



## SECTION 1 – TECH BUZZ

### ARTIFICIAL INTELLIGENCE



#### Personal AI Chatbots Soon

The co-founder of DeepMind, now the CEO and co-founder of Inflection AI, Mustafa Suleyman, envisions the next evolution of generative AI chatbots: a personal AI that can serve as your digital representative, even handling personal tasks like online shopping and contract agreements on your behalf.

- Suleyman's startup is committed to enhancing its AI chatbot, Pi, with both a high emotional quotient (EQ) to reduce toxic responses and a high intellectual quotient (IQ) for improved accuracy and factual information.
- The next step, as Suleyman explains at 'The Wall Street Journal Tech Live' conference, is to equip Pi with a high action quotient (AQ). This means that Pi will autonomously interact with APIs to access databases, make reservations, and check inventory. The AI will function like a valuable assistant, a mentor, or a confidante, acting in your best interests. This is a stark contrast to existing AI chatbots like ChatGPT, which primarily answer questions.
- Suleyman highlights that this personal AI will work on your behalf, eliminating the need to rely on big tech companies for personal tasks such as online shopping. He believes that these tools can be leveraged to help users organize, prioritize, synthesize information, and accomplish tasks efficiently. In the coming years, Pi aims to handle more abstract goals,

such as helping you organize your schedule and manage appointments by accessing relevant information.

- Beyond this, the personal AI could serve as your proxy in various personal settings. It may offer advice on relationships, recommend relocations or job choices, and eventually act as a legal proxy, making online purchases and entering contracts on your behalf. Suleyman anticipates this transformation within three to four years.
- Inflection AI has recently secured substantial funding, with a \$1.5 billion investment from notable figures like Microsoft founder Bill Gates, former Google CEO Eric Schmidt, LinkedIn co-founder Reid Hoffman, and Nvidia, among others. The company's ambitious plan is to develop the largest AI cluster by acquiring 22,000 Nvidia H100 chips for training and deploying large-scale AI models.
- Suleyman also proposes a distinct business model for Pi. Unlike popular internet services that offer products for free and rely on advertising revenue, Pi will not disseminate its APIs for commercial use. Instead, consumers will be the sole financiers of the AI. This approach is intended to align the interests of the tech platform with the user, rather than prioritizing advertisers.
- Addressing the known challenges of generative AI, such as toxic content, hallucinations, and bias, Suleyman emphasizes that Pi has been built to avoid toxic subjects.
- Prompt hacks, which attempt to elicit harmful or misleading responses from AI, are said to be ineffective against Pi. To combat hallucinations, Pi has access to real-time information, although this remains a complex issue.
- AI models are designed to predict the likelihood of the next word or sentence but struggle to express uncertainty.
- Suleyman believes that teaching AI models to communicate their uncertainty will be a significant step in addressing the hallucination problem and enhancing reliability, although it remains a work in progress.
- In summary, Mustafa Suleyman's vision for a personal AI like Pi represents a significant advancement in generative AI technology. With high emotional, intellectual, and action quotients, Pi aims to be a reliable and useful digital representative for individuals, offering assistance, recommendations, and the ability to manage various personal tasks.

### **ChatGPT gets 'Browse with Bing' and DALL-E-3 integration**

OpenAI has exciting news for ChatGPT users: the long-awaited 'Browse with Bing' feature is finally here. This addition marks a significant step forward for the popular AI-powered chatbot, which was previously restricted to information only up until September 2021. This limitation left users in the dark about the latest global events and updates.

- OpenAI had initially attempted to connect ChatGPT to the internet, but this move resulted in the AI generating hate speech and misinformation, leading to concerns. To address this issue, in May of the same year, OpenAI partnered with Microsoft-backed Bing. This collaboration allowed ChatGPT to tap into Bing's extensive search capabilities, providing users with access to a wealth of information.
- However, a problem arose when it was discovered that ChatGPT could display content that required payment to access. OpenAI promptly retracted the update to resolve this

issue. Fast forward to September, after fine-tuning the AI model to adhere to a website's robot.txt file, OpenAI reintroduced the feature, now named 'Browse with Bing.'

