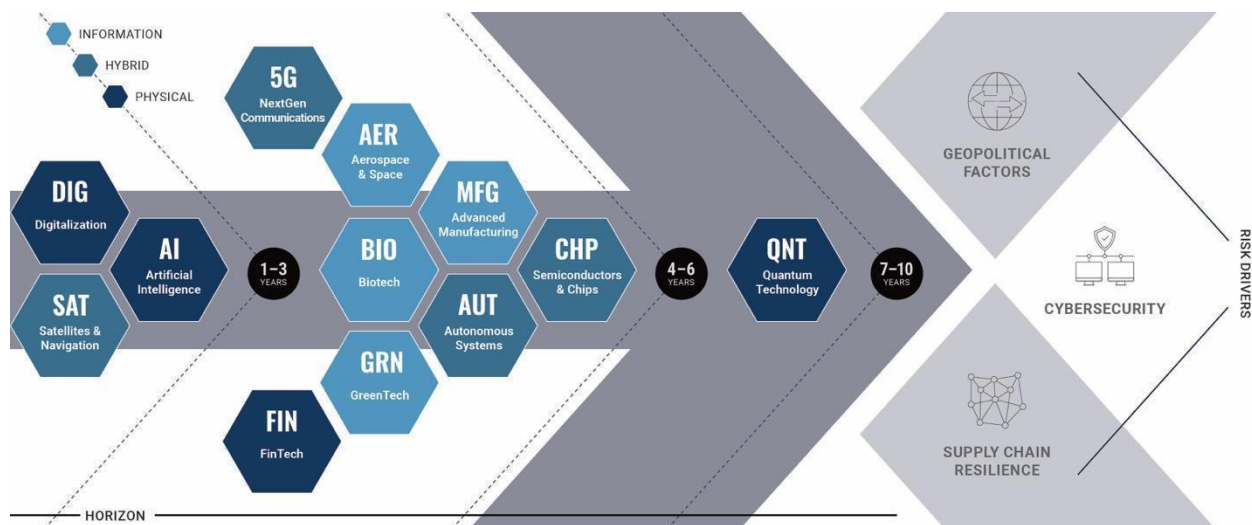




# MATRIX MONITOR

Friday October 15, 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 latest on Google's "digital transformation" across Africa, the European Parliament's call for a ban on facial recognition technology in public places, competition for spectrum, G7 principles for digital currencies, record human genome sequencing, agricultural methods for mitigating climate change, ASML's projected market activity, LinkedIn shutting down in China, and projections for the global supply chain for the upcoming holiday season.*

## NEXT5 NEWS & AMPLIFICATIONS:

→ **Consider signing the [Making Space Cybersecurity Pledge](#):** Diversity is security. In support of the movement to eradicate systemic racism and lack of gender diversity in the cyber industry we aim to make a step towards equality and equity with the #MakingSpace pledge. The R Street Institute has created #MakingSpace in partnership with more than 20 think tanks, universities, foundations, corporate partners, and individuals in an effort to increase the diversity of speakers and experts in the cybersecurity space at events that are hosted or funded by these organizations. This pledge is just the first step in the ongoing dialogue necessary to create a culture that seeks to nurture talent; elevate a diversity of ideas and individuals; and enhance scholarship within the cybersecurity policy space. Including a broader array of voices in cybersecurity discussions will not only improve them, but will also encourage the involvement of a diverse pool of people and help ensure cybersecurity policy accurately reflects the perspectives and concerns of society at large.

→ **Next5 CEO Bryan Ware contributed to a panel discussion at DHS & NIST's second Space Cybersecurity Symposium alongside colleagues in the space industry.** Follow us on Twitter to catch the highlights: [@Next5Inc](#)

Bryan's take on the future of this space:



→ **Asia investment this year has already surpassed the total of 2019 and nearly all of 2020** according to [Crunchbase analysis](#). Funding hit \$42.7B Asia's biggest quarter since Q2 2018, when total funding hit \$47.1B. In fact, Asia investment this year has already surpassed the total of 2019 and nearly that of all 2020. Thus far, the continent has realized \$106.1B in funding—compared to \$98.2B in 2019 and \$109.5B last year. As was the case for early and seed rounds, late-stage and technologies funding continued to climb in the region. Those late-stage growth rounds—from both venture capital and private equity—totaled \$29.2B for the quarter. That represents the highest total in any quarter since Q2 2018 when late-stage growth funding totaled more than \$36B. Investors seemed to pull back on Chinese companies a little in Q3—[possibly because of new regulations and rules on going public](#). The somewhat [turbulent quarter](#) in China still saw \$12 billion come to companies there, a 12 percent decline from the previous quarter, which saw \$13.7 billion, and an 8.7 percent decline year to year. Nevertheless, India has pulled ahead of China, racking up \$16.2B of investment dollars going to its companies in Asia by the end of Q3. #CHN #IND [Crunchbase](#)

→ The Hudson Institute hosted a virtual event to discuss their findings from a recent paper they published titled, *Powering Innovation: Advanced Batteries and Critical Supply Chains*. To read the paper click [here](#). To watch panels from thought leadership on the findings, click [here](#).

