MATRIX MONITOR

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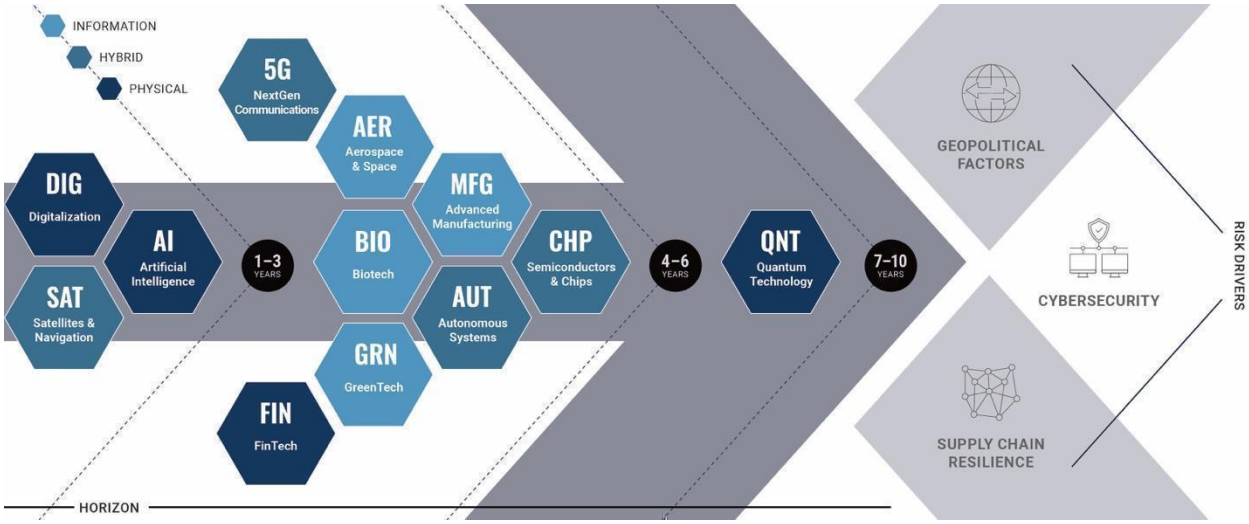
The only source dedicated exclusively to the emerging technologies shaping the future of business and national security.



This week's Next5 Matrix Monitor features the largest slump in US corporate history, SpaceX's efforts to restore connectivity to the Pacific Island nation of Tonga, the DOD's new Chief Digital and AI Office, research into a possible digital US Dollar, the financial benefits of leasing capacity on commercial space stations, the first mRNA HIV vaccine, developments in "Industry 4.0," 3D printed rockets, China's efforts to establish collaboration between domestic firms and overseas semiconductor corporations, and the use of cargo planes to circumvent prolonged supply chain issues.

NEXT5 NEWS & AMPLIFICATIONS

→ **The White House added five new technology areas to its list of critical and emerging technologies - including hypersonic capabilities, directed energy, renewable energy generation and storage, nuclear energy, and financial technology**. The update closely reflects key technologies included in the Pentagon's new science & technology vision which was signed last week. The CET list is not meant to be a strategy but is designed as a resource to promote US technological leadership and inform future US strategies for competitiveness and national security. Along with the additions, the White House update eliminates several technologies included in the Trump Administration's 2020 National Critical and Emerging Tech Strategy, removing: advanced conventional weapons technology, agricultural technology, chemical biological radiological & nuclear mitigation technologies, and distributed ledger technologies. The final White House CET List:

- Advanced Computing
- Advanced Engineering Materials
- Advanced Gas Turbine Engine Technologies
- Advanced Manufacturing
- Advanced Nuclear Energy Technologies
- Artificial Intelligence
- Autonomous Systems and Robotics
- Biotechnologies
- Communication & Networking Technologies
- Directed Energy
- Financial Technologies
- Human-Machine Interfaces
- Hypersonics
- Networked Sensors & Sensing
- Quantum Information Technologies
- Renewable Energy Generation & Storage
- Semiconductors & Microelectronics
- Space Technologies & Systems

C4ISRNet #QNT #DIG #GRN #MFG #AI #AUT #5G #BIO #FIN #AE #CHP #SAT #Cybersecurity

→ **The US House of Representatives passed a POTUS-backed expansive technology bill - the America COMPETES Act of 2022 - to boost American competitiveness and resilience.** The House bill incorporates key elements of an expansive industrial policy bill that passed the Senate last year but still **requires Senate negotiations before it can become law**. It includes nearly a quarter of a trillion dollars to subsidize domestic semiconductor manufacturing and research on AI, quantum, among other critical technologies. It also proposes a new Supply Chains for Critical Manufacturing Industries Fund with a budget of $45B over six years and $52B over five years to promote semiconductor production. Additionally, the bill authorizes $8.8B in research and development funding for the Energy Department this fiscal year, with that amount increasing each year until fiscal 2026. It also authorizes up to $8B in funding over the next two years to help developing countries address climate change, as well as an additional $2B per year to help them deploy clean energy technologies, expand zero-emission vehicles, promote sustainable land use, and adapt to the effects of climate change. Republicans argued the bill does too little to keep US technology out of the hands of the Chinese military or taxpayer money from supporting China's own green energy industry. #CHP #Geopolitics #SCRM #GRN #USA #CHN Bloomberg Lawfare