- Currently, 'Browse with Bing' is available to ChatGPT Plus and Enterprise users, with plans to make it accessible to everyone in the near future. To utilize this feature, users can navigate to the ChatGPT app settings, select 'New Features,' and opt for 'Browse with Bing.' From there, users can choose the GPT-4 model from the selector and click 'Browse with Bing' to access real-time information from the internet.
- In addition to the browsing feature, OpenAI has integrated the latest version of its text-to-image generator, DALL-E-3, directly into ChatGPT. This integration allows users to generate images without leaving the app, enhancing the user experience.
- It's important to note that the DALL-E-3 integration is currently in the beta stage, so users might encounter unexpected results. Similar to the 'Browse with Bing' feature, users can switch to DALL-E 3 by selecting it from the GPT-4 tab in the app. OpenAI continues to enhance ChatGPT's capabilities, providing users with a more versatile and dynamic experience.

## **Potential Success Of Collective Constitutional AI**

The ongoing debate in Silicon Valley revolves around the control and regulation of artificial intelligence (AI) systems. The question arises: should a few corporations be entrusted with the responsibility of ensuring the safety of their AI systems? Alternatively, should governmental bodies step in, creating regulations and guidelines? A third perspective suggests making AI models open-source, allowing users and developers to establish their own rules.

- Anthropic, the creator of the chatbot Claude, has embarked on a unique experiment called "Collective Constitutional AI," which explores a middle-ground approach. In this experiment, ordinary citizens are invited to formulate rules that guide AI behaviour. This initiative builds upon Anthropic's earlier work on Constitutional AI, which utilized a written set of principles to train large language models. The objective is to provide explicit instructions to AI systems on handling sensitive requests, determining off-limits topics, and aligning their actions with human values.
- The potential success of Collective Constitutional AI could pave the way for further experiments in AI governance. By involving outsiders in the rule-making process, it could democratize the decision-making currently dominated by a small group of industry insiders. Presently, these insiders determine AI behaviour based on a combination of personal ethics, commercial interests, and external pressures, leaving ordinary users without a voice in the process.
- Opening up AI governance has several advantages. It could enhance societal trust in these technologies and provide regulators with confidence that these tools are being used responsibly. Additionally, it might prevent the concentration of power witnessed during the social media boom of the 2010s when a handful of Silicon Valley giants controlled significant portions of online speech.
- Constitutional AI operates by employing a written set of rules, akin to a "constitution," to regulate the behaviour of AI models. The initial version of Claude's constitution incorporated rules from authoritative documents such as the United Nations' Universal

Declaration of Human Rights and Apple's terms of service. Although this approach made Claude relatively well-behaved compared to other chatbots, it still left Anthropic with the authority to select the rules, a power that raised concerns within the company.

- In an effort to decentralize this power, Anthropic collaborated with the Collective Intelligence Project, Polis (a crowdsourcing site), and PureSpectrum (an online survey site) to engage approximately 1,000 American adults. These panelists were presented with a set of principles and were encouraged to express agreement or propose additional rules. The resulting suggestions were consolidated into a list of 75 principles, referred to as the "public constitution."
- Two miniature versions of Claude were then trained: one on the existing constitution and another on the public constitution. Comparative analysis revealed that the publicly sourced version of Claude performed similarly to the standard version in various benchmark tests given to AI models and exhibited slightly lower biases. However, it's important to note that these versions have not been made publicly available, and Anthropic has no immediate plans to replace Claude's original constitution with the crowdsourced version.
- In summary, Anthropic's experiment with Collective Constitutional AI represents a promising step toward inclusive AI governance. By involving ordinary citizens in the rule-making process, this approach could potentially shape the future of artificial intelligence, ensuring that it aligns with diverse societal values and perspectives.

## **Indian Govt AI Initiatives**

The Indian government is actively working to tap into the potential of Artificial Intelligence (AI), with the aim of adding \$967 billion to the economy in the next decade. However, drafting legislation for this rapidly evolving field presents a challenging task. The government has taken significant steps in this direction, including the formation of seven expert committees to devise a comprehensive policy framework for AI. Recently, one of these committees released a 180-page report outlining key strategies.