## DIGITALIZATION

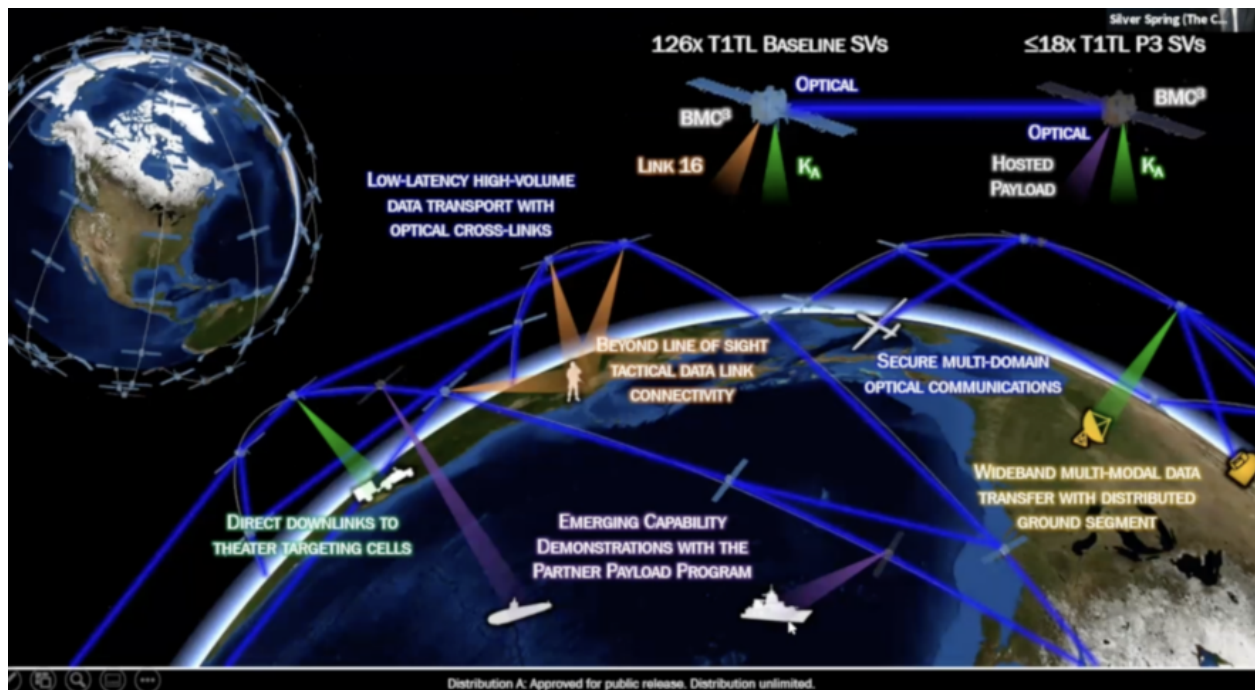
→ **Google will invest \$1B to support “digital transformation” across Africa.** This will include a subsea cable to enable faster internet speeds, low-interest loans for small businesses, equity investments into African startups, and skills training, among other things. The plans were unveiled on October 6 at an event led by Google and Alphabet CEO Sundar Pichai. The subsea cable will cut across South Africa, Namibia, Nigeria, and St Helena, connecting Africa and Europe. It will provide approximately 20 times more network capacity than the last cable built to serve Africa and is projected to create about 1.7M jobs in Nigeria and South Africa by 2025 as the digital economy grows. Google also announced the launch of the Africa Investment Fund, where it will invest \$50M in start-ups across the continent. Additionally, the company is to disburse \$10M in low-interest loans to small businesses in Nigeria, Ghana, Kenya, and South Africa, to alleviate hardships brought about by the COVID pandemic. #DIG #USA #ZAF #NAM #NGA #SHN #GHA #KEN [Tech Crunch](#)

## SATELLITES & NAVIGATION

→ **There is a shift underway in the Intelligence Community’s acquisition and use of imagery produced by non-U.S. satellite operators.** A study done in the spring by the National Geospatial-Intelligence Agency, in the form of mock Olympic Games for remote sensing providers, showed leaders that in a number of key sensor technologies, non-U.S. firms are at the head of the pack. NRO in its new Broad Agency Announcement (BAA) Framework for Strategic Commercial Enhancements is allowing foreign owned firms with vetted U.S. subsidiaries to compete for contracts involving new sensor tech, a change from its June draft request for proposals on electro-optical imagery. While many policy-makers assumed that US companies would be industry leaders across the board, U.S. firms won “gold” in only three of the categories. This included San Francisco startup [Capella Space](#), which took first place for best SAR resolution. [Maxar Technologies](#), with its Worldview 3 constellation, won for best electro-optical sensor resolution. Chinese firms also placed first in three categories; one of the insights that jumped out was how quickly Chinese firms have become competitive in the global marketplace. #SAT #USA #CHN [Breaking Defense](#)

→ **The Space Development Agency on October 8 issued a draft request for bids for 18 satellites that will carry experimental payloads.** These 18 spacecraft will be integrated with SDA’s planned mesh network of 126 optically interconnected data transport satellites. The plan is to deploy the 18 satellites in a single plane about 600 miles above Earth, a mix of 12 satellites

carrying industry-developed payloads and six with government-furnished payloads. The initial draft Request for Proposal said up to three vendors would be selected to produce the satellites and secure launch services by 2025. The request was updated October 12 saying that SDA will only make one award. According to the agency, the Transport Layer will support multiple Defense Department customers and branches of the military. Government-development experimental payloads are likely to come from the Defense Advanced Research Projects Agency and the Air Force Research Laboratory. For the industry-developed payloads, SDA would be interested in sensors and other technologies that support the DoD's strategy to use satellites in space to track targets on the ground, at sea, and in the air and share that intelligence across military platforms deployed around the world. #SAT #USA [Space News](#)



