MATRIX MONITOR

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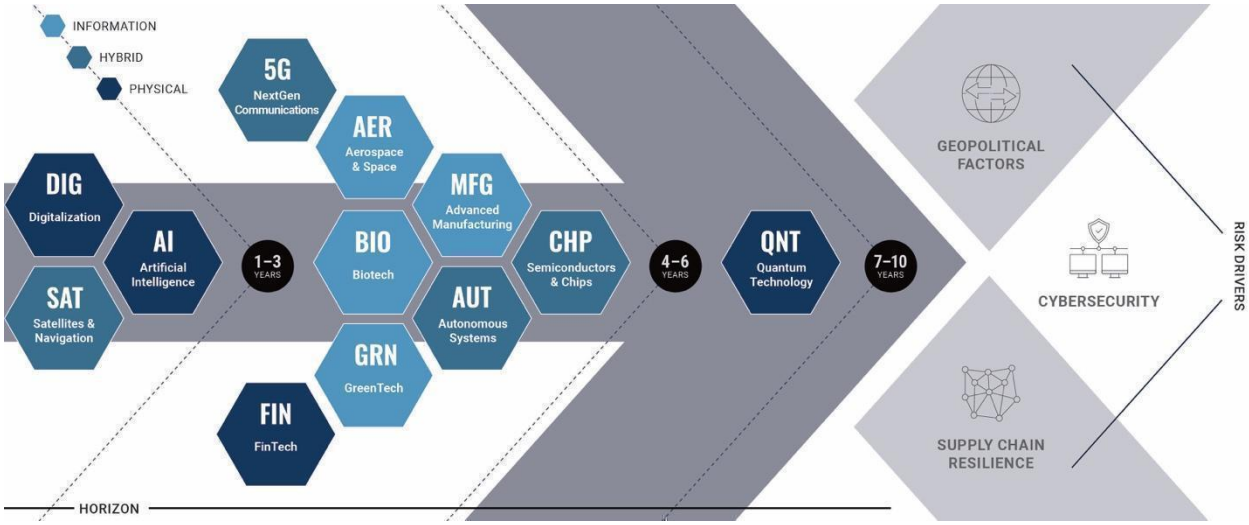
The only source dedicated exclusively to the emerging technologies shaping the future of business and national security.



This week's Next5 Matrix Monitor features Chinese satellites that evaded and monitored a US surveillance satellite, the transmission of AT&T's 5G network via drone, a Russian radar to track the F-35 fighter jet, an effort to boost the US manufacturing capacity for electric vehicle chargers, a large-scale direct air capture plant in Iceland, CSET recommendations for the US to bolster its semiconductor advantages over China, a research consortium in Washington, DC, for sharing information between quantum computers, and DDoS cyberattacks against Norwegian institutions.

NEXT5 NEWS & AMPLIFICATIONS

→ **President Biden and G7 leaders are formally launching the Partnership for Global Infrastructure and Investment (PGII) - which has already awarded contracts to US tech companies to build out infrastructure around the world.** According to the White House fact sheet: the effort will "deliver game-changing projects to close the infrastructure gap in developing countries, strengthen the global economy and supply chains, and advance US national security." The U.S. aims to mobilize $200B (and $600B total with G7 allies) for PGII over the next 5 years through grants, Federal financing, and leveraging private sector investments. Biden's four priority pillars include: investing in climate resilient infrastructure, deploying ICT networks and providing 5G/6G capabilities, advancing gender equality, and upgrading healthcare infrastructure. Flagship projects include a $600M contract awarded to US telecommunications company SubCom to build the Southeast Asia-Middle East-Western Europe 6 submarine telecommunications cable that will connect Singapore to France through Egypt and the Horn of Africa; a contract for US firm Nuscale Power to provide Front-End Engineering and Design study for Romania's deployment of a first-of-a-kind small modular reactor plant; as well as funding for vaccine manufacturing, alternative energy and carbon capture projects, internet connectivity, agricultural advances, among several other efforts. The White House #USA #DIG #5G #GRN #BIO #Geopolitics #SCRM

> Analyst Comment: *The contracts awarded to U.S. tech companies to carry out infrastructure projects overseas is a notable change. As we previously reported, the US government funded a 5G project in Ethiopia designed to offer an alternative to China's Huawei, but was unable to award the contract to a US company, and instead funded Vodafone. Next5 has long encouraged efforts that allow US companies to take advantage of new market space created by US government-funded projects such as those awarded to SubCom and Nuscale Power through the PGII. Out of 100+ executives we've polled over the USG's response to Huawei, they nearly unanimously agreed that US policy to stop Huawei was warranted, but it was ineffective because it was protection oriented versus promoting US alternatives. Offering US alternatives is a much stronger approach and more likely to be successful over the next 5 years, rather than punishing the first company to market, as was the case with Huawei.*

→ **The House Appropriations Committee directed the Secretary of Defense to provide a report detailing how Pentagon leadership delineates roles and responsibilities within cyberspace among its different component agencies.** The guidance, released Friday, June 24, comes as a companion report to a spending bill for the DoD; it must be carried out within 90 days of the bill's passing. Reciting a long list of high-level DoD positions and offices, they write that it "remains unclear … which offices and positions at the Department of Defense are responsible for cyber, cybersecurity, and cyberspace policy and activities." The committee noted, for example, that a Deputy Assistant Secretary of Defense for Cyber Policy and a Deputy Principal Cyber Advisor for Cyber Policy both fall under the office of the Under Secretary of Defense for Policy. The committee wants the report to include an organizational chart listing each office with responsibility over cyber activities, descriptions, and distinctions between each

position and their reporting structure to Pentagon leadership. The legislation also pushes the department's chief information office to look at opportunities to collaborate with CISA on a commercial cyber threat intelligence shared service. It also directs the secretary of defense to provide "supplementary support" to CISA where needed to respond to hacks from countries like Russia and China. Moreover, the committee wants the DoD to collaborate with colleges and universities to recruit cyber-focused students during their junior and senior years with the expectation that students will have a completed security clearance upon graduation. #Cybersecurity #USA SC Magazine

