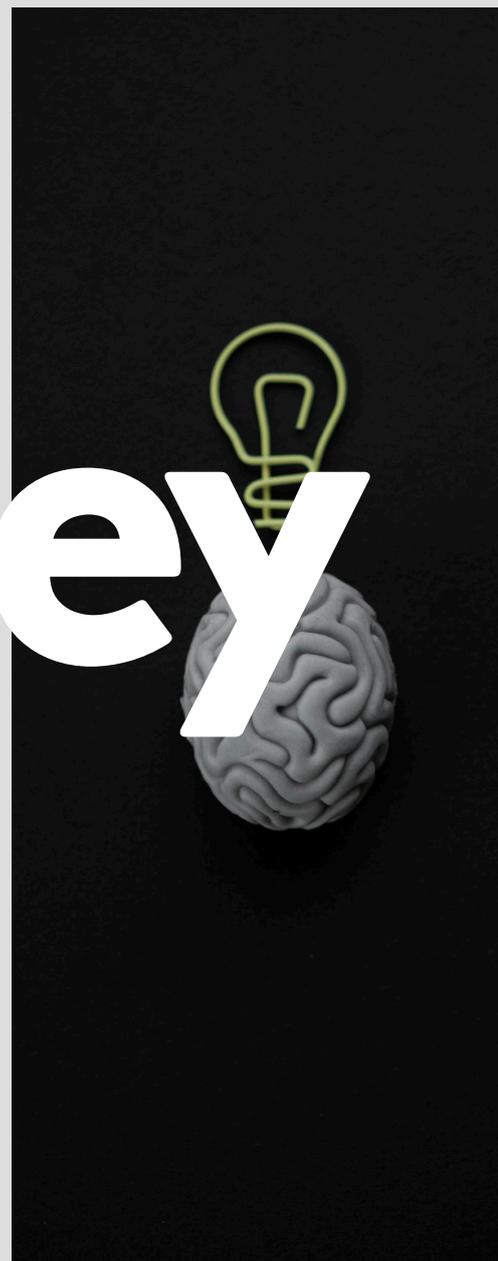


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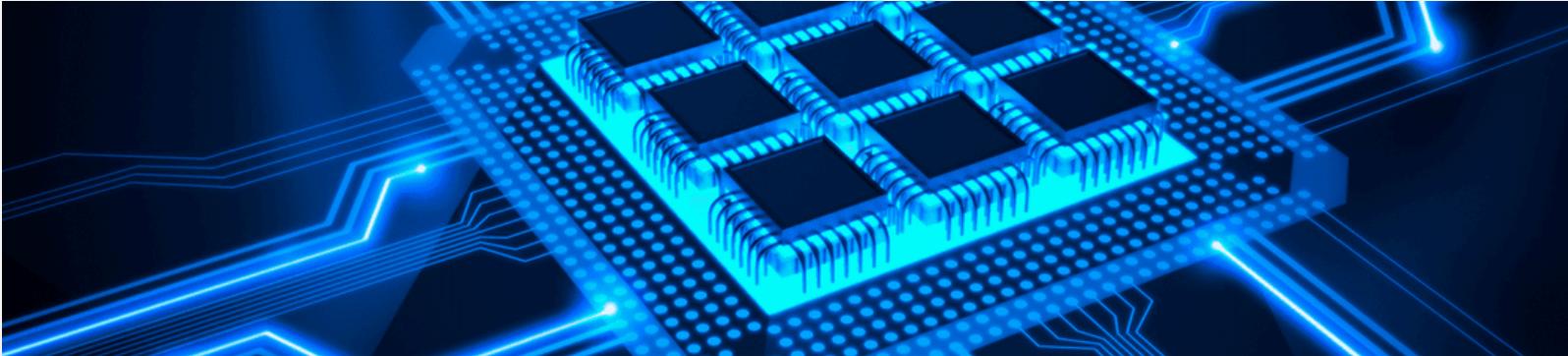


The journey  
through  
cognizance

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## TSMC's Arizona Expansion

### Taipei, Taiwan - April 12, 2024

In the ever-evolving landscape of semiconductor manufacturing, TSMC (Taiwan Semiconductor Manufacturing Co.) stands as a cornerstone, driving innovation and powering the digital revolution. Since its inception in 1987 under the visionary leadership of Dr. Morris Chang, TSMC has pioneered the pure-play semiconductor foundry business model, reshaping the semiconductor landscape and becoming one of the world's largest dedicated foundries with facilities spanning across Asia, Europe, and North America.

