

INFOTAINMENT EDGE[™]

Tuesday, October 17, 2023 (Daily E-booklet on Artificial Intelligence, VR, Tech, Robotics, Coding, Global Info, Health, Science & more)

SECTION 1 – TECH BUZZ

ARTIFICIAL INTELLIGENCE



AI-powered Voice Payments Revolution

The Reserve Bank of India (RBI) is set to revolutionize digital payments through the Unified Payments Interface (UPI) by integrating Artificial Intelligence (AI) into financial transactions.

- Termed "Conversational Payments," this innovative approach introduces a seamless method of conducting business by embedding payment requests directly into chat or message conversations, facilitating swift money transfers during daily interactions.
- Voice assistants have emerged as powerful tools with diverse applications across various industries, including finance, healthcare, retail, and advertising.
- Financial institutions and payment services are now exploring the potential of integrating voice technology into transactions. Giants like Google, Amazon, and Apple are producing AI-enhanced devices with conversational voice interfaces, fuelling widespread interest in voice assistants across markets.
- Experts predict that "Voice" will play a significant role in the evolution of payments, leading to what is termed as the payments 4.0 era. In 2016, PayPal pioneered voice-activated technology for processing transactions, marking the beginning of this transformative journey.

- Subsequent innovations include the development of voice-activated systems like the Eyowo payment platform's Voice Chatbot, the "Voice Pay" digital payment system, and the "DashCam" system for face- and voice-activated payments in moving vehicles.
- Creating a voice payment account parallels the process of setting up a digital wallet but offers a more convenient approach. Users link their credit, debit, or checking accounts to the voice payment account. When making a payment, users simply command their device to process the transaction, eliminating the need to manually enter payment information.
- The device then launches the preferred payment app, seeking transaction confirmation from the user. Authentication methods such as PINs, facial recognition, or fingerprint scans ensure secure transactions. This innovation also enables users to track payments and account balances effortlessly.
- However, challenges persist, such as voice assistants' ability to comprehend various accents and integrating speech-activated technologies at the point of service. Despite these challenges, the integration of voice payments into IoT speakers and voice assistants is reshaping our daily lives.
- For instance, Google's "Hands-Free" app allows users to complete purchases without pulling out their phones or wallets. Android Pay, integrated into the app, is supported by over a million retailers globally. Users can authorize transactions through Bluetooth, Wi-Fi, phone sensors, and in-store cameras, streamlining the payment process significantly.
- In conclusion, the introduction of UPI in 2016 marked the beginning of a digital payment era, significantly surpassing debit and credit card activity. With the emergence of Conversational Payments and voice-enabled payment systems, traditional payment methods are rapidly becoming obsolete.
- Financial institutions and businesses that embrace voice technology are positioned at the forefront of this transformative wave, while those hesitating risk falling behind as voice technology reshapes our interactions with banks and financial transactions.

Med42 AI Healthcare Revolution

M42, a global tech-enabled healthcare network, has introduced a groundbreaking advancement in healthcare technology with the launch of Med42, an open-access Clinical Large Language Model (LLM). This generative artificial intelligence (AI) model, boasting an impressive 70 billion parameters, is set to revolutionize the healthcare sector and significantly impact patient care outcomes.

- Med42 is designed to provide high-quality answers to both short and long-form medical queries. Its development aims to greatly enhance clinical decision-making processes and facilitate access to synthesized medical knowledge for healthcare professionals, patients, and medical researchers, all the way to regulatory bodies.
- Trained using M42's meticulously curated dataset of medical knowledge, Med42 outperforms larger closed models, such as ChatGPT 3.5, when tested on various healthcare-relevant datasets. In a zero-shot evaluation, the model achieved an impressive 72% score on the United States Medical Licensing Examination (USMLE) Sample Exam questions, showcasing its effectiveness.