DIGITALIZATION

→ **Meta on Thursday, February 3 suffered the largest slump in US corporate history after posting its earnings report the day before.** Its valuation slumped by nearly $240B as its shares fell 26.4%. After markets closed last Wednesday, Meta stated in its fourth-quarter earnings report that Facebook's daily active user base shrank for the first time in its history. Meta also reported $10B in operating losses from its nascent metaverse business. The company's 26.4% stock slump left it valued at $661.4B compared with its $898.5B market capitalization when Wall Street closed Wednesday – a loss of $237.1B. Separately, on a conference call, the company detailed the extent to which Apple's iOS changes are hurting the business, forecasting a $10B impact in 2022. Apple's iOS 14.5 update, released in April 2021, included an App Tracking Transparency (ATT) feature that has had a notable impact on digital advertising. The ATT feature requires app developers to get permission from a user to track their activity across other apps and websites when using an iPhone or iPad. Like Meta, the social media company Snap has complained that the updated iOS platform is impacting its revenues. #DIG #USA Business Insider ZDnet

→ **While Reels is now Meta's fastest-growing content format, TikTok is still growing faster.** The Chinese app was the most-downloaded in 2021 overtaking Meta's Instagram in popularity among young users. Meta launched Reels on Instagram in the U.S. in August 2020 in response to TikTok. The company has yet to release Reels's exact usage figures, but outside research shows it is falling farther behind TikTok in the battle for younger users. In 2021, TikTok reached 63% of Americans between the ages of 12 and 17 weekly, up from 50% a year prior, according to a November survey by Forrester. Instagram, meanwhile, declined from 61% in 2020 to 57% in 2021. Other industry data show similar trends. #DIG #USA #CHN WSJ

→ **TikTok is working on ways to rate and restrict content by age to prevent adult content from reaching teenage users of its short video app, according to the company.** TikTok stated at a news briefing it was running a small test for how adult-rated content could be restricted from accounts belonging to younger users, either by the user or their parents and guardians. According to the company, owned by Chinese tech giant ByteDance, it is drawing on the types of content-rating standards already used for movies and gaming. It stated it would test a way for creators on the app to specify if they want their content to only be viewed by older audiences. TikTok, which has been criticized for posts promoting eating disorders and maintains it bans such content, said in a blog post on Tuesday it would start to remove posts promoting broader disordered-eating content as well. #DIG #CHN Reuters

SATELLITES & NAVIGATION

→ **SpaceX lost 40 out of 49 Starlink satellites it launched last week due to a geomagnetic storm, in the largest number of lost satellites knocked out by a single geomagnetic event**

ever. SpaceX does not disclose the cost of its Starlink satellites but analysts say they cost between $250-500k each so, in total, this event could ultimately have cost the space startup about $20M. SpaceX has already deployed 1,469 Starlink satellites into orbit and is targeting a grand total of 30,000 to build its revolutionary internet infrastructure. SpaceX has repeatedly received criticism for cluttering the LEO space and come under fire from China over allegations its satellites pose a high risk of collision. However, the company has pushed back saying its satellites do not pose risk of collision due to their ability to maneuver in orbit. On this incident specifically, Starlink said their satellites do not pose risk of collision and no satellite parts should reach the ground since they burn upon reentering Earth's atmosphere. #SAT #AER #USA #CHN Fortune

→ **Recent developments in space highlight that earth observation (EO) is trending in the commercial space sector**. ICEYE – One of the earliest commercial players in the synthetic aperture radar (SAR) imaging market has raised $136M in a Series D funding round, bringing its total raised to nearly a third of a billion. The company now claims it is second only to SpaceX in terms of the amount it has raised while remaining a private company. And Wyvern – An EO startup focusing on hyperspectral imaging has earned a $4M contract award sourced from an initiative run by the government of Canada. The funding vehicle backs startups working on clean technology innovation, and doesn't take equity, instead parceling out its awards over a set term in response to the startup meeting certain milestones. This development follows the company's $4.5M seed round.
#SAT #GRN #USA #FIN #CAN TechCrunch

→ **Credit Suisse released a new report which takes a deep dive into the prospects of Low-Earth Orbit (LEO) satellite operators and compares the prospects with stocks Credit Suisse traditionally covers, such as Eutelsat and SES.** The report detailed the main issue facing satellite broadband providers – that peak data traffic tends to increase 20% to 30% a year. To maintain the same quality of service for customers, fully loaded operators could have to reduce year-over-year the number of customers a constellation can service. Credit Suisse expects business-to-consumer broadband to be the largest LEO revenue contributor, with $2.7B of revenues in the US and $2B in Europe, which equates to around 5.5M subscribers across both geographies. Within mobility, Credit Suisse forecasts LEO to account for half of all growth in in-flight connectivity (IFC) and maritime VSAT over the next decade which is a total revenue contribution of about $1.8B annually. Also, Credit Suisse assesses there is economically only room for about three large-scale LEO constellations, which typically cost around $10B to deploy. Deployment of more LEO constellations could destroy value within the sector. #SAT Satellite Today