- In the 2023 Budget announcement, Indian Finance Minister Nirmala Sitharaman revealed plans to establish three centers of excellence (CoEs) focused on AI. These centers are expected to concentrate on crucial sectors such as governance, healthcare, agriculture, and manufacturing. Their objectives encompass foundational research, technology development, innovation promotion, entrepreneurship support, and AI skill development. Startups are particularly encouraged to leverage these CoEs, making applications commercially viable and fostering product development and innovation challenges.
- Additionally, the government is set to introduce the India Datasets Platform, one of the largest publicly assembled and anonymized datasets globally. This platform, containing non-personal data, will be open-source, promoting accessibility and enabling developers to contribute and enhance its capabilities. The platform will feature data and API catalogues to facilitate user discovery of resources.
- Although the idea of monetizing non-personal data faced criticism and was initially withdrawn, the working committee has recommended revisiting this concept for the India Datasets Platform. Data providers will have the flexibility to set pricing models based on

the value and uniqueness of their datasets, whether through one-time purchases, subscriptions, or licensing fees.

- To oversee the India Datasets Platform, the report recommends establishing the National Data Management Office (NDMO) within two months. This body will be responsible for the platform's management and quality assurance. The government is also urged to hire data management units within ministries and departments to enhance data quality and usage.
- Furthermore, the report outlines plans for a substantial investment of Rs 4,000 crore to support 725 AI startups. A significant portion of this funding will be directed towards the Future Design IndiaAI scheme, aimed at consolidating tech startups over five years. The proposal also includes initiatives like the AI Ignition Grant Program, providing grants for product development, and challenges at the commercialization stage across various sectors.
- To boost innovation, experts recommend creating a National AI Compute Grid, consisting of 24,500 graphics processing units (GPUs) spread across 17 centers. This infrastructure will enable startups and academia to innovate in AI-related fields. Additionally, the report emphasizes supporting the development of AI chips, such as GPUs, FPGAs, and ASICs, through public-private partnerships.
- The government is also focusing on AI education by providing funding for AI research fellowships and research grants for institutions. The report suggests a model curriculum covering AI fundamentals, mathematics, machine learning, deep learning, natural language processing, computer vision, and AI ethics for schools, colleges, and vocational institutes.
- To enhance AI accessibility, the report emphasizes the use of AI marketplaces to develop service models like AI as a Service (AIaaS), Infrastructure as a Service (IaaS), and Platform as a Service (PaaS). Open-source AI frameworks and libraries will be utilized to encourage vendor-agnostic AI development, fostering innovation and collaboration in the AI community.

## **CODING**

### **Building A Chatbot in Python**

Creating a chatbot involves developing a software program capable of engaging with human users through natural language, whether it's in written or spoken form. These chatbots serve a variety of purposes, including information retrieval, education, entertainment, and customer support. By enabling more natural and engaging communication between humans and machines, chatbots save time and resources for both parties involved.

- However, constructing a chatbot is a complex endeavour, demanding expertise in natural language processing (NLP), machine learning, and artificial intelligence. NLP focuses on understanding and generating human language, while machine learning involves creating algorithms that learn from data. Artificial intelligence simulates human intelligence in machines.

- **Getting Started:** To embark on building your chatbot, you need to establish your development environment. This involves familiarizing yourself with essential Python libraries and tools like NLTK, spaCy, and TensorFlow.
- **Understanding NLP and Chatbot Basics:** Effective chatbot development necessitates a solid grasp of Natural Language Processing fundamentals and an understanding of various chatbot types. This section also delves into designing a logical conversation flow.
- **Data Collection and Preprocessing:** Collecting and organizing relevant data is pivotal. Discover where to find suitable training data and how to preprocess it, making it suitable for your chatbot's use.
- **Building the Chatbot:** Begin by constructing a basic rule-based chatbot to grasp foundational concepts. Progress by integrating machine learning techniques to enhance conversational capabilities.
- **Training Your Chatbot:** This segment explores fine-tuning and training your chatbot using diverse machine learning models. Evaluation metrics and techniques to measure your chatbot's performance are also discussed.
- **Enhancing User Experience:** A successful chatbot goes beyond answering queries; it focuses on delivering a pleasant user experience. Learn how to incorporate features like context awareness, personality, and humour.
- **Deploying Your Chatbot:** Once your chatbot is ready, it's time to launch it. Explore various deployment options to make your chatbot accessible to users.
- **Future Improvements and Expansion:** Your chatbot is a dynamic entity that can continually evolve. Strategies for scalability and adaptability are crucial. Understand how to ensure your chatbot learns and improves over time, meeting the changing needs of users.
- By following these steps, you can embark on the journey of creating an intelligent chatbot, fostering seamless interaction between humans and machines.