- Developed by M42's team in Abu Dhabi, Med42 was trained and fine-tuned in collaboration with Cerebras and Core42, a G42 company focused on national-scale AI and Enterprise AI programs. The accuracy of the model was further validated by a team from the Mohamed bin Zayed University of Artificial Intelligence (MBZUAI).
- Hasan Jasem Al Nowais, Managing Director and Group Chief Executive Officer of M42, expressed his enthusiasm about Med42, stating that it will enhance global access to healthcare knowledge.
- He emphasized M42's commitment to transforming the healthcare sector, making it more personalized and patient-centric, and ensuring that AI is accessible to all while adhering to ethical standards and prioritizing user safety. He also acknowledged the support from the Abu Dhabi Department of Health and the wider technology ecosystem in Abu Dhabi.
- Med42 has the potential to significantly expedite clinical decision-making by acting as an AI assistant for healthcare professionals. Its capabilities extend to developing personalized treatment plans by analyzing patients' medical histories to identify the most suitable courses of action.
- Additionally, it assists doctors in accessing insights more quickly, aids pharmacists in determining correct dosages, and supports scientists in efficiently studying treatment options and reviewing relevant literature.
- To encourage collaboration and further enhancement of the generative AI model, Med42 is available for download on Hugging Face. This availability allows the scientific and developer community to extensively test, review, and assess the model. Similar to Meta's Llama 2 model, Med42 is free for non-commercial use and research, with appropriate usage controls due to the potential risks associated with deploying AI in healthcare contexts.
- Ashish Koshy, Group Chief Operating Officer of M42, highlighted that Med42 is not just a tool but a platform for collaboration. M42 aims to catalyze global innovation in AI for healthcare, empowering experts worldwide to refine and expand the model's applications in various medical domains. Partnerships with technology leaders, including Cerebras, enable M42 to achieve its long-term transformative objectives and bring this vision to life.
- The full-parameter fine-tuning of the largest Llama 2 model was successfully accomplished on Cerebras and G42's Condor Galaxy 1 (CG-1) AI supercomputer. This achievement was made possible by the substantial memory and AI cores within the 64 Cerebras CS-2 systems inside CG-1.
- Andrew Feldman, co-founder and Chief Executive Officer of Cerebras Systems, expressed excitement about the collaboration, emphasizing how it has changed the AI landscape. The partnership has delivered Condor Galaxy 1, the world's largest AI supercomputer, as well as Jais, the leading Arabic LLM, to the community. Now, they have contributed another cutting-edge LLM, Med42, which promises significant benefits for the healthcare landscape.
- M42 is uniquely positioned to lead the transformation of the healthcare industry due to its unparalleled access to medical and data-centric technologies, including genomics and AI.

• Coupled with its extensive portfolio of patient services and state-of-the-art facilities, M42 delivers highly personalized, precise, and preventative care. Established in 2022, following the merger of G42 Healthcare and Mubadala Health, M42 stands as a pioneering integrated healthcare company, redefining the traditional healthcare ecosystem with innovative medical and data-centric technologies.

AI Revolutionizes Talent Scouting in Football

Artificial intelligence is revolutionizing the way budding football talents are discovered, giving players who might otherwise go unnoticed a shot at professional success. Premier League clubs Chelsea and Burnley, alongside several Major League Soccer teams, have embraced a groundbreaking app developed by ai.io.

- This app enables footballers worldwide to perform specialized drills and upload match footage, which is then evaluated using computer vision and deep-learning technology. Each user receives a score, and scouts are alerted to players who meet specific criteria.
- The aiScout platform, the only digital scouting product included in the FIFA Innovation Programme, has already yielded remarkable success stories. For instance, Burnley signed Jez Davies and Chelsea offered a 10-week trial to Ben Greenwood after discovering their talent on the app. What sets ai.io's technology apart is its ability to empower players.
- Traditionally, players had to rely on scouts visiting their matches, a process that could be both time-consuming and inefficient. However, with the aiScout app, players now have the power to showcase their skills directly, bridging the gap between talent and opportunity.
- Richard Felton-Thomas, COO and director of sports science at ai.io, emphasized the democratizing effect of this technology. He highlighted how the app provides a unique opportunity, especially for those players who might not participate in registered football leagues.
- Through the app, even players from remote regions, such as in India, have been scouted. In one notable instance, a player named Ben Greenwood, who had exceptional skills but had never been scouted by any team, was given a chance through the app. Chelsea, surprised that they had missed such local talent, brought him in for validation and ended up offering him a 10-week trial.
- Although he didn't secure a contract with Chelsea, he was subsequently signed by Bournemouth and has since played in the Carabao Cup, illustrating the life-changing impact of this AI-powered scouting system.
- It's important to note that while AI technology identifies potential talent based on specific metrics, the ultimate decision-making power remains with human scouts and recruitment teams. The app acts as a catalyst, ensuring that talented players are no longer overlooked, levelling the playing field and offering a brighter future for aspiring football stars.