→ **Elon Musk's satellite internet venture is helping to restore connectivity to the Pacific Island nation of Tonga.** Tonga's sole optic-fiber link to the internet and the rest of the world was severed by a volcanic eruption on January 15 and only limited connectivity has been possible since. The timing of SpaceX's work is not clear, although local media sources say

engineers would operate a ground station in nearby Fiji for six months. #SAT #USA #TON Reuters

ARTIFICIAL INTELLIGENCE

→ **Scale AI, which focuses on the data that powers AI, is one of many tech startups that recently won a nearly $250M blanket purchasing agreement that aims to give all federal agencies access to its tech.** The contract was issued by the DoD's Joint Artificial Intelligence Center (JAIC) and is the startup's largest federal contract to date. According to the company, it will develop a range of test and evaluation AI products that will focus on image analysis, autonomy, natural language processing, and interfaces like augmented reality. The company lists the U.S. Army and Air Force as customers on its website and information from the Federal Procurement Data System shows it has won several smaller contracts with military departments. #AI #USA Fed Scoop

→ **The DoD's Chief Digital and AI Office, a new hub to align disparate AI-centered efforts, officially reached initial operating capability last week.** As we previously reported, the Pentagon in December announced plans to stand up this central office to underpin the integration and synchronization of all data- and AI-associated work, which is primarily led by the JAIC, office of the chief data officer, and Defense Digital Service. Officials intend for the reorganization to eventually provide the DOD with "end-to-end" cohesion from the time data is captured, to when it's used for advanced analytics. The deadline for initial operating capacity, set for February 1, was met. Now, officials are working to reach full capacity by June 1. A senior defense official explained that the goal for the office is to enable data, data analytics, and AI to promote faster and better decision-making, and therefore military advantage. The official drew attention to the US effort to keep pace with China, which is investing aggressively and using these capabilities to offset traditional U.S. advantages. #AI #USA #CHN Nextgov

NEXT GENERATION COMMUNICATIONS

→ **US telecom carriers have requested approximately $5.6B in reimbursements from the government to rip and replace their existing Huawei or ZTE infrastructure.** In 2019, the FCC voted unanimously to ban US carriers from using the Universal Service Fund to subsidize the cost of purchasing networking equipment from companies deemed a "national security threat." The first two firms the agency added to that list were Huawei and ZTE. In 2020, former President Donald Trump signed the Secure and Trusted Telecommunications Networks Act, mandating that carriers replace equipment from the two manufacturers. That same year, the FCC established a program to reimburse smaller telecom operators for replacing equipment the law had deemed a risk to national security. At the time, the agency estimated it would cost carriers more than $1.8B to comply with the order, and it subsequently set aside $1.9B to cover reimbursements. US carriers sent 181 applications to the FCC for funding support before the

filing window closed on January 28th, 2022. Presently, the agency only has enough money to grant about a third of all the requests it received. #5G #USA #CHN Engadget

FINANCIAL TECHNOLOGY

→ **The Federal Reserve Bank of Boston conducted initial research into the code for a possible digital US Dollar.** The Boston Fed, in collaboration with the Massachusetts Institute of Technology's Digital Currency Initiative, released a 35-page white paper on the findings of its technological research, which focused on developing software to process transactions. The researchers created and examined two possible code bases, including one that was capable of handling 1.7M transactions per second. The researchers wanted to be able to process 100k transactions per second and settle them in less than 5 seconds – the two code bases beat those projections. Thursday's release concludes the first phase of the multi-year research initiative, known as "Project Hamilton," that was announced in August 2020. A second phase will explore more complex capabilities and examine key issues, such as cybersecurity and how to balance user privacy with the need for transparency to deter criminal activity. Pursuing a US CBDC could help ensure the US dollar's dominance, especially as other countries like China move forward with their own digital currencies. #FIN #Cybersecurity #USA #CHN SCMP

→ **Two individuals were arrested in Manhattan for an alleged conspiracy to launder stolen cryptocurrency from the 2016 hack of Bitfinex, a virtual currency exchange, presently valued at approximately $4.5B.** A criminal complaint alleges that Ilya Lichtenstein and Heather Morgan – both of New York, NY – employed numerous laundering techniques, including using fictitious identities to set up online accounts; utilizing computer programs to automate transactions; depositing the stolen funds into accounts at a variety of virtual currency exchanges and darknet markets and then withdrawing the funds; converting bitcoin to other forms of virtual currency; and using US-based business accounts to legitimize their banking activity. Acting Executive Associate Director Steve Francis of Homeland Security Investigations (HSI) emphasized that with a hack of this magnitude, there is a need for public and private sector collaboration to ensure continued consumer confidence in the US financial system. Deputy Attorney General Lisa O. Monaco stated that the arrests show that cryptocurrency is not a safe haven for criminals. #FIN #Cybersecurity #USA Justice.gov

