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From the Editor

Its time talk about scientific advancements which has potential to change the history as well as our future. When we talk about advanced technologies, the latest news is the James Webb Space Telescope. The JWST was meticulously crafted with the primary objective of capturing the earliest stars and galaxies that came into existence in the cosmos. In any location equipped with this observatory and its powerful telescope, we anticipate a revelation of previously unseen worlds. Similarly, lots of scientific research is going on which are in verge of changing the fundamental concepts in the text books.

In this issue we have given little more focus on space and aliens. I hope this issue is more appealing for the readers. Happy Reading!

Soundar
Editor, RSM

The Royal Science Forum

The Royal Science Forum is a technical professional platform that was founded in 2013. RSF strives to bring together scholars, academicians, and industry professionals. Through its several divisions, RSF's mission is to assist the international science and engineering community by disseminating information on current developments in various disciplines of science and engineering. Further, recognition of talents among students, young and expertise researchers/academicians by means of Awards is also a mission of RSF. With our potential connections, we provide details of job opportunities such as Postdoctoral Research Position, Research Associate, Junior Research Fellow, Senior Research Fellow, academic jobs and non-academic jobs. We also provide details of fellowships and scholarships for Masters and Ph.D. students. From January 2022, The Royal Science Forum releases "The Royal Science Magazine".

The Royal Science Magazine is an Outreach/Extension Magazine where the advancements in Science and Technology from all fields are presented in a simplest manner to as to reach the public. Authors are welcome to submit their contribution as per the guidelines given in the "Royal Science Magazine" section. For more details about the forum and the scientific services, visit **www.royalsci.com.**

HEALTH

Best Time for Workout

The best time to work out can vary from person to person, and it largely depends on individual preferences, daily schedules, and specific fitness goals. There is no universally "best" time to work out, but there are advantages and disadvantages to consider for different times of the day:

Morning Workouts

Advantages: Morning workouts can help boost your energy levels for the day ahead and enhance your mood. Exercising in the morning can also make it easier to establish a consistent routine because it's less likely to be interrupted by other commitments.

Disadvantages: Some people may find it challenging to exercise in the morning due to stiffness, low body temperature, or time constraints.

Afternoon Workouts

Advantages: Body temperature and muscle function tend to be at their peak in the afternoon, which can lead to better performance and reduced risk of injury. Afternoon workouts can also serve as a stress reliever after a busy day.

Disadvantages: Scheduling afternoon workouts may be difficult for those with busy work or school schedules.

Evening Workouts

Advantages: For many people, evening workouts can be convenient because they have more free time after work or school. It can also be a way to unwind and de-stress after a long day.

Disadvantages: Exercising too close to bedtime can interfere with sleep for some individuals. Additionally, gyms may be more crowded during evening hours.

Ultimately, the best time to work out is when you can consistently make it a part of your routine. Consistency is key to achieving and maintaining fitness goals. Some people may find they perform better and enjoy their workouts more at a particular time of day, while others may have no preference.

It's also important to consider your individual body clock and how it affects your energy levels and alertness. Experiment with different workout times to see what works best for you. What matters most is finding a time that allows you to exercise regularly and enjoy the process, as this is what will lead to long-term success in your fitness journey.

SPACE

James Webb Space Telescope: A Vision Beyond the Stars

The James Webb Space Telescope (JWST) stands on the cusp of becoming one of the most significant astronomical instruments in human history, poised to revolutionize our understanding of the universe. Named in honor of NASA's second administrator, James E. Webb, this space-based observatory represents a monumental leap forward in our quest to explore the cosmos. With its advanced capabilities and technological innovations, the JWST promises to unveil the deepest cosmic mysteries and expand our knowledge of the universe to unprecedented levels.

Credit: NASA

Origins and Ambitions

The concept for the James Webb Space Telescope was born out of a desire to succeed the Hubble Space Telescope, which has provided us with awe-inspiring images and invaluable scientific insights for decades. While Hubble has been a tremendous success, the JWST was designed to take astronomical observation to the next level. Conceived in the early 1990s and developed through international collaboration between NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA), the JWST represents a culmination of scientific ambitions and engineering prowess.

