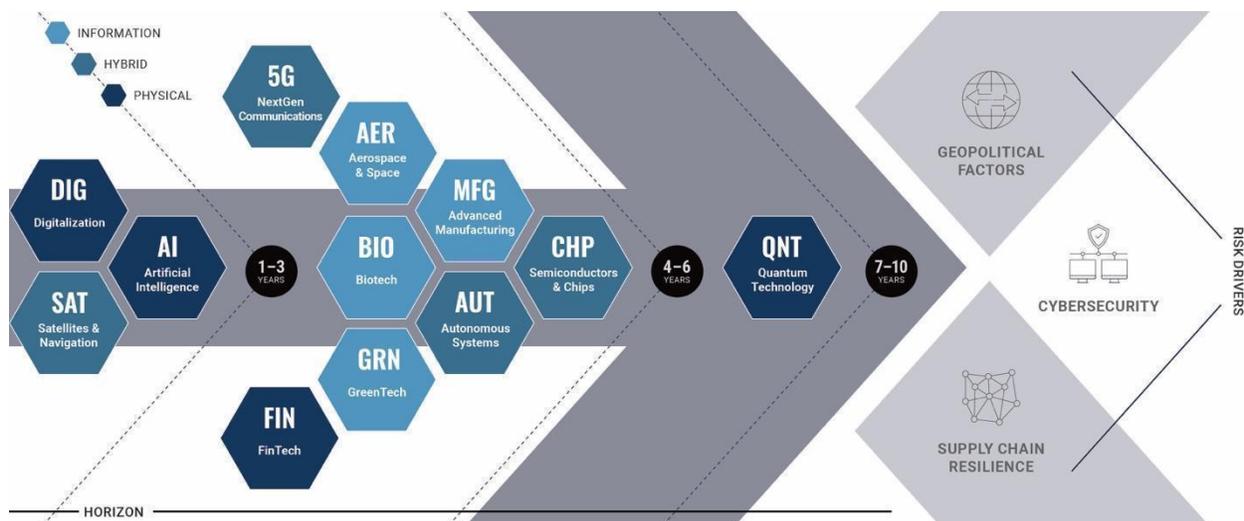




MATRIX MONITOR

Friday November 19, 2021

Welcome to Next5's weekly digest – emerging technology news and analysis to keep you on your game and ready for what's Next



*This week's **Next5 Matrix Monitor** features the metaverse's impact on large chip companies, a test of a Russian anti-satellite device that created thousands of pieces of debris, the Defense Innovation Unit's release of "responsible artificial intelligence" guidelines, a potential delay in some US 5G services, developments in decentralized finance, an alternative method of launching spacecraft to orbit, innovations in the methods of repairing sewer systems, and the Senate's bill to help the U.S. better compete with China and strengthen US semiconductor manufacturing.*

NEXT5 NEWS & AMPLIFICATIONS:

→ **The US-China Economic & Security Review Commission presented its bipartisan, unanimous annual report to Congress this week.**

Key findings:

- CCP leadership remains confident it can win a future war against the West, but the international environment is hostile to its goals & it must confront domestic challenges.
- China is pursuing economic, political, military, and security objectives in Latin America.
- China's quick economic recovery from COVID-19 is not sustainable.
- American companies remain committed to the Chinese market and USG policy can't keep up with US investment risks in the country.
- The Chinese government plans to compete with the US for technological dominance in: synthetic biology, new mobility, cloud computing.
- China is on track to become a US nuclear peer.
- The PLA is likely capable of invading Taiwan and it's uncertain if the US can deter it.
- Imposition of National Security Law in Hong Kong has hampered freedoms, the CCP remains in de facto control, and Hong Kong business has been "Mainlandized."

Recommendations for Congress:

- Consider legislation to address investment risks from China, extend SEC authorities to collect more information from companies operating in China, screen offshoring of critical supply chains to the PRC, and strengthen restrictions of sanctions on Chinese nationals.
- Establish a Technology Transfer Review Group (TTRG).
- Strengthen the US military's credibility in deterring Chinese military threats to Taiwan.
- Impose a region-wide Withhold Release Order on products originating from Xinjiang.
- Mandate an annual report from the Treasury Department on US investment in China.

Read the full report and watch the briefing to Congress [here](#).

→ **Next5 attended the Baird Government and Defense Conference this week, 17 November.** Our key takeaways from the event:

- **This has been the busiest year in terms of deal volume and the highest valuations ever in the Government and Defense sector.** These are driven by historically high contracting dollars, many high quality options for buyers - especially in the historically scarce mid-tier, and prevailing secular trends in AI, cyber, and space.
- Even with looming political pressures around continuing resolution and the nearly simultaneous debt ceiling, **PSC and others noted that FY22 will have historically high contracting dollars again.** And, the infrastructure bill presents many opportunities for companies in the sector, indicating good years ahead.
- **Space was a major theme** with USG leaders discussing the need to get "left of launch" to invest in hypersonics and the ability to counter hypersonics, including a constellation of LEO satellites to track hypersonic launches from China.
- In a sign of the times, in addition to traditional government sector players, Palantir and Anduril presented at this year's conference. Both stated their "humility" while brandishing

pretty considerable ego (like Palantir's observation that they're the 6th largest Defense company by market cap). Nevertheless, both companies made the compelling case that **business models are changing, that the private sector can out-invest in R&D, and that they are focused on leading in this sector.**

→ **In recent weeks, the US Intelligence Community has launched a campaign to warn American companies in five emerging industries: AI, quantum, biotech, semiconductors, and autonomous systems, about their interactions with business partners in countries like Russia and China.** The goal is to make American firms aware of what they might be getting themselves into when they work with foreign investors and collaborators. Part of the worry is illegal attempts to steal intellectual property, like cyber incidents and data theft. National Counterintelligence & Security Center (NCSC) leadership has also raised concerns about legal interactions where companies may be unknowingly putting themselves, their data, and their IP at risk. As we previously reported, Acting Director of the NCSC Michael Orlando feels that these five technologies are going to be transformative in nature and may determine whether the US remains the world's leading superpower, or if our competitors will be able to gain an edge in supremacy. He said, "we can't afford not to focus on protecting these technologies." To read a detailed interview with Michael Orlando, check out this [piece](#) from MarketPlace.