AEROSPACE & SPACE

→ **The US has denied China's claim that Starlink satellites twice endangered its space station.** In December, China sent a note verbale – an unsigned message less formal than a diplomatic note – to the United Nations to complain that there had been "close encounters" last July and October when internet satellites approached the Tiangong station in orbit. It said the satellites operated by SpaceX forced the station to take avoidance maneuvers. However, the US has responded with its own note verbale to the UN, saying that neither incident referred to

by China amounted to an emergency. According to the note, the activities did not meet the threshold of established emergency collision criteria, and emergency notifications were not warranted in either case. The note also stated that if there had been a significant probability of collision involving the space station the US would have provided a close approach notification directly to the designated Chinese point of contact. #AER #USA #CHN SCMP

→ **NASA expects that retiring the International Space Station in favor of leasing capacity on commercial space stations will save the agency up to $1.8B per year.** That estimate comes from an updated ISS transition report published by NASA last week. The report was submitted to Congress as an update to a 2018 report, required by a provision of a 2017 NASA authorization bill seeking information on the agency's use of the ISS and how it will shift to future commercial stations. NASA currently spends about $3.1B a year on the space station program, with more than $1.3B going to operations of the station and research performed there, and nearly $1.8B on crew and cargo transportation. Spending is projected to temporarily increase in fiscal year 2028 as NASA begins efforts to decommission the station. Spending on both ISS operations and research, and on transportation to the station, would be gradually phased out from 2028 through 2031, as spending increases on purchases of commercial low Earth orbit destination services, using commercial stations whose development NASA is currently supporting through the Commercial LEO Destinations (CLD) program. #AER #USA Space News

→ **A new CSIS report argues that as the Defense Department looks for ways to augment hypersonics, it needs to refocus its priorities towards protecting ships, air bases, and other critical tactical assets.** The report comes days after the Department of Defense arranged a high-level meeting between senior Pentagon officials, including Defense Secretary Lloyd Austin, and the CEOs of major defense contracting firms – the latest signal of the urgency with which the US is pursuing hypersonic capabilities. But the CSIS study finds that there is a disparity between Defense Department spending on offensive hypersonic missile programs and ways to defend against them. Whereas DoD and the services provided more than $2.5B for offensive hypersonic missile programs in their FY 2022 budget requests, CSIS analysis shows that funds budgeted for the Missile Defense Agency (MDA) and DARPA on defensive capabilities barely exceeded $2.5M. The CSIS study noted that DoD and the services need to focus on the issue of protecting against the tactical uses of scram-jet-based hypersonic missiles and maneuvering glide vehicles. #AER #USA #CHN #RUS Breaking Defense

BIOTECHNOLOGY

→ **Scientists believe that mRNA could serve as the foundation for a new generation of vaccines and drugs to combat a wide range of diseases.** Now scientists are aiding efforts in development of mRNA treatments including cancer therapies and HIV vaccines. Clinical trials for mRNA products are under way for influenza, and vaccines are in development for malaria, tuberculosis, and liver ailments. Because the new mRNA technology interacts directly with the body's own molecular machinery, scientists may test medicines and conduct studies much more

quickly once they have a pathogen's genome sequence. The technology holds out the promise of developing more targeted medicines in less time and at lower costs. Drugmakers see an enormous opportunity in mRNA and are competing with investments in research and development. In fact, Sanofi spent $3.2B to acquire Translate Bio in September 2021. Additionally, Pfizer is building an mRNA division and has recently formed collaborations with Beam Therapeutics and Acuitas Therapeutics to explore the technology. According to health experts, mRNA technology can produce vaccines so swiftly that the technology has altered the time parameters for future vaccines. #BIO #USA #DEU #FRA #CAN WSJ

→ **The publication of preliminary trial results for China's lead candidate ARCoV brings the country one step closer to developing a home-grown mRNA vaccine against Covid-19, leveraging a technique Beijing initially rejected.** The phase 1 clinical trial data, published last week by The Lancet Microbe, showed no serious adverse events, but scientists said it was too early to judge the trial's success. According to online database clinicaltrials.gov, the trials will involve 28,000 participants in Mexico and Indonesia, who will be given ARCoV in two 15 microgram doses, 28 days apart. Analysts believe China is waiting for a home-grown version so it will not have to rely on imported booster shots using the cutting edge technology. According to the published paper, ARCoV's phase 1 trial involved 120 volunteers at a hospital in Hangzhou, Zhejiang province, in eastern China. The participants were divided into groups and given two doses of varying strength with a 28-day interval between them. The trial discovered that 15 mcg was the most effective dose, capable of producing approximately twofold more neutralizing antibodies than typically found in recovered Covid-19 patients. Experts state that the ARCoV vaccine looks promising and scientists would want more information about how effectively its 15 mcg dosing can neutralize Omicron and Delta. #BIO #CHN SCMP Fortune