A view of carina nebula: Credit: NASA

Technological Marvels

At the heart of the James Webb Space Telescope lies a suite of groundbreaking technologies that sets it apart from its predecessors. One of its most significant innovations is the incorporation of a massive 6.5-meter primary mirror, composed of 18 hexagonal segments coated with ultra-thin layers of gold. This mirror dwarfs the Hubble's 2.4-meter primary mirror, enabling the JWST to collect more light and observe fainter celestial objects.

Additionally, the JWST is equipped with a highly sensitive Near Infrared Spectrograph (NIRSpec) and a Mid-Infrared Instrument (MIRI), both of which will enable it to peer through cosmic dust clouds and

observe distant galaxies, stars, and planets with unprecedented clarity. Moreover, its location in space, at the second Lagrange point (L2), shields it from Earth's atmosphere and its thermal interference, allowing it to capture infrared light, which is crucial for studying objects shrouded in cosmic dust and gas.

Unveiling Cosmic Mysteries

The James Webb Space Telescope's primary mission objectives are as broad as they are ambitious. It will delve into the origins of stars and galaxies, probing the universe's distant past to help us understand how galaxies formed and evolved over billions of years. It will peer through the atmospheric haze of exoplanets, searching for signs of habitability and potential extraterrestrial life.

Furthermore, the JWST aims to unravel the secrets of star formation, planetary system formation, and the chemical composition of celestial bodies. By observing distant, young galaxies, it will offer glimpses of the universe's infancy, shedding light on the conditions that prevailed shortly after the Big Bang.

Challenges and Anticipation

The development of the James Webb Space Telescope has not been without its share of challenges and delays. Its complexity, technological requirements, and budget constraints led to numerous setbacks. However, these obstacles have only heightened the anticipation for its launch, which is scheduled for December 2021.

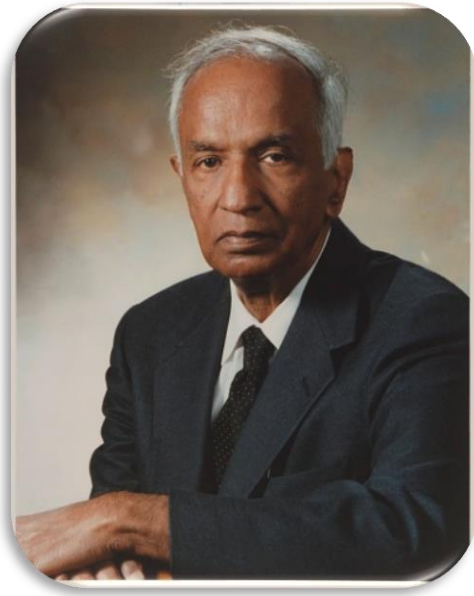
The JWST's successful deployment will undoubtedly mark a watershed moment in the history of astronomy. It represents humanity's collective pursuit of knowledge, a testament to our insatiable curiosity and determination to unravel the mysteries of the cosmos. As the JWST gazes deep into the universe, it invites us to embark on a journey of discovery that promises to rewrite our understanding of the cosmos and inspire generations to come.

In conclusion, the James Webb Space Telescope stands as a testament to human ingenuity, ambition, and our relentless quest for knowledge. With its cutting-edge technologies and bold mission objectives, the JWST is poised to usher in a new era of discovery, one that will undoubtedly expand the frontiers of human understanding and inspire awe and wonder for generations to come. As it gazes beyond the stars, the James Webb Space Telescope invites us to dream, explore, and push the boundaries of what we know about the universe.

Nobel Laureate Subrahmanyan Chandrasekhar

In this column, the magazine will cover on how the famous people get in the position where they are today. And this issue's famous personality is Nobel Laureate Subrahmanyan Chandrasekhar.