## Natural Language Processing (NLP)

### LLMs' Self-Correction Challenges

The intelligence of large language models (LLMs) hinges entirely on the data used to train them. Researchers have been striving to enhance these models' self-correction abilities when generating inaccurate outputs. Promising approaches, like MIT's multi-agent strategy, have shown positive outcomes in this regard.

- However, new research from Google DeepMind suggests that LLMs might face performance setbacks after self-correction attempts. In their paper titled 'Large Language Models Cannot Self-Correct Reasoning Yet,' Google DeepMind scientists conducted experiments to manage expectations regarding LLMs' self-correction capabilities.
- The researchers identified issues when LLMs intrinsically attempted self-correction, meaning correcting their initial responses without external feedback. This contradicts prior findings that suggested intrinsic self-correction as effective. Google's study revealed that previous research utilized 'oracles,' essentially correct labels, guiding the models. Without these 'oracles,' the models did not improve accuracy.



- According to the Google DeepMind team, LLMs must correct themselves effectively for self-correction to work, as external feedback is often unavailable in real-world applications.
- One challenge faced by LLMs is the generation of hallucinations, unavoidable byproducts of these models. Efforts to reduce them include approaches like Gorilla's AST tree method or MIT's 'Multiagent Society' proposal.
- The research community is actively working towards enabling LLMs, such as chatbots for customer services, to self-correct without external prompts. Google researchers considered integrating feedback into the initial instruction, but this does not align with the goal of autonomous self-correction. For instance, prompting the model to "Review your previous answer and find problems with your answer" yielded incorrect results if the original answer was correct.
- The research involved various models, including OpenAI's ChatGPT, undertaking benchmark tests like generating code. Other agent-based systems critiqued these responses for errors, aiming for self-correction. The models generated multiple responses to achieve consistency across systems. While no AI model consistently produced the same result, Google DeepMind's team suggested that deploying multiple LLMs could help agree on a consistent response.
- However, the paper clarifies that the observed improvement was due to 'self-consistency' rather than 'self-correction.' It emphasized that LLMs cannot currently self-correct their reasoning without external assistance. Google DeepMind's researchers argued against overly optimistic assumptions about LLMs' future self-correction abilities and called for improvements in existing models to make them self-correction ready.
- In conclusion, while the prospect of LLMs achieving autonomous self-correction is enticing, the current reality suggests that there are significant challenges. Researchers should adopt a discerning perspective, understanding the potential and limitations of self-correction, to steer the evolution of LLMs toward enhanced accuracy and reliability.

## ROBOTICS

### Amazon Tests Humanoid Robot

Amazon is currently experimenting with a humanoid robot as part of its ongoing efforts to automate warehouse operations. The company has begun testing Digit, a two-legged robot capable of grasping and lifting items, at its facilities. Initially, Digit is being used to handle empty tote boxes.

- Amazon's push to integrate robotics into its operations has raised concerns about the potential impact on its workforce of nearly 1.5 million employees. Tye Brady, the chief technologist at Amazon Robotics, acknowledged that the deployment of robots might make some jobs redundant.
- However, he emphasized that it would also lead to the creation of new roles. During a media event near Seattle, Brady stated his goal of eliminating "all the menial, mundane, and repetitive" tasks within Amazon's business. Despite this automation drive, he denied that it would result in job cuts, asserting that Amazon would not require fewer staff.