CODING

MySQL Adds Vector Support

PlanetScale recently unveiled plans to fork MySQL, a move aimed at integrating vector search capabilities into the popular open-source database. While PostgreSQL has traditionally been the go-to choice for vector search, PlanetScale, the team behind the Vitess database, intends to introduce vector support to MySQL and PlanetScale.

- The implementation will incorporate the Hierarchical Navigable Small World (HNSW) algorithm, an efficient method for searching vector similarity in large datasets by constructing optimized graph structures.
- Nick Van Wiggeren, CTO at PlanetScale, highlighted the significance of this development for AI/ML applications, emphasizing that users can harness MySQL's power, stability, reliability, and scalability without the need for a secondary database solely for vectors. This integration promises significant cost savings and reduces operational complexity.
- Vector support plays a pivotal role in embedding, a technique used in machine learning to convert diverse data into uniform numerical representations (vectors) for similarity analysis. This feature caters to various applications, including semantic search, recommendation systems, anomaly detection, and image recognition workloads.
- While PostgreSQL has been the leader in open-source databases for vector similarity search, MySQL has lagged in this aspect. Although Oracle recently enhanced MySQL HeatWave with vector store support, the MySQL Community Edition does not yet support it. Peter Zaitsev, founder of Percona and an open-source advocate, praised PlanetScale's initiative, applauding their efforts to introduce vector support in MySQL.
- According to John Hwang, Generative AI Architect at AWS, the trend indicates that vector search will become a standard feature across databases, blurring the lines between databases specialized in vector operations and those that are not. PlanetScale's move to incorporate vector search aligns with this industry shift.
- PlanetScale is not alone in this endeavour. Several other databases and cloud providers have also introduced vector search capabilities recently. Cloudflare released the beta version of Vectorize, Timescale Vector enhanced pgvector for faster searches, and Google Cloud integrated vector search into managed databases. Additionally, Amazon OpenSearch Serverless introduced the Vector Engine in preview, and Aurora PostgreSQL supports pgvector.
- MongoDB Atlas Vector Search and Oracle's plan to support AI vector similarity search in Oracle Database 23c further highlight the growing importance of vector capabilities in the database landscape.
- Van Wiggeren confirmed that PlanetScale is actively working on their MySQL fork with integrated vector types and indexes. They plan to run this modified MySQL version within PlanetScale, offering packages and containers for users to test and develop locally.

• Although the feature is currently in private beta, developers can sign up for notifications about upcoming releases, signalling an exciting step forward in the evolution of MySQL's capabilities.

Internet Of Things (IoT)

IoT Revolutionizes Business

The business landscape is undergoing a radical transformation thanks to the Internet of Things (IoT). This technology is reshaping how companies operate and create value by connecting smart devices and systems, enabling unprecedented data collection, analysis, and sharing capabilities.

- Automating Processes: One of the primary ways IoT is revolutionizing businesses is through automation. IoT-enabled sensors and devices can monitor various aspects of operations in real-time. By continuously collecting data and identifying inefficiencies, organizations can optimize workflows automatically. This leads to enhanced productivity, reduced operating costs, and minimized downtime. Predictive maintenance, spending, and manufacturing alone could see a substantial growth of up to \$483 billion by 2027, as predicted by IoT Analytics. This automation capability signifies a significant shift in business operations.
- Enhancing Customer Experiences: In today's service-oriented economy, customer experience is paramount. IoT offers opportunities to transform how companies engage with their customers. IoT sensors can track customer interactions, providing insights to offer personalized recommendations and tailored experiences. Retailers are utilizing smart fitting rooms with RFID technology to enhance customer experiences by suggesting complementary products, and IoT-connected vehicles predict maintenance needs, ensuring a smoother journey for drivers.
- **Revolutionizing Decision-Making**: The proliferation of IoT devices generates vast amounts of data that can provide invaluable insights for decision-making. However, analyzing this data requires specific skills. Business management and accounting online degrees are valuable resources in developing the necessary analytical skills. With real-time data access, managers gain unprecedented visibility into operations, marketers understand customer behaviour patterns, and executives track core business metrics, guiding strategic decisions. This influx of IoT data marks a shift where decisions become proactive, not reactive.
- **Facilitating Remote Work**: The remote work revolution, accelerated by the COVID-19 pandemic, is further propelled by IoT. IoT enables remote work in industries where physical presence was traditionally necessary. Real-time monitoring and control empower employees to operate machinery and manage supply chains remotely, untethering operations from physical locations.
- **Bolstering Cybersecurity**: While IoT offers immense possibilities, it also introduces new cybersecurity challenges. The growing number of connected devices widens the attack surface. Cybersecurity measures are evolving, utilizing blockchain and AI for IoT security, isolating vulnerabilities through security analytics and network segmentation,