→ **In a provocative opinion piece, Historian Anne Applebaum argues that autocracy is winning.** She argues that the systems of governance run by various autocrats like Russia, Iran, and China are somewhat similar and their goals to defeat Democracy are common. And it is not limited to state leadership, but now includes business, financial structures, paramilitary groups, security services, and propagandists. She collectively calls them Autocracy Inc.:

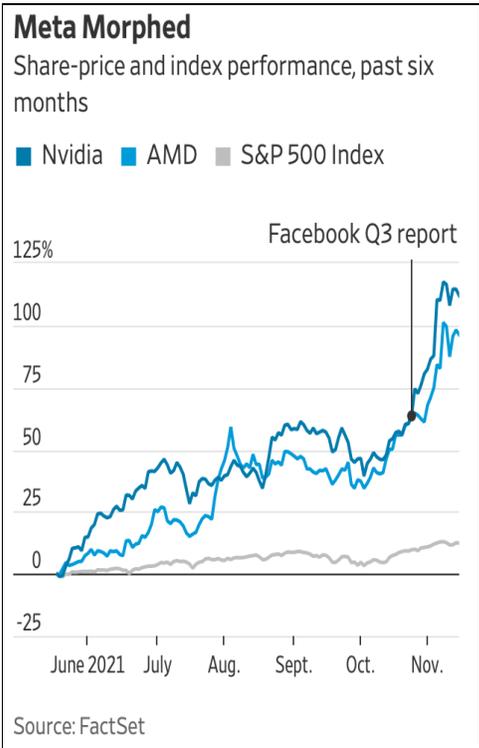
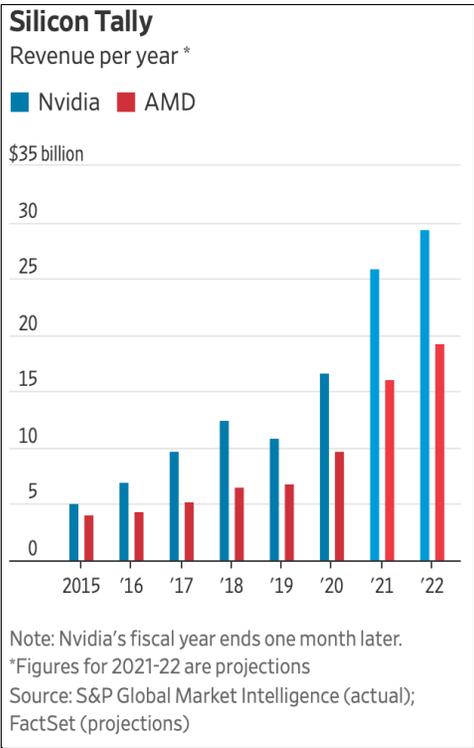
*"Nowadays, autocracies are run by sophisticated networks composed of kleptocratic financial structures, security services (military, police, paramilitary groups, surveillance), and professional propagandists. The members of these networks are connected not only within a given country, but among many countries. The corrupt, state-controlled companies in one dictatorship do business with corrupt, state-controlled companies in another. The police in one country can arm, equip, and train the police in another. The propagandists share resources—the troll farms that promote one dictator's propaganda can also be used to promote the propaganda of another—and themes, pounding home the same messages about the weakness of democracy and the evil of America... Unlike military or political alliances from other times and places, the members of this group don't operate like a bloc, but rather like an agglomeration of companies—call it **Autocracy Inc.** Their links are cemented not by ideals but by deals—deals designed to take the edge off Western economic boycotts, or to make them personally rich—which is why they can operate across geographical and historical lines."*

In an [interview](#) with Christiane Amanpour on CNN, Applebaum said, "**The Democratic world doesn't have an answer to these tactics yet, and we still act surprised.**" Read her full piece in [The Atlantic](#).

DIGITALIZATION

→ **Ohio’s attorney general is suing Meta Platforms, formerly known as Facebook, alleging the company misled the public about how it controlled its algorithm and the effects its products have on children.** The lawsuit, filed on behalf of Meta investors and the Ohio Public Employees Retirement System, seeks more than \$100B in damages and demands that Meta make significant changes so as to not mislead investors again, Ohio Attorney General Dave Yost said in a statement. The lawsuit alleges that between April 29 and October 21, 2021, Facebook and its executives violated federal securities law by intentionally misleading the public about the negative impact of its products on minors in an effort to boost its stock and deceive shareholders. Revelations by Facebook whistleblower Frances Haugen also are accelerating efforts in the Europe Union to impose sweeping new restrictions on big technology companies. #DIG #USA [WSJ](#)