→ **Through a collaboration with Moderna, George Washington University researchers have administered doses of the first mRNA HIV vaccine.** In a Phase 1 clinical trial sponsored by the International AIDS Vaccine Initiative (IAVI) and the Bill & Melinda Gates Foundation, the School of Medicine and Health Sciences and its Vaccine Research Unit collaborated with Moderna to research the vaccine's safety and immune responses in two participants. In a joint-effort with three other institutions including Hope Clinic of Emory Vaccine Center, Fred Hutch Cancer Research Center, and the University of Texas–Health Science Center, GWU made plans to enroll 56 healthy, HIV-negative adult volunteers, 48 of whom will receive one or two doses of eOD-GT8 60mer mRNA Vaccine with 32 who will receive the boost Core-g28v2 60mer mRNA Vaccine. Additionally, eight volunteers will only receive the boost immunogen. Research experts noted that the mRNA technology in the Covid-19 and HIV vaccines allows researchers to consider a preventative vaccine to protect patients from HIV and also potentially create a therapeutic vaccine to reduce immune defects in HIV-positive patients in the future. #BIO #USA The GW Hatchet IAVI

GREEN TECHNOLOGY

→ **The Biden administration will extend a set of tariffs on solar-energy imports for four years, but significantly reduce their scope by doubling the number of solar cells that can enter the US without facing any levies.** The tariffs apply to imports of solar cells and modules globally. About two-thirds of the familiar solar modules that go on rooftops and utility installations are made in China, and about 15% are manufactured by countries in Southeast Asia, often at Chinese-owned companies, according to data from IHS Markit. US producers make about 2%. The Biden administration has been under intense pressure over the decision, which has created a dilemma between the president's climate agenda of accelerating a transition to green energy and his supply-chain goals of boosting American manufacturers in critical industries. China produces 96% of the world's supply of solar wafers, according to data from IHS Markit. Those wafers are processed into solar cells, where China controls 79% of the market. Currently, no US factory makes solar cells. #GRN #Geopolitics #SCRM #USA #CHN #MEX #CAN WSJ

→ **The EU will move forward with a controversial proposal to label certain nuclear energy and natural-gas investments as sustainable over the coming years**; the EU faces strong opposition from some of the bloc's member states, environmental groups, and investors. The European Commission published a revised version of its proposal on Wednesday, February 2 which includes tweaks to the criteria for labeling nuclear and natural gas as sustainable and changes that are meant to strengthen companies' disclosure requirements. The proposal, which was first released on New Year's Eve, is part of the EU's "green taxonomy," a detailed breakdown of what regulators believe should count as a sustainable investment. The goal is to funnel more capital into projects and activities that have been vetted for their sustainability and avoid greenwashing, where companies exaggerate their sustainability credentials. Climate activists and some investors say that if nuclear power and natural gas projects are designated as potentially environmentally friendly, such projects could draw funding away from less-harmful investments in sustainable renewables. #GRN WSJ

ADVANCED MANUFACTURING

→ **The top trends set to transform manufacturing of the future, known as "Industry 4.0" are:**

1. The Industrial Internet of Things (IIoT) – Interconnected devices are used to collect data that can be used to enhance the manufacturing process.
2. 5G & edge computing – 5G will connect IIoT technology and leverage the data collection and data processing within devices to optimize manufacturing.
3. Predictive maintenance – sensor data and AI can detect failure patterns in machinery and components, enabling manufacturers to take preventative action.
4. Digital twins – Digital twins can be used to simulate a new product's dimensions or create a digital replica of the equipment on the factory floor to simulate how the machinery operates under certain conditions.

5. Extended Reality and the metaverse – AR/VR will enhance product design & planning, augment human assembly abilities, and enable immersive training.
6. Automation and dark factories – More entirely automated factories or so-called dark factories may emerge – fully automated sites where production happens without direct human intervention on site.
7. Robots and cobots – Robotic exoskeletons help those on the production line lift heavier parts without compromising their safety. Collaborative, intelligent robots – or "cobots" – are designed to work alongside humans.
8. 3D printing – 3D printing methods use fewer materials and create less waste than traditional manufacturing methods.
9. Web3 and blockchain technology – Web3 and digitalization present opportunities to better monitor supply chains and automate transactions.
10. Smarter, more sustainable products – Customers will increasingly demand products that are more sustainable, reusable, and recyclable.

#MFG Forbes

→ **Relativity plans to 3D print almost every single component of its 200-foot-tall orbital rockets, called Terran 1.** Investors are drawn in by the promises that Relativity's methods will allow them to build a rocket in less than a month, while labor-driven rocket manufacturing can take months to more than a year. The company has backing from high-profile investors such as Fidelity and BlackRock at a $4B-plus valuation. Other rocket factories use 3D printers to quickly draft up certain components, but most components are brought in from suppliers via a complex supply chain. At Relativity, the rocket parts are almost entirely constructed by one-armed robots, a process that can replace the need for hundreds of tiny parts. About 90% of its rockets are 3D printed. Because of this, Relativity says it can use less than 1% of parts traditional rockets use. The company has a $1B deal with the US Space Force as part of a broader slew of investments the military has made in the rocket industry. Relativity has also won several other military launch contracts. #MFG #AER #USA CNN

