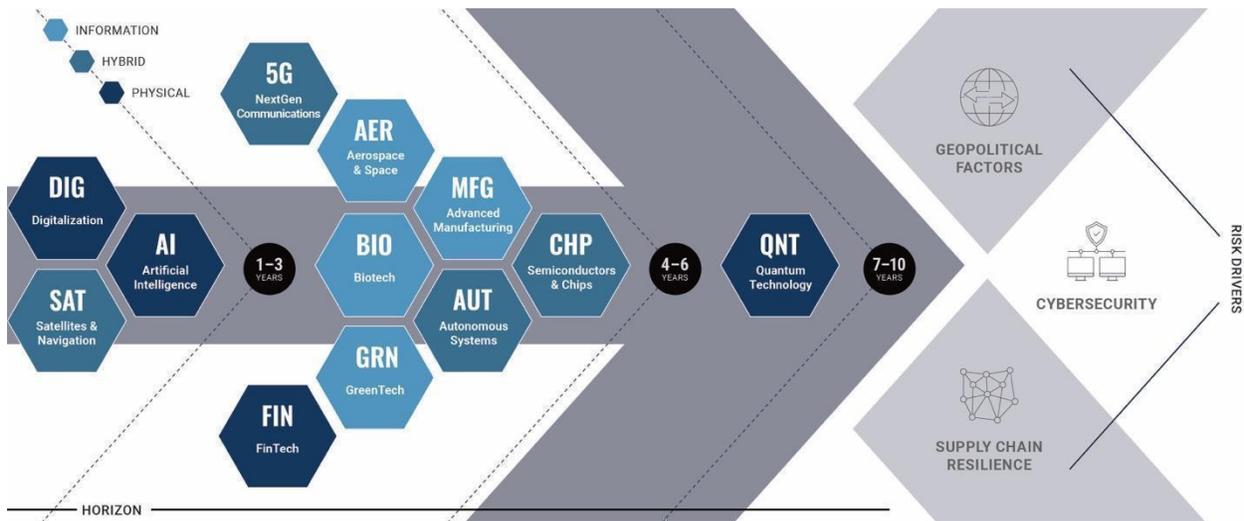




# MATRIX MONITOR

Friday April 22, 2022

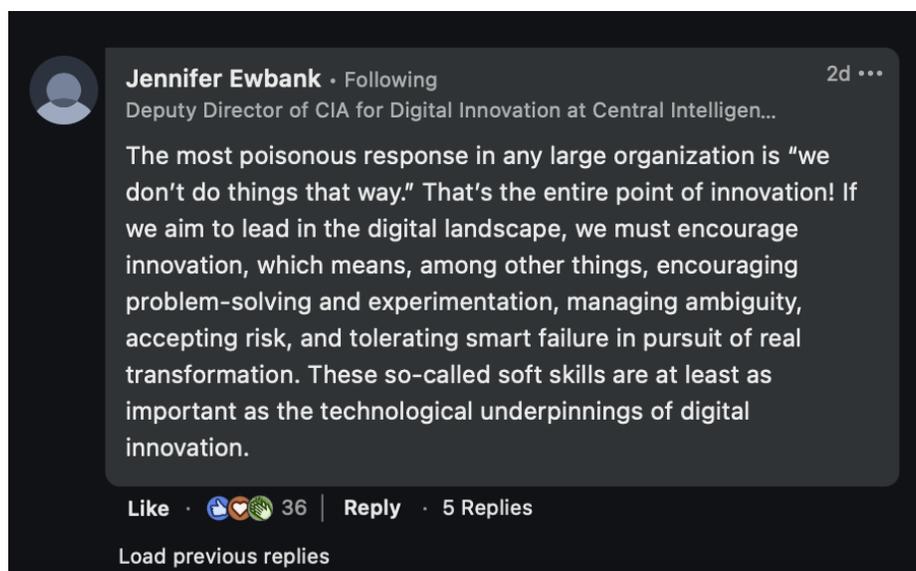
The only source dedicated exclusively to the emerging technologies shaping the future of business and national security.



*This week's Next5 Matrix Monitor features increased corporate spending on cloud computing, Chinese social platforms' move to display user locations via IP addresses, new White House policy on ASAT missile tests, South Africa's mass surveillance operation, sound technology that fights cancer in rats, Mitsubishi's plans for nuclear reactors small enough to be delivered on trucks, a device that endows micro robotics with color-vision, and US cyber firms' push to strengthen Ukraine's cyber defenses.*

## NEXT5 NEWS & AMPLIFICATIONS

→ **A third Pentagon official - the DoD's first chief architect officer, Preston Dunlap - resigned saying the US is at risk of losing its technology edge over adversaries like China.** Dunlap was responsible for pushing more technology into a \$70 budget for research, development, and acquisition. He said the Pentagon needs to stop focusing on internal turf wars and reinventing the wheel and instead work together to tap the private sector, defend the country, and compete with China. His comments came after two other senior tech officials in the DoD resigned calling on the Pentagon to modernize its approach to technology on the way out the door. Earlier this month, David Sprik, the DoD's outgoing chief data officer said the Pentagon needs to speed up efforts to counter adversaries who are developing military tools supported by advanced technologies such as AI, ML, and quantum science. And Nic Chaillan, the USAF's chief software officer resigned last year saying the US was losing the AI race to China. **Sitting senior Pentagon officials have expressed similar concerns.** Michael Brown, director of the Defense Innovation Unit, told the Senate Armed Services Committee earlier this month that a slow pace of inventing and adopting new technology was a "glaring weakness" adding the US risked falling behind China. Deputy Defense Secretary Kathleen Hicks voiced concern last week over "real resistance" from Congress to taking technologically risky approaches that might fail. Dunlap said the government should emulate SpaceX's and other innovative companies' approach, saying the government must become braver about **undertaking tests that might initially fail, spanning hypersonics to AI algorithms.** He added the consolidation of the defense industrial base from dozens of companies during the Cold War to a handful today was bad for competition and the country. Dunlap was credited with bringing in more than 100 new commercial contractors to the USAF, but the Pentagon struggled to do that at scale. Senior CIA leadership's response:



#Geopolitics #AI #AER #SAT #USA #CHN [Bloomberg](#)

## DIGITALIZATION

→ **Corporate spending on cloud computing is rising at double-digit rates, as tech leaders adopt advanced capabilities such as AI that cost more than other business applications.**

On top of the inherent costs of the technologies themselves, typically purchased as subscriptions, many of these applications tend to eat up computing power, adding to cloud-usage bills, according to industry analysts. Companies worldwide this year are expected to spend an estimated \$494.7B on cloud computing, up 20% from 2021, and such spending is on pace to reach \$600B by the end of 2023, according to information technology research and consulting firm Gartner. Spending on infrastructure-as-a-service – a type of cloud-computing service that provides companies with on-demand computing, storage, and networking resources – is forecast to show the highest growth of any cloud category in 2022, at 31%, Gartner said. Close behind is an expected 26% increase in spending on cloud-based platform services used to build, test, deploy, and update business software applications, including sophisticated AI, business intelligence, and Internet-of-Things capabilities. Gartner expects cloud-based platform services to drive \$109.6B in corporate spending this year, up from \$86.9B in 2021, with spending levels inflated by advanced applications. #DIG #AI [WSJ](#)

→ **Several Chinese social platforms, including Quora-like Zhihu and Douyin, announced on Friday, April 15 that they will display user locations based on IP addresses, a feature that users cannot disable.** According to the platforms, the measure, which is not mandated by law, is meant to prevent users from pretending to be locals and spreading rumors. Other platforms implementing the change include TikTok owner ByteDance's news aggregator Jinri Toutiao, Douyin short video rival Kuaishou, and lifestyle community Xiaohongshu, which all said locations will be visible on user profiles. According to Zhihu, China's popular question-and-answer site, user locations will be displayed alongside each post. Weibo has already been displaying locations on user profiles since announcing the move last month, citing fake information related to hot topics like Russia's invasion of Ukraine and the Covid-19 pandemic. The move marks the largest effort since 2017 to introduce more transparency to user identities online. Five years ago, a slew of social platforms started requiring users to associate their accounts with a phone number, which in China must be registered with a national ID. #DIG #CHN [SCMP](#)

→ **TikTok is under investigation by US government agencies over its handling of child sexual abuse material as the app struggles to moderate a flood of new content.** The US Department of Homeland Security is investigating how TikTok handles child sexual abuse material, and the Department of Justice is also reviewing how a specific privacy feature on TikTok is being exploited by predators, according to sources. The investigations highlight how TikTok is struggling to cope with the torrent of content generated by more than 1B users. The company, owned by China's ByteDance, has more than 10k human moderators worldwide and has been rapidly hiring staff in this area. Social media networks use technology trained on a database of images collected by the National Center for Missing and Exploited Children, a centralized organization where companies are legally required to report child abuse material.

TikTok said it had removed 96% of content that violated its minor-safety policies before anybody had viewed them. One pattern that the Financial Times verified with law enforcement and child safety groups was content being procured and traded through private accounts, by sharing the password with victims and other predators. Key code words are used in public videos, usernames, and biographies, but the illegal content is uploaded using the app's "Only Me" function where videos are only visible for those logged into the profile. #DIG #AI #USA #CHN [Financial Times](#)

## SATELLITES & NAVIGATION

→ **A SpaceX Falcon 9 rocket launched a US National Reconnaissance Office spy satellite into orbit on April 17 from Vandenberg Space Force Base, California.** The payload, designated NROL-85, was the agency's second mission of the year and the second orbital launch of 2022 from the Western Range. NROL-85's first stage previously flew NROL-87 in February, and NROL-85 is the NRO's first mission to reuse a SpaceX Falcon 9 rocket booster. SpaceX received a contract from the US Air Force in February 2019 to launch NROL-85 and NROL-87 – the company had previously launched NRO satellites under commercial contracts. The NRO builds and operates classified US government surveillance and intelligence satellites. NROL-85 is the 61st mission launched by the agency since its existence was disclosed in 1996. #SAT #USA [Space News](#) [Defense News](#)

→ **The White House announced on April 18 that the US will ban direct-ascent anti-satellite (ASAT) missile tests that create orbital debris.** The self-imposed US ban on destructive anti-satellite weapons tests is an effort to start an international push to develop "new norms for responsible behavior in space," said Vice President Kamala Harris. She called on every nation to do the same. Russia on November 15 test-launched an anti-satellite missile that struck a defunct Soviet-era spy satellite in low-Earth orbit, creating at least 1,632 pieces of space debris, according to a US Space Force database of orbital objects. US Secretary of State Anthony Blinken condemned the test at the time as "reckless and irresponsible," as the debris field posed risks to active satellites in orbit and forced into shelter US astronauts aboard the International Space Station. The US, China, and India are the only other countries that have created orbital debris from anti-satellite weapon tests in the past, with China's lone demonstration in 2007 spawning the largest swarm of debris. #SAT #USA #RUS #CHN #IND #UKR [Reuters](#) [Space News](#)

## ARTIFICIAL INTELLIGENCE

→ **According to civil rights activists, South Africa's mass surveillance operation is fueling a digital apartheid.** In the past few years, South African fiber coverage has expanded, AI capabilities have advanced, and companies abroad began dumping the latest surveillance technologies into the country. The effect has been the rapid creation of a centralized, coordinated, and privatized mass surveillance operation. [Vumacam](#), the company building the nationwide CCTV network, already has over 6,600 cameras and counting. The video footage it

takes feeds into security rooms around the country, which then use AI tools like license plate recognition to track population movement and trace individuals. Over the years, a growing number of experts have argued that the impact of AI is repeating the patterns of the country's colonial history. Private security companies now manage duties usually associated with policing, even though they don't have the same legal powers. Whereas South Africa has just over 1,100 police stations with just over 180,000 staff members, there are 11,372 registered security companies and 564,540 actively employed security guards, more than the police and the military combined.