→ **Metaverse hype has put more fire under the market’s two hottest chip stocks.** Shares of NVIDIA and Advanced Micro Devices have surged 30% and 20%, respectively, since the company once known as Facebook reported third-quarter results last month. Those results included a plan to boost capital expenditures by about 66% next year, in large part to start funding the company’s vision of a “metaverse,” the next generation of the internet that will include virtual worlds with real economies. Meta’s plan to spend as much as \$34B next year would put the social-network provider roughly on par with the annual capital-spending levels of tech giants Amazon, Microsoft, and Google. All three use chips from Nvidia and AMD in their data centers to power their booming cloud-computing businesses. Meta’s ambitions will thus expand an already lucrative market for the two chipmakers. #DIG #CHP #USA [WSJ](#)



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SATELLITES & NAVIGATION

→ U.S. group [Viasat](#) proposed a \$7.3B deal for the UK satellite business [Inmarsat](#) earlier this month. The takeover, if completed, would be the largest for the global satellite sector and will leave rivals including [SES](#), [Eutelsat](#), [Intelsat](#), and [EchoStar](#) considering how to scale up in a fragmented market. These companies have dominated the space communications sector for decades, but their values have slumped in recent years as sources of cash flow have started to dry up. This has coincided with the rise of terrestrial LEO satellites, such as Elon Musk’s Starlink, Amazon’s Project Kuiper, and the UK government-backed OneWeb. This new generation of companies have launched thousands of low-cost satellites capable of delivering broadband, transforming the space economy in the process. Space Capital, which has tracked the rise in activity, reported \$231B of equity investment in 1,654 companies over the past decade. The U.S. and China account for more than two-thirds of the spending and just last year the Chinese government filed applications with the International Telecommunications Union for two LEO constellations with almost 13,000 satellites. Inmarsat’s owners accelerated plans to sell the company because of the effect of the pandemic on its business providing communication services to aviation and shipping. The combined Viasat-Inmarsat would have 19 satellites — with 10 to be launched over the coming three years — and 20% of satellite industry revenues. #SAT #USA #GBR #CHN [Financial Times](#)



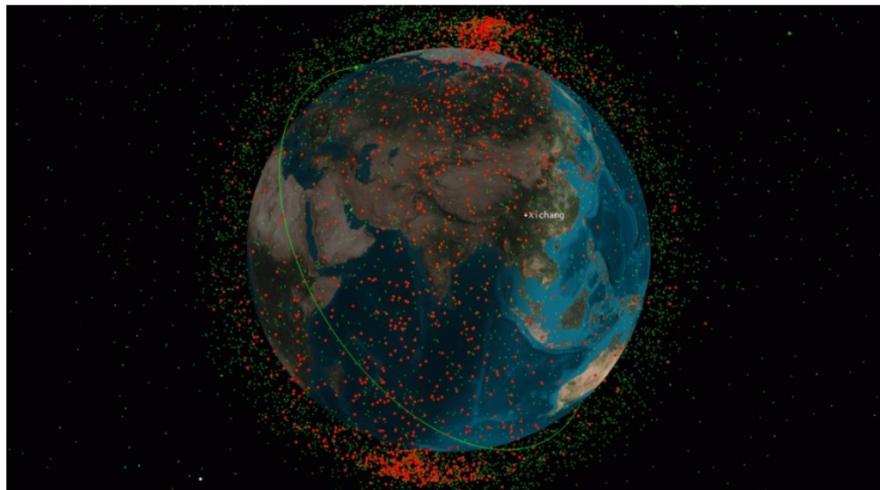
→ A Russian satellite broke up in low Earth orbit in a deliberate test of a Russian anti-satellite device that created thousands of pieces of debris. The satellite, Cosmos-1408, appears to have broken up late November 14 or early November 15 Eastern time, based on commercial and government tracking data. State Department spokesman Ned

Price confirmed the satellite was destroyed by an ASAT and added that the test “will significantly increase the risk to astronauts and cosmonauts on the International Space Station.” Early November 15, the seven people on the ISS were instructed to shelter in their Crew Dragon and Soyuz vehicles because of a “debris cloud,” remaining in their vehicles for about two hours. That debris cloud has since made several other close approaches to the station, although no damage was reported. The station’s crew resumed some operations later in the day although parts of the station remain sealed off as a precaution against any impacts. Hours after the State Department announced the Russian ASAT test, NASA confirmed in a separate statement that it was the debris from that event that required the crew to shelter earlier in the day. #SAT #USA #RUS [Space News](#)

Russia’s test Monday was the fourth direct ascent ASAT launch to destroy a satellite. According to U.S. Space Command:

- In 2007, China hit its Fenyun 1C satellite. Some 3,013 of its 3,679 trackable pieces of debris are still in orbit.
- In 2008, the U.S. conducted Operation Burnt Frost to destroy an NRO satellite that was failing. None of the 173 pieces of debris remain in orbit;
- In 2018, an Indian direct ascent launch destroyed Microsat-R. One of its 168 trackable pieces of debris is left in orbit.
- On Nov. 15, 2021, Russia destroyed its COSMOS 1408 in 2021, generating at least 1,500 pieces of debris that are trackable, meaning they measure 10 cm across or more.