→ **A collection of organizations from Germany and Canada have set up a new consortium to automate the process of repairing parts using 3D printing and AI.** The project, named Artificial Intelligence Enhancement of Process Sensing for Adaptive Laser Additive Manufacturing (AI-SLAM), aims to develop advanced AI-based software to automatically run Directed Energy Deposition (DED) 3D printers. Used in conjunction with Fraunhofer's LMD technology (a form of DED), the software will algorithmically manage the printing process to more effectively repair irregular surfaces on damaged components – all without the need for human input. #MFG #AI #DEU #CAN 3D Printing Industry

AUTONOMOUS SYSTEMS

→ **The UK's Royal Navy is moving forward with UAV Project VAMPIRE, which aims to develop a low-cost unmanned vehicle to test operational concepts, payload types, and other technologies.** The project is designed to obtain low-cost fixed-wing drones for intelligence, surveillance, and reconnaissance, as well as electromagnetic operations and threat simulation. It is the first phase of the Royal Navy's Future Maritime Aviation Force (FMAF) program. According to reports, the FMAF program is now exploring the transition to a number of aviation roles – intelligence, surveillance, reconnaissance, communications, lift, and strike – from crewed to uncrewed air platforms. Project VAMPIRE's first phase would last four years, with a possibility to extend it by a year until March 31, 2026. It would provide four aircraft per year in 2023-24 and 2024-25, with an additional one in 2025-26. The project is part of a global trend in the naval arena to develop multi-mission unmanned aerial platforms that go beyond the traditional use of UAVs for intelligence, surveillance, and reconnaissance (ISR) tasks, an analyst says. #AUT #AER #GBR The National Interest

→ **Researchers have built autonomous delivery robots that can climb stairs, paving the way for more sustainable delivery services.** The new robots were developed by the UPC and CARNET, a mobility and innovation research hub in Catalonia (Spain) funded by the Volkswagen Group, SEAT, and the UPC. The project, which began in 2017, was directed by the Institute of Robotics and Industrial Informatics (IRI). These robots will be used for last mile delivery and will start operating in a pilot phase this year in Spain, Germany, and Hungary. According to the researchers, it's estimated that last mile delivery accounts for more than 20% of the pollution in cities, something that could potentially be resolved with more efficient autonomous electric robots. The researchers also stated that these devices would reduce transportation costs, with last mile costs currently accounting for 40% of total delivery costs. #AUT #GRN #ESP #DEU #HUN Business Insider

→ **Toyota researchers have developed an autonomous drifting car technology, which is currently being tested on a modified 2022 GR Supra.** Toyota stated that its research subsidiary, Toyota Research Institute (TRI) has "successfully programmed a vehicle to autonomously drift around obstacles on a closed track," and can "calculate a whole new trajectory every 20th of a second". It drifts around obstacles that the computers are aware of before the car detects them. However, the long-term goal is for it to be able to navigate around unexpected obstacles. Toyota says the focus of this research is to use controlled, autonomous drifting to avoid accidents by navigating unexpected obstacles or hazardous road conditions such as black ice. #AUT #JPN KBB

SEMICONDUCTORS & CHIPS

→ **Chinese regulators have authorized US chipmaker AMD's acquisition of Xilinx Inc, paving the path for one of the semiconductor industry's largest mergers.** The State Administration for Market Regulation has cleared the deal with certain conditions, including asking AMD not to discriminate against Chinese clients and to continue supplying Xilinx's

products to the country. AMD's acquisition of Xilinx, a maker of programmable silicon, will expand the company's services in areas like automotive and communications networking, while also reinforcing its position in the cloud data center component market. Governments now treat semiconductor technologies and supply as a national security issue, especially after a prolonged shortage of crucial microelectronics crippled the auto sector and undermined post-Covid economic recovery. Nations such as the US, Japan, and China are racing to protect and build their own chip technologies as well as domestic manufacturing chains to ensure future supply and protect their economies from another semiconductor global supply chain crunch. #CHP #SCRM #Geopolitics #USA #CHN #JPN Bloomberg

→ **SoftBank Group has called off its $80B sale of Arm Ltd to US chipmaker Nvidia, citing regulatory hurdles, and will instead seek to list the company.** SoftBank acquired Arm, whose technology powers Apple's iPhone and nearly all other smartphones, in 2016 for $32B. Arm licenses its architecture and technology to chip designers such as Qualcomm, Apple, and Samsung. The deal with Nvidia was announced in 2020, but the US Federal Trade Commission moved to block it in December 2021, claiming that it would harm competition in the emerging markets for chips in self-driving vehicles and a new type of networking devices. The deal was also being scrutinized in the UK and the EU, while it had yet to be approved in China, which has historically withheld approval of cross-border chip acquisitions. According to analysts, the acquisition would have put Nvidia into even more intense competition with rivals in the data center chip market such as Intel and AMD. The collapse of the deal highlights the challenge that firms face in convincing antitrust regulators and governments to accept significant technology mergers, particularly in the semiconductor industry. Nvidia recently rose to the seventh largest US business, passing Meta for the first time. #CHP #Geopolitics #USA #JPN #GBR #EUR #CHN Reuters MarketWatch