#AI #DIG #ZAF [MIT Technology Review](#)

→ In a recent survey of more than 2k business leaders by [IDC](#), one of the lead findings was the growing realization that AI needs to reside on purpose-built infrastructure if it is to bring real value to the business model. Lack of proper infrastructure was cited as one of the primary drivers for failed AI projects, which continues to stymie development in more than two-thirds of organizations. As with most technological initiatives, key hurdles to more AI-centric infrastructure include costs, lack of clear strategies, and the sheer complexity of legacy data environments and infrastructure. All hardware is interrelated in the enterprise, whether it sits in the data center, the cloud, or the edge, making it difficult to deploy new platforms and put them to work. While AI is poised to bring change to the enterprise, its use of data requires sound infrastructure; the realization of AI's potential will require the right physical underpinnings. #AI [Venture Beat](#)

## NEXT GENERATION COMMUNICATIONS

→ The US Navy chief digital innovation officer hailed 5G as a “great enabler” of future operations, as the service experiments with the technology and focuses on greater connectivity through Project Overmatch. Fifth-generation wireless gear is being considered

for a range of applications, Michael Galbraith suggested on April 19, from pier-side and shipboard links to smart warehouses and other logistical feats. Project Overmatch is the Navy's contribution to Joint All-Domain Command and Control (JADC2), a broader Pentagon effort to better connect sensors and shooters and dissolve communication barriers between the services. The DOD has selected a dozen military installations as testbeds for 5G, including sites in California, Georgia, and Virginia. This month, the department unveiled a multimillion-dollar challenge to accelerate the growth and adoption of a fifth-generation open ecosystem. AT&T this year claimed initial success in setting up a 5G network experiment that could realize [smart warehouses](#) for the Navy. The service believes smart warehouses could boost the efficiency and fidelity of its logistics. The Defense Department received nearly \$338M for 5G and microelectronics in fiscal year 2022. It requested \$250M for fiscal year 2023, according to [budget documents](#). #5G #USA [C4ISRNet](#) [Defense News](#)

## FINANCIAL TECHNOLOGY

→ **The US Treasury Department has tied the North Korean hacking group Lazarus to the theft of more than \$600M in cryptocurrency from a software bridge used for the popular Axie Infinity play-to-earn game.** The Treasury Department added an Ethereum wallet address that held the stolen funds to its list of sanctions on April 14, prohibiting US financial institutions from making transactions with the wallet. Sky Mavis, the Vietnam-based startup behind Axie Infinity said on March 29 that 173,600 Ethereum and 25.5M USDC stablecoins were stolen from its "Ronin Bridge," where cryptocurrency is transferred into and out of the game. The value of those cryptocurrencies was more than \$600M, making it one of the biggest crypto heists on record. According to an FBI statement, an investigation determined that the hacking outfits Lazarus Group and APT38, both associated with North Korea, were behind the theft. The bureau added that such crimes generate revenue for the North Korean regime. According to a Treasury spokesperson, secondary sanctions could be imposed on anyone attempting to support the regime of Kim Jong Un through money laundering, the counterfeiting of goods or currency, bulk cash smuggling, or narcotics trafficking. #FIN #DIG #USA #PRK #VNM [Bloomberg](#) [Nikkei Asia](#)

→ **Decentralized finance project [Beanstalk Farms](#) suffered one of the largest-ever flash-loan exploits on Sunday, April 17, considerably reducing its price.** The credit-focused, Ethereum-based stablecoin protocol suffered a total loss of around \$182M and the attacker got away with ~\$80M of crypto tokens, according to blockchain security firm PeckShield, which had flagged the incident on Twitter. In the wake of the attack, the value of the BEAN stablecoin has tanked, breaking the \$1 peg and trading for around 14 cents on Monday afternoon. Unlike traditional lending, which requires a loan to be secured with a collateral or credit checks, DeFi smart contracts allow users to borrow huge sums of stablecoins in what are known as flash loans, without any form of security. Flash loans, where the entire process of borrowing and returning the loan happens in a single transaction on the blockchain, are fairly popular among arbitrage traders. Flash loans are also a soft target for exploits, as any lapse in a smart contract code lets an attacker manipulate the protocol and drain millions. According to

PeckShield, the hacker has already moved the entire \$80M onto crypto-asset mixing service Tornado Cash to hide their tracks. The perpetrator also donated \$250k in stablecoin USDC to Ukraine. #FIN #DIG #RUS #UKR [Bloomberg](#) [The Verge](#)

→ **Registrations for the Faster Payment System (FPS) have surpassed 10M, suggesting that the Covid-19 pandemic has hastened Hong Kong's shift to digital banking services.**