and prioritizing security in device design. With robust cybersecurity, enterprises can leverage IoT without compromising data integrity.

- Leveraging 5G Connectivity: The rollout of 5G networks is a game-changer for IoT adoption. With ultra-low latency and enhanced bandwidth, 5G facilitates real-time communication and data transmission. Companies are exploring innovative ways to optimize operations, leading to more complex and mission-critical IoT implementations.
- **Mitigating Privacy and Security Risks**: As IoT devices become ubiquitous, ensuring consumer privacy and data security is crucial. Transparent data practices, allowing optouts, and proactive privacy-oriented IoT product design are imperative. Building public trust through ethical IoT data practices is essential for widespread adoption.
- **Conclusion**: IoT represents the future of business computing, promising operational efficiency, intelligent decision-making, and innovative business models. To fully capitalize on IoT's potential, companies must integrate it into their strategies and computing ecosystems. Early IoT adopters stand to gain sustainable competitive advantages as this technology revolutionizes the business landscape. The future is here, offering boundless possibilities for those willing to embrace IoT transformation.

VIRTUAL REALITY

Microsoft patents swappable batteries for AR glasses

Microsoft's recently approved patent for augmented reality (AR) glasses has sparked significant interest, offering a potential game-changer in the competitive tech market. The patent, published last week as reported by MSPowerUser, showcases a distinctive feature that could make these AR glasses highly desirable among consumers once they hit the market.

- AR glasses represent the forefront of mobile technology, with the potential to revolutionize the way we interact with digital information, possibly replacing smartphones in the near future.
- A decade ago, Google attempted to introduce a similar concept with its Google Glass, but high costs and limited functionality hindered its widespread adoption, leading to its eventual discontinuation. Despite this setback, the concept of AR glasses continued to thrive, with tech giants like Apple and Microsoft actively exploring ways to innovate and offer compelling products in this space.
- Apple, another major player in the tech industry, has been eyeing the AR glasses market but has delayed its entry, waiting for the technology to mature sufficiently. Microsoft, on the other hand, seems poised to make its mark, investing in innovations that could set its AR glasses apart from the competition.
- Microsoft previously ventured into the mixed reality (MR) market in 2016 with its HoloLens, but the product faced challenges in gaining widespread adoption. One major obstacle was the weight of the device, primarily due to the hefty battery pack. Additionally, the limited battery life necessitated frequent recharging, disrupting the user experience.

- In response to these challenges, Microsoft's new AR glasses boast a modular design, allowing the battery to be placed in the temple section of the glasses or in a detachable earpiece worn by the user. This innovative approach enables users to swap out batteries seamlessly, ensuring continuous usage throughout the day. Moreover, the smaller battery size not only reduces the overall weight of the glasses but also enhances comfort during extended wear.
- What sets Microsoft's approach apart is the company's vision of expanding the glasses' capabilities by connecting them to various accessories, such as necklaces and backpacks. These connections, potentially facilitated by Wi-Fi or Li-Fi technology in the future, could decentralize the computing and storage components, allowing users to offload the heavy computational tasks while the glasses focus solely on displaying and collecting information.
- The implications of this technology are vast, especially in the context of the growing trend toward remote work. AR glasses could enable individuals to interact in virtual environments, completing tasks without the need for physical presence at work sites, thereby enhancing productivity and reducing the necessity for travel.
- If Microsoft successfully materializes these innovative ideas, its AR glasses could emerge as the preferred choice for users seeking an alternative to traditional smartphones, ushering in a new era of augmented reality experiences for consumers worldwide.