→ **China intends to establish a special organization that will facilitate collaboration between domestic firms and overseas semiconductor powerhouses like Intel.** The proposal comes as Beijing rushes to establish a domestic supply chain for semiconductors that are not subject to US sanctions. The "cross-border semiconductor work committee" will be overseen by the Ministry of Commerce in collaboration with the Ministries of Industry and Information Technology. The organization appears to be designed as a way to acquire advanced semiconductor technologies from the US, Japan and Europe to help further China's goal of building an independent chip supply chain. According to documents obtained by Nikkei, among the targeted overseas companies are Intel, AMD, Infineon Technologies, and ASML. #CHP #SCRM #Geopolitics #CHN #USA #JPN #EUR Nikkei Asia

QUANTUM TECHNOLOGY

→ **Arqit has entered into a new Cooperative Research and Development Agreement (CRADA) with the US Air Force's (USAF) Research Laboratory to demonstrate the viability of quantum encryption.** The CRADA will demonstrate the interoperability and performance of Arqit's QuantumCloud™ platform for defense use cases. When the Arqit

platform is upgraded to include quantum satellites, the space-to-ground quantum encryption links will be investigated to demonstrate the potential of high bit-rate global quantum encryption to USAF and DoD end-points. The expected outcome of the CRADA is to prove viable quantum encryption services from a commercial platform to DoD infrastructure for USAF and wider DoD use cases. Arqit has established a method of quantum keys to end-points using a new software crypto system, which may have significant benefit in solving the security layer problem evident in plans for achieving and securing decision advantage in Joint All-Domain Command and Control. #QNT #Cybersecurity #SAT #AER #USA #GBR The Quantum Insider

GEOPOLITICS

→ **The US and Japan have agreed to remove Trump-era tariffs on around 1.25M metric tons of Japanese steel imports.** Under the agreement, Japan says it will help to tackle excess steel supplies, which push down prices. The agreement's goal is to put an end to "unfair practices" in the world's steel industry, which is controlled by China. Under the new deal, the US will stop charging a 25% tax on Japanese steel imports, excluding aluminum, up to a 1.25M metric ton annual threshold. Tokyo stated that it will take steps within six months to support a more equitable steel market, including taxing goods believed to be priced below market value and imposing a tax to offset subsidies received by an exporter. #Geopolitics #USA #JPN #CHN BBC

→ **The US has warned Chinese firms against supporting Russia in the face of potential Ukraine sanctions.** On Thursday, February 3, the US warned Chinese firms that they would face repercussions if they attempted to circumvent any export controls imposed on Moscow in the event that Russia invades Ukraine. The White House has said the Administration is working on the export-control measures with allies in Asia, including Japan and South Korea. #Geopolitics #USA #CHN #UKR #RUS #JPN #KOR Reuters

CYBERSECURITY

→ **A cyber attack on a critical energy infrastructure could have far-reaching consequences for business operations and the European economy.** The cyber attack on Amsterdam-Rotterdam-Antwerp (ARA) has considerably disrupted the loading and unloading of refined product cargoes amid a continental energy crisis. Similar cyber incidents, such as the ransomware incident with German oil companies last week, highlight the kinetic impact to society-at-large of having an infrastructure breakdown due to a cyber incident. The increasing sophistication of cyber actors combined with digital transformation exposes critical infrastructure to greater cyber risk, with potential future safety and environmental consequences and business disruptions. In order to mitigate future disruptions caused by cyber attacks, the World Economic Forum's Cyber Resilience in the Oil and Gas Community published the following guiding principles for senior leaders:

- Establish a comprehensive cybersecurity governance model.

- Promote security and resilience-by design culture.
- Increase the visibility of third parties' risk posture and consider broader ecosystem impact.
- Implement holistic risk management and defense mechanisms with effective preventive, monitoring, response and recovery capabilities.
- Prepare and test a resilience plan based on a list of predefined scenarios to mitigate the impact of an attack.
- Strengthen international public-private collaboration between all stakeholders in the industry.

#Cybersecurity #Geopolitics #EUR WEF

→ **A hack on News Corp resulted in unauthorized access to emails and data belonging to journalists, in an intrusion the company says was likely linked to China.** The hack, discovered on January 20 2022, affected a number of publications and business units including The Wall Street Journal and its parent Dow Jones; the New York Post; the company's UK news operation; and News Corp headquarters. In a securities filing on Friday, News Corp disclosed the hack, claiming that preliminary analysis indicated that data was taken. According to investigators, the hackers appeared to be interested in a range of topics, including issues of importance to Beijing such as Taiwan and China's Uyghur ethnic group. Other areas of interest included draft Journal articles and notes about US military troop activity, US technology regulation related to China, and articles about President Joe Biden, Vice President Kamala Harris and senior White House officials. The actors also searched using keywords for emails related to traditional intelligence areas, including defense. #Cybersecurity #Geopolitics #USA #CHN WSJ