→ **Big defense firms buying up smallsat companies has become a trend in recent years according to a new Quilty Analytics report.** BAE's acquisition of In-Space Mission announced last month is the fifth major aerospace and defense contractor to acquire or invest in a smallsat company since 2018. Other recent deals involving large primes and smallsat companies include Lockheed's investment in [Terran Orbital](#), Boeing's acquisition of [Millennium Space](#), Raytheon's acquisition of [Blue Canyon Technologies](#), and General Atomics' acquisitions of [Tiger Innovations](#) and [Surrey Satellite Technology](#)'s U.S. operations. According to Quilty, the four announced M&A transactions, combined with a Marlink buyout by a PE - plus an unrelated & unsolicited offer for Eutelsat - suggest another wave of M&A may be looming. Additionally, Spire's pending acquisition of Canada-based AIS services provider [exactEarth](#) may mark the start of a broader wave of EO/geospatial consolidation. #SAT #USA #GBR #CAN [Quilty Analytics](#)

→ **Another recent report from Quilty, written at the request of DIU, identified six areas expected to be critical to the future space economy that could benefit from a government boost**, summarized below:

1. **U.S. Spaceports:** The lack of access to spaceports “could singlehandedly throttle the industry’s long-term growth rate.” The U.S. remains precariously dependent on a handful of key spaceports.
2. **Orbital Transfer Vehicles:** Propulsive spacecraft designed to ferry satellites to their intended destinations in space after separation from a launch vehicle have emerged as viable platforms for in-space transportation. But these systems are still in their infancy and their business case is still unclear.
3. **On-Orbit Servicing, Manufacturing:** Some technologies are at the beginning of commercial adoption, but progress remains slow. Component production to full spacecraft manufacturing in orbit are still several years away.
4. **Orbital Fueling:** Lower launch costs are opening up access to space and activities will move deeper into cislunar space, bolstering the need for orbital refueling services. But establishing an industrial base to make this happen remains a daunting challenge.
5. **Deep Space Communications, Domain Awareness:** More than 100 lunar missions and 40,000 satellites are expected to launch over the next decade. The infrastructure needed to support this growth does not exist. The government could play an active role as an advocate and anchor customer.
6. **Commercial Lunar Utilization:** The moon holds significant military-strategic value and could become a source of national wealth creation. If the U.S. cedes the lunar opportunity to China, the U.S. will be disadvantaged militarily and economically. Efforts should be directed at lowering investment risks and creating demand for lunar-derived products and services.

**The Quilty analysts also suggested 3 ways the government can support the space economy:**

1. Avoid procurements of customized systems and instead buy commercial products and services that meet 80% or more of mission requirements.
2. Engage with a cross-section of small-to-mid-sized companies using acquisition approaches that minimizes paperwork and knowledge of government procurement systems.
3. Buy American but don’t overlook the potential contributions of allies that both need U.S. security support and are capable contributors in the space domain.

#AER #SAT #USA [Quilty Analytics](#)

## ARTIFICIAL INTELLIGENCE



→ **The European Parliament passed a non-binding resolution calling for a ban on law enforcement use of facial recognition technology in public places.** The resolution, which also proposes a moratorium on the deployment of predictive policing software, would restrict the use of remote biometric identification unless it's to fight "serious" crime, such as kidnapping and terrorism. The approach stands in contrast to that of U.S. agencies, which continue to embrace facial recognition even in light of studies showing the potential for ethnic, racial, and gender bias. The global facial recognition market is expected to be worth \$4.45B in 2021 — and many governments are clamoring for the technology. Vendors like [AnyVision](#) and [Gorilla Technologies](#) are alleged suppliers for Taiwanese prisons and Israeli army checkpoints in the West Bank.

Huawei has tested software that could reportedly recognize the face of a member of the Uighur minority group. And [Clearview](#), which has scraped 10B mugshots from the web to develop its facial recognition systems, claims to have 3,100 law enforcement and government customers, including the FBI and U.S. Customs and Border Protection. #AI #TWN #ISR #CHN #USA [Venture Beat](#)



→ **A new technology can inconspicuously scan a wall surface for shadows and reflections imperceptible to the human eye, then analyze them to determine details.** This can include how many people are in the room—and what they are doing. The technology could be used to spy on activity from around a corner, learn more from a partial view of a space, or watch someone avoiding a camera's line of sight. The method highlights how imaging and machine learning can transform imperceptible indicators into surveillance for the military and Intelligence Community. But more innocuous uses potentially exist as well: for example, vehicles could scan blank walls as part of an autonomous pedestrian-detection system for areas with poor lines of sight, such as parking garages. And some researchers suggest the technology could be used to monitor the elderly and detect falls or other problems. #AI #USA [Scientific American](#)

## NEXT GENERATION COMMUNICATIONS

→ **The deployment of 5G networks is supposed to usher in a new era for technology ranging from enhanced virtual reality to remote heart surgery.** That vision has been slow to come into focus, but the first wave of 5G-enabled gadgets is emerging. Such technologies include home broadband internet services for those looking to abandon Internet access via wires. Samsung, for instance, has teamed up with Verizon to offer wireless 5G routers that promise to deliver at-home broadband access. Other consumer devices include 5G-compatible laptops and new drone technologies. In August, Qualcomm unveiled a new drone technology

with 5G and AI capabilities that enables higher-quality photo and video collection. Because of the new camera technology enabled by 5G, the drones can be used for mapping large areas of land and rapidly transferring the data for analysis and processing. #5G #AI #BIO #USA #KOR [WSJ](#)