The FPS is a digital payments system developed by the Hong Kong Monetary Authority (HKMA), the city's de facto central bank. The system enables people to transfer money online between different banks. HKMA has been promoting smart and digital banking services since 2017 to save costs for both customers and banks and to improve banking services. Covid-19, which forced people to work from home and many bank branches to close, has inadvertently given its digital push a big boost – FPS gained about 6M new registrations over a period of two years that coincided with Hong Kong's worst outbreaks of the virus. More than 98% of money transfers in the second half of 2021 were carried out through FPS or other online channels, with the rest moving through bank branches, according to an HKMA survey. Every one in four new retail bank accounts was opened online in the first half of last year, compared with 17% in 2019. #FIN #DIG #HKG [SCMP](#)

## AEROSPACE & SPACE

→ **As NASA pushes to get humans back on the moon, questions have emerged on the Space Force's prospective role in lunar activities.** If successful, NASA's return to the moon will lead to a permanent presence there and lay the groundwork for scientific research and commercial development. A 2020 memo signed by NASA and the Space Force noted that a military presence near the moon would help ensure civilians can operate safely – some early efforts are underway to prepare for operations in the lunar environment. An experiment planned by the Air Force Research Laboratory (AFRL), dubbed the Cislunar Highway Patrol System (CHPS), will investigate technologies to monitor the region of space between Earth and the moon. In the recently enacted defense budget for 2022, lawmakers inserted funds for two cislunar space programs: \$61M for AFRL's experiment and \$70M for a thermal nuclear propulsion demonstration the Defense Advanced Research Projects Agency wants to launch to the cislunar region. #AER #USA #CHN [Space News](#)

→ **Three Chinese astronauts returned to Earth on April 15 after spending a national record of 182 days in orbit, completing China's second crewed space station mission.**

The astronauts spent six months aboard Tianhe, the core module for China's under-construction space station. They conducted a pair of extravehicular activities totaling 12 hours and 36 minutes, carried out a range of science experiments and technology tests, and hosted live science lectures for students back on Earth. It was the first time that China had employed a "rapid return," cutting the number of orbits after leaving Tianhe from 11 down to 5. Search and rescue teams reached the landing site soon after the capsule touched down, slowed by a main parachute and retrorockets shortly before impact. The mission has demonstrated Chinese capabilities to conduct long-term human spaceflight missions, while also preparing future

missions as emergency standbys. China is already gearing up for the next crewed mission. The Tianzhou-4 cargo spacecraft and its Long March 7 launch vehicle are now at the Wenchang spaceport, south China, being prepared for launch next month. #AER #CHN [Space News](#)

## BIOTECHNOLOGY

→ **Researchers at the University of Michigan have developed noninvasive sound technology that breaks down liver tumors in rats, kills cancer cells, and stimulates the immune system to prevent further spread.** By destroying only 50% to 75% of the liver tumor volume, the rats' immune systems were able to clear away the rest, with no evidence of recurrence or metastases in more than 80% of the animals. Histotripsy, a noninvasive treatment that uses ultrasound waves to mechanically destroy target tissue with millimeter precision, to treat cancer in rats. The technique is currently being used in human liver cancer trials in the US and Europe. Whereas a typical ultrasound uses sound waves to create images of the inside of the body, the engineers have pioneered the use of those waves for treatment. And their method is free of the harmful side effects associated with current approaches such as radiation and chemotherapy. The transducer's microsecond long pulses create microbubbles within the targeted tissues, which rapidly expand and collapse. The extremely localized mechanical stresses kill cancer cells while also shattering the tumor's structure. Recently, the group's research on histotripsy treatment of brain therapy and immunotherapy has yielded promising results. #BIO #USA #EUR [Science Daily](#)

## GREEN TECHNOLOGY

→ **Japan's Mitsubishi Heavy Industries plans to develop and commercialize nuclear reactors small enough to be delivered on trucks by the end of the next decade, hoping to draw on demand for non-carbon emitting energy.** At 3 meters tall and 4 meters wide, the microreactors will weigh less than 40 tons. The reactor and power generating equipment will fit inside a container truck, enabling it to be delivered to remote or disaster-hit areas. Mitsubishi plans to commercialize the technology in the 2030s at the soonest, once it receives approval from Japan and other governments. Each microreactor will cost tens of millions of dollars, far less than the ~\$6B to build a 1.2 gigawatt nuclear plant. The cost to produce 1 kilowatt-hour will exceed that of a conventional reactor, but will be in line with the cost it now takes to provide power to isolated islands. The microreactors will enable remote areas to access an economical carbon-free source of power. Nuclear power is receiving another look amid the global decarbonization push. The European Union this year unfurled a plan to designate nuclear power and natural gas as low-carbon energy alternatives. #GRN #JPN [Nikkei Asia](#)

→ **Rivian Chief Executive RJ Scaringe warned that the auto industry could soon face a shortage of battery supplies for electric vehicles – a challenge that could surpass the current computer-chip shortage.** The CEO's comments are the latest in a series of alarms to go off across both the auto and battery sectors with executives worried that the fast-rising demand for electric-vehicle parts and a shortfall of critical materials and production could result

in an acute supply crunch. As we previously reported, Tesla CEO Elon Musk earlier this month tweeted that his company might start mining lithium due to skyrocketing costs. Already, demand for lithium-ion batteries, which are the core power source for electric vehicles, has surged to 400 gigawatt hours in 2021 – up from 59 gigawatt hours in 2015 – and it is expected to jump another 50% in 2022, according to Benchmark Mineral Intelligence, which tracks the battery supply chain. The demand is coming from other sectors, too, with clean-energy companies looking to build more batteries to store power from sources, such as wind and solar, according to analysts. #GRN #USA [WSJ](#)

