

THE PARTICLE POST

BY
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QUORUM

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MYTHBUSTERS

EDITION 2:2 (February)



QUANTUM QUORUM



"Give up your head, but forsake not those whom you have undertaken to protect. Sacrifice your life, but relinquish not your faith"



S. Amarjeet Singh
(Chairman,GTBIT)

We would like to express our sincere thanks to our respected Chairman **S.Amarjeet Singh** for his continuous support in all our endeavors.



DR. Rominder Kaur
Randhawa
(Director,GTBIT)

Thank you to our honorable director, **DR. Rominder Kaur Randhawa**, for encouraging us to start our society and explore the world of physics.



DR. Parsan Kaur
(Associate Professor
HoD, Applied Sciences
Dept.)

We want to thank **DR. Parsan Kaur** for their ongoing support and motivation, which helps us to achieve our goals.



S. Harjeet Singh
(Manager,GTBIT)

We are deeply grateful to **S.Harjeet Singh** for his unwavering support throughout our journey, which has been vital to our growth and achievements.



DR. Simmi Singh
(Professor
Head, Exam cell)

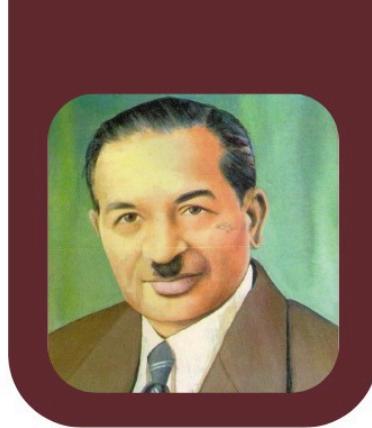
We also want to express our sincere gratitude to **Prof. Simmi Singh** for continuously lighting our pathway with her valuable advice.



DR. Daljeet Kaur
(Associate
Professor,
Convener)

We would like to acknowledge the invaluable effort put forth by **DR. Daljeet Kaur** for guiding us and providing essential ground-level support.

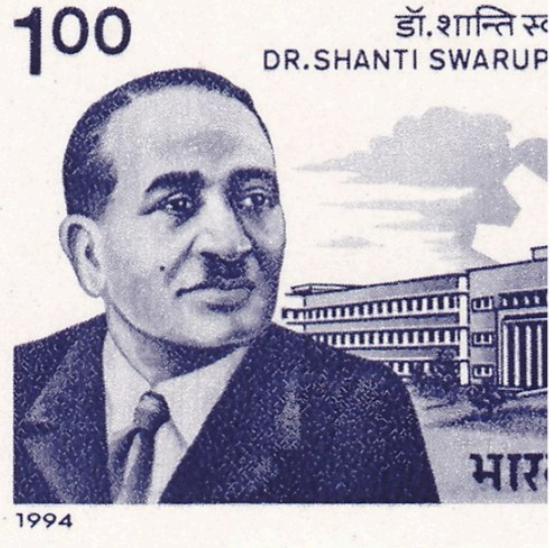
LESSER KNOWN GEMS



SIR SHANTI SWARUP BHA TNAGAR

Sir Shanti Swarup Bhatnagar (21 February 1894 – 1 January 1955) was an Indian colloid chemist, academic and scientific administrator. The first director-general of the Council of Scientific and Industrial Research (CSIR), Bhatnagar is revered as the Father of Research Laboratories in India. He was also the first Chairman of the University Grants Commission (UGC). He was born in Bhera, Shahpur in a Hindu Kayastha family. Bhatnagar completed his elementary education at Dayanand Anglo-Vedic High School, Sikandrabad. He passed the Punjab University's Intermediate Examination in 1913 and graduated from Forman Christian College with a BSc in Physics and MSc in Chemistry.

He earned his Doctorate in Science in 1921. Dr. Bhatnagar solved the issue of mud hardening during drilling in saline water by applying colloidal chemistry. He added Indian gum, which lowered the mud suspension's viscosity while enhancing its stability against electrolyte-induced flocculation. His research covered emulsions, colloids, and industrial chemistry, with key contributions in magnetochemistry for studying chemical reactions. In 1928 he and K.N. Mathur jointly developed the Bhatnagar-Mathur Magnetic Interference Balance, which was one of the most sensitive instruments at the time for measuring magnetic properties. This device allowed precise measurements of magnetic susceptibility – the degree to which a material becomes magnetized when exposed to a magnetic field.



In 1919, Dr. Bhatnagar's doctoral research under Frederick Donnan focused on colloidal systems, where particles between 1 to 1000 nanometers are dispersed in a continuous medium. He studied their thermodynamic stability and the role of interparticle forces in maintaining dispersion. His work also explored surface tension effects at phase interfaces. Additionally, he examined electrical double layers, which influence particle interactions and suspension stability.

