5/2

S NARAYANAN, VP-ENGINEERING, OPENAI & APARNA CHENNAPRAGADA, CHIEF PRODUCT OFFICER-AI, MICROSOFT

'Still early to gauge AI's impact'

*As artificial intelligence reshapes industries rapidly, two senior leaders engaged in the new age technology say that despite the speed of progress, it is still difficult to predict the economic and societal impact of the technology. **Srinivas Narayanan,** vice president of engineering at OpenAI, and **Aparna Chennapragada,** chief product officer - AI at Microsoft, spoke to **Anees Hussain** about AI's development, India's role in shaping the field and the limits of current systems. Excertps:*

How would you characterise this moment in AI development?

Narayanan: This is a major technological shift. Many of us in tech haven't seen a tool this broad in scope. People are applying it in education, healthcare, finance, and across many other fields.

Chennapragada: The pace of progress is very fast. Things that seemed impossible just two years ago are now part of daily use. For example, generating images from text used to feel like magic. Now, it's common. This creates both opportunity and pressure, novelty alone isn't enough anymore.

What are the biggest risks and challenges you are grappling with?

Narayanan: There are short- and long-term concerns. Right now, people can misuse AI to spread disinformation or develop unbalanced relationships with the technology. In the long term, it will affect jobs and economic systems. We are still in early days, so the full impact is unclear. But it's important to start preparing society for what's coming.

Chennapragada: In the past, knowledge was naturally limited by access. Now, AI gives people expertise in areas like health and finance instantly. That's positive, but it raises hard questions about how economic systems shift and which skills remain valuable.

There's debate in India about building indigenous LLMs versus using existing ones. What's your perspective?

Narayanan: There's room for both large and small models, depending on the task. For straightforward applications, smaller models can work. But for situations that require reasoning in new contexts, larger models are more effective. Each country has its own needs and building for those alongside general-purpose tools is useful.

Chennapragada: It's not just about the model. A bigger question is whether the data used to train models represents all viewpoints, languages and cultures. More countries are now creating their own training data. This helps ensure the systems reflect local realities. In the future, people won't just write for other people, they will write for machines too.

Where do you see the next breakthrough coming from? Architecture or human-led training?

Narayanan: Recent progress came from training models that reason more effectively by thinking in context, not just predicting the next word. There's still room to grow using current techniques. A key challenge now is designing more complex problems that the models can learn from. For that, high-quality expert data is essential.

Chennapragada: There's already a lot we can do with current systems. Many tasks that professionals handle today are repetitive and simple. AI can take over those, allowing people to focus on more skilled work. That doesn't require new breakthroughs in model design, it just needs thoughtful product development.

Given that LLMs are trained on next-token prediction, they rarely say "I don't know". Is this a limitation you are addressing?

Narayanan: Yes, it's something we are working on. Current models are designed to give answers, not ask questions or express doubt. But future systems need to feel more conversational. Recognising what they don't know is a necessary improvement.

THERE'S ROOM FOR BOTH LARGE, SMALL LANGAUGE MODELS, DEPENDING ON THE TASK

THINGS THAT SEEMED IMPOSSIBLE JUST TWO YEARS AGO ARE NOW PART OF DAILY USE

Source: The Financial Express Newspaper, 07-07-2025
Page No 04

Link: https://epaper.financialexpress.com/4030211/Mumbai/July-07-2025#page/5/2

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