SECTION 2 – GLOBAL INFO

ASIA

JAPAN

Amid escalating strategic competition between the United States and China, coupled with China's history of economic coercion and its pursuit of long-term objectives, the Japanese government is growing increasingly concerned about its economic reliance on China, as reported by Asia Times.

- To address these concerns, Japan has adopted a policy of separating politics from economics, known as seikei bunri, in its economic engagements with China. However, this approach is evolving under the leadership of Japanese Prime Minister Fumio Kishida, who is championing a new "economic realist" diplomacy.
- Under this pragmatic strategy, Japan is taking proactive measures to safeguard its economic security. These initiatives include selectively diversifying supply chains away from China, reshoring key industries back to Japan, fostering alliances with friendly nations (friend-shoring), and investing in national technological development, according to Asia Times.

• Japanese political leaders have committed substantial strategic and financial resources to enhance economic security. These efforts involve the allocation of supplementary budgets dedicated to economic security, which prioritize initiatives like establishing domestic production bases for advanced semiconductors. These budgets aim to boost domestic investments, support existing supply chains, and encourage their diversification.

EUROPE

GERMANY

The German Finance Minister, Christian Lindner, has extended an unexpected invitation to the UK, urging the country to take "new steps" in its post-Brexit trade relations with the European Union (EU). Lindner made this offer during a BBC interview, stating, "If you want to intensify your trade relationship with the EU - call us!" A spokesperson from the UK government responded, expressing openness to "new opportunities" worldwide.

- Lindner, who leads the German liberals and is part of the ruling coalition headed by Chancellor Olaf Scholz's centre-left SPD, emphasized the strength of the German economy and energy supplies. Speaking at the sidelines of the IMF and World Bank's annual meetings in Marrakech, he revealed that the UK had a "standing invitation" for future discussions aimed at reducing trade barriers and overcoming the challenges faced in daily business since Brexit.
- "In the daily operations of German corporations, new obstacles have emerged since Brexit. I don't believe the United Kingdom is benefiting from Brexit," Lindner commented in the BBC interview. He expressed a deep appreciation for the UK, its values, and its people, emphasizing the importance of intensifying trade relationships once again.
- According to the German Chamber of Industry and Commerce, German goods exports to the UK saw a significant decrease of 14.1% in 2022 compared to 2016, the year of the Brexit referendum. The UK, which was once Germany's third most important export partner, has now slipped to eighth place.

AFRICA

SOUTH AFRICA

Following the recent devastating storm that hit South Africa's Cape region, local authorities moved swiftly to mitigate the damage.

- However, this efficient response highlighted a growing disparity between the Western Cape and the rest of the country, which has struggled to address its own crises.
- This governance gap poses a significant challenge for the ruling African National Congress (ANC) party in the upcoming elections.
- Despite the ANC's efforts to improve the lives of the country's poorest citizens, their achievements are being overshadowed by the escalating consequences of 15 years of corruption and nepotism.

- Local government dysfunction has reached unprecedented levels, with municipal administrations facing internal conflicts and coalitions falling apart.
- Johannesburg, the nation's economic hub, has witnessed six different mayors in just two years, while Tshwane, which includes Pretoria, has had four.
- This turmoil has led to a rapid decline in South African towns and cities. Municipal finances are in dire straits, with only 38 out of 257 municipalities receiving a clean audit from the auditor general last year.
- Remarkably, 21 of these municipalities were in the Western Cape, a region predominantly controlled by the opposition Democratic Alliance (DA) party. Collectively, South Africa's municipalities owe the state-owned electricity monopoly, Eskom, a staggering 63 billion South African rand (\$3.3 billion).
- Instances of this decline are widespread. The port city of Gqeberha, home to major manufacturing operations including Volkswagen AG, experienced a water shortage in 2022, and large parts of the city still lack a reliable water supply.

MIDDLE EAST

UAE-South Korea

Thani bin Ahmed Al Zeyoudi, UAE Minister of State for Foreign Trade, and Dukgeun Ahn, Minister of Trade for the Republic of Korea, have successfully concluded negotiations on a Comprehensive Economic Partnership Agreement (CEPA) between their nations. This milestone marks the beginning of a new era of economic cooperation between the UAE and South Korea.