## ADVANCED MANUFACTURING

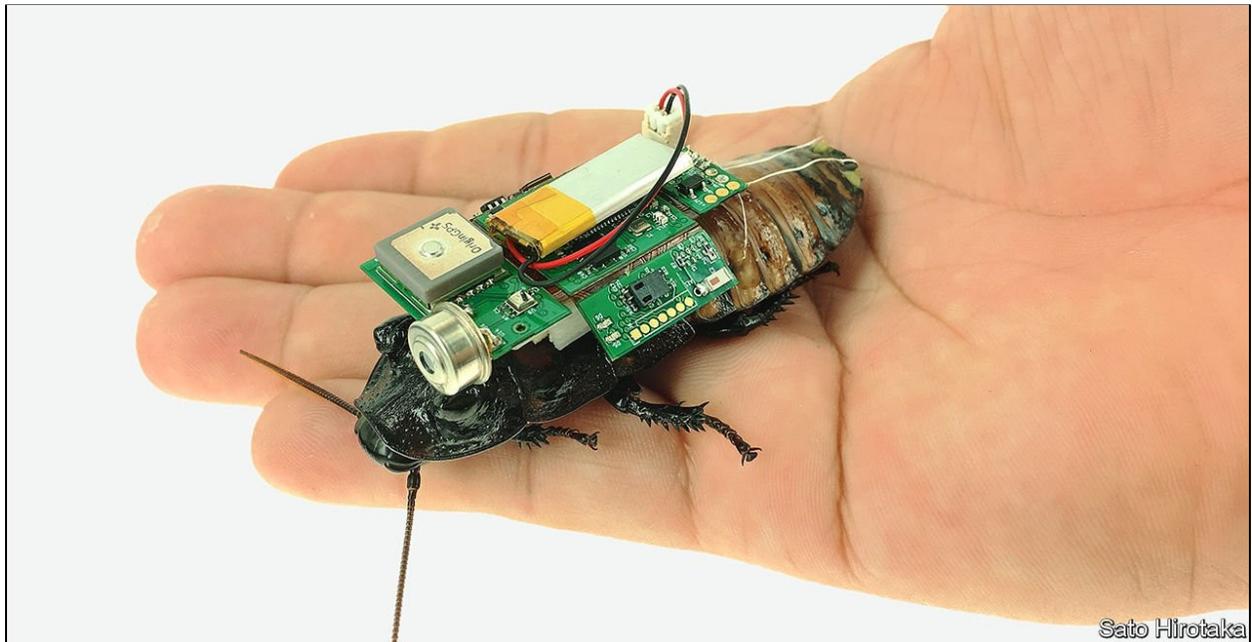
→ **Japanese motor maker Nidec plans to nearly triple production capacity for a key part in industrial robots this fiscal year, taking advantage of the rapid rise in demand for automation amid the Covid-19 pandemic.** The expansion focuses on gear reducers, particularly strain wave gears, used mainly in joints for robot arms. Nidec will spend \$80M to enlarge a manufacturing site in the Philippines, lifting the company's total capacity combined with domestic facilities to 80k units per month from 30k now. The manufacturer will also increase the output of reducers for servo motors used in applications such as chip-making equipment. Nidec is the world's second-largest supplier of reducers behind compatriot Harmonic Drive Systems, a specialist in the field, but seeks to take the lead by 2025. It targets sales of \$777M in this business in fiscal 2025, double its estimate for fiscal 2021. Research firm Global Information forecasts the market for industrial automation, including software and peripheral equipment, will more than double to \$28.9B in 2026 from \$12.8B in 2020. #MFG #JPN #PHL [Nikkei Asia](#)

→ **Using nanotechnology, scientists at Georgia State University have created a newly designed neuromorphic electronic device that endows micro robotics with colorful vision.** The researchers' artificial vision device incorporates a novel vertical stacking architecture and allows for greater depth of color recognition and scalability on a micro-level. The device could have far-reaching applications for the fields of medicine, artificial intelligence, and microrobotics. According to project leader Sidong Lei, it is the first step toward the development of a micro-scale camera for microrobots. #MFG #BIO #AI #MFG #USA [Science Daily](#)

## AUTONOMOUS SYSTEMS

→ **Based on their drone-like capabilities, researchers are working to transform insects into autonomous agents for search-and-rescue operations.** For the past 15 years, Sato Hirota of Nanyang Technological University in Singapore has been researching "cyber insects." His cyber insects are autonomous agents, controlled by algorithms that react to sensors in their backpacks. A communications chip, a carbon-dioxide sensor, a motion sensor, an infrared camera, and a tiny battery are all housed in the backpacks. For search-and-rescue operations in collapsed buildings, fleets of these insects would be released into the rubble to crawl through, looking for signs of human movement, body heat, and elevated CO2 levels from

respiration. The artificial intelligence that determines whether a set of signals indicates the presence of a human being is directly programmed into the camera. It alerts a rescuer if it believes it has spotted someone. The software correctly identified humans 87% of the time, a success rate the researchers believe could be improved further by collecting multiple images from different angles. The project's next phase is to modify the system for outdoor use and commercialize the technology. Researchers believe the autonomous agents will be ready for deployment within the next 5 years.