TSMC's semiconductors serve as the digital engines inside over 12,000 electronic products crafted by more than 500 companies worldwide. From smartphones to cloud data centers, from EVs to AI-powered applications, TSMC's technology permeates diverse industries, empowering the world's biggest brands and most innovative startups to unleash their creativity and drive progress.

### Arizona Expansion: A Historic Endeavor

In a historic announcement in May 2020, TSMC unveiled plans to invest \$12 billion in Phoenix, Arizona, marking a significant milestone in the company's global expansion strategy. This investment aimed at constructing an advanced semiconductor manufacturing fabrication facility underscored TSMC's commitment to bolstering semiconductor production in the United States.

Subsequently, in December 2022, TSMC reaffirmed its dedication to Arizona by announcing a commitment to build a second fab in Phoenix, raising its total investment in the state to a staggering \$40 billion. This monumental investment garnered praise from President Joe Biden as a testament to the resurgence of American manufacturing prowess.

However, recent developments have cast a shadow over TSMC's Arizona expansion plans. The company's Chairman, Mark Liu, revealed during an earnings call on Thursday that the operational timeline for the second factory in Arizona would be delayed. Originally slated for a 2026 start, the facility is now expected to commence operations in 2027 or 2028, highlighting the complexities involved in such large-scale projects.

### Challenges and Adjustments

Construction on the factory's infrastructure has already commenced, but TSMC finds itself in a phase of reassessment, particularly concerning the incentives provided by the U.S. government.

This delay marks the second setback for TSMC in its Arizona endeavors, with the company previously pushing back the production timeline of its first fab from 2024 to 2025 due to a shortage of skilled workers. Furthermore, uncertainties persist regarding the type of products to be manufactured in the second facility, with plans subject to modification based on the level of government incentives.

Despite these challenges, TSMC remains at the forefront of the global semiconductor industry, supplying an estimated 90% of the world's super-advanced semiconductors to tech giants such as Apple and Nvidia.

### TSMC: Navigating Forward

As TSMC navigates through these hurdles, its recent earnings report paints a promising picture for the future. Despite a challenging year in 2023 attributed to the weakening global economy, the company's CEO, C.C. Wei, expressed optimism, stating that "our business has bottomed out." TSMC projects a 20% jump in revenue for 2024, citing the rising emergence of generative AI-related applications as a significant growth driver.

While setbacks may temporarily slow down TSMC's expansion plans in Arizona, the company's resilience and strategic foresight position it as a key player in shaping the future of technology and manufacturing on a global scale.



# Impact of widespread technology use in India

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India's journey from being a third-world country to embracing widespread technology adoption has been nothing short of remarkable. Initially lagging behind in accessing global standards of technology, India's populace was skeptical about its potential impact. However, as access to technology slowly permeated society, people gradually opened up to the idea, recognizing its transformative power.

Today, the widespread use of technology in India has propelled the nation into a global player across various fields. By staying connected to the world, India has been able to meet global standards in industries ranging from IT to manufacturing. This connectivity has not only boosted economic growth but has also improved living conditions as people have gained access to better-paying jobs and opportunities.

Moreover, technology has revolutionized product and content production and consumption in India. With the advent of digital platforms, entertainment, education, and information dissemination have become more accessible than ever before. This has not only enriched cultural exchange but has also empowered individuals to participate actively in shaping global discourse.

In essence, the impact of widespread technology use in India cannot be overstated. It has catapulted the nation onto the global stage, driving economic development, improving living standards, and fostering innovation. As India continues to harness the power of technology, its trajectory towards prosperity and progress seems ever more assured.





# Dubai Floods: A Wake-Up Call

## **Dubai Floods Spark Cloud-Seeding Debate:**

The recent flooding in Dubai has stirred a contentious debate, with speculation arising over whether cloud-seeding operations may have played a role in the unprecedented rainfall. While some voices have pointed fingers at this weather modification technique, experts have swiftly moved to dismiss such claims, instead emphasizing the broader impact of climate change on extreme weather events.