US Space Force leadership said they are taking Russia’s ASAT launch as a deterrence message. #USA #CHN #RUS #IND [DefenseOne](#)



The Russian ASAT test destroying Cosmos-1408 drew comparisons to a 2007 Chinese ASAT test that created thousands of pieces of debris still being tracked today. Credit: AGI

ARTIFICIAL INTELLIGENCE

→ **In a bid to promote transparency, the Defense Innovation Unit has released what it calls “responsible artificial intelligence” [guidelines](#) that it will require third-party developers to use when building AI for the military.** The guidelines provide a step-by-step process for companies to follow during planning, development, and deployment. They include procedures for identifying who might use the technology, who might be harmed by it, what those harms might be, and how they might be avoided—both before the system is built and once it is up and running. The work could change how AI is developed by the U.S. government if the DoD’s guidelines are adopted or adapted by other departments. DIU says they have given the guidelines to NOAA and the Department of Transportation and are talking to ethics groups within the Department of Justice, the General Services Administration, and the IRS. The purpose of the guidelines is to make sure that tech contractors stick to the DoD’s existing ethical principles for AI that the DoD [announced](#) last year. #AI #USA [MIT Technology Review](#)

→ **According to analysts, the Gulf monarchies are willing to bet big on AI, knowing they must move away from their reliance on fossil fuel industries and become more active in tech, tourism, and other areas.** AI courses in Bahrain primary schools, the UAE’s plans for automated delivery drones, and Dubai’s ambition to have 25% of all transport automated by 2030 offer further evidence of the Gulf’s tech aspirations. The Middle East is predicted to receive only 2% of the estimated \$15.7T global AI economy by 2030, according to consultancy firm PwC Middle East. But analysts say the Gulf countries are playing the long game, positioning themselves to leapfrog global players. The annual growth rate of the Middle East AI market is about 20-34%, led by the UAE and then Saudi Arabia, according to a PwC report, predicting that more than 10% of each of the two countries’ GDP will come from AI by 2030. The UAE has said it aims to become one of the leading nations in AI by 2031, creating new economic and business opportunities, and generating up to \$91B in extra growth. #AI #GRN #BHR #ARE #SAU [France24](#)

→ **When it comes to technological innovation in the field of AI, Taiwan is punching well above its weight, building on its reputation as a global hub for information and communications technology and semiconductor production.** Below are three Taiwanese companies — all of which were celebrated recently at the 2021 Taiwan Excellence Awards — whose product innovations highlight the benefits of AI.

1. [Acer Medical](#) has produced a software known as VeriSee DR that provides support on clinical decisions. It uses AI to analyze images of a patient’s retina and delivers a referral recommendation. The device takes just three seconds to determine whether the patient should be referred to an ophthalmologist for further care and has already obtained approvals from regulatory authorities in Taiwan, Thailand, Indonesia, and the Philippines.

2. [Cyberlink](#), the tech company known for its innovations in multimedia software, has developed the FaceMe facial-recognition engine that incorporates its AI capabilities. Powered by deep-learning algorithms, the engine claims a 99.73% accuracy level. Even when masks are worn, FaceMe can still produce a 98.5% accuracy rate.
3. [Syscom](#) has created a service robot called Ayuda. Ayuda is capable of facial recognition, voice recognition, voice chat, video chat, QR-code reading, and even the detection of human forms. It can also provide environment mapping and target navigation, which means it can build a virtual representation of its physical surroundings and use this to move around independently. Ayuda is even able to identify people not wearing masks and then request that they do so.

#AI #BIO #Cybersecurity #TWN [Business Insider](#)

NEXT GENERATION COMMUNICATIONS

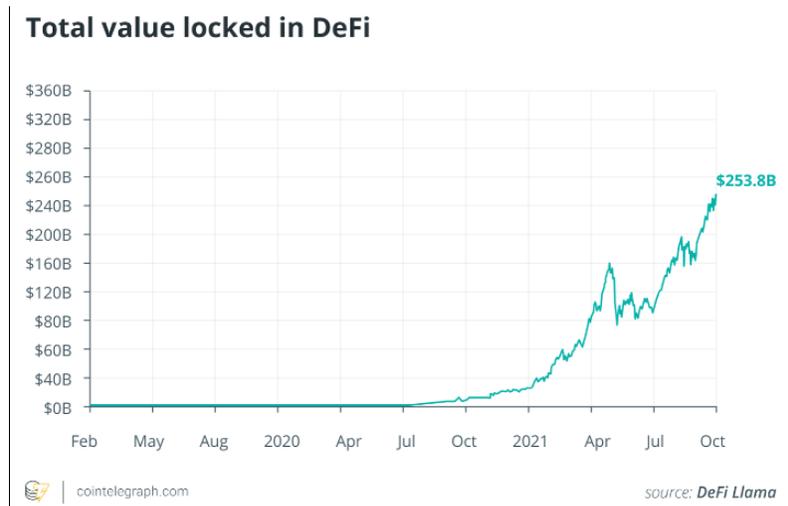
→ **AT&T and Verizon earlier this month said they would delay the launch of some 5G services after the Federal Aviation Administration warned it could restrict U.S. airspace in bad weather if the networks were turned on as planned in December.** The FAA warning came in the thick of cell phone carriers' network upgrade projects, and regulators are now working on a tight deadline. FAA officials are tentatively planning to issue restrictions by December 3, according to people familiar with the matter. To resolve the impasse, the FAA and the FCC must work out a compromise. The FCC has allowed cellular service over the airwaves in question, known as C-band, and only its current leaders have the power to tweak those permissions. But if FAA officials aren't satisfied, they have their own power to issue safety warnings that could result in significant flight disruptions. #5G #AER #USA [WSJ](#)

FINANCIAL TECHNOLOGY

→ **San Francisco-based investment firm [Paradigm](#) is starting a \$2.5B venture-capital fund aimed at the "next generation of crypto companies and protocols."** Coinbase co-founder Fred Ehrsam and former Sequoia Capital partner Matt Huang's Paradigm One would be the largest new venture-capital fund aimed at the industry. The three-year-old firm's fund raising outstripped VC firm [Andreessen Horowitz](#)'s \$2.2B fund earlier in 2021 amid record-breaking venture capital raising activity this year. Paradigm invests in crypto shops big and small, with as much as \$100M or as little as \$1M, according to the company's website. #FIN #USA [Bloomberg](#)

→ **Decentralized finance (DeFi) is a natural product made possible by blockchain technology and has the infrastructure to propel the technology to a bigger playing field.** The space has grown substantially since the Ethereum network went live in July 2015, with Ethereum network transactions growing 33x to 1.2M per day currently, and blockchain

transactions would exceed millions per day if other chains were included. While these are relatively large numbers, it is only a decimal point of the trillion-dollar traditional finance (TradFi) industry. Mainstream DeFi services currently include lending, borrowing, decentralized trading, and yield-aggregating — a relatively short list as compared to the wide-ranging financial services offered in TradFi. But this will not remain the status quo as the DeFi developers are actively exploring and building more services to the ecosystem.