#AUT #AI #BIO #SGP [The Economist](#)

## SEMICONDUCTORS & CHIPS

→ **Despite soaring prices, Chinese companies are continuing to invest in second-hand chip manufacturing machines, which are expected to account for 20% of global chip production capacity this year.** According to industry sources, the cost of second-hand lithography machines that etch circuits onto silicon wafers has more than doubled. This booming market reflects the high level of investment in the production of chips for automobiles and appliances, a less advanced but still profitable segment than high-end chips for smartphones. "This is an unprecedented boom for second-hand semiconductor production machinery," said Shuji Kumazawa, senior vice president of SurplusGLOBAL Japan, a supplier of second-hand chip making equipment. Buyers appear as soon as an item is listed for sale, he added. As the chip shortage persists, chipmakers are expanding existing production lines and constructing new ones. According to the Semiconductor Equipment Association of Japan, a record-high \$26B in Japanese-made chip making equipment was sold during the fiscal year of 2021, up 41% from fiscal 2020. A shortage is especially evident in legacy machinery for 200 mm wafers. While chips from 300 mm wafers are typically used in smartphones and similar devices, chips from 200 mm wafers are still used in automobiles and appliances. Machines for 200 mm wafers

have been in use since the 1990s, so many of those on the used market are more than 20 years old. #CHP #SCRM #CHN #JPN [Nikkei Asia](#)

## QUANTUM TECHNOLOGY

→ **According to Intel, its engineers collaborated with QuTech scientists to create the first silicon qubits at scale at Intel's D1 manufacturing facility in Hillsboro, Oregon, using a 300mm wafer similar to those used to mass produce processor chips.** Next5 [previously reported](#) that the same team delivered the first industrially manufactured qubit in this facility, but Intel and QuTech now claim to be able to mass-produce these silicon qubit devices. The result is a process that can fabricate more than 10k arrays with several silicon-spin qubits on a single wafer with greater than 95% yield, which is significantly higher in both qubit count and yield than current processes used to create qubits, according to Intel. Manufacturing qubits at scale is a critical step, and if conventional silicon manufacturing processes developed and tuned over many years by chipmakers such as Intel can be repurposed for this, it will be a significant step toward scaling to the thousands of qubits required for practical quantum systems. #CHP #QNT #MFG #USA #NLD [The Register Intel](#)

→ **IonQ and Hyundai are collaborating to apply quantum machine learning to image classification and 3D object detection for autonomous vehicles.** IonQ and Hyundai plan to improve computational functionality on quantum computers by using more efficient machine learning, as quantum computers can process massive amounts of data faster and more accurately than classical systems. As part of this project, IonQ and Hyundai will seek to develop quantum techniques for the broad task of 3D object detection, broadening current work on recognizing road signs to include other entities such as pedestrians or cyclists. IonQ is in the process of classifying 43 different types of road signs using IonQ's quantum processors, by encoding images into quantum states. The two companies will then apply IonQ's machine learning data to Hyundai's test environment and simulate various real-world scenarios in the following phase. #QNT #AI #AUT #USA #KOR [The Quantum Insider](#)

→ **Quantinuum's System Model H1-2 more than doubled its performance to become the first commercial quantum computer to pass Quantum Volume 4096.** IBM introduced Quantum Volume (QV) in 2019 as a benchmark to assess the overall capability and performance of quantum computers. Quantinuum's H-Series hardware, powered by Honeywell, has set an industry record for measured quantum volume for the sixth time in two years. The Quantinuum team used standard QV optimization techniques to run 200 circuits with 100 shots each, yielding an average of 152.97 two-qubit gates per circuit. The System Model H1-2 successfully passed the quantum volume 4096 benchmark, generating heavy outcomes 69.04% of the time, which is above the 2/3 threshold with greater than 99.99% confidence. #QNT #USA #GBR [The Quantum Insider](#)

## GEOPOLITICS

→ **Russia has touted the country's alternative to the SWIFT financial-messaging service, but it will no longer publicly disclose who participates.** US and European sanctions over Russia's invasion of Ukraine have cut several major banks off from SWIFT. Russia set up the system in 2014 after the first waves of sanctions over Ukraine. It previously reportedly had 52 institutions from 12 countries participating, which - until recently - was posted on the central bank's website. The list of participants is only one of several items that have disappeared from the central bank's website in the weeks since Russia invaded Ukraine, which triggered sanctions. #FIN #RUS #UKR #Geopolitics [Bloomberg](#)

→ **Chinese President Xi Jinping is further pursuing his "common prosperity" strategy, betting that China will become the world's center of innovation over the next decade by focusing on the city of Zhuzhou as a new tech hub.** New investment and migration are shifting from wealthy coastal hubs to inland cities like Zhuzhou. The Chinese government is supporting thousands of groups working in data science, network security, and robotics. This shift occurs at a critical time. The narrative that the West is declining and China is rising is prevalent in state media. Shanghai, a city of 25M people, has been closed down as President Xi seeks to eradicate Covid-19. His support for Russia during the invasion of Ukraine has raised the prospect of additional sanctions against Chinese firms. These circumstances appear to be reinforcing his desire for technological independence. According to The Economist's analysis of company registration data, firms dealing with big data, artificial intelligence, IoT, robotics, cloud computing, and clean energy are establishing themselves at an unprecedented rate in China. Many of the new hubs are the capitals of impoverished provinces. However, many smaller cities, such as Zhuzhou, are also seeing rapid growth in tech firms. Many VC firms in China are finding fewer constraints on their investments as long as they focus on the fast-growing areas of hard-tech and clean-energy companies. According to [PitchBook](#), VC investments surged in clean energy from \$5.6B in 2020 to \$8.7B in 2021. #Geopolitics #SCRM #AI #AUT #DIG #Cybersecurity #GRN #CHP #CHN #USA #EUR #UKR #RUS [The Economist](#)

→ **According to Alexander Sergeev, President of the Russian Academy of Sciences and a leading Russian research scientist, Chinese cooperation has ceased in the aftermath of Ukraine's invasion.** He claimed that the situation had been going on for more than a month, coinciding with Ukraine's invasion. According to the most recent data from the Chinese Ministry of Science and Technology, China and Russia have established over 1,000 joint research and exchange programs in the last year as their strategic partnership has deepened in the face of mounting Western pressure. Chinese President Xi Jinping and Russian President Vladimir Putin said in a joint statement in February 2022 that scientific cooperation was a top priority. In the past, Russia has contributed crucial components, such as cooling devices, to China's fusion energy research programs. In exchange, China provided high-quality superconducting cables for a large particle accelerator in Russia, which is expected to begin operations this year. However, some Chinese scientists claim they have not received any orders to cease collaboration. According to publicly available information, the largest scientific cooperation projects between China and Russia are primarily in the fields of space, nuclear energy, mathematics, physics, and smart manufacturing. #Geopolitics #CHP #QNT #AER #GRN #MFG #RUS #CHN #UKR [SCMP](#)