## **Event Overview:**

The cascade of events began with a storm originating in Oman, which gathered strength before making landfall in the United Arab Emirates (UAE). The repercussions were significant, with widespread power outages and disruptions to air travel reported across affected areas. Tragically, Oman bore the brunt of the storm's fury, with reports indicating at least 20 fatalities due to the heavy rainfall.

In the UAE, the situation was no less severe. Government offices and schools shuttered their doors for several days as the deluge brought life to a standstill. Of particular note was the astonishing 254 millimeters (10 inches) of rainfall recorded in Al Ain, a city sharing its border with Oman. This single-day accumulation shattered records, surpassing the typical annual rainfall for the region.

## **Rain Enhancement Programme:**

Central to the discussion is the UAE's Rain Enhancement Programme (UAERP), managed by the Emirates' National Centre of Meteorology (NCM). This program has been at the forefront of cloud-seeding research and implementation, utilizing advanced techniques such as nanomaterial composed of fine salt coated with titanium oxide.

However, despite the program's capabilities, the NCM confirmed that no cloud-seeding operations were conducted during the storm or in the lead-up to the unprecedented rainfall in Dubai and neighboring areas.

## **Climate Change Connection:**

Experts argue that while cloud-seeding may be a factor in weather modification, the primary driver behind the recent extreme weather events is likely conventional weather systems exacerbated by climate change. Rising global temperatures, largely attributed to human activities, are altering weather patterns worldwide, leading to more frequent and intense extreme weather events.

## **Expert Insights:**

Esraa Alnaqbi, a senior forecaster at NCM, explained that a combination of low-pressure systems in the upper atmosphere and surface-level pressure fluctuations created the ideal conditions for the formation of intense thunderstorms, without the need for cloud-seeding interventions.

Climate scientists, including Dim Coumou of Vrije Universiteit Amsterdam and Friederike Otto of Imperial College London, echo this sentiment. Coumou highlights the strengthening of thunderstorm activity in a warming world, while Otto emphasizes that cloud-seeding cannot conjure clouds from nothing, suggesting that the volume of rain witnessed in Dubai cannot solely be attributed to such practices.

In light of these expert opinions and the absence of cloud-seeding operations during the storm, it becomes increasingly evident that while cloud-seeding remains a tool in the arsenal of weather modification, the broader context of climate change must not be overlooked in understanding and addressing extreme weather events.

# BHOPAL - 1984

The Indian Chernobyl!

On the fateful night of December 2-3, 1984, one of the world's worst industrial disasters unfolded in the city of Bhopal, India. The incident occurred at the Union Carbide pesticide plant, where a deadly gas leak of methyl isocyanate (MIC) occurred. Thousands of residents, including men, women, and children, were exposed to the toxic gas, as they slept in their homes unaware of the impending danger.

The gas leak was caused by a combination of factors, including inadequate safety measures, poor maintenance, and human error. Water entered a storage tank containing the highly reactive MIC, triggering a runaway reaction that led to the release of toxic gases into the atmosphere.

The impact of the Bhopal Gas Leak was catastrophic. Thousands of people lost their lives within days of exposure, and many more suffered from debilitating health effects, including respiratory problems, blindness, and neurological disorders.

The financial and architectural losses were immense, with the immediate aftermath witnessing scenes of devastation and despair.

India faced significant challenges in coping with the aftermath of the disaster. Legal battles ensued, seeking justice for the victims and holding the responsible parties accountable. Compensation was provided to some of the affected individuals, although many argued it was inadequate given the scale of the tragedy.

In the years following the Bhopal Gas Leak, India has made strides in improving industrial safety standards and disaster management protocols. However, the incident serves as a haunting reminder of the need for stringent regulations, corporate accountability, and effective response mechanisms to prevent such tragedies from recurring.



# WHITE GOLD OF INDIA

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Dubbed as the "White Gold of India," the recent discovery of an estimated \$3 trillion dollars worth of lithium reserves in Jammu and Kashmir has sparked both excitement and concerns. This valuable resource, often referred to as the "new oil," is essential for powering the batteries of electric vehicles, smartphones, and renewable energy storage systems.

The discovery of lithium in Jammu and Kashmir came to light through geological surveys conducted by the Geological Survey of India. This revelation has the potential to transform India's economy, reducing its dependence on imported lithium and positioning it as a major player in the global lithium market.