#FIN [CoinTelegraph](#)

→ **India is likely to bar the use of cryptocurrencies for transactions or making payments, but allow them to be held as assets like gold, shares, or bonds, the Economic Times reported on Wednesday, November 17.** According to the newspaper, this approach would avoid implementing a complete ban, though the government was keen to stop crypto companies, including exchanges and platforms from actively trying to attract new investors. The crypto community has made several representations to Indian authorities asking to be classified as an asset rather than as a currency, in order to gain acceptance and avoid a ban. Sources told the newspaper that details of a bill were still being finalized, and the cabinet could receive the proposed legislation in the next two to three weeks for its consideration. The Reserve Bank of India has so far appeared very reluctant to accept cryptocurrencies, expressing concerns over potential risks to macroeconomic and financial stability, and capital controls. India's digital currency market was worth \$6.6B in May 2021, compared with \$923M in April 2020, according to blockchain data platform Chainalysis. #FIN #IND [Reuters](#)

AEROSPACE & SPACE

→ **NASA recently revealed long-term plans for the Space Launch System (SLS), the monster rocket it has been working on since about 2010.** The SLS has cost many billions of dollars, and NASA proposes to launch it for the first time in February 2022. NASA would like to

commercialize the SLS, fly it once a year for the Artemis Program, and pay half price for the privilege—the space agency wants to do this for at least the next 30 years. Meanwhile, a federal court has thrown out a lawsuit brought by Blue Origin against NASA and SpaceX over the award to Elon Musk’s company for the Human Landing System, as we previously reported. Work on the SpaceX HLS can now proceed. #AER #USA [The Hill](#)

→ **[SpinLaunch](#), a startup that is building an alternative method of launching spacecraft to orbit, conducted a successful first test flight of a prototype in New Mexico last month.**

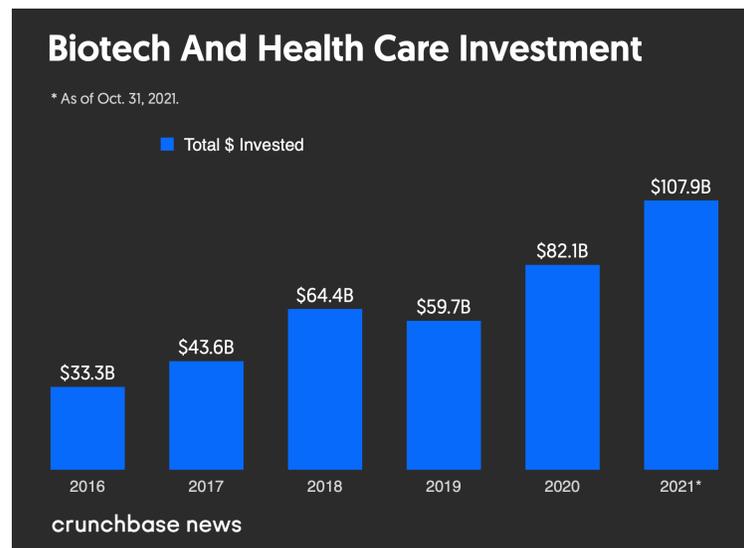
The Long Beach, California-based company is developing a launch system that uses kinetic energy as its primary method to get off the ground – with a vacuum-sealed centrifuge spinning the rocket at several times the speed of sound before releasing. The vacuum chamber holds a rotating arm, which, according to SpinLaunch CEO Jonathan Yaney, accelerates the projectile to high speed and then releases the vehicle for launch. While the first test flight vehicle did not have a rocket engine onboard, SpinLaunch plans to add that and other internal systems in later suborbital test flights. The company also plans to recover and reuse its vehicles. The current SpinLaunch test schedule has the company conducting about 30 suborbital test flights over the next six to eight months from Spaceport America. The design for the company’s orbital vehicle would be able to carry about 200 kilograms of payload to orbit, equivalent to a few small satellites. #AER #USA [CNBC](#)

BIOTECHNOLOGY

→ **Many life science startups successfully shifted their focus to the demands of the COVID era. However, startups and investors are increasingly re-thinking their future in a post-pandemic world.**

Investments into venture-backed startups in biotech and healthcare jumped from nearly \$60B in 2019 to more than \$82B in 2020, demonstrating COVID’s influence on the success of life science startups. However, many are worried about a potential COVID bubble that could be on the verge

of popping. As a result, startups that benefitted by COVID are trying to stay ahead of the curve. Regardless, some pandemic-induced trends are here to stay. For instance, technology adoption by pharmacists has allowed them to continue offering vaccinations and diagnostics. Additionally, telehealth options and at-home testing for certain ailments may also become the norm. But



businesses that banked on revenue spikes because of COVID have a small window to start thinking about other services to increase revenue and investments. #BIO [Crunchbase News](#)