- Brady vehemently defended the irreplaceable role of humans in Amazon's operations, emphasizing their ability to think critically and solve problems. He dismissed the possibility of fully automating warehouses, stating that people are essential to the fulfillment process and that he had never encountered an automated system that worked flawlessly all the time.
  - Digit, the robot being tested by Amazon, was developed by Agility Robotics, a startup based in Oregon, with backing from Amazon. This versatile robot stands at 5 feet 9 inches tall, weighs 143 pounds, and can carry loads of up to 35 pounds. Digit is capable of walking in various directions, including forwards, backwards, and sideways, and can even crouch.
  - Amazon intends to deploy Digit in warehouses, utilizing its capabilities in innovative ways. Initially, the robot will assist employees with tote recycling, a repetitive task involving picking up and moving empty totes once they have been emptied of inventory. The company sees the potential for Digit to work collaboratively with human employees.
  - In addition to Digit, Amazon also announced the deployment of another robotic system called Sequoia at one of its Houston warehouses. This system is designed to expedite inventory identification and storage by 75%, reducing order processing times by up to 25%.
  - Brady emphasized the concept of collaborative robotics, where humans remain central to the operation, with robots enhancing and streamlining specific tasks. He envisions a future where robots seamlessly integrate into the background of operations, much like household appliances, allowing human employees to shine as the focal point of Amazon's workforce.
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## **SECTION 2 – GLOBAL INFO**

### **NORTH AMERICA**

#### **UNITED STATES**

For the second time, US lawmakers rejected the bid of hard-line conservative Jim Jordan to become the Speaker of the House of Representatives. This has left Washington in a state of paralysis for the 15th consecutive day, with no clear resolution in sight.

- The deadlock in the lower chamber of Congress began when Republican Speaker Kevin McCarthy was removed from his position by the party's far-right faction on October 3. Since then, the House has been unable to address critical issues such as a potential government shutdown or the ongoing conflict in the Middle East.



- Jordan, a staunch supporter of former President Donald Trump, needed to secure the votes of his fellow Republicans. However, in the second ballot, 22 of his colleagues opposed his candidacy, two more than the previous day.
- The stakes have been raised significantly due to pressing matters like the Israel-Hamas conflict, the urgent need for aid to Ukraine, and the looming threat of a government shutdown. Republicans had hoped that these pressing issues would unify the party and expedite the selection of a new Speaker.
- Despite these urgent matters, Jordan's centrist colleagues, who were already wary of his hard-right political stance, expressed frustration over his attempts to garner additional votes. A prominent supporter of Jordan, California Republican David Valadao, emphasized the national security risk posed by the prolonged absence of a Speaker of the House, underscoring the urgency for the Congress to act.

## ASIA

### CHINA

Chinese President Xi Jinping has unveiled significant commitments to enhance foreign access to China's vast market and provide over \$100 billion in fresh financing for developing economies, marking the opening of a forum dedicated to his ambitious Belt and Road infrastructure initiative.

- While the initiative has successfully constructed power plants, roads, railways, and ports worldwide, it has also raised concerns due to the substantial loans involved, burdening some nations with hefty debts and, in certain cases, resulting in China assuming control of these assets.
- During the forum's inauguration at the grand Great Hall of the People, President Xi announced substantial measures. Two major Chinese-backed development banks, the China Development Bank and the Export-Import Bank of China, will establish financing windows of 350 billion yuan (\$47.9 billion) each.
- Additionally, an extra 80 billion yuan (\$11 billion) will be injected into Beijing's Silk Road Fund to support Belt and Road Initiative (BRI) projects. Xi pledged to eliminate barriers to foreign investment in the manufacturing sector and outlined plans to broaden market access for digital products, promote cross-border trade and investment in services, and implement reforms in areas such as the digital economy, intellectual property rights, government procurement, and state-owned enterprises.
- These commitments are significant, particularly considering China's recent economic slowdown and declining foreign investments.
- President Xi addressed global efforts, particularly by the United States and its allies, to reduce dependence on Chinese manufacturing and supply chains amid escalating competition and diplomatic tensions. He reiterated Beijing's commitment to fostering a more equitable environment for foreign companies, reaffirming his promises to the international community.

## EUROPE

### RUSSIA

Russian President Vladimir Putin criticized the United States for supplying long-range missiles to Ukraine, stating that they would only prolong the country's suffering.

- This statement came shortly after Ukrainian President Volodymyr Zelensky praised the missiles for their effectiveness.
- Ukraine also reported more casualties from recent Russian missile strikes and anticipated a new attack on the frontline town of Avdiivka.
- During a press conference, Putin described the decision by Washington to provide Ukraine with long-range ATACMS missiles as a "mistake."
- He acknowledged that these weapons posed a threat but emphasized that they would not significantly alter the situation on the frontline.
- According to Putin, "War is war, and, of course, they pose a threat, that goes without saying." He criticized the U.S., labelling the missile supply as "another mistake," asserting that it merely extended Ukraine's agony without substantially changing the ongoing conflict.