## CYBERSECURITY

→ **Eight cyber authorities from Five Eyes published an [advisory](#) warning that more malicious Russian cyber activity is expected after Russian-affiliated cyber criminals and organizations pledged support for the government in retaliation to sanctions against Russia.** The agencies said “evolving intelligence indicates that the Russian government is exploring options for potential cyber attacks.” The advisory is a joint warning by CISA, FBI, NSA, Australia’s CSC, Canada’s CCCS, New Zealand’s NCSC, UK’s NCSC, and the UK NCA. The advisory says Russian aligned cybercrime groups have threatened to conduct cyber operations in retaliation for perceived cyber offenses against the Russian government and the Russian people. Some groups have also threatened to conduct cyber operations against countries and organizations providing materiel support to Ukraine. Five Eyes cybersecurity agencies have urged critical infrastructure network defenders to prepare for potential cyber threats, including destructive malware, ransomware, DDoS attacks, and cyber espionage. The advisory lists precautions for organizations to take. #Cybersecurity #USA #GBR #AUS #CAN #NZL #RUS #UKR #Geopolitics #SCRM [ZDNet](#)

→ **Citizen Lab warned British officials on Monday, April 18 that electronic devices connected to government networks, including those in the prime minister's office and the foreign ministry, appeared to be infected with Israeli-made spy software (Pegasus).** According to a [blog post](#) published by Citizen Lab, the spy software is known as Pegasus, a product of Israeli cyber arms dealer NSO Group. Citizen Lab believes the targeting of the prime minister's office was carried out by NSO clients in the United Arab Emirates, while the British foreign ministry hacking was carried out by other countries such as Cyprus, Jordan, and India. Citizen Lab discovered evidence of compromised UK devices by monitoring internet traffic and other digital signals to spy servers that control Pegasus for a variety of NSO clients. According to a [New Yorker article](#) about NSO Group, the hacking activity linked to the British prime minister's office was investigated by the UK National Cyber Security Center, where technicians tested multiple phones for malware, but the findings were inconclusive. #Cybersecurity #DIG #CAN #GBR #ISR #ARE #CYP #JOR #IND [Reuters](#)

→ **In the midst of Russia's invasion of Ukraine, NATO's cyber game puts defenses to the test, with cyber experts from Ukraine and NATO countries taking part in simulated wargames.** The annual cyber wargames, known as Locked Shields, began on Tuesday, April 19 in Tallinn, Estonia. The event is organized by NATO's Cooperative Cyber Defense Center of Excellence and includes hypothetical cyber-attack exercises that test teams must mitigate. NATO officials have been discussing various ways in which the alliance could assist Ukraine in defending itself against cyber-attacks, and the country was granted access to its malware information-sharing platform in January 2022. According to Ian West, the NATO Cyber Security Center Chief, the NATO alliance team consists of around 30 cyber defenders from various NATO bodies and member countries with specializations such as communications, digital forensics, legal expertise, and recovering systems damaged by an attack. The exercise allows cyber defenders from different countries to communicate with one another about attacks on the

same technology products that several governments use. #Cybersecurity #Geopolitics #USA #CAN #EUR #EST #UKR #RUS [WSJ](#)

→ **American cybersecurity firms are assisting the Ukrainian government in strengthening its cyber defenses by donating physical security keys.** According to Ukrainian officials, Ukraine is now issuing keys to as many government agencies as possible. The government intends to "push phishing proof, password-less authentication solutions in Ukraine". Ukraine has received assistance from [Yubico](#), a Palo Alto, California-based company that has donated 20k "Yubikeys," (worth ~ \$1M) and [Hideez](#), a Herndon, Virginia-based cybersecurity company that operates in Ukraine and is assisting with logistics. Security keys are a type of additional authentication that uses public-key cryptography to verify a user's identity by comparing information stored on a chip to online servers. They are less vulnerable to compromise than usernames and passwords, which can be guessed by bots or stolen and sold on dark web forums. According to a Western intelligence official, it is much easier for hackers to target people who run critical infrastructure rather than the equipment that supports them, such as substations, telecommunication switches, and so on. Ukraine's government announced last week that the country has been subjected to three times the number of cyber-attacks in the first month and a half of the conflict as it did in the same period last year. **In line with CISA guidance on the risks of using portable media devices, Next5 does not condone the use of untrusted or "free" devices.** #Cybersecurity #USA #UKR [Bloomberg](#)

## SUPPLY CHAINS

→ **As supply chains remain strained, Onsemi, a US automobile chip manufacturer, is the latest to warn of Shanghai disruptions.** Onsemi has reportedly shut down operations at its Shanghai distribution center, one of four in Asia, as supply chain disruptions in China continue to reverberate through the global supply chain. According to a letter signed by Onsemi VP of Sales Mike Balow, there is no set date for the company's Shanghai center to resume operations. Bloomberg supply chain data shows Onsemi's customers include auto parts supplier Robert Bosch, a supplier to Volkswagen, Mercedes-Benz, and Audi; Denso Corp, a major supplier to Japanese carmakers; Magna International, a supplier to US carmakers GM and Ford; and South Korean firms Hyundai and Samsung. Additionally, Onsemi is the world's second-largest supplier of discrete transistors such as insulated gate bipolar transistors (IGBTs) and metal oxide semiconductor field-effect transistors (MOSFETs), according to PitchBook data. The company also warned that increasing restrictions in smaller cities across China could have an impact on the operations of its suppliers of materials, equipment, and services across the country. According to Interos, a supply chain risk management firm, over 315k US companies have some supply chain dependencies in Shanghai, and it is expected that semiconductors and other electronics used in a variety of industries – including automotive, aerospace, and defense – would be impacted. #SCRM #CHP #USA #CHN [SCMP](#)