DIGITALIZATION

→ **Brendan Carr, a leader of the US Federal Communications Commission asked Apple and Google to remove TikTok from their app stores due to China-related data security concerns.** The FCC commissioner shared via Twitter a letter to Apple CEO Tim Cook and Alphabet CEO Sundar Pichai pointing to reports and other developments that made TikTok non-compliant with the two companies' app store policies. He emphasized that the app is not just for sharing videos or memes. It "functions as a sophisticated surveillance tool that harvests extensive amounts of personal and sensitive data." Carr's letter, dated June 24, said Apple and Alphabet should provide statements to him by July 8 if they do not remove TikTok from their app stores. He requested that the statements provide the basis for the companies' conclusion that the access of private and sensitive US user data by persons in Beijing, coupled with TikTok's misleading representations and conduct, does not run afoul of any app store policies. Carr's letter cited a BuzzFeed News report from earlier in the month that said recordings of TikTok employee statements indicated engineers in China had access to US data between September 2021 and January 2022. #DIG #USA #CHN CNBC

→ **ByteDance, owner of short video app TikTok and its Chinese version Douyin, has acquired Chinese VR start-up PoliQ, the latest move in the tech giant's push into the metaverse as interest in the sector continues to grow.** PoliQ, operator of the once-popular virtual social platform Vyou that allowed users to create their own avatars, was bought by ByteDance for "tens of millions of yuan" last week, according to business and trademark registration tracking firm Tianyancha. The startup was absorbed into VR headset company Pico, which was acquired by ByteDance in August last year, local media outlet VR Tuoluo reported separately. ByteDance's acquisition of PoliQ comes as the company has been expanding its metaverse portfolio, including hardware, platforms, and content, as tech giants around the world invest in the sector. ByteDance's acquisition of Pico for nearly $772M was the first major investment by a Chinese tech giant into the metaverse hardware sector. The Beijing-based company has increased its support for the VR unit since the acquisition. Earlier this year, ByteDance said it would work with US chip giant Qualcomm to advance metaverse-related extended reality (XR) technologies. It also moved three managers from its short video unit to oversee the metaverse venture. #DIG #USA #CHN SCMP

→ **China cybersecurity investigators launched a probe of the operator of the country's biggest academic database as Beijing heightens scrutiny of technology companies with large troves of data.** The database operator, Tongfang Knowledge Network (Beijing) Technology Co., manages a cache of personal information and data for key industries that include defense, telecommunications, transportation, and natural resources, according to the Cyberspace Administration of China on Friday, June 24. The database, known as China National Knowledge Infrastructure, also contains sensitive information about the country's major research projects and its scientific and technological development, according to the internet watchdog, which leads such investigations. The probe is aimed at pre-empting risks related to the security of national data and protecting national security, the regulator said. The move comes as Beijing re-examines data security and seeks to tighten controls over information that it deems to be critical or sensitive to national security and its technological competitiveness. It is also against a broader backdrop of China reducing the flow of information about what is happening inside the country. #DIG #Cybersecurity #CHN WSJ

→ **Officials in Indonesia are discussing blockchain for elections among other use cases in the country.** Blockchain can enable e-Voting, thus eliminating the necessity of a polling station (TPS) and the special election team's role. According to Dr. Andry Alamsyah, an honorary member of the Indonesian Blockchain Association (ABI), blockchain technology can also cut costs and eliminate the need for paper ballots. According to Budi Rahardjo, an IT practitioner and honorary member of ABI, eVoting is an effective blockchain implementation in Indonesia, but the present digital gap in the country necessitates a hybrid online/offline implementation of the technology. Budi also emphasized the safety of the decentralized technology, stating that hackers must compromise at least 50% plus one of the total number of servers – a near impossibility due to the large number of servers that would be needed for an election. Asih Karnengsih, Chairwoman of ABI, highlighted the many other benefits of blockchain for Indonesia. The technology can improve the distribution of G2P (Government to Person) programs for the distribution of social assistance in Indonesia. It can also make cross-border transactions for the financial industry faster, cheaper, and more secure because they are on the same network and do not require verification from third parties. In the health service industry, blockchain can enable smart hospital systems, namely data integration between hospitals. Moreover, in the Supply Chain Industry, blockchain technology can track the movement and distribution of goods. #DIG #FIN #SCRM #IDN Yahoo Finance

SATELLITES & NAVIGATION

→ **Chinese satellites have shown the ability to evade and monitor a US surveillance satellite, prompting experts to call for new norms as the space powers increasingly play cat-and-mouse games in orbit, according to a new report.** Earlier this year, two Chinese satellites were approached by an American space surveillance satellite after they reached geostationary orbit, according to the report published by Space News on June 16. The Chinese satellites – Shiyan-12-01 and Shiyan-12-02 – took off in opposite directions as USA 270 drew near, and the Shiyan-12-02 then positioned itself to look back at the US satellite, the report said.