Subrahmanyan Chandrasekhar, a name revered in the world of astrophysics, left an indelible mark on our understanding of the universe. Born on October 19, 1910, in Lahore, British India (now Pakistan), and passing away on August 21, 1995, in Chicago, USA, Chandrasekhar's groundbreaking work and pioneering contributions earned him the Nobel Prize in Physics in 1983. His life and career exemplify the pursuit of scientific excellence and the profound impact a single individual can have on our comprehension of the cosmos.



Pic Credit: Current Affairs

Chandrasekhar's passion for science ignited during his early years, influenced by his father's intellectual pursuits and a supportive family environment. He showed remarkable aptitude in mathematics and physics, which eventually led him to study at the prestigious Presidency College in Madras, India. At the young age of 19, he published his first scientific paper, setting the stage for a remarkable career.

Chandrasekhar's academic journey took him to the University of Cambridge, where he became a student of the renowned astrophysicist Sir Arthur Eddington. Under Eddington's guidance, he began to explore the intricate world of astrophysics, particularly the behavior of stars under extreme conditions.

One of Chandrasekhar's most influential contributions to astrophysics was the formulation of the Chandrasekhar Limit. In 1930, while still a graduate student, he demonstrated that there is a critical mass limit, now known as the Chandrasekhar Limit, beyond which a star will inevitably collapse under the influence of its own gravitational forces and become a white dwarf. This groundbreaking discovery laid the foundation for our understanding of the life cycles of stars.

However, Chandrasekhar's idea initially faced resistance from the scientific community, particularly from Sir Arthur Eddington, who disagreed with his findings. Eddington's skepticism, based on his own theories, caused a temporary setback for Chandrasekhar's career. Nevertheless, he persevered, and his work was eventually recognized as one of the cornerstones of astrophysics.

Chandrasekhar's research on white dwarfs, compact remnants of stars, deepened our understanding of stellar evolution. He continued to explore the intricate physics of these celestial objects and their properties, making significant contributions to the field of astrophysics.

In 1983, Subrahmanyan Chandrasekhar was awarded the Nobel Prize in Physics, along with William A. Fowler, for his pioneering work on the physical processes that govern the structure and evolution of stars. This recognition not only celebrated his brilliance but also validated the Chandrasekhar Limit and its crucial role in astrophysics.

Chandrasekhar's legacy extends far beyond his scientific achievements. His unwavering dedication to the pursuit of knowledge and his resilience in the face of skepticism continue to inspire scientists and aspiring researchers worldwide. He demonstrated the importance of challenging conventional wisdom and the necessity of believing in one's own scientific convictions.

Subrahmanyan Chandrasekhar's life and work are a testament to the power of intellect, perseverance, and the human spirit's capacity to explore the unknown. His groundbreaking contributions to astrophysics have illuminated the secrets of the cosmos and reshaped our understanding of the universe. Chandrasekhar's legacy endures not only through his scientific discoveries but also through the inspiration he provides to future generations of scientists, reminding us that the pursuit of knowledge knows no boundaries.

The Magical Adventure of Luna the Moon Rock

Once upon a time, in a bustling science lab, there was a small, unassuming rock named Luna. Luna wasn't just any rock; she was a moon rock, and she had a secret. She held the key to a magical adventure that would take her on an incredible journey through space and time.

One day, a curious young scientist named Mia discovered Luna while examining moon rock samples brought back from a space mission. As Mia examined Luna under a powerful microscope, she noticed something extraordinary. Luna's surface seemed to shimmer and sparkle with tiny, colorful specks.

Intrigued, Mia decided to investigate further. She placed Luna in a special machine and turned a dial. Suddenly, Luna began to glow and hum with energy. Before Mia's eyes, Luna started to levitate, and a shimmering portal appeared above her.

Without hesitation, Luna flew into the portal, and Mia followed. They found themselves in the vastness of space, surrounded by stars and planets. Luna was no longer a simple rock; she had transformed into a lively, talking character.

"Luna, you're alive!" gasped Mia.

"Yes, Mia," Luna replied, "I've always had a magical connection to the universe, and now we can explore it together!"