GREEN TECHNOLOGY

→ **Cities are deploying an array of advanced technology like AI, robotics, and autonomous systems to explore, diagnose, and repair sewer systems in new, more affordable ways.** The arsenal includes flying drones, crawling robots, and remote-controlled swimming machines. They are armed with cameras, sonar, lasers, and other sensors, and in some cases with tools to remove obstructions, using water-jet cutters capable of slicing through concrete, tree roots, and even grease and personal-hygiene products known as fatbergs. Some can also fix leaking pipes using plastics that cure via ultraviolet light. The tools also include artificial-intelligence systems for automating the labor-intensive process of cataloging defects in sewer pipes and stormwater culverts, and for giving priority to repairs based on need and location. According to Gregory Baird, a former finance chief in charge of water- and wastewater infrastructure for cities in California and Colorado, all this tech represents a major shake-up for an industry that has been slow to change. #GRN #AI #USA [WSJ](#)

→ **Over a week ago, Toyota raced an experimental car - the Corolla Sport - powered by a converted GR Yaris engine running on hydrogen. Making such power plants commercially viable could keep internal combustion engines running in a carbon-free world.** Toyota's latest push into hydrogen tech comes as the world's biggest carmaker joins the rush to win a share of the growing market for battery electric vehicles as the world tightens emission regulations to meet carbon-cutting pledges. Although still only a small portion of vehicles on the road, global electric car registrations in 2020 grew 41% even as the overall car market contracted by almost a sixth, according to the International Energy Agency (IEA). By 2025, Toyota plans to have 15 EV models available and is investing \$13.5 billion over a decade to expand battery production. #GRN #JPN #GBR [Reuters](#)

→ **Australia's University of Queensland (UQ) on Wednesday, November 17, said it would recruit Tesla car owners around the world to analyze if the vehicle's spare battery capacity could support the energy grid and even power homes in the future.** The university has partnered with analytics platform Teslascope for the research project, which it said would be a world-first trial that would check how owners of electric vehicles (EV) currently drive and charge their vehicles. With increasing numbers of EVs globally, scientists are looking to find how the batteries can provide other cleaner energy services besides helping lower emissions in the transport industry. Researchers at UQ said most EVs are driven only one-eighth of their daily driving range of 400 km (249 miles), providing opportunities to store energy and export power to the grid using vehicle-to-grid (V2G) chargers. V2G technology is a connection between the EV and the grid through which power can flow from the grid to the vehicle and vice-versa. That potentially enables car owners to sell energy to the network, while

utilities could use electric cars as a backstop during peak demand periods. #GRN #AUS #USA
[Reuters](#)

→ **John Deere has received an Innovation Award from the Consumer Technology Association (CTA) in two categories for its See & Spray technology.** See & Spray is a technologically advanced robot for the agriculture industry that uses deep learning, cameras, and robotics to distinguish plants from weeds. The future of this technology is key to treating each plant individually, providing only and exactly what every single plant needs at the moment, making chemical usage more efficient, protecting the surrounding soil and plants, and producing healthier, more productive crops. #MFG #GRN #USA [Yahoo Finance](#)

ADVANCED MANUFACTURING

→ **On Friday, November 12, Desktop Metal—the billionaire-backed 3D-printer maker—announced its acquisition of ExOne, another 3D-printing company, for ~\$561M.** In December, Desktop Metal SPAC'd at a \$2.5B valuation, with plans to use its newfound capital to begin consolidating the additive manufacturing industry. The purchase will, according to Desktop Metal, drive down costs while improving quality. The 3D printing industry has been expanding—with an average ~27% annual growth over the past decade, and reached about \$12.8B worldwide in 2020. Though Desktop Metal started out associated with heavy industry and automakers, it's now expanded its clientele into consumer electronics, sporting goods, and surgical tooling, as well as automotive, aerospace, and defense. Persistent supply-chain issues could cause even more interest in the space since Desktop Metal has said its systems are 100 times faster than legacy options. #MFG #USA [Morningbrew](#)

AUTONOMOUS SYSTEMS

→ **In 2018, a Chinese state-owned company bought an Italian manufacturer of military drones, Alpi Aviation Srl, without authorities' knowledge.** After the acquisition, the Chinese company began transferring Alpi's know-how and technology to China. Italian authorities say that the company was a front for the Chinese state. This takeover fits the pattern of Chinese state firms using private shell companies as fronts to acquire firms with specific technologies that they then shift to new facilities in China. In Europe, companies are required to report themselves for official review when undergoing relevant foreign takeovers, which allows many deals to go unnoticed. However, following a wave of Chinese acquisitions like Alpi's, Europe is strengthening controls on investments. In 2018, the EU established a new framework for screening but the majority of responsibility must be shouldered by individual states. #AUT #ITA #EUR #CHN [WSJ](#)

→ **German automaker BMW will be using Qualcomm's chips for its next generation of driver assistance and self-driving systems.** Qualcomm, the world's biggest supplier of mobile

phone chips, is now diversifying its business to supply automakers. Its new chips will be used for BMW's Neue Klasse series of cars, set to start production in 2025. Specifically, BMW will use Qualcomm's computer vision processing chip to analyze data from front, rear, and surround-view cameras. BMW will also use a Qualcomm central computing chip and another set of Qualcomm chips to help the car communicate with cloud computing data centers. Besides BMW, Qualcomm supplies chips for GM's infotainment systems and is challenging rivals like NVIDIA in supplying chips that power driver assistance computers. #AUT #CHP #DEU #SCRM
[Reuters](#)