The benefits of harnessing these lithium reserves are immense. It can drive economic growth, create employment opportunities, and bolster India's strategic autonomy in the renewable energy sector. However, there are also concerns regarding the environmental and social impacts of lithium extraction.

The process of mining and refining lithium can result in habitat destruction, water pollution, and displacement of local communities.

India has the capability to leverage its lithium reserves responsibly, provided it implements stringent environmental regulations and adopts sustainable mining practices. However, the political aspect of accessing these reserves cannot be overlooked. The region of Jammu and Kashmir, where the lithium deposits are located, is geopolitically sensitive, and there may be challenges associated with extraction and distribution.

Despite the potential benefits, India must proceed cautiously, considering the environmental and social ramifications of lithium extraction. Balancing economic development with environmental sustainability is paramount to ensure that the "White Gold of India" contributes to the nation's progress without compromising the well-being of its people and the planet.

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# REVISED NEET CRITERIA - NON-BIOLOGY STUDENTS

## Introduction:

The National Medical Commission (NMC) has recently introduced a significant revision to the eligibility criteria for the National Eligibility cum Entrance Test for Undergraduate (NEET UG) 2024. The most noteworthy change is the inclusion of non-Biology students, allowing them to participate in the entrance examination. This move has sparked considerable debate within the academic and medical communities, raising both support and concerns regarding its implications.

## Pros:

Diverse Skill Sets: Allowing non-Biology students to take NEET UG broadens the pool of potential medical candidates. It recognizes that skills beyond Biology, such as problem-solving, critical thinking, and analytical abilities, are valuable in the medical field.

Encouraging Interdisciplinary Learning: The eligibility expansion encourages interdisciplinary learning. Students from non-Biology backgrounds may bring fresh perspectives and ideas to medical education, fostering a more collaborative and innovative healthcare environment.

Addressing Shortages in Specialized Fields: The inclusion of non-Biology students might help address shortages in specialized medical fields that require expertise from diverse academic backgrounds.

Opportunities for Career Switching: This change provides an opportunity for individuals who may have initially pursued non-Biology fields but later developed an interest in medicine. It allows for career switching and aligning personal interests with professional pursuits.

## Cons:

Lack of Core Biological Knowledge: One of the primary concerns is that non-Biology students may lack the foundational knowledge required for medical studies. This could lead to difficulties in grasping essential concepts, potentially compromising the quality of medical education.

Increased Competition: The expansion of eligibility might result in a surge in the number of applicants, intensifying competition for limited seats. Potentially increasing stress levels among candidates.

Standardization Challenges: Ensuring a standardized evaluation process becomes more challenging when candidates with diverse academic backgrounds are included. Maintaining a fair and equitable assessment for all applicants could pose logistical challenges.



Impact on Existing Medical Education Infrastructure: Medical colleges may need to adapt their curriculum and teaching methods to accommodate students from non-Biology backgrounds. This adjustment might strain existing resources and necessitate significant changes in the educational system.

## Conclusion:

The NMC's decision to allow non-Biology students to participate in NEET UG 2024 has generated mixed opinions. While it opens doors for diverse talents, it also raises concerns about the potential dilution of essential biological knowledge. Striking a balance between inclusivity and maintaining the integrity of medical education is crucial. As the medical community adapts to these changes, ongoing evaluation and adjustments may be necessary to ensure the effectiveness and fairness of the revised eligibility criteria.

# SECRETS OF THE UNIVERSE

The Universe can be directly compared to a room filled with secrets. The tool that has helped us come close to uncovering the beauties of the Universe is Physics. One of the most interesting sects of Physics is Quantum Physics (QP). To put it in simple terms, QP is the study of matter and energy at the most fundamental level.



Quantum Physics has introduced us to various beguiling theories, let us look at a few of them.