It is not the first time there have been close encounters between the two countries' satellites, as games of "geostationary orbit cat and mouse" between the competitors are becoming more frequent, according to the report. In November, Shijian 20, China's most advanced communication satellite, was approached by a US surveillance satellite but reportedly sped away. The latest encounter between the US and Chinese satellites has prompted discussions about creating new norms and rules for space, according to the Space News report. #SAT #USA #CHN SCMP

→ **China is continuing its mission to carry out more than 50 orbital launches this year with a pair of missions lifting off within just over 24 hours of each other.** Commercial launch service provider Expace launched a Kuaizhou-1A rocket from Jiuquan Satellite Launch Center on June 21, sending a Tianxing 1 satellite into a near-polar orbit. On June 22, the China Aerospace Science and Technology Corporation (CASC) launched a Long March 2D rocket from Xichang Satellite Launch Center, sending three Yaogan 35 (02 group) satellites into orbit. Chinese state media outlet Xinhua reported that the trio of satellites would be mainly used to "conduct science experiments, land resource surveys, yield estimation of agricultural products, and disaster prevention and reduction." Outside of China, it is believed that Yaogan satellites are for military purposes, akin to how Russia and the US use "Kosmos" and "USA" designations, respectively, for military satellites. The launches were China's 21st and 22nd of the year. CASC alone is planning more than 50 missions across 2022, including six missions to complete the country's Tiangong space station. #SAT #AER #USA #CHN #RUS Space.com

ARTIFICIAL INTELLIGENCE

→ **GitHub's new automated computer-coding tool will help companies manage a shortage of software developers, but it will not replace them, according to the company's CEO.** Thomas Dohmke, the CEO of Microsoft-owned GitHub, says the AI-powered coding tool, launched last week as Copilot, is designed to ease the task of writing long lines of computer code from scratch. The tool acts like a predictive-text feature on smartphones. As developers work, the tool suggests options for lines of code needed to execute given tasks within a larger software program. Developers, who can also ask for suggestions, then choose which option to use. The tool was created in partnership with OpenAI, an AI software maker best known for its GPT-3 natural-language model that can mimic writing. According to GitHub, in the past year, more than 1.2M developers signed up to use a preview version of the tool. The company said test runs indicate the tool can cut application development times in half, with an average of 40% of code in users' applications generated automatically. According to Mr. Dohmke, automated coding is meant to supercharge developers, accelerating what they're able to achieve and stretching their imaginations, but AI will not replace developers as the tool cannot predict human ideas. #AI #USA WSJ

→ **Amazon is developing a voice-mimicking feature for Alexa that replicates the speech of people alive and dead, joining other companies experimenting with creating digital memories of people after death.** Rohit Prasad, head scientist of Alexa, showed a video clip of

the new feature in action at Amazon's re:MARS 2022 conference on AI on Wednesday, June 23. The clip showed a boy asking Alexa to read him "The Wizard of Oz" in the voice of his grandmother. Alexa then switched from its default voice to a softer voice. According to Mr. Prasad, Alexa can mimic voices after accessing less than a minute of recorded audio of a voice. He said the new voice-mimicking feature is something the company has been exploring based on recent advancements in text-to-speech technology. It allows the company to produce a high-quality voice with less data rather than relying on hours of recording in a professional studio. Numerous startups are working on using AI to create versions of people after their deaths. One app, Replika, learns to replicate a person in the form of a chatbot. HereAfter AI records the life stories of people and uses them to create a replica embedded in a smart speaker. Using AI to duplicate the voice of someone who has already died could raise ethical issues. The documentary "Roadrunner" about Anthony Bourdain came under fire for including a few lines read by a digital replica of the deceased celebrity chef's voice. #AI #USA WSJ

NEXT GENERATION COMMUNICATIONS

→ **An SES satellite, launched from Cape Canaveral, will clear part of the C-band spectrum for 5G.** The SES-22, built by Thales Alenia Space, will deliver TV and radio content to millions of US homes and provide other critical data transmission. Intelsat and SES, both based in Luxembourg, were the two biggest holders of C-band spectrum in the US and are likely to gain about $9B combined by clearing their part of the band in time. In his quarterly transition report in March, SES Chief Development Officer Christophe De Hauwer noted that Thales Alenia Space usually relied on the Ukrainian Antonov AN-124 aircraft charter to transport geostationary satellites, such as the SES-22, to launch sites. However, because of the Russian war in Ukraine, there were no Antonov aircraft available to transport the SES-22 to Cape Canaveral, so they had to work with Thales to transport it by sea and ensure it arrived in time for the scheduled launch. The FCC developed a transition plan with the satellite companies to clear the C-band for 5G. SES's responsibilities include ensuring ground stations are correctly pointed and tuned, technology is upgraded where needed, and filters are installed to protect customers against interference. #5G #SAT #USA #LUX #RUS #UKR Fierce Wireless

→ **Earlier this month, AT&T announced that their drone operations team has achieved an industry first in transmitting its 5G network via a drone.** The test was performed in April in rural Missouri with AT&T's "Flying COW," or Cell on Wings. Ethan Hunt, AT&T's Unmanned Aircraft Systems (UAS) Principal Program Manager, shared in an announcement that the team flew the drone at an altitude of about 300 feet, and the 5G coverage extended over roughly 10 square miles. These Flying COWs have been operating since 2017 to provide LTE connectivity over a region, according to Art Pregler, UAS Program Director at AT&T. Following the successful test flight in April, AT&T's UAS program is upgrading its fleet to provide a 5G network via drone to customers everywhere. The team is also working on a pseudo-satellite drone solution capable of operating at an altitude of 60k feet to provide connectivity for months at a time. Other future advancements include tethered multirotor drones and vertical take-off and landing (VTOL) aircraft. One of AT&T's clients has requested a customized version of the 5G Flying COW

solution. A drone launched over the ocean would provide a private bubble of connectivity between multiple ships, a capability the UAS program will be demonstrating in August.