SEMICONDUCTORS & CHIPS

→ **The global semiconductor shortage is forcing manufacturers to produce lower-tech models of products.** In order to deliver products on time while counteracting the chip shortage, companies from a variety of industries are now redesigning their products and shifting production lines. For instance, T3 Motion, which makes electric stand-up vehicles for security officers, is using fewer chips and electronics by using a centralized, integrated board with a single processor to control all parts of its vehicles. To compensate, companies are promising to install key electronic features in the lower-tech products that they were forced to develop once parts become available. #CHP [WSJ](#)

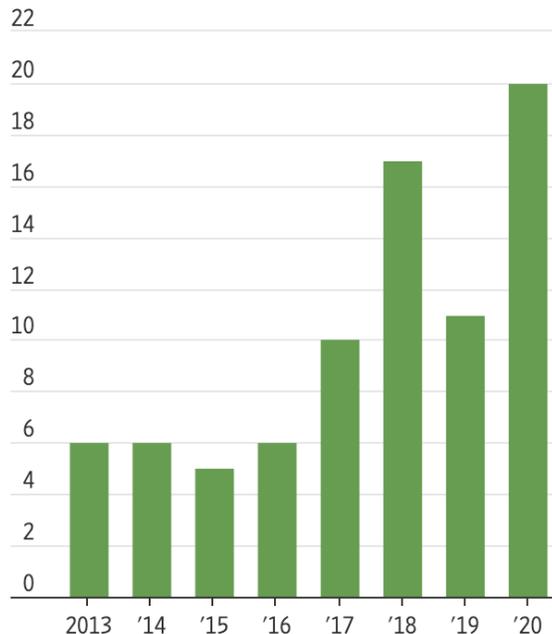
→ **The Senate will add a \$250B bill to help the U.S. better compete with China and strengthen U.S. semiconductor manufacturing.** The legislation increases research and development funding for manufacturing and scientific innovation. It also includes \$52B in emergency appropriations to provide grants and incentives to companies looking to build semiconductor manufacturing facilities in the U.S. Although the bill passed with bipartisan support by the Senate in June, negotiations between the House and Senate regarding its next steps have halted due to Democrats' efforts to act on President Biden's agenda. However, the Senate is working with the House to resolve the different versions of their bills and hopefully come to a resolution before the end of the year. #CHP #USA #CHN [Bloomberg](#)

→ **U.S. firms are increasing investment in Chinese semiconductor companies, aiding Beijing's goal for chip-sector dominance but complicating Washington's efforts to preserve its lead in semiconductors.** U.S. companies including VC firms and chip giants like Intel participated in 58 investment deals in China's semiconductor industry from 2017 through 2020, doubling the number from the past four years. Additionally, China-based affiliates of venture firms made at least 67 investments in Chinese chip companies since 2020. Simultaneously, China is aggressively pursuing self-sufficiency in chips and focusing on areas of the semiconductor supply chain where the U.S. is more dominant, and U.S. investment is assisting this move. The U.S. government is considering regulation on outbound investment flows that could "enhance the technological capacity of [its] competitors in ways that harm... national security." The Senate is already proposing legislation that would screen outbound investments and the offshoring of critical supply chains and tech resources to foreign adversaries. However, business groups like the U.S. Chamber of Commerce and the U.S.-China

Business Council oppose the bill, citing the unprecedented nature of capital flow regulations and that the current export controls are already sufficient to protect national security. #CHP #USA #CHN #Geopolitics [WSJ](#)

Chip Deals

Number of Chinese chip deals involving U.S. private investors



QUANTUM TECHNOLOGY

→ **IBM said that it has designed a new quantum chip that it believes will let quantum systems outperform classical computers at some tasks within the next two years.** IBM said that its Eagle chip has 127 qubits, which is the first of its kind. However, qubits are difficult to build and require huge cryogenic refrigerators to operate correctly. IBM said that its new techniques will produce more qubits when combined with other advances in quantum refrigeration and control systems. In the future, IBM plans to build an Osprey chip with 433 qubits and a Condor chip with 1,121 qubits. At that point, IBM claims it will be close to “quantum advantage,” the point where quantum computers can beat classical computers. #QNT #CHP [Reuters](#)

→ **[Multiverse Computing](#) announced a partnership with [IonQ](#), which will enable financial services organizations to better model risk by using IonQ’s Quantum Cloud platform within Singularity, Multiverse’s computing financial solution.** The partnership combines IonQ’s advanced quantum hardware with the simplicity of Mutliverse’s systems. By integrating the companies’ systems, financial institutions can model real-life financial problems with

unprecedented speed and accuracy, without having to write any code. Thus, this partnership will increase the accessibility of quantum computing for financial professionals, including those without technical backgrounds or understanding of quantum computers. #QNT [Quantum Daily](#)

GEOPOLITICS

→ **China has recently been pushing U.S. executives and businesses to fight against China-related bills in the U.S. Congress.** The Chinese embassy in Washington sent letters urging executives to get members of Congress to alter or drop bills that will enhance U.S. competitiveness, specifically the the U.S. Innovation and Competition Act (USICA) – designed to boost competition with China and fund semiconductor production – and the Eagle Act. Chinese officials warned in the letters that if the bills become law, U.S. companies will lose market share and revenue in China. #GEO #USA #CHN [Reuters](#)