Over the course of their adventure, Luna and Mia visited distant planets, learned about gravity, met friendly aliens, and even witnessed the birth of a new star. Along the way, Luna shared her knowledge of space and science with Mia, and they formed a deep friendship.

After many exciting adventures, Luna and Mia returned to the lab, their hearts full of wonder and knowledge. Luna resumed her position as a moon rock, but she was forever changed by her magical journey.

Mia continued her research, inspired by the incredible things she had seen and learned during her adventure with Luna. Together, they showed that science could be not only fascinating but also an enchanting journey through the universe.

The moral of the story is that science is an exciting and magical adventure that can take you to places beyond your wildest dreams, and it's a journey best enjoyed with curiosity and an open heart.

Call For NOMINATIONS

2022 The Royal Science Awards

Life Time Achievement Award
Senior most Researchers/Academicians who made excellent contribution to their stream are given this award.

Young Researcher Award
Budding researchers (upto 35 age) who have given excellent contribution are given this award.

Best Teacher Award
Teachers of all streams who have contributed to the learning community are given this award.

Student Project Awards
Graduate students who have come up with innovative ideas and products are welcome to submit their application.

Best Thesis Award
The students from any stream who have done excellent research work at any degree/diploma level can apply for this award.

Best Extension Worker Award
This award is given to those who transferred more technologies to the common people and/or developed excellent communication/service tools such as apps, websites for communicating to the beneficiaries.

Visit www.royalsci.com to file your nominations.

Apply for the Awards
You can submit your application for the awards through the website. Applications are open throughout the year.

Benefits of the Awards

- The awardees will get an opportunity to chair and deliver invited talks in the seminars, conferences, and workshops organized by the Royal Science Forum
- Recognition among peers
- This award is a kind of motivation for further innovation and best practices.
- This award is an indicator of success and it enhances the reputation and improves the benchmark of the award winner
- As a matter of pride and motivation, it raises the visibility of the success.
- The award will be a testimony of your success
- Awards winners profile shall be included in the Book, " The most accomplished individuals from around the world" released every year

Aliens on Mars: Exploring the Possibilities

The prospect of finding extraterrestrial life, particularly on our neighboring planet Mars, has captured the imagination of scientists and space enthusiasts for generations. While concrete evidence of Martian aliens remains elusive, ongoing exploration and scientific research have raised intriguing possibilities and fueled the hope that we might one day make one of the most profound discoveries in human history.

The fascination with Martian life dates back centuries, with early astronomers speculating about the possibility of intelligent beings on the Red Planet. In the late 19th and early 20th centuries, observations of apparent "canals" on Mars stirred imaginations and led some to believe that an advanced civilization might exist there. However, subsequent missions and advances in astronomy dispelled these notions.

In recent decades, Mars exploration has transitioned from science fiction to scientific reality. The NASA Mars rovers, such as Sojourner, Spirit, Opportunity, Curiosity, and Perseverance, have provided invaluable data about the Martian environment, geology, and potential habitability.

One of the most compelling discoveries came from the detection of water ice on Mars. Water is a fundamental ingredient for life as we know it, and the presence of water suggests that Mars may have had, or could still have, conditions suitable for microbial life. Additionally, the confirmation of methane in the Martian atmosphere has raised questions about its source, as on Earth, methane can be produced by both geological and biological processes.

The primary focus of Mars exploration is the search for microbial life. The harsh surface conditions, including extreme cold, low air pressure, and high levels of radiation, make it unlikely that complex multicellular organisms, like those found on Earth, could survive there. However, the subsurface of Mars, beneath the protective layer of rock and soil, may offer a more hospitable environment. Liquid water, geothermal heat, and chemical nutrients could potentially sustain microbial life deep below the surface.

In 2021, NASA's Perseverance rover successfully landed on Mars with a suite of scientific instruments, including the Mars Sample Caching System, which aims to collect and store Martian rock and soil samples for a potential future return to Earth. These samples could provide definitive evidence of past or present life on Mars.