- The signing ceremony, held in Seoul and attended by prominent figures including Abdullah Saif Al Nuaimi, UAE Ambassador to South Korea, and Juma Al Kait, Assistant Undersecretary for Foreign Trade Affairs in the Ministry of Economy, signifies a significant achievement in the UAE's foreign trade agenda. Launched in September 2021, this agenda aimed to strengthen ties with strategic allies worldwide.
- The UAE-Korea CEPA is poised to bolster East-West supply chains, facilitate mutual foreign direct investment flows, and foster collaborative efforts in research and knowledge exchange across various sectors such as energy, advanced manufacturing, technology, food security, and healthcare.
- Reflecting on the successful negotiations, Al Zeyoudi emphasized the importance of the Republic of Korea as a key growth partner for the UAE. He highlighted Korea's sophisticated economy, which is grounded in manufacturing, logistics, and advanced technology. Both nations share a mutual commitment to driving sustainable growth through trade, investment, and economic diversification. Al Zeyoudi expressed optimism about the CEPA serving as a catalyst for innovation and enterprise, providing both economies with fresh insights and experiences.
- This bilateral agreement comes at a time when trade between the UAE and South Korea is flourishing. In the first half of 2023, bilateral non-oil trade reached USD 3 billion, showing a consistent trend from H1 2022 and a remarkable 21% increase compared to the same period in 2021.

SECTION 3 – MIXED BAG

HEALTH

Stroke Epidemic in India

India stood at the forefront of a global health concern in 2019, with the highest number of new stroke cases worldwide, as revealed by a recent study published in The Lancet. This comprehensive research, a collaboration between the Indian Council of Medical Research and medical institutions in India, Sri Lanka, and Singapore, sheds light on the alarming magnitude of the stroke epidemic in India.

- The study's findings are staggering, emphasizing that stroke accounted for a substantial 37.9% of the burden of neurological disorder DALYs (disability-adjusted life-years) in India. Even more concerning is the study's projection, foreseeing a significant increase in stroke-related deaths globally. By 2050, the toll could reach a daunting 9.7 million, primarily affecting low-middle-income countries.
- **Understanding Stroke**: The Centers for Disease Control and Prevention (CDC) defines a stroke as a condition where a part of the brain experiences a blocked blood supply or a blood vessel in the brain ruptures, leading to brain damage, disability, or even death. The brain's oxygen supply is crucial, and any disruption in blood flow can result in brain cell damage or death, causing a stroke.
- **Recognizing Common Stroke Symptoms**: Certain symptoms signal deteriorating heart conditions, indicating a potential stroke. These symptoms include facial drooping, numbness, paralysis, or lack of sensation in one side of the body, slurred speech, severe headaches, vision problems, difficulty walking, and loss of balance or coordination.
- **Preventing Strokes**: Adopting a healthy lifestyle significantly reduces the risk of strokes. This includes maintaining a balanced diet rich in fruits, vegetables, and whole grains while limiting the intake of saturated fats and salt.
- Key risk factors for stroke include high blood pressure and diabetes. Regular monitoring and effective management of these conditions are crucial in stroke prevention. Smoking cessation is vital, as smoking damages blood vessels and increases the risk of stroke. Additionally, excessive alcohol consumption can lead to high blood pressure and other health issues, further elevating the risk of stroke.
- Addressing the Urgent Need: The study identifies several key risk factors, including high blood pressure, diabetes mellitus, high cholesterol, obesity, unhealthy diet, sedentary lifestyle, and smoking. These findings underscore the pressing need for public health initiatives to tackle these risk factors head-on and stem the rising tide of stroke cases. Immediate and sustained efforts in public health education and intervention are imperative to combat this growing crisis.

ASTRONOMY

An immense solar storm hit Earth 14,300 years ago

Researchers have delved into ancient semi-fossilized tree rings to uncover secrets about a colossal solar flare event that transpired around 14,000 years ago. These scientists studied "subfossils," particles of fossilized biological material, extracted from a forest in the Southern French Alps.