#5G #USA Aviation Today

FINANCIAL TECHNOLOGY

→ **Chinese President Xi Jinping chaired a meeting Wednesday, June 22 that approved promoting the "healthy" development of the payment and fintech sectors, a sign that a broad crackdown on tech companies like Ant Group may be easing.** The meeting of the central commission for deepening overall reform also backed enhancing regulation of major payment platforms, state broadcaster China Central Television reported, adding that companies would be encouraged to return to their roots while the authorities will improve regulation. As part of the plans, China would ensure the security of payment and financial infrastructure and work to prevent systemic financial risks, according to CCTV. The government will also enhance oversight of financial holding companies and financial institutions invested by platform firms. Beijing has promised to unwind crackdowns that halted Ant's record initial public offering in 2020 and affected every sector from online education to gaming. Once Ant can set up the financial holding company, it can fold key operations into the entity, following a framework laid down by the central bank last year. A relaxation of curbs on Ant – one of the most high-profile casualties of Xi's sweeping clampdown – would send a powerful signal that policymakers are following through on recent pledges to support the industry. #FIN #DIG #CHN Bloomberg

AEROSPACE & SPACE

→ **Satellite imagery has revealed the construction of a Russian radar to track the F-35 fighter jet.** The new Rezonans-NE radar is located near Zapolyarny, a mining town close to Russia's border with Norway. The radar can purportedly provide early warning and target tracking against stealth aircraft like the F-35 that both Norway and Finland will operate in the airspace west of the Kola Peninsula. It is one of at least six similar radars already deployed, or soon to be deployed, along Russia's Arctic coastline, from the Kola Peninsula in the west to the Bering Strait in the east. According to the Russian designers, the radar system can spot aerodynamic targets up to a 600 km distance, while ballistic missiles can be detected from 1200 km. One reason to locate such an EW radar on the western border of the Kola Peninsula is to protect the airspace from possible enemy attacks on the strategically important submarine bases on the coast of the Barents Sea. The waters from Zapadnaya Litsa to the Kola Bay are home to the Northern Fleet's bases for both multi-purpose submarines and ballistic missile submarines. #AER #RUS #FIN #NOR The Barents Observer

→ **Russia's government announced plans on Monday, June 27, to invest $14.5B in the country's aviation industry by the end of the decade to boost the share of domestically manufactured aircraft.** The Russian aviation industry has been in crisis since the West imposed sanctions after Moscow's invasion of Ukraine, banning Russian airlines from flying to destinations in Europe, the US, and other countries. Foreign plane makers have also stopped delivering new aircraft, while spare parts for foreign-built planes are in short supply. Russia has been pushing to localize aircraft production but only the Sukhoi Superjet regional aircraft is mass-produced inside Russia, while a significant number of its components, including vital engine parts, are imported. Russia is preparing to mass-produce the MS-21 medium-haul aircraft, which also has some foreign components. It also expects to begin building a small number of Soviet-designed Tu-214. According to the program, Russian airlines should receive about 1k new locally built aircraft by 2030. #AER #MFG #RUS Reuters

→ **Iran reportedly launched a rocket into space on Sunday, June 26 as negotiations between the US and Tehran on the nuclear deal scrapped in 2018 are expected to resume soon.** Iranian state television aired footage of the solid-fueled rocket, named "Zuljanah," being launched into space on Sunday. It is the second test of the satellite-carrying rocket that was first launched in February of last year. Western nations worry that the Iranian satellite program is a cover for the regime's development of ballistic missiles capable of carrying nuclear warheads. Iran claims the satellites will gather data in low-Earth orbit and promote Iran's space industry. It's unclear if the test was successful and from where the rocket was launched; however, satellite photos from earlier in June showed a launch site being prepared at Imam Khomeini Spaceport in Iran's Semnan province. The White House said it was aware of Iran's announced rocket launch and criticized it as "unhelpful and destabilizing," according to a report. The launch comes one day after Iran's foreign minister and the European Union's foreign policy chief both said that nuclear talks between the US and Iran are expected to resume "in the coming days." #AER #SAT #Geopolitics #USA #IRN Washington Examiner

BIOTECHNOLOGY

→ **ETH Zurich researchers have created a wearable textile exomuscle that acts as an extra layer of muscles.** The Myoshirt is a type of vest with upper arm cuffs and a small box containing all of the technology that is not directly applied to the body. A smart algorithm detects the wearer's intentional movements and the amount of force required using sensors embedded in the fabric. A motor then shortens a cable in the fabric that runs parallel to the wearer's muscles, creating a kind of artificial tendon that supports the desired movement. This assistance is always responsive to the user's movements and can be customized to their specific preferences. The user is always in command and has the ability to override the device at any time. The prototype was recently tested for the first time in a study with 12 participants: ten people with no physical impairments, one with muscular dystrophy, and one with a spinal cord injury. The results were encouraging: thanks to the exomuscle, all participants were able to lift their arms and/or objects for significantly longer periods of time. Endurance increased by about a third in healthy subjects and by about 60% in the participant with muscular dystrophy, while the participant with a spinal cord injury could perform the exercises three times as long.