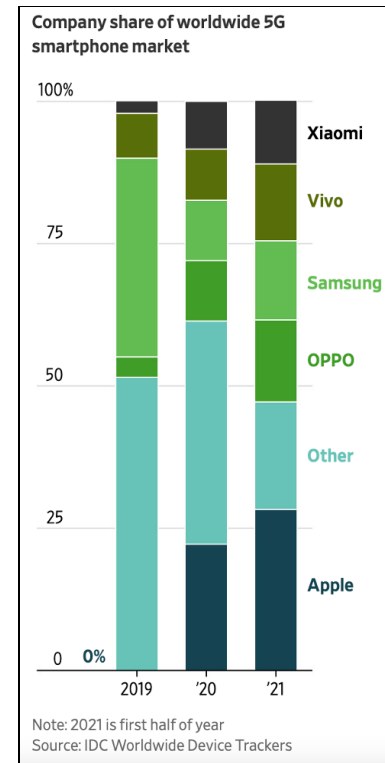
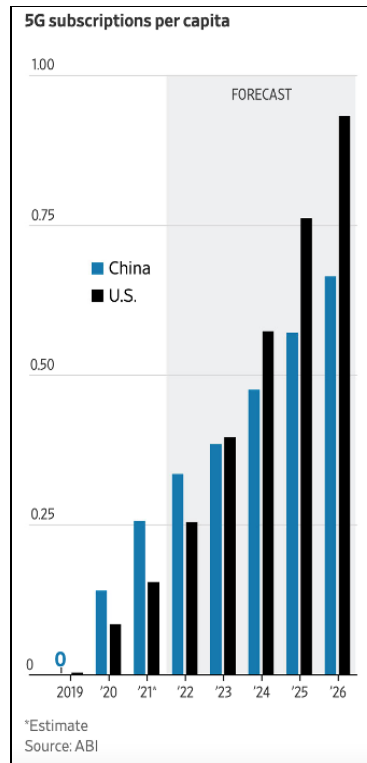
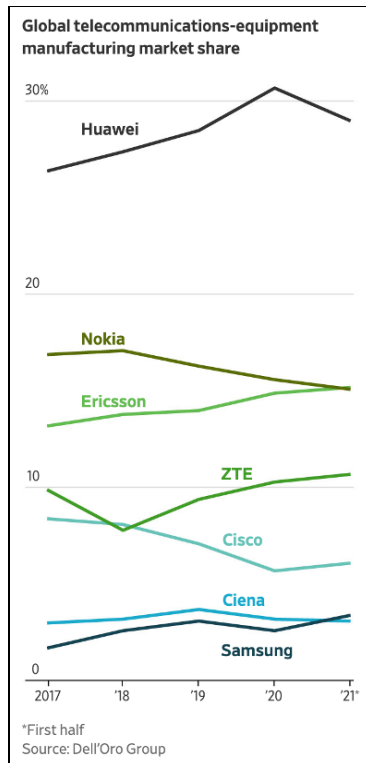
Qualcomm's Flight RB5 5G Platform for drones enables higher-quality photo and video collection. Lenovo Group in August teamed up with AT&T to release one of the latest 5G laptops, the ThinkPad X13 5G. PHOTOS: QUALCOMM INC.; AT&T INC.

→ **5G now dominates a broad swath of the global supply chain—and the competition to control different parts of it is heating up.** Below the Wall Street Journal offers a scorecard of some of the most competitive 5G races:

**Equipment Suppliers**—China's Huawei leads the \$90B-a-year market for telecommunications equipment. But others are gaining ground, as Huawei faces restrictions from governments around the world due to Washington's campaign to stifle sales of the company's equipment over **cybersecurity** concerns. Sweden's Ericsson increased its market share to 15% in the first half from 14.7% last year, putting it in second place, while Finland's Nokia slipped to third place as its share declined to 14.9% from 15.4%.

**Smartphones** — When Apple introduced its first 5G-capable smartphone to great fanfare a year ago, it was months behind rivals like Samsung. But by the time of this year's iPhone 13 launch last month, Apple had taken the lead. It held 28.3% of the 5G phone market, as measured by shipments, in the first half of this year. Chinese company Guangdong Oppo Mobile Telecommunications was second with a 14.4% share, just ahead of Samsung at 13.9% and another Chinese company, Vivo Mobile Communication Co., at 13.5%. China's Xiaomi was next at 11.2%.

**Countries** — China continues to lead in 5G, although the U.S. and some of China's Asian neighbors are making strides. China's lead stems from its head start in the rollout of 5G networks. In July, China's Ministry of Industry and Information Technology said the country had installed 961,000 5G base stations, more than any other country so far.