→ **Global consulting giant McKinsey & Co's works with both the US Department of Defense and powerful Chinese state-owned enterprises, in what critics are calling a risk to national security that can't be ignored.** The Pentagon and other federal government agencies rely on McKinsey to carry out often sensitive work touching on national security strategy, cybersecurity and cutting-edge technology, paying the firm hundreds of millions of dollars for its advice and data-crunching. McKinsey's consulting contracts with the federal government give it an insider's view of U.S. military planning, intelligence and high-tech weapons programs. But the firm also advises Chinese state-run enterprises that have supported Beijing's naval buildup in the Pacific and played a key role in China's efforts to extend its influence around the world. There is no evidence or allegation that McKinsey has damaged U.S. national security, and U.S. authorities have not charged the firm with violating federal contracting laws related to its work with Chinese clients. But with tensions high between China and the U.S., McKinsey's business operations in both countries are coming under growing scrutiny. Critics say the firm, the world's largest consulting company, needs to divulge more details about its work in China, particularly amid concerns in Washington about Beijing's industrial espionage, arms buildup and intellectual property theft. #CHN #USA #Geopolitics [NBC](#)

→ **The U.S. Air Force Research Laboratory is opening a scientific research facility in Melbourne, Australia, to be co-located with Australia's Defense Science and Technology Group.** The office is part of the International Science Division of the Air Force Office of Scientific Research (AFOSR), and the new office aims to increase cooperation between the U.S. and Australia on scientific research that will benefit both of their militaries. Australia has a long history of scientific cooperation with the AFOSR because it is part of the "five eyes" nations along with Canada, New Zealand, the UK, and the U.S. The nations share intelligence with each other and excel in combustion, hypersonics, aerospace, and quantum. The new office in Australia seeks to expand upon this by bringing scientists from both countries together and

launching country initiatives, which are AFOSR-sponsored three-year efforts aimed at promoting international cooperation. #GEO #USA #AUS [AFCEA](#)

CYBERSECURITY

→ **A Ryuk ransomware group-affiliated entrepreneur was arrested this week and faces extradition from Mexico to the US on charges of conspiracy to commit money laundering, proving that US sanctions at least limit criminals' ability to travel without risk.** US sanctions and indictments often have limited impact on individuals harbored abroad, but this case demonstrates that such designations at least limit criminals' ability to travel as Mexico and other US partners have demonstrated commitment to upholding the law. The entrepreneur, Denis Dubnikov, is accused of receiving more than \$400,000 in bitcoin out of the millions paid to Ryuk by ransomware victims. However, Dubnikov will be pleading not guilty saying he had no knowledge of the criminal activity. This is part of a larger FBI investigation into Ryuk, which was linked to one-third of all U.S. ransomware attacks in 2020. Specifically, it attacked 235 general hospitals and inpatient psychiatric facilities, plus dozens of other healthcare facilities in the U.S. since its founding in 2018. Ryuk's average ransom demand was around \$700,000. #Cybersecurity #USA #RUS [WSJ](#)

→ **As Latin America becomes an increasingly attractive location for cybercriminals, its lackluster cybersecurity foundation must be updated.** Crunchbase has provided several relevant factors and recommendations to help Latin America develop more robust cybersecurity solutions:

- Since it is behind, Latin America has the chance to build a sturdier cybersecurity infrastructure from the ground up, maximizing the potential of frontier technology. One of the most prominent frontier technologies is blockchain, which can arguably make online identities truly sovereign – unique and controlled by the user.
- The cybersecurity industry in emerging markets such as Latin America is growing so rapidly that it is drawing investment away from Silicon Valley. Businesses like the LACChain alliance are integrating blockchain into organizations and countries in Latin America and the Caribbean, and are working toward a sovereign ID based entirely on blockchain.
- Governments must help cultivate an ecosystem in which companies can overcome existing infrastructure limitations. Governments should offer financing strategies for companies and foster better education on IT security among youths. From a policy lens, countries must update laws around privacy, user consent, and right to be forgotten. Private companies should engage in dialogue with governments on cybersecurity, providing constant feedback and acting as a source of current information on trends that will help the government regulate the tech space.

SUPPLY CHAINS

→ **COVID-19 is accelerating a technological transformation in the logistics sector as supply chains start to shift from paper to digital transactions.** Among those on the front lines is the Global Shipping Business Network (GSBN), a Hong Kong-based nonprofit established to simplify the business of trade through blockchain. Its technology can facilitate the secure sharing of data needed to settle trade. For instance, its product, Cargo Release, can cut the process of physical exchanges of documentation at Shanghai port to less than two hours instead of three days by eliminating the need for queues and in-person interaction. Due to COVID-19, this digitization will become increasingly prevalent within logistics – the Asia Development Bank reported that the global trade finance gap rose 15% to \$1.7T in 2020, underscoring the need for digitizing the trade ecosystem as that would generate data, increase transparency, improve interoperability, and boost access to trade finance. #SCRM #DIG #HKG [Bloomberg](#)

→ **The future of energy in America will depend on whether the U.S. can decrease its reliance on other countries that dominate clean energy supply chains.** To reach Biden's ambitious environmental goals such as net zero emissions by 2050 and 100% clean power by 2035, the U.S. must scale up its mining and manufacturing capabilities. Supply chains for clean energy technologies and raw materials are concentrated overseas. Moreover, supply chain bottlenecks and inflation caused by COVID-19 are threatening progress made on clean energy. For instance, U.S. battery production capacity would not have been able to meet even half of the demand for lithium-ion batteries for electric vehicles in 2028 if the U.S. government had not intervened. Paradoxically, digging up critical minerals for clean energy would pose threats to local environments and communities. The largest lithium resource in the U.S., for example, sits on indigenous land. As an alternative solution to supply chain woes, the U.S. can build up its battery recycling capacity to avoid the strenuousness of producing and mining from scratch. #SCRM #GRN #MFG #USA [The Verge](#)