#BIO #CHE Tech Xplore

→ **Researchers have developed a new electronic tattoo (e-tattoo) that can be worn on the wrist for hours and provides continuous blood pressure measurements with an accuracy level that exceeds nearly all currently available options on the market.** The continuous monitoring of the e-tattoo allows for blood pressure measurements in all kinds of situations: at times of high stress, while sleeping, exercising, etc. It can deliver thousands of measurements more than any device thus far. E-tattoos make sense as a vehicle for mobile blood pressure monitoring because they are enclosed in a sticky, stretchy material that is comfortable to wear for extended periods of time and does not slide around. Cuff-less blood pressure monitoring is the "holy grail" of medicine, according to the research team, but there is no viable solution on the market yet. It's part of a larger push in medicine to use technology to untether patients from machines while collecting more data wherever they go, allowing them to move from room to

room, clinic to clinic while still receiving personalized care. “All this data can help create a digital twin to model the human body, to predict and show how it might react and respond to treatments over time,” the researchers stated. #BIO #USA ScienceDaily

→ **Chinese researchers claim to have made it feasible for individuals to emit radio waves with their minds, a development that could have uses ranging from mind-controlled military radar to health monitoring.** Professor Wang Jiafu of Air Force Engineering University stated in a paper published in the peer-reviewed journal eLight, "Our design gives users a universal way to manipulate electromagnetic waves using brainwaves." His team was inspired by the recent discovery of metamaterial, a programmable material capable of producing or manipulating radio waves. By forming a "metasurface" over an object, extremely thin metamaterials can transform it into a radio transmitter. Wang and his colleagues proposed that a metasurface could act as a conduit for brainwaves and radio waves. The researchers used commercially available technology known as a brain-computer interface to detect brain waves using a wearable device in their experiment. The brain signal was then transmitted to the metasurface by the researchers using Bluetooth wireless technology. Because radio and brain waves do not communicate in the same "language," Wang's team programmed the metasurface to convert brainwaves into radio signals almost instantly. Previous studies on metasurfaces, according to Wang's group, utilized a wired connection to the signal source. It was the first time that a metasurface was controlled directly by brainwaves, according to the researchers. #BIO #CHN SCMP

GREEN TECHNOLOGY

→ **Google’s cloud-computing division is preparing to reveal the carbon footprint for its Workspace apps, including Gmail and Docs, as it builds out its suite of tools to help customers assess their impact on the environment.** The move by Google Cloud expands measures unveiled last year to help clients measure and reduce the gross carbon emissions of using Google Cloud services. Google plans to reveal the Workspace carbon data in early 2023 and aims to completely decarbonize by 2030. Last year, it touted its efforts to help users reduce their carbon emissions by suggesting certain flights or driving routes that cause less pollution. However, cloud computing, a key area of operations for Google, is known as a particularly energy-heavy domain. Google runs data centers globally and has for years purchased renewable energy offsets to keep pace with usage by its server farms. It claims that its cloud, which delivers internet-based computing and storage to other companies, is the world’s cleanest. #GRN #DIG #USA Bloomberg

→ **According to the White House on Tuesday, June 28, companies are planning to invest more than $700M to boost US manufacturing capacity for electric vehicle (EV) chargers.** The investments are set to add at least 2k jobs and make charging more accessible and affordable. The plans include $450M earmarked by Volkswagen unit Electrify America and more than $250M by Siemens to expand its Grand Prairie, Texas and Pomona, California EV charger plants. FLO, an EV charging network operator, is also investing $3M in its first US assembly

plant in Auburn Hills, Michigan. The investments will help boost US manufacturing capacity for EV chargers to more than 250k per year, the White House said, without giving a figure for current production capacity. Last August, President Joe Biden set a non-binding goal to make half of all new vehicles sold in 2030 electric, fuel cell, or plug-in hybrid. As part of that, he wants to see the US network of EV chargers grow to 500k by 2030, up from ~100k today. #GRN #MFG #USA Reuters

→ **Swiss startup Climeworks AG is building its second large-scale direct air capture (DAC) plant in Iceland with the ability to capture 36k tons of CO2 per year from the air.** That amount is negligible in comparison to the 36B tons of energy-related CO2 emissions produced worldwide last year. But it is a 10-fold increase from Climeworks' existing DAC plant, currently the world's largest, and a leap in scale for a technology that scientists this year said is "unavoidable" if the world is to meet climate change goals. The new "Mammoth" plant will contain around 80 large blocks of fans and filters that suck in air and extract its CO2, which Icelandic carbon storage firm Carbfix then mixes with water and injects underground where a chemical reaction turns it to rock. #GRN #CHE #ISL Reuters

ADVANCED MANUFACTURING

→ **Researchers at the Universidade Federal de Pernambuco in Brazil created a new deep learning model to estimate the pose of robotic arms and predict their movements.** This model, introduced in a paper pre-published on arXiv, is designed to enhance the safety of robots while they are collaborating or interacting with humans. Estimating a robot's pose is an essential step for predicting its future movements and intentions, and in turn, reducing the risk of collision with objects in its vicinity. In the future, the framework developed by this team of researchers could be used to improve the safety of both existing and newly developed robotic systems. In addition, the algorithms they used could be adapted and applied to other tasks, such as human pose estimation, object detection, and object classification. #MFG #AI #BRA Tech Xplore

AUTONOMOUS SYSTEMS

→ **After receiving approval from federal regulators, Swedish autonomous-truck startup Einride AB will test its autonomous freight vehicles on public roads in the US in collaboration with GE Appliances.** The freight sector is moving more quickly toward autonomous transportation than the passenger-car industry, in part because the technology can reduce costs and simplify operations for commercial trucking companies, according to an industry expert. Einride's autonomous EVs, known as "Pods," can carry up to 10 pallets of freight (~57k lbs). According to Einride, the Pods are managed by remote operators who can monitor multiple vehicles at once. Einride's pilot program, which will last two weeks in Q3 of 2022, will place the Pod on public roads along with trucks and cars.