#5G #SCRM #USA #CHN #SWE #FIN #KOR [WSJ](#)

→ **Starlink and Dish are continuing to compete for influence over the FCC's allocation of spectrum in their respective 5G networks.** In previous calls and filings with the FCC, SpaceX said that if the commission considered opening up a certain swath of wireless frequencies for ground-based 5G service, it would pose a threat to Starlink's satellite network. The airwaves SpaceX says it needs sit above 12 gigahertz on the wireless spectrum, and Starlink needs those airwaves free and clear for its satellites to eam high-speed broadband internet service - essentially saying sharing the spectrum scientifically won't work. Dish, on the other hand, is pressing the government to allow cellphone towers to send high-speed internet signals over the same airwaves. Fights over wireless spectrum are becoming increasingly common as technological advances like 5G let companies stream data in ways considered impossible a few years ago, spurring new demand for space on the airwaves to carry those signals. The fight between SpaceX and Dish is not likely to be resolved any time soon and the FCC has bought more time by drafting a neutral document on the matter. #5G #USA [WSJ](#)

→ **Ericsson is officially a supplier for AT&T's upcoming C-band rollout and 5G network expansion.** The two companies have already partnered on 5G and in recent months conducted multiple trials in the mid-band frequencies. Verizon previously named Ericsson as a C-band vendor as part of a massive 8.3B 5G deal. Now, the Swedish vendor has a new 5-year network deal with AT&T that supports AT&T's plan to cover 70-75M people with 5G using C-band by the end of 2022 and expansion to 200M people by the end of 2023. Financial terms were not



disclosed. AT&T has said it expects to invest between \$6B and \$8B for C-band rollouts over the next few years. #5G #USA #SWE [Fierce Wireless](#)

## FINANCIAL TECHNOLOGY

→ **G7 finance officials endorsed 13 public policy principles for retail central bank digital currencies, saying they should be grounded in transparency, the rule of law, and sound economic governance - according to the Treasury Department.** In their joint statement, G7 officials said central bank money in the form of CBDCs would complement cash and could act as a liquid, safe settlement asset, and anchor the payments system. They said the principles were meant to support policy and design deliberations within and beyond the G7. No G7 authority has decided to issue a CBDC, and careful consideration of the potential policy implications will continue, the statement said. The G7 officials stressed the importance of rigorous privacy standards, cybersecurity, the need to protect users' data and transparency on how information will be secured and used. They said such currencies must be energy efficient and operate in an open, transparent and competitive environment, while underscoring the importance of interoperability on a cross-border basis and the need to minimize any harmful spillovers to the international monetary and financial system. They reiterated that no global stablecoin project should begin operation until it addresses legal, regulatory and oversight requirements, echoing a similar statement made by the larger Group of 20 finance officials earlier Wednesday. #FIN #Geopolitics #USA #EUR #FRA #DEU #ITY #GBR #JPN [Reuters](#)

→ **Digital transactions make the financial lives of young adults more convenient, but they come with a price.** Consumers can purchase almost anything, or send money to friends and family, with only a phone swipe. However, this convenience has left many young adults with “decentralized” finances. People are outsourcing expenses in a way that makes it easy to overspend and hard to budget. A June 2021 report from digital consulting firm West Monroe Partners found that American consumers on average are paying \$273 a month in subscription services, up from \$237 in 2018. Yet the report, which surveyed 2,500 U.S. consumers, also found that most people thought they were spending less on subscriptions than they did in 2018. To reduce cash leakage, some consumers are turning to money-management apps such as [Truebill](#) and [Trim](#), which comb through a customer’s spending activity and identify any recurring charges. Some of these apps will even negotiate those bills down or cancel subscriptions on a customer’s behalf, for a fee. #FIN [WSJ](#)

→ **Chinese President Xi Jinping is zeroing in on the ties that China’s state banks and other financial stalwarts have developed with big private-sector players, expanding his push to curb capitalist forces in the economy.** Mr. Xi, who started his campaign late last year with a regulatory assault on private technology giants, is launching a sweeping round of inspections of financial institutions. According to people with knowledge of the plan, the inspections, announced in September with few details, focus on whether state-owned banks, investment funds, and financial regulators have become too close with private firms. According

to analysts, amid the uncertainty, many banks are already pulling back from lending to private developers and other businesses. #FIN #CHN [WSJ](#)

→ **A growing number of Salvadorans have experimented with bitcoin since the country became the first to adopt it as legal tender last month.** But only a fraction of the Central American nation's businesses have taken a bitcoin payment and technical problems have plagued the government's cryptocurrency app. Dozens of Salvadorans told Reuters they had at least one problem with the Chivo digital wallet, and few had used it on a daily basis. Others have also reported irregularities with transactions and attempts of stolen identity. President Nayib Bukele has blamed high demand for the issues Salvadorans have faced. One month since launch, 12 percent of consumers have used the cryptocurrency, the Salvadoran Foundation for Economic and Social Development reported. #FIN #SLV [NBC](#)

## AEROSPACE & SPACE

→ **The uptick in human space flight handled by commercial space enterprises is part of a broader wave of interest by entrepreneurs and investors in space as a venue for economic activity.** Startups have developed businesses to provide fuel for satellites and to capture and sell data about Earth; they have also helped to launch rockets. Moreover, larger aerospace companies have made investments in vehicles and services. Space tourism could generate roughly \$4B in annual revenue by 2030, according to analysts at UBS. Ticket prices, however, remain out of reach for most people, with Virgin Galactic, for example, charging at least \$450K per seat. #AER #SAT #USA [WSJ](#)