→ **Russia arrested six people this week - all allegedly part of a hacking group involved in stealing and selling credit cards**. Russian law enforcement has not disclosed which groups specifically the arrested individuals were affiliated with. These arrests mark the third hacking group arrested by Russian authorities since the beginning of 2022. As we previously reported, in January, Russia seized $6M and arrested 14 individuals associated with REvil. And at the end of the month, Russia arrested the leader of the Infraud Organization, a hacking group that caused more than $560M in losses to business worldwide. This stream of arrests by Russia is unusual as the country does not have a history of cooperating in the crackdown on cybercrime operating within its borders, and has frequently come under international scrutiny for harboring cyber criminals. #Cybersecurity #Geopolitics #RUS Bleeping Computer Krebs on Security

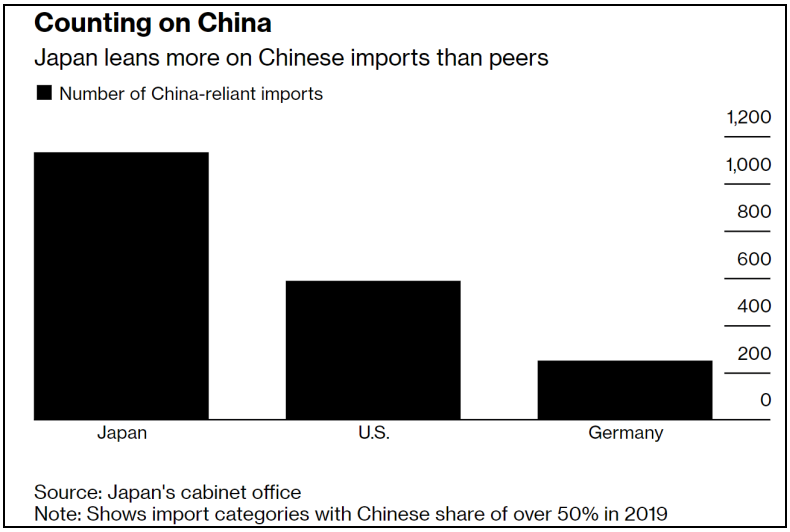
SUPPLY CHAINS

→ **The world's biggest shipping lines are buying their own fleets of cargo planes and adding airlifts to provide faster shipping services and circumvent prolonged supply chain issues.** Shipping executives believe planes will be used to support their core maritime freight business at a time when getting cargo delivered on time is critical. They also want to

branch out beyond their boats and become full-service logistics suppliers. Danish giant A.P. Moller-Maersk agreed last year to buy German freight forwarder and airfreight specialist Senator International for $644M, with the buyout set to double the company's air-cargo volume when it is completed later this year. Maersk subsidiary Star Air operates 15 Boeing 767 freighters and is leasing another three. It has also ordered two 777 aircraft. France's CMA CGM SA, which in 2019 bought CEVA Logistics for $1.67B, launched its own airfreight service in 2021 when much of the global commercial-jet fleet was halted due to Covid-19 travel restrictions. The price gap of airfreight has shrunk from 17x to 6x the cost of ocean cargo because of record-high ocean-freight rates in 2021. #SCRM #AER #USA #DNK #FRA WSJ

→ **As China hosts the Winter Olympics with artificial snow, the severe water scarcity in the Zhangjiakou region, which ranks among the worst in the country, worsens.** According to Hong Kong-based environmental group, China Water Risk, over half of Zhangjiakou is "highly water stressed," and the local water resource per capita is less than one fifth of China's national average. China could use as much as 2M cubic meters of water — enough to fill 800 Olympic-sized swimming pools — to create enough fake snow to cover ski runs and access roads throughout the Olympics. In Zhangjiakou, the dry weather means a significant amount of water tends to be lost due to evaporation and strong winds during the snow-making process. That hasn't stopped China from investing heavily in Zhangjiakou's tourism industry since Beijing won its bid for the Winter Olympic Games in 2015. Today it has seven bustling ski resorts and the city receives 3M skiers annually. However, experts warn that the approach could still interrupt the region's natural water cycle. The International Olympic Committee even flagged the issue as one of its chief concerns when considering China's bid to host. #SCRM #GRN #CHN Bloomberg

→ **Japan reported its vulnerability to supply-side limitations in China, revealing that over 1,000 import items are largely reliant on the country's largest trading partner.** According to a trade analysis by Japan's cabinet office, China had more than 50% share in 1,133 categories of imported goods, accounting for 23% of the value of Japan's imports in 2019. The level of reliance was about twice as much as US dependence on China. The analysis comes as Prime Minister Fumio Kishida's government is expected to introduce an economic security bill later this month. The bill intends to improve supply chains, safeguard the security of critical infrastructure, boost research and development, and tighten patent information disclosure. According to the report, Japan's reliance on China was most pronounced in household electronics items such as personal computers, tablets and cellphones, again outweighing the corresponding levels of dependence for the US and Germany. While the overall level of reliance remained relatively unchanged from a decade ago, global supply constraints during the Covid-19 pandemic have prompted calls for more resilient supply lines and reduced reliance on China.



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