#AUT #GRN #USA #SWE WSJ

SEMICONDUCTORS & CHIPS

→ Despite its advantages in research, equipment, design software, and intellectual property (IP), the US lacks onshore semiconductor fabs and other inputs into leading-edge chips. Therefore, **CSET recommends that the US should work toward two primary objectives when it comes to sustaining and growing its semiconductor advantages over China:**

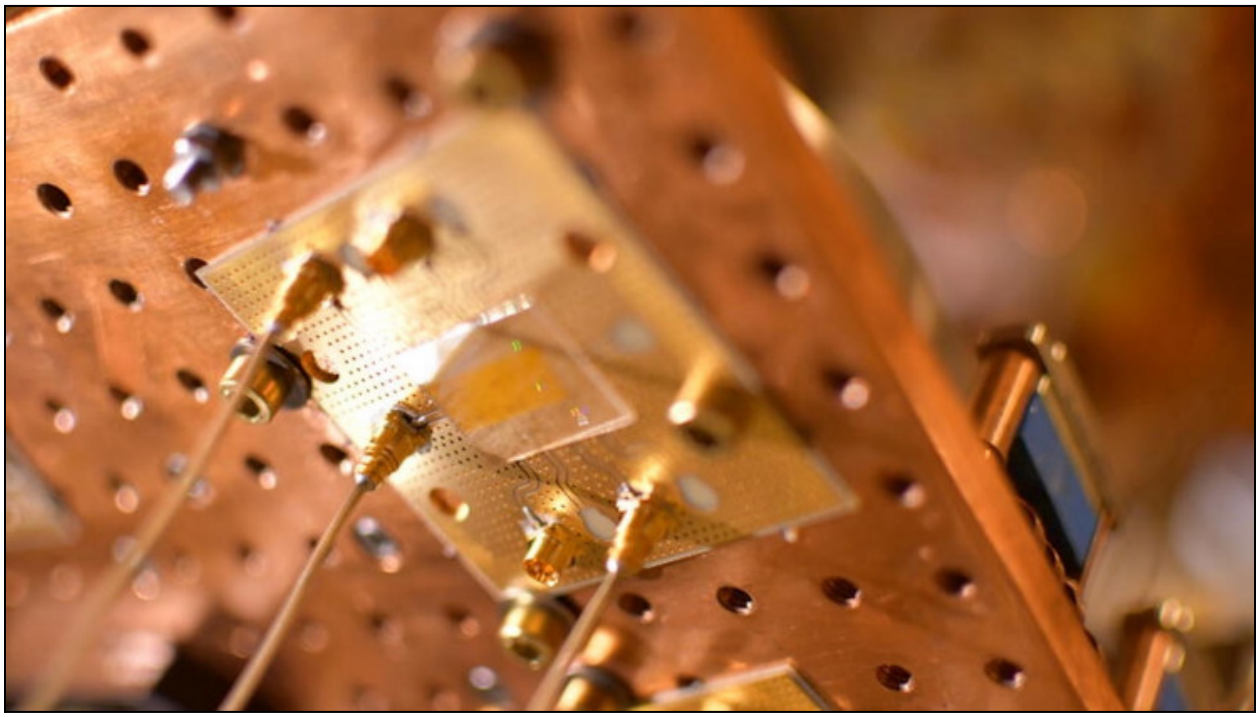
1. Protecting the US semiconductor manufacturing equipment (SME) advantage entails preventing China from producing leading-edge chips. The US will need to collaborate with its allies and partners to protect SME supply chains from Chinese access and promote their development on friendly shores, while preserving US economic and military advantages through tools such as export controls and end-use monitoring. Navigating competitive economic dynamics among governments and multinational private sector firms while working toward common goals is critical.
2. The US needs to limit potential risks to its own semiconductor supply by reshoring chipmaking capacity. The US can achieve this goal by prioritizing and allocating incentives to domestic and allied firms through vehicles like CHIPS for America Act funding that, coupled with regulatory reforms that ease burdens on firms, would decrease the attractiveness of offshoring chip manufacturing.

In the short term, CSET recommends that the US consider developing highly skilled work visa programs for Taiwanese and South Korean workers in order to benefit from their knowledge and help boost the success of CHIPS Act-funded fabs. #CHP #SCRM #Geopolitics #USA #CHN #TWN #KOR CSET

→ **GlobalWafers, a Taiwan-based company, announced plans to build a $5B factory in Texas to produce silicon wafers used in semiconductors, but the deal is contingent on financial incentives that are currently being debated in Congress.** The company said its planned factory in Sherman, Texas, would be the first US silicon wafer-facility in more than two decades and create as many as 1.5k jobs, as well as helping fuel the expansion of the US chip-making industry. By supplying materials to companies such as Intel and TSMC, the GlobalWafers plant in Texas would contribute to the US' effort to boost domestic production of advanced semiconductors and reduce reliance on imports. The existing silicon wafer manufacturing capacity in the US will be able to meet only 20% of the estimated domestic demand by 2025, and the wafers will not be suitable for some of the advanced chips planned to be manufactured at the new production facilities currently being built by Intel, TSMC, and Samsung, according to GlobalWafers. #CHP #USA #TWN WSJ