→ **According to a Tech Crunch Oped, an industry-led sustainability effort needs to be adopted by all space stakeholders as the space economy emerges.** The size of the global space economy—which combines satellite services and ground equipment, government space budgets, and global navigation satellites equipment—is estimated to be about \$345B. Startup space ventures brought in \$5.7B in 2019, easily besting 2018's \$3.5B record. By 2040, Morgan Stanley estimates that the global space industry could generate revenue of more than \$1T. In an environment where both debris and spacecraft are traveling at velocities in excess of 15,700 mph in low-Earth orbit, even a 5 mm nut can shred a solar panel like it was made of paper. NASA reports that millimeter-sized orbital debris represents the highest mission-ending risk to most robotic spacecraft operating in low-Earth orbit. So as space becomes more and more congested, unsafe or irresponsible actions by any one actor could have catastrophic consequences. Therefore, sustainable economic expansion will require innovative solutions to support traditional and new customers throughout the life cycle of a space mission, from a careful analysis of a mission's requirements to end-of-life decommissioning. #AER #SAT [Tech Crunch](#)

## BIOTECHNOLOGY

→ **Researchers say they've finally sequenced the entire human genome.** The first draft of the human genome in 2000 led to a boom in technology, like CRISPR, and therapeutics, but scientists didn't realize how incomplete the draft was at the time. An international consortium of about 100 scientists say they've finally assembled the human genome in its entirety. If peer review checks out, this finding could change the future of medicine, enabling more precise and effective medicines including the kind of gene-focused treatment that powered the first effective COVID-19 vaccines. #BIO #USA [Popular Mechanics](#)

→ **Thanks to the success of the COVID-19 vaccine, companies are now exploring different applications of mRNA technology that can potentially be more transformative.** The synthetic mRNA used in COVID-19 vaccines is very versatile as it can be programmed to make virtually any protein found in the target virus. When our cells produce the protein, our body recognizes it as foreign and begins to produce an immune response against it. Using this technology, Moderna has developed an experimental HIV vaccine that will soon begin its early-stage trial. Pfizer has also begun human testing of an mRNA flu shot, which can be more successful than traditional flu vaccines. More significantly, synthetic mRNA might even be able to cure diseases by working with the gene-editing technology known as CRISPR. [CRISPR Therapeutics](#) and [Vertex Pharmaceuticals](#) are attempting to treat sickle cell anemia and a related blood disorder by taking patients' blood cells out of the body and editing them, which can be an impractical procedure. Thus, mRNA is being considered as a vehicle to deliver the gene-editing capabilities of CRISPR to cure genetic diseases with lower risk. #BIO [Boston Globe](#)

## GREEN TECHNOLOGY

→ **A group in France, as part of a new agricultural business venture called Hectar, is studying profitable techniques to reverse climate change through farming.** France is the European Union's main breadbasket, accounting for a fifth of all agricultural output in the 27-country bloc. Yet half of its farmers are over 50 and set to retire in the coming decade. 70K farm jobs are thus going unfilled, and young people aren't lining up to take them. And in contrast to the United States, where the digital evolution of agriculture is well underway, and huge high-tech hydroponic farms are multiplying, the farm-tech revolution has been slower to take hold. President Emmanuel Macron has sought to rejuvenate agriculture's image and has called for a shift to "ag-tech" and a rapid transition toward environmentally sustainable agriculture as part of a European Union plan to eliminate planet-warming emissions by 2050. Hectar's vision revolves around attracting 2,000 young people from urban, rural, or disadvantaged backgrounds each year, and equipping them with the business acumen to be farmer-entrepreneurs capable of producing sustainable agriculture ventures and attracting investors — all while generating a profit, and having their weekends free. #GRN #USA #FRA [NYT](#)

→ **A new Pentagon strategy calls for all defense-related organizations to make changes to mitigate potential vulnerabilities from climate change and reduce emissions.** The

32-page report states that the Defense Department must adapt to a world where military operations, installations, and even weapon systems can all be impacted by climate change. The department plans to target places in the supply chain where it can reduce emissions, while also having a positive impact on operations and resiliency.

The other lines of effort include:

- Ensuring the Department has access to quality data on climate and the environment, and that it creates processes to include that information in the decision-making process, reducing costs and the risk to operations.
- Training troops to withstand extreme weather conditions and making certain that equipment can also function in very hot and cold temperatures.
- Mitigating the risk of floods, wildfires, and other natural disasters on military installations by continually assessing the risk to bases and other facilities.
- Enhancing cooperation with partner nations and other U.S. agencies that can increase knowledge about climate change, contribute to resiliency, and reduce costs.

#GRN #USA [Breaking Defense](#)

→ **The National Business Aviation Association (NBAA) and other industry groups on Tuesday, October 12, committed to “net zero” carbon emissions by 2050**—the commitment came as the sector's flagship private jet show kicked off in Las Vegas. Previously, the industry had pledged to halve emissions from 2005 levels by 2050. Aviation accounts for roughly 3% of global CO2 emissions, and a surge in private travel is putting the business aviation industry under greater pressure to cut emissions. Planemakers are adding more recycled material on planes, seeking ways to lighten aircraft to burn less fuel, and working on a new generation of electric aircraft. But like airlines, corporate aircraft executives agree the quickest way to cut emissions is through use of sustainable aviation fuel (SAF) which is not widely available due to its higher costs. #GRN #AER #USA [Reuters](#)

## ADVANCED MANUFACTURING

→ **Not only is it becoming easier to undertake experiments in space, but there is also increased demand for satellite repair and maintenance, and life extension services.** One of the fastest-growing areas of application for in-space robotics is to maintain in-orbit satellites, including geostationary satellites. The microgravity and vacuum conditions that exist in space make manufacturing processes easier to control. In addition, the ability to capture solar radiation and transform it into directional, thermal energy has facilitated the production of advanced materials, such as ultra-strong glasses and ceramics. Separately, NASA is attempting to demonstrate 3D printing technology in space using simulated lunar soil. In the future, this could allow colonists on the moon or Mars to produce some of their own habitats and reduce the need

to take large volumes of construction materials into space. #MFG #SAT #AER #USA [Aerospace Manufacturing](#)