- By meticulously analyzing hundreds of single tree rings, they gained a nearly annual record of the environmental conditions these trees experienced millennia ago. The focus of their analysis was the relative amount of carbon-14, a radioactive isotope, which undergoes decay with a half-life of 5,730 years. Carbon-14 is primarily generated on Earth when energetic particles from space interact with molecules in the upper atmosphere. This information helped age the subfossils and identify any anomalies.
- What astonished the researchers was a significant abnormality: a drastic one-year surge in carbon-14 dating back 14,300 years. Seeking an explanation, they turned to ice core samples from Greenland, which revealed a spike in a radioactive isotope of beryllium around the same time. There was only one plausible explanation for such a rapid increase in both carbon-14 and beryllium: an epic solar flare event.
- Unlike any ordinary solar flare, this event had to be of extraordinary magnitude. Historically, solar activity has been monitored only since the 17th century, making it challenging to understand the Sun's behaviour further back in time. Edouard Bard, a Professor of Climate and Ocean Evolution, emphasized the significance of using radiocarbon measurements in tree rings and beryllium in polar ice cores to comprehend solar activity in the distant past.
- The most powerful recorded solar flare event, known as the Carrington Event in 1859, generated intense electromagnetic energies, causing visible aurorae in Cuba and electrical disturbances in telegraph devices. To produce the recorded carbon-14 levels, the event 14,300 years ago must have been at least ten times more powerful.
- Such energetic events occur when magnetic fields in the Sun release pent-up energy, leading to a burst of intense x-ray radiation and the ejection of plasma chunks, known as coronal mass ejections, into the solar system.
- These findings aren't the first instances where researchers have identified massive solar flares through tree ring records. Previous events, named Miyake events, have been detected in carbon-14 tree ring data, including one in 774 CE mentioned in the Anglo-Saxon Chronicle.
- Fortunately, humanity has not experienced such powerful solar storms since the development of electronics and electrical grids. Extreme solar storms could wreak havoc on Earth, damaging transformers in electricity grids, rendering satellites unusable, and posing severe radiation risks to astronauts.
- By extending our understanding of ancient solar events, scientists can better predict and prepare for future solar storms. Tim Heaton, a Professor of Applied Statistics, highlighted the importance of studying Earth's history to accurately predict the future and mitigate

potential risks, emphasizing that there is still much to learn in this fascinating field of research.

ECONOMY

IMF Boosts African Representation

During the week-long meetings of the International Monetary Fund (IMF) and World Bank in Marrakech, Morocco, significant decisions were made to enhance the IMF's resources and increase Africa's influence within the institution. This marked the first time these organizations had convened on African soil since 1973.

- One of the main priorities of these discussions was to bolster the IMF's quota resources. Quotas, determined by a country's economic size, dictate the funding a nation provides to the IMF, its voting power, and the maximum loan it can obtain.
- Spanish Economy Minister Nadia Calvino, chair of the IMF Financial Committee, announced an agreement to substantially increase quotas by the year-end, highlighting the consensus reached during the talks.
- IMF chief Kristalina Georgieva and World Bank President Ajay Banga utilized this opportunity to urge member nations to increase funding, enabling these institutions to better assist countries grappling with poverty and climate change.
- The ongoing conflict between Israel and Palestinian group Hamas raised concerns about its impact on the fragile global economy, already strained by the Ukraine war, heightened inflation, and soaring interest rates. Georgieva emphasized the importance of strengthening the IMF's financial capabilities to respond effectively to future shocks.
- Addressing the issue of voting shares, Georgieva stated that the membership had agreed on a clear plan to revise the IMF's quota distribution. This move could potentially result in emerging economies like China, the world's second-largest economy, having a larger voting share. While this idea sparked controversy, with some suggesting that countries benefiting from this change, including China, must adhere to established global rules, the decision to alter voting shares remained pending.
- Despite the lack of change in voting shares, an important development emerged the expansion of the IMF's executive board from 24 to 25 members. This expansion was specifically aimed at providing Africa with a stronger representation.
- Sub-Saharan Africa, previously represented by two executive board members, will now have three, marking a significant step toward ensuring the continent's voice is heard on critical global economic matters.
- Georgieva expressed her satisfaction with the unanimous support for the addition of a third African chair on the executive board. She emphasized the significance of this decision, particularly when discussions are held on African soil, and praised the members for their collaborative efforts, acknowledging the positive impact this decision would have on the lives of millions of people who rely on these international institutions for support.

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