→ **Renesas Electronics of Japan and Tata Motors of India have formed a strategic partnership to design, develop, and manufacture semiconductor solutions for domestic and global markets.** Renesas will work with Tata Motors, India's largest electric vehicle manufacturer, to develop "next-generation automotive electronics" to accelerate the growth of EVs, the companies announced in a statement. Renesas will also collaborate with Tejas Networks, a Tata Group company, on wireless network solutions, including 5G, as part of the partnership. The products will initially be available in India, with plans to expand into global markets. #CHP #GRN #5G #JPN #IND Nikkei Asia

→ **Harvard researchers used an electric field in a computer chip to control and modulate sound waves for the first time, a breakthrough that could have far-reaching implications for quantum computing and classical computing.** Classical computer chips process data by manipulating electrons. This is done by transistors, which encode data as ones and zeros using high and low currents. Photonic chips alter photons before passing them through waveguides. The researchers created an on-chip electro-acoustic modulator out of lithium niobate to control the acoustic waves on the chip. An electric field is used by the modulator to control the phase, amplitude, and frequency of the sound waves. Previously, acoustic devices were passive, but researchers now have the ability to actively tune acoustic devices using electrical modulation, enabling the future development of microwave signal processing employing these types of acoustic devices to incorporate a wide range of functionalities. In addition, the researchers hope to develop more complex, large acoustic-wave circuits and quantum systems.



#CHP #QNT #USA Interesting Engineering

QUANTUM TECHNOLOGY

→ **Researchers from the IllinoisExpress Quantum Network (IEQNET) have successfully deployed a long-distance (50 km) quantum network using local fiber optics between two US Department of Energy (DOE) laboratories.** The experiment marked the first time that quantum-encoded photons (the particle through which quantum information is transmitted) and classical signals were delivered simultaneously across a metropolitan-scale distance with an unprecedented level of synchronization. Classical computers use Network Time Protocol to synchronize operations and functions for security and computation acceleration (NTP). This protocol sends a clock signal over a network that sends data at light speed. Quantum computing requires even more precision. Because there were only two fiber strands between the two labs, the researchers had to send the clock on the same fiber. The network was so precisely synchronized that clocks at each location differed by only five picoseconds. Such precision will let scientists identify and manipulate entangled photon pairs over metropolitan distances. The IEQNET team is now preparing to conduct entanglement swapping experiments. #QNT #5G #USA Phys.org

→ **Six federal government agencies have formed a research consortium in Washington, DC, to develop a test network for securely sharing information between quantum computers.** The DC-QNEt, or Washington Metropolitan Quantum Network Research Consortium, will conduct research on the use of qubits to transmit sensitive data. The Army Combat Capabilities Development Command, Army Research Laboratory, Naval Research Laboratory, Naval Observatory, National Institute of Standards and Technology, National

Security Agency, and NASA are the six departments involved in the quantum network. Furthermore, security experts have advised that agencies should test post-quantum cryptography algorithms with their software to determine whether the benefits of information security outweigh the efficiency losses. CISOs must prioritize areas where the data is particularly valuable and the encryption most at risk, and a lot of them don't have that information readily available, according to Duncan Jones, head of cybersecurity at Quantinuum. #QNT #Cybersecurity #USA FedScoop

→ **The EY Quantum Readiness Survey 2022, conducted in cooperation with the National Quantum Computing Center (NQCC), found that 81% of UK executives anticipate quantum computing will play a key role in their business by 2030.** Despite growing interest among executives, most organizations' strategic planning for quantum computing is in its early stages. For example, only 33% of executives are engaged in strategic planning for quantum computing, and only 25% have appointed specialist leaders or established pilot teams. While the majority believe the full impact will not be felt immediately, nearly half (48%) believe quantum will begin to transform industries as early as 2025. Furthermore, respondents were nearly unanimous in their belief that quantum computing will cause moderate to severe disruption in their own organization, industry sector, and the broader UK economy over the next 5 years. Consumer products and retail executives are the most optimistic, with 70% believing quantum will play a significant role by 2025. Meanwhile, 56% of executives in the telecoms, media, entertainment, and technology sectors anticipate the same impact in this timeframe. However, most respondents in the health and life sciences industries believe advancement will occur between 2026 and 2035. Despite the fact that the majority of survey respondents expect quantum disruption to occur by 2030 or sooner, strategic planning cycles for quantum are lagging. #QNT #GBR The Quantum Insider

GEOPOLITICS

→ **US Commerce Secretary Gina Raimondo increased pressure on Congress on Monday, June 27, to approve $52B in funding for chipmakers to expand operations, warning that firms would abandon American expansion plans if the legislation was not passed.** Raimondo's warning came shortly after Taiwan's GlobalWafers announced plans to build a $5B plant in Sherman, Texas to produce silicon wafers used in chip manufacturing. Raimondo stated that the company's CEO informed her that the investment was conditional on Congress approving the funding. #Geopolitics #CHP #USA Reuters