## AUTONOMOUS SYSTEMS

→ **China announced that it will introduce assessment measures to regulate data sent abroad by vehicles.** Currently, auto companies in China cannot export key vehicle data abroad unless they obtain approval from regulators. But as cars become smarter with more information and autonomous driving functions, there is a growing concern that mountains of data collected by automakers and tech companies could be attacked or misused. Although China's Ministry of Industry and Information Technology did not detail the new assessment measures, it stated that regulators will improve the monitoring of vehicle data security and encourage telecommunication companies to invest more in cybersecurity. #AUT #CHN [Reuters](#)

→ **Lucid, a luxury electric vehicle company, revealed information about its suite of active safety and driver assist systems called DreamDrive.** DreamDrive has 32 sensors, a driver-monitoring system, and an onboard Ethernet connection to power everything. Together these pieces enable adaptive cruise control, lane centering, and even Auto Park. Customers can also choose DreamDrive Pro, which has all DreamDrive features plus more advanced ones like Highway Pilot, which uses lidar technology to provide hands-free driving under the right conditions. #AUT [CNET](#)

## SEMICONDUCTORS & CHIPS

→ **ASML, a Dutch firm that makes high-tech machines for semiconductor manufacturing, will see its market value increase from \$302B to \$500B next year.** As the linchpin to the global semiconductor industry, ASML provides chipmakers with lithography technology to mass produce patterns on silicon. It is the only company in the world that offers extreme ultraviolet (EUV) lithography machines capable of producing the smallest and most sophisticated chips. ASML's future growth will stem from nations' desire to onshore chip making and become less reliant on Asia. In order to do that, countries need to purchase ASML's EUV machines as they are the most advanced in the market. Thus, ASML expects that its annual revenue will hit \$28-35B by 2025 with gross margins up to 54-56%. #CHP [CNBC](#)

→ **Nvidia's \$54B bid for British chip designer ARM will likely face an extended EU antitrust investigation after concessions offered failed to address competition concerns.** The European Commission will end its preliminary review of the deal on October 27 and a four-month investigation into the deal will now follow. Although the review process is confidential, the Commission said that Nvidia offered "behavioral remedies," which are usually pledges companies make to preserve competition. Nvidia itself has stated that it would maintain ARM as a neutral technology supplier amid concerns from customers such as Qualcomm and Apple. #CHP #EUR [Reuters](#)



## QUANTUM TECHNOLOGY

→ **IBM and Raytheon announced that they will jointly develop advanced AI, cryptographic, and quantum solutions for the aerospace, defense and intelligence industries.** AI and quantum give aerospace and government clients the ability to design quicker systems, secure their communication networks, and improve decision-making. This partnership will leverage IBM's breakthrough commercial research with Raytheon's aerospace and defense expertise to solve once-unsolvable challenges. To secure potential vulnerabilities with quantum, the companies will also research and develop advanced cryptographic technologies. #QNT #AI #AER #USA [Quantum Daily](#)

→ **Cambridge Quantum released the first ever open-source toolkit and library for a Quantum Natural Language Processing (QNLP) toolkit called lambeq.** The toolkit uses QNLP to turn sentences into quantum circuits for implementation on quantum hardware. Specifically, QNLP works as follows:

- Firstly, sentence words are converted into something the computer can understand. Through this process, the sentence is converted into a logical format called a syntax tree.
- Next, the software analyzes the syntax tree, then organizes it into parts of speech. Once the parts of speech have been identified, it is converted into a string diagram.
- After being encoded, tensor networks or quantum circuits are ready to be optimized for machine learning tasks such as text classification.

lambeq is significant as it accelerates the development of practical, real-world QNLP applications, including automated dialogue, text mining, language translation, text-to-speech, language generation and bioinformatics. #QNT #GBR [Forbes Quantum Daily](#)

## GEOPOLITICS

→ **136 countries agreed to the most sweeping overhaul of global tax rules in a century, a move that aims to curtail tax avoidance by multinational corporations and raise additional tax revenue of as much as \$150B annually.** The reform sets out a global minimum corporate tax of 15% targeted at preventing companies from exploiting low-tax jurisdictions. The agreement also seeks to address challenges posed by companies, particularly tech giants who register the IP that drives their profits anywhere in the world. As a result, many of those countries established operations in low-tax countries such as Ireland to reduce their tax bills. The new agreement, if implemented, would divide existing tax revenues in a way that favors countries where customers are based. The biggest countries, as well as the low-tax jurisdictions, must implement the agreement in order for it to meaningfully reduce tax avoidance. The signatories still face a few hurdles, like getting a divided Congress on board. Treasury Secretary Janet Yellen urged Congress to move swiftly to enact the international tax proposals it

has been debating which would help pay for extending the expanded child tax credit and climate-change initiatives, among other policies. #Geopolitics #DIG #USA #EUR [WSJ](#)