In recognition of his contributions to pure and applied chemistry, Bhatnagar was honored as an Officer of the Order of the British Empire (1936), Fellow of the Institute of Physics and Royal Institute of Chemistry (1942), and Vice President of the Society of Chemical Industry, London (1943). He was awarded the Padma Bhushan by the Government of India in 1954 for his contributions to science and technology. An Indian science award, the Shanti Swarup Bhatnagar prize for Science and Technology was created in his honour.



QUANTUM QUEENS

JOCELYN BELL BURNELL

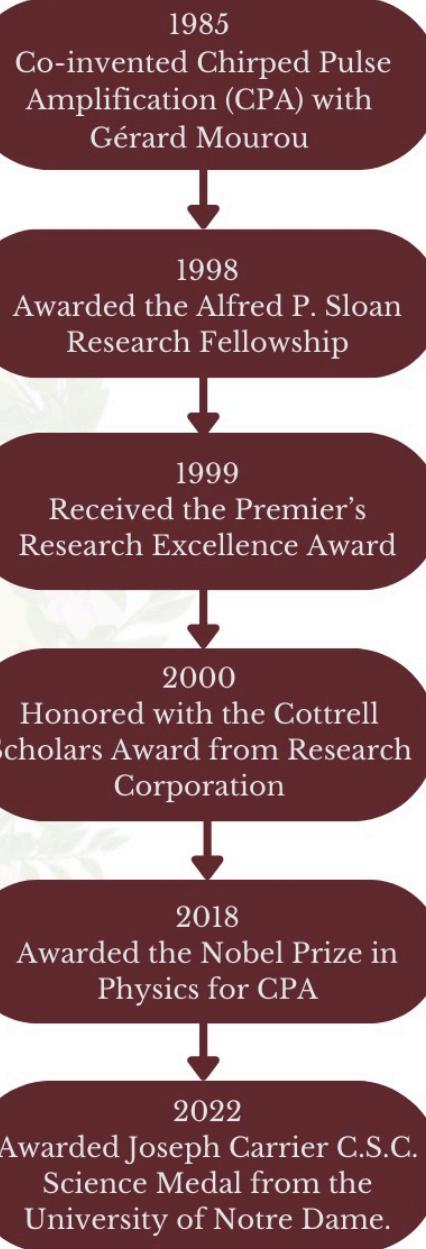
Jocelyn Bell Burnell (born 15 July 1943) is an astrophysicist from Northern Ireland who, as a postgraduate student, discovered the first radio pulsars in 1967. The discovery eventually earned the Nobel Prize in Physics in 1974; however, she was not one of the prize's recipients. Her discovery of pulsars transformed astrophysics, influencing studies on neutron stars, black holes, and general relativity.

Her father was an architect who helped design the Armagh Planetarium, and during her visits there, the staff encouraged her to pursue a career in astronomy. She also enjoyed her father's books on astronomy.

She grew up in Lurgan and attended the Preparatory Department of Lurgan College from 1948 to 1956. At the time, boys could study technical subjects, but girls were expected to study subjects such as cooking and cross-stitching. Bell Burnell was able to study science only after her parents and others challenged the school's policies.

She failed the eleven-plus exam and her parents sent her to The Mount School, a Quaker girls' boarding school in York, England, where she completed her secondary education in 1961. She next joined the University of Glasgow, where in 1965 she graduated with a Bachelor of Science degree in Natural Philosophy (physics), with honours, and then New Hall, Cambridge, where she gained a PhD in 1969.

At Cambridge, she worked with Antony Hewish and others to construct the Interplanetary Scintillation Array just outside Cambridge to study quasars, which had recently been discovered.





DR. PHOTON'S CORNER

Dr. Photon's Blazing Encounter with Mercury

After a fiery birth in the Sun, Dr. Photon zipped through space at 300,000 km/s, spotting a shimmering, cratered planet ahead. "Well, well, what do we have here?" he mused, marveling at Mercury's rugged surface.

Surprised by the planet's extremes, he noted the scorching day side at 430°C and the freezing night at -180°C. "Why is it so hot on one side and freezing on the other?" he wondered, realizing the planet lacked an atmosphere to trap heat.

"And who would have thought," Dr. Photon mused, "despite Venus being Earth's so-called twin, Mercury is actually closer to Earth on average thanks to its speedy orbit!"

"Wait... A day here is longer than a year?" Dr. Photon was astonished to learn Mercury's day spanned 176 Earth days while a year zipped by in just 88. Diving into shadowy craters, he exclaimed, "Is that ice?" Protected from sunlight, frozen water

gleamed in the depths. Mercury's weak magnetic field added to the intrigue of Dr. Photon, sending charged particles dancing across the surface.

"You're full of surprises," he chuckled. But the Sun's gravity tugged him back. "Until next time, Mercury," Dr. Photon bid his farewell to Mercury before shooting off into space for his next adventure.