→ **Britain's pensions department will remove Chinese-made surveillance cameras from its buildings due to growing concerns about equipment manufactured by China's Hikvision and other Chinese camera makers**, according to a civil liberties group. In a letter to the Department for Work and Pensions (DWP), it stated that as part of a three-year program to upgrade its security systems, it would remove Chinese-made cameras and prohibit new purchases. The pensions department bar is the latest development in a row over the dominance of internet-protocol cameras manufactured by Hikvision and Dahua in the UK. However, ending the UK's reliance on Chinese-made CCTV cameras will be difficult. In the UK, an estimated

1.3M Hikvision cameras are in use, or slightly more than one camera for every 50 people, according to an analyst. Separately, on June 29, BT Group asked the UK government for more time to remove the Huawei core of its network after supply chain concerns led to an impending ban on the equipment. The core is the most vulnerable part of a broadband network, similar to a mail sorting office. Following the announcement of a ban following the US sanction of the Shenzhen-based company, operators are required to remove Huawei from network cores by January 28, 2023, or face fines of up to $122k per day. The request highlights the British telecommunications industry's previous reliance on the Chinese technology giant, even in sensitive parts of its largest systems, as well as the difficulties of carrying out the politically charged order to replace its equipment. BT is shifting the core of its mobile network from Huawei to Ericsson in Sweden, and it has already begun migrating customers. #Geopolitics #DIG #5G #SCRM #GBR #CHN #USA #SWE SCMP Bloomberg

CYBERSECURITY

→ **A number of Norwegian institutions have been victims of a DDoS cyberattack in the last twenty-four hours, which has been blamed on a "criminal pro-Russian group," according to the Norwegian NSM security authority.** The attacks, which began overnight, targeted private and public institutions providing critical services, according to the agency, which did not name any of those affected. "We are working to find out whether there is a link with state-sponsored actors," NSM chief Sofie Nystroem later told TV2. "We've seen similar attacks in other countries recently, but none of them have reported any long-term consequences," the NSM stated. #Cybersecurity #Geopolitics #NOR #RUS Reuters

→ **A former Canadian government employee has agreed to plead guilty in the US to charges that he worked for the NetWalker ransomware group, which researchers say has received nearly $50M in illegal payments over the last two years.** The NetWalker group provides ransomware-as-a-service, which means it rents out its malware to "affiliates" in exchange for a cut of the illegal proceeds. The DOJ described the defendant, Vachon-Desjardins, as an affiliate who was accused of converting Bitcoin stolen from ransomware victims into Canadian currency. However, the full extent of his alleged involvement in cyberattacks is unclear. This is a rare instance of an alleged ransomware hacker facing charges in a US courtroom. While many suspected hackers operate from Russia, where they are beyond the reach of US law enforcement, authorities claim Vachon-Desjardins did the majority of his illegal activity from Canada. #Cybersecurity #CAN #USA Bloomberg

→ **A new risk to global trade has been identified: hackers with the ability to penetrate onboard maritime technology that is replacing old methods of steering, propulsion, navigation, and other key operations.** Such advances in hacking capabilities could cause enormous economic damage, especially at a time when supply chains are already stressed due to the pandemic and the war in Ukraine, according to experts, including a top Coast Guard official. Hackers are learning more about what they can do once they gain control of an operational technology system. There is a tremendous amount that could be done to harm both the network and physical operations in the case of maritime — whether it be the ports or the

vessels themselves, according to Rick Tiene, VP at Mission Secure, a cybersecurity firm in Charlottesville, Virginia. Rear Admiral Wayne Arguin, the Coast Guard's assistant commandant for preventative policy, stated that cyber risks in the shipping industry are comparable to those in other industries, but the stakes are significantly larger given that approximately 80% of trade is conducted by sea. BlueVoyant, a New York-based cyber-defense platform that recently analyzed 20 well-known shipping companies, stated that while some progress has been made since 2021, "the industry can take more cyber-defense actions to make things more secure." The ocean shipping sector is the backbone of global commodities commerce, but its extensive reach is a cybersecurity weakness. German shipping giant Hapag-Lloyd AG will be the first to equip its complete container fleet with real-time tracking devices. Such innovations boost visibility and efficiency, but they may make hackers' tasks simpler. Across industry and government, there's agreement that there needs to be more information sharing. "Everybody needs to be all-in in this game and understand when there are vulnerabilities — getting that information out quickly is going to be a thing that continues to help us close doors," the Coast Guard's Arguin stated. #Cybersecurity #SCRM #USA Bloomberg

SUPPLY CHAINS

→ **A severe semiconductor shortage resulted in record wire fraud cases reported by desperate buyers in 2021, according to ERAI, a company that tracks counterfeit and fraud in the chip industry.** ERAI reported 101 wire fraud cases in 2021, up from 70 in 2020 and 17 five years ago. Companies looking for chips that they couldn't find through authorized and vetted distributors were trying to buy them from brokers and transferring funds for goods that never arrived, according to ERAI president Mark Snider. The majority of the wire fraud was committed by chip brokers in China, he stated. While there is a government counterfeit parts database called GIDEP (Government-Industry Data Exchange Program), it does not allow anonymous reporting, making ERAI the primary database that companies use for navigating counterfeit chip problems and reporting fraud, according to industry experts. Nonetheless, according to the most recent data, the number of counterfeit chip incidents reported to ERAI in 2021 was 504, and in 2020 it was 463. This represents a significant decrease from 963 in 2019. Snider believes that China's pandemic-related shutdowns are making it more difficult for counterfeiters to operate, and that counterfeits are becoming more sophisticated, evading detection. The true figure, however, is likely to be much higher because companies that fear brand damage often prefer not to report counterfeit chip purchases. #SCRM #CHP #USA #CHN Reuters