→ **Microsoft's LinkedIn is shutting down in China, marking the end of the last major American social media network operating openly in the country.** LinkedIn, in a statement Thursday, said that it made the decision after “facing a significantly more challenging operating environment and greater compliance requirements in China.” According to WSJ sources, China gave LinkedIn 30 days to better regulate its content in March. As we previously reported - in recent months, LinkedIn notified several China-focused human right activists, academics, and journalists that their profiles were being blocked in China, saying they contained prohibited content. LinkedIn also said it would replace its Chinese service with a job board service lacking social media features such as the ability to share opinions and news stories. #Geopolitics #USA #CHN [WSJ](#)

→ **China vowed to include biodiversity protection in its economic plans in all regions and sectors at COP15 – a UN talk aimed at halting mass extinction.** In addition to formulating “a national biodiversity protection strategy and action plan for the new era,” China also committed to cooperating on conservation through its controversial Belt and Road Initiative, aimed at building infrastructure, energy, and technological links through Asia to the Middle East, Africa, and Europe. Many are worried about the environmental impacts of China's economic ambitions around the world. China's biggest impact on biodiversity is actually in the Afro-Tropics and South America due to its increasing demand for soybeans and imported beef. #Geopolitics #CHN [Reuters](#)

## CYBERSECURITY

→ **According to Microsoft, Russia accounted for 58% of state-sponsored hacking over the past year, targeting mainly government agencies and think tanks in the U.S.** Not only are Russian hacks becoming more prominent, but they are also becoming more frequent. After the SolarWinds hack last year, the success rate of Russian state-backers hackers increased from 21% to 32%. After that attack, Russian state hackers transitioned back to focus on government agencies involved in foreign policy, defense and national security, think tanks, and healthcare, where they targeted organizations developing and testing COVID-19 vaccines and treatments. Microsoft's report observes that 92% of the detected attacks were conducted by the elite hacking team in Russia's foreign intelligence agency, Cozy Bear. **Microsoft's findings stand in stark contrast to a recent CrowdStrike report we recently cited which found that China was responsible for at least two thirds of attributable nation state-backed cyber attacks in the past year.** #Cybersecurity #RUS #USA [AP News](#) [The Sydney Morning Herald](#)

→ **The White House kicked off a 2-day ransomware summit involving 30 nations this week and many countries promised offensive responses to big ticket ransomware.** Opening comments from multiple nations suggest a massive uptick in the number of attacks with Israel, Ireland and the Czech Republic citing ongoing or recent attacks on their health care

system. National Security Advisor Jake Sullivan says “No one country, no one group can solve this problem,” and said that transnational criminal groups operating across multiple countries, jurisdictions and networks are responsible for the majority of attacks. The UK, Netherlands, and Australia published statements vowing to use its military agencies to fight ransomware groups. #USA #Cybersecurity [Cyberscoop](#) [Risky.Biz](#)



→ **A map of U.S. ransomware attacks from 2018 to present published by Comparitech reveals an alarming increase in attacks.** In 2018, there were only a few ransomware attacks and the primary industries affected were business and healthcare. In 2019, attackers started targeting the education and government sectors as well. 2020 was the biggest year for ransom attacks, where not only the amount of attacks increased significantly, but the number of records affected by the attacks also increased. More than half of attacks in 2020 targeted the business industry, and the largest scale attacks also occurred within business. Thus far in 2021, the largest attacks have been targeted at the healthcare industry, likely because healthcare records are increasingly valuable in light of COVID-19. #Cybersecurity #USA [Comparitech](#)

## SUPPLY CHAINS

→ **The White House, Walmart, FedEx, and UPS are all stepping in to relieve bottlenecks at California ports that have persisted for weeks.** Walmart, FedEx, and UPS announced they will rev up operations 24/7 to relieve the Port of Los Angeles. As we've repeatedly reported: The supply chain bottlenecks like chip shortages and resulting shortage of cars in the market are largely due to enduring stress on the global economy sparked by COVID 18 months ago. President Biden addressed the nation in a speech on Wednesday where he underscored the

need for transportation and rail sectors to step up by increasing operations to help move goods quickly. Data released Wednesday showed that consumer prices rose 0.4% in September from the previous month and 5.4% compared to September 2020, driven mainly by increases in energy, food and shelter costs. The supply and logistics challenges are ones where the federal government has limited power, with some officials acknowledging that there is no off-the-shelf supply chain playbook for these strains. Before his remarks on Wednesday, Biden convened a private meeting of leaders from major retailers and transportation companies, unions and industry groups to discuss their plans. He later said the White House would call out private sector companies who don't step up. #SCRM #USA [The Hill](#)

→ **Amid global supply chain crunches and shortages of everything from truck drivers to energy, the crisis is only set to get worse as the holiday shopping season approaches.**

Gadgets have been hit especially hard because they require many different components. Currently, these parts are not being made in a synchronized manner, delaying the assembly and delivery of gadgets. A large contributor to this delay is China's power shortage, which has forced many factories that build components for large tech companies to pause or cut production. On top of this, a petrochemical shortage caused by short oil supplies is making it more difficult to produce all kinds of goods, especially ones that require plastic. All of these problems have manifested into rising price and shipping delays for a variety of products. As the holiday season approaches, consumers should act early to ensure that their products arrive on time. #SCRM [Vox](#)

→ **JPMorgan Chase CEO Jamie Dimon predicted that current global supply chain hiccups caused by COVID-19 are temporary and will disappear next year.** While some experts believe that the supply chain crisis will continue through 2023, Dimon argued that the economy is set up for growth because of the strength of consumers, who are spending 20% more than they were spending pre-COVID. As a result, Dimon said that supply chain disruptions are only elongating economic recovery rather than derailing it. #SCRM [CNBC](#)