## MIDDLE EAST

### Israel-Hamas war

The United States utilized its veto power within the UN Security Council to block a resolution advocating for a "humanitarian pause" in the ongoing conflict between Israel and Hamas.

- The US ambassador, Linda Thomas-Greenfield, expressed the disappointment of the United States, pointing out that the resolution failed to acknowledge Israel's right to self-defense.
  - The resolution, proposed by Brazil and discussed over several days, received support from 12 out of the 15 Council members. Russia and the United Kingdom chose to abstain from voting.
  - Despite being the sole dissenting vote, the United States' status as one of the Council's five permanent members allowed it to exercise a veto. Ambassador Thomas-Greenfield emphasized the absence of any reference to Israel's right to defend itself in the resolution.
  - The resolution, in its condemnation of all violence against civilians and acts of terrorism, explicitly denounced the terrorist attacks carried out by Hamas and the abduction of hostages.
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## SECTION 3 – MIXED BAG

### HEALTH

#### Preventing osteoporosis

In anticipation of World Osteoporosis Day, the Health Promotion Administration (HPA) has highlighted the significance of maintaining peak bone mass, which is typically achieved around the age of 30 but tends to decrease gradually afterward. Osteoporosis, often dubbed a "silent" disease, weakens bones, making them brittle and susceptible to fractures. Unfortunately, many individuals are unaware of their condition until a bone is broken.

- This year's World Osteoporosis Day, slated for October 20, revolves around the theme "Building Better Bones Throughout Life." The HPA emphasized that establishing a higher peak bone mass at a younger age provides superior protection against osteoporosis.
- Statistics from the HPA's 2017-2020 National Health Interview Survey revealed that approximately 8.1 percent of individuals aged 50 and above suffer from osteoporosis. Notably, women are more susceptible than men, with one in ten women aged 50 or older affected. Surprisingly, the survey highlighted that the average daily calcium intake for individuals aged 19 to 64 hovers around 505mg to 566mg, a mere half of the recommended 1,000mg for adults.
- Director-General Wu Chao-chun emphasized the pivotal role of calcium in osteocyte (bone cell) formation. Sufficient calcium intake is crucial for robust bones, making it imperative to store higher bone mass before the age of 30 to impede bone loss and prevent osteoporosis.
- The HPA proposed four essential tips for maintaining bone mass:
- **Adopt a Balanced Diet:** Ensure your diet is rich in calcium. The HPA recommends consuming 1.5 to two cups of milk (240ml per cup) daily or incorporating calcium-rich foods like cheese, black sesame, dried clove fish, traditional tofu, and dark green leafy vegetables.
- **Regular Exercise:** Engage in regular physical activity, especially weight-bearing and resistance exercises like jogging, aerobics, and weight training. These activities stimulate bone growth in youth and sustain bone mass in adults.
- **Sunlight Exposure:** Spend some time outdoors, preferably early in the morning or at dawn. Sunlight exposure boosts vitamin D levels, enhancing calcium absorption and strengthening bones.
- **Healthy Lifestyle Choices:** Maintain a healthy body weight, abstain from any kind of addiction. These practices slow down bone mass loss and decrease the risk of osteoporosis.
- Embracing these habits can significantly contribute to preserving bone health and reducing the incidence of osteoporosis, empowering individuals to lead healthier life.

## SPACE

### Large Quake Detected On Mars

NASA's InSight lander made a groundbreaking discovery on Mars on May 4, 2022. It detected the largest quake ever recorded on the Red Planet, measuring 4.7 in magnitude. While this may seem modest compared to earthquakes on Earth, it was a significant event for Mars, a planet lacking Earth's plate tectonics, the geological process responsible for most earthquakes.