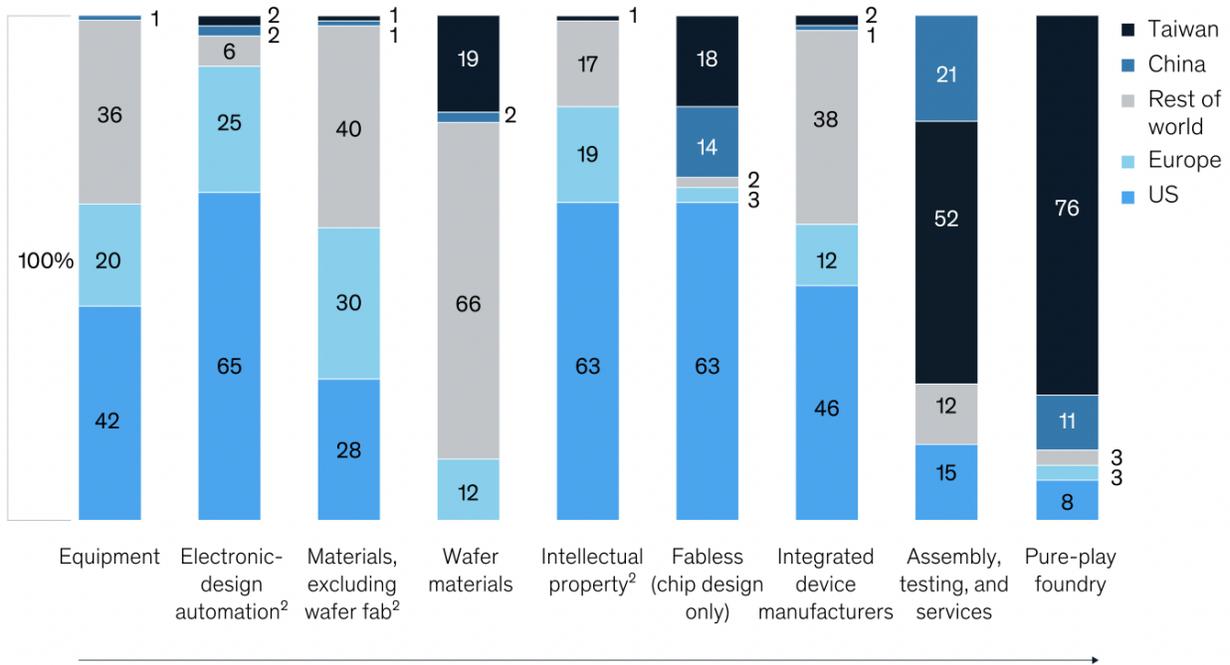
→ **LG and the Indonesian government will collaborate to establish a unified supply chain for electric vehicle (EV) batteries in the resource-rich Southeast Asian country, which will**

**include the construction of an EV battery plant.** The supply chain will extend from raw material extraction to the manufacture of EV batteries. [LG Energy Solution](#) is one of South Korea's largest battery manufacturers. According to a source with knowledge of the project, the total investment could be around \$9B. The partnership is especially concerned with ensuring a steady supply of nickel, whose prices are rapidly rising. Participants will include other LG group companies and South Korean steelmaker [Posco](#), Indonesian state-owned nickel miner [Antam](#), the Indonesia Battery Corporation, and Chinese miner [Zhejiang Huayou Cobalt](#). Additionally, LG Energy Solution is building five battery plants in North America and investing to expand production in Poland and China. Jakarta aims to develop nickel-related industries that will turn batteries and EVs into key exports for the country. CATL, the world's leading battery supplier, has also made an investment in Indonesia. #SCRM #GRN #KOR #IDN #CHN #USA #CAN #POL [Nikkei Asia](#)

→ **The current semiconductor shortage has highlighted the industry's reliance on a well-functioning supply chain.** Over the last two decades, the semiconductor industry has become increasingly consolidated in many of the value chain segments, with a few leaders emerging in each. As a result, expertise is frequently concentrated in specific markets (for example, the US has the greatest presence of fabless players (chip design only) and equipment manufacturers). No single market possesses all of the capabilities required for end-to-end semiconductor design and manufacturing, and the concentration of expertise has resulted in a web of interdependencies along the supply chain. Some emerging trends, such as autonomous driving, vehicle electricity generation, and artificial intelligence, rely on ongoing semiconductor technology innovation and a stable chip supply. Additionally, semiconductor companies could benefit from rethinking their approach in six critical areas in order to develop a more stable supply chain: technology leadership, long-term R&D, resilience, talent, ecosystem capabilities, and increased capacity, according to analysts.

**No local market or company has all the capabilities required for end-to-end semiconductor design and manufacturing.**

2020 semiconductor sales along the value chain,<sup>1</sup> % share



<sup>1</sup>Figures may not sum to 100%, because of rounding.  
<sup>2</sup>Based on 2018 sales.  
 Source: Gartner; Omdia; McKinsey analysis

#SCRM #CHP #AI #GRN #AUT #USA #EUR #CHN #TWN [McKinsey & Company](#)