Additionally, the European Space Agency's (ESA) Rosalind Franklin rover, part of the ExoMars mission, is scheduled to launch in the coming years. It is equipped with a drill and a suite of instruments to search for signs of life beneath the Martian surface.

While we have not yet discovered definitive proof of aliens on Mars, the ongoing exploration of the Red Planet continues to uncover tantalizing clues and raise important questions. Whether we find evidence of past or present microbial life or not, our quest for knowledge and our exploration of Mars exemplifies humanity's insatiable curiosity and our unwavering determination to explore the cosmos. The possibility of finding aliens on Mars remains a beacon of hope and a driving force behind our exploration of the fourth planet from the Sun. Regardless of the outcome, each mission to Mars brings us one step closer to unraveling the mysteries of our planetary neighbor and, perhaps, to discovering life beyond Earth.

India's Remarkable Journey to Mars: Mangalyaan Mission

India's foray into interplanetary exploration with its Mars Orbiter Mission, often affectionately called "Mangalyaan," marked a significant milestone in the nation's space endeavors. Launched by the Indian Space Research Organisation (ISRO) on November 5, 2013, Mangalyaan exemplified India's prowess in space technology, its commitment to scientific exploration, and its ability to achieve ambitious goals in space.

Before Mangalyaan, only a handful of nations had successfully reached Mars, including the United States and Russia. India's decision to embark on a mission to Mars demonstrated its ambition and determination to join the ranks of spacefaring nations capable of interplanetary exploration.

Mangalyaan's primary objectives were to study the Martian surface, morphology, atmosphere, and mineralogy. The spacecraft was equipped with a suite of scientific instruments, including a methane sensor to search for signs of life, a camera to capture high-resolution images of the Martian surface, and a spectrometer to analyze the planet's mineral composition.

One of the most remarkable aspects of Mangalyaan was its cost-effectiveness. The mission garnered international attention not only for its scientific goals but also for its frugal budget. With a total cost of approximately $74 million, Mangalyaan became one of the most cost-effective Mars missions ever conducted. This achievement showcased India's ability to innovate and achieve complex space missions without breaking the bank.

Mangalyaan's success also showcased India's advancements in space technology. The development of the spacecraft, its propulsion system, and its orbital insertion into Martian orbit demonstrated ISRO's technical capabilities. Notably, Mangalyaan employed a novel and highly efficient method of reaching Mars called the "slingshot effect," which involved using the Earth's gravity to propel the spacecraft toward its destination.

Mangalyaan's successful insertion into Martian orbit on September 24, 2014, made India the fourth space agency in the world to reach Mars and the first to do so on its maiden attempt. This accomplishment earned India global recognition and respect in the field of space exploration.

Since its arrival at Mars, Mangalyaan has provided valuable scientific data. It has studied the Martian surface, monitored its atmosphere, and contributed to our understanding of the Red Planet. The discovery of methane plumes on Mars, for instance, raised intriguing questions about potential sources of the gas and its implications for the possibility of past or present life.

Mangalyaan's success has paved the way for further exploration of Mars by India. ISRO has expressed its intentions to follow up with additional Mars missions, possibly including lander and rover missions.

India's Mars Orbiter Mission, Mangalyaan, is a testament to the nation's scientific and technological prowess. It not only demonstrated

India's capability to reach Mars but did so with remarkable cost-efficiency. Mangalyaan's legacy extends beyond its scientific contributions, serving as an inspiration to the global space community and showcasing India's ambitions in the realm of space exploration. As India continues to look to the stars, Mangalyaan remains a symbol of the nation's commitment to expanding our understanding of the cosmos.

Feedback: The readers are welcome to send their feedback/suggestions to info@royalsci.com for positive growth of this magazine.

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An International Interdisciplinary Journal to further Chemical Sciences

| NAAS Rating 4.75 | International Chemistry Journal | E Journal of Chemistry | Biochemistry | Agricultural Chemistry Journal | Soil, Nutrition, Food Science |

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