- Initially, scientists suspected a meteorite impact might have caused this "marsquake." However, their search for an impact crater turned up empty, leading to a surprising revelation: Mars was experiencing tectonic activity, causing seismic rumbles deep within its interior. This revelation challenged previous assumptions about Mars being geologically inactive and provided scientists with a deeper understanding of the planet's seismic behaviour.
- The lead author of the research, planetary scientist Ben Fernando from the University of Oxford, emphasized the importance of this discovery, stating, "We concluded that the largest marsquake seen by InSight was tectonic, not an impact. This is important as it shows the faults on Mars can host hefty marsquakes." The findings, published in the journal *Geophysical Research Letters*, marked a significant advancement in understanding Martian seismic activity and brought scientists closer to unraveling the planet's tectonic processes.
- Despite Earth's tectonic plates constantly shifting and causing earthquakes, Mars, with its single solid crust, was not expected to be seismically active. However, the research team discovered that Mars still had active faults, triggering quakes as the planet slowly contracted and cooled over time. The 4.7 magnitude marsquake was pinpointed to the Al-Qahira Vallis region in Mars's southern hemisphere, approximately 1,200 miles southeast of InSight's location near the equator. It was believed to have originated several dozen miles below the Martian surface.
- What made this discovery even more intriguing was the absence of observable surface features indicating ongoing tectonic processes. Previous marsquakes detected by InSight had been associated with the Cerberus Fossae region. This event, however, left scientists puzzled, as there were no apparent causes on the surface for such a powerful quake. The energy released during this event exceeded the cumulative energy of all other marsquakes detected by InSight combined.
- To unravel the mystery, scientists collaborated with various space agencies monitoring Mars, including those from Europe, the United States, China, India, and the United Arab Emirates. They conducted extensive searches for evidence of an impact on the day of the quake but found none, marking a significant milestone in interpreting seismic signals on Mars.
- The implications of this discovery extend beyond scientific curiosity. As humanity contemplates future missions to Mars, understanding Martian seismic activity becomes crucial.
- According to Constantinos Charalambous, co-author of the study and co-chair of InSight's Geology Working Group, "Each seismic event detected by InSight is a valuable

piece of the puzzle, but this particular event plays a crucial role in unveiling the Red Planet's geological history, shedding light on its interior and evolution."

- This newfound knowledge also provides vital insights into the distribution of seismic activity on Mars, essential for planning future human missions to the Red Planet.

## DISCOVERY

### Discovery At The Bottom Of Red Sea

In a groundbreaking expedition beneath the depths of the Red Sea, scientists have made a spine-chilling discovery: vast, treacherous brine pools, harbouring deadly deep-sea creatures. These natural wonders, about 100 feet in length, lie hidden on the ocean floor, posing a lethal threat to any unsuspecting creature that ventures too close.

- These pools, although devoid of oxygen, hold the key to unravelling the origins of life on Earth and provide invaluable insights into the environmental changes occurring in this region.
- Unveiled during a 2020 expedition by researchers from the University of Miami, using a remotely operated underwater vehicle, this massive brine pool sprawls across an astonishing 107,000 square feet. While lacking oxygen, these pools are paradoxically teeming with life.
- They offer a unique window into Earth's early conditions, where life likely originated in oxygen-deprived, anoxic environments. Dubbed "extremophiles," the microbes thriving in these pools may hold clues about the emergence of life on our planet. Moreover, studying these extreme environments could inform the search for life on other celestial bodies, such as water worlds within our solar system and beyond, according to Sam Purkis, a professor at the University of Miami.
- Despite their deadly reputation, these brine pools may hold the key to groundbreaking medical discoveries. Scientists have identified substances with potent antibacterial and anticancer properties within the tiny organisms residing in these pools.
- The Red Sea is home to numerous deep-sea brine pools, typically found about 25 km away from the shore. However, in a remarkable revelation, scientists discovered the first brine pools near the Gulf of Aqaba in 2020, much closer to the coast of Saudi Arabia, in a previously unexplored area.
- Referred to as "death pools," these oxygen-devoid brine pools prove fatal to any organism that ventures too close. Remarkably, unlike the barren seabed at such depths, these pools harbour a thriving ecosystem. Microbes, the foundation of this unique ecosystem, serve as sustenance for various animals living in proximity to these deadly waters.
- Apart from their biological significance, these newly discovered brine pools have provided scientists with invaluable data to comprehend natural disasters. By studying these pools, researchers have gained insights into historical rainfall patterns spanning over 1,000 years.

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