1. **Wave-Particle Duality** – We know objects to be either a particle or a wave. However, in the world of QP, certain particles like electrons and protons can behave like both- a particle and a wave. This idea was first proposed by Sir Louis de Broglie in the early 20th Century and was later confirmed by various experiments like the double-slit experiment.
  2. **Quantum Superposition** – It allows particles to exist in multiple states simultaneously. “Schrödinger’s Cat” is one famous experiment per this theory. Superposition lies at the heart of quantum computing, where quantum bits or qubits can represent multiple states simultaneously, enabling exponentially faster computation for certain tasks compared to classical computers.
  3. **Quantum Entanglement** – This occurs when the properties of particles become correlated in such a way that the state of one particle instantaneously influences the state of another. This phenomenon enables teleportation and also forms the basis of quantum cryptography providing a secure means of communication through principles of quantum key distribution.
  4. **Quantum Tunneling** – This is a phenomenon where particles can “tunnel” through energy barriers that classical physics would predict to be impenetrable. This phenomenon plays a crucial role in various natural processes such as nuclear fusion in stars, radioactive decay and the operation of tunnel diodes in electronics.
- As we continue to unravel the various mysteries of the Universe, we are bound to encounter more profound insights and unexpected phenomena that continue to push our horizons of acknowledged knowledge sources.

***NIELS BOHR***

*“Anyone who is shocked by Quantum Theory has not understood it”*

NOBEL PRIZE RECIPIENT

# HOW MUCH FURTHER DOES TECHNOLOGY GO?



## Elon Musk

“AI will probably be smarter than any single human next year”

In the past two decades, technology has advanced at an unprecedented rate, revolutionizing the way people live, work, and interact. The proliferation of smartphones, artificial intelligence, and the internet of things has fundamentally transformed society, ushering in an era of unprecedented connectivity and convenience.

Yet, amidst these remarkable advancements, the question looms: how much further can technology go? While it seems that there are endless possibilities for innovation, there are also limitations to consider. There must be a point at which technological progress reaches a plateau, where further advancements become incremental rather than revolutionary.

Identifying this cap is challenging, as technology's evolution appears boundless. However, there may come a time when certain fundamental principles or physical constraints restrict further innovation. Additionally, ethical and societal considerations may impose limits on technological development, ensuring that progress aligns with human values and well-being.

Nevertheless, the trajectory of technological advancement suggests that there may never be a definitive endpoint. Instead, technology may continue to expand indefinitely, albeit at a slower pace. This perpetual evolution raises concerns about its potential adverse effects on humanity, including job displacement, privacy breaches, and social inequalities.

To mitigate these risks, proactive measures are essential. Regulation and ethical frameworks can help guide technological development, ensuring that it aligns with societal values and priorities. Additionally, investments in education and skill development can empower individuals to adapt to technological changes and thrive in a rapidly evolving digital landscape.

Ultimately, while the limits of technology remain uncertain, it is imperative to approach its advancement with caution and foresight, prioritizing the well-being of individuals and society as a whole. By doing so, we can harness the transformative potential of technology while minimizing its unintended consequences.

# GENERAL TRIVIA



## GEOGRAPHY

1. Which ocean is known as the world's smallest and shallowest?
2. What is the capital city of Australia?
3. What is the longest river in Africa?
4. Which European country has the most volcanoes?
5. What is the largest desert in the world?

Answers:  
1. Arctic Ocean  
2. Canberra  
3. Nile  
4. Iceland  
5. Antarctic Desert



## POLITICS

1. What is the primary legislative body in the United States called?
2. Who is considered the first President of the United States?
3. What is the name of the legislative body in the United Kingdom?
4. What type of government does China have?
5. Which country has the oldest written constitution still in use?

Answers:  
1. Congress  
2. George Washington  
3. Parliament  
4. Communist  
5. United States

## TECHNOLOGY

1. Which tech company is known for the search engine "Google"?
2. What does "HTTP" stand for in web addresses?
3. Which company created the iPhone?
4. What year was the first iPod released?
5. What does "RAM" stand for in computing?

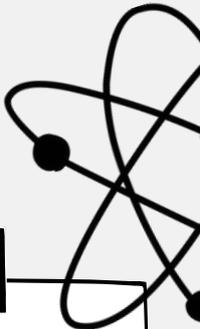
Answers:  
1. Google  
2. HyperText Transfer Protocol  
3. Apple  
4. 2001  
5. Random Access Memory



## PHYSIOLOGY

1. What is the main muscle used for breathing?
2. Which hormone regulates blood sugar levels?
3. What is the longest bone in the human body?
4. What part of the brain is responsible for balance and coordination?
5. Which organ is responsible for filtering blood and producing urine?

Answers:  
1. The diaphragm  
2. Insulin  
3. The femur  
4. The cerebellum  
5. The kidneys



# THANK YOU



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