Next stop: Venus.

"Ah, Venus next!" Dr. Photon grinned. "Let's see what secrets the so-called twin of Earth has waiting for me."



MOVIE



INTERSTELLAR

CHRISTOPHER NOLAN

REVIEW

Christopher Nolan's *Interstellar* (2014) is a breathtaking sci-fi epic that explores the vastness of space, the resilience of the human spirit, and the unbreakable bonds of love. With stunning visuals and a deeply emotional story, the film stands as one of the greatest science fiction movies of the 21st century. With the guidance of physicist Kip Thorne, *Interstellar* presents some of the most scientifically accurate depictions of black holes and wormholes ever seen on screen.

SYNOPSIS

Set in a near-future where Earth is dying due to environmental collapse, *Interstellar* follows Cooper, a former NASA pilot. Alongside a team of astronauts, including ventures through a wormhole near Saturn into another galaxy, where they encounter breathtaking yet dangerous alien worlds.

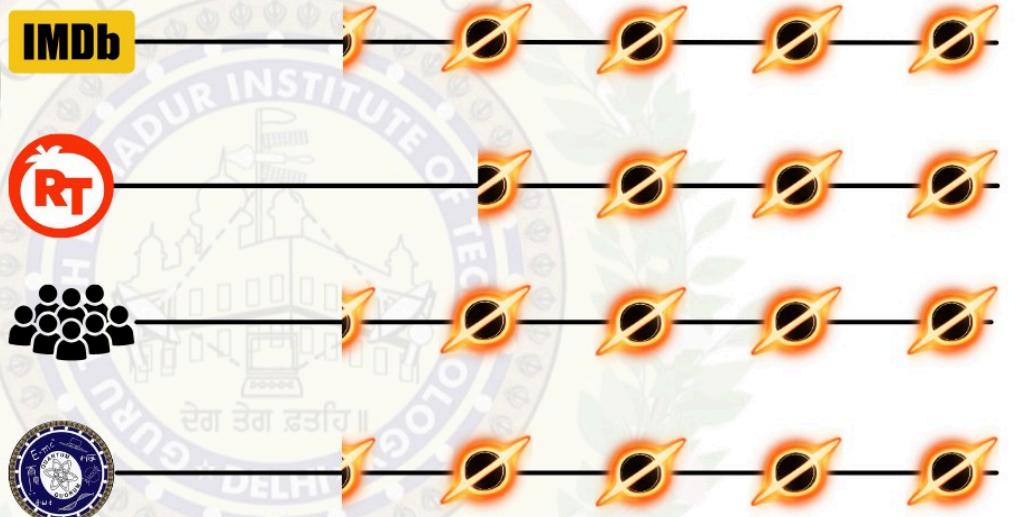
FUN FACTS

To make the farm scenes look authentic, Christopher Nolan planted 500 acres of corn in Alberta, Canada. The corn was harvested and sold for a profit of \$162,000. The visualization of the black hole required 40,000 lines of code. This software is used in scientific research as well. Most of the spaceships in the movie were actually miniatures rather than CGI to achieve a more tangible and realistic look.

REVIEW



RATINGS



SCIENTIFIC TOPICS

The storyline encases many scientific theories throughout the movie with the major focus on time dilation . it is the difference in elapsed time as measured by two clocks, either because of a relative velocity between them , or a difference in gravitational potential between their locations. The script also uses the world famous einstien's theory of relativity that deals with the structure of space-time. Einstein explained this theory based on two postulates - The laws of physics are the same for all, irrespective of the observer's velocity. The speed of light is always constant regardless of the motion of the light source or the motion of the observer. Along with these theories it also takes the creative liberty to use various unproven theories to support the plot like The theory of wormholes describes a tunnel-like shortcut through space-time that connects distant points in the universe. Wormholes are predicted by Einstein's general theory of relativity, but there is no evidence that they exist. And also explores the proposed higher dimensions based on Kaluza Klein theory

RESEARCH • RUNDOWN



STUDENT'S COLUMN

Quantum teleportation is a groundbreaking concept in quantum mechanics that enables the transfer of information without physically moving the object. Rooted in quantum non-locality, it was first debated in the early 20th century through the EPR paradox, where Einstein, Podolsky, and Rosen questioned quantum mechanics' completeness. John Bell later introduced Bell's inequalities, and their experimental violations confirmed quantum entanglement.

Quantum teleportation involves two parties, Alice and Bob, who share an entangled particle pair. Alice, possessing an unknown quantum state, performs a Bell state measurement, collapsing the system. She then sends classical information to Bob, who applies a quantum operation to reconstruct the original state. Since classical communication is required, teleportation does not allow faster-than-light transmission.

Since its theoretical proposal in the 1990s, quantum teleportation has seen experimental successes, including photon entanglement, parametric down-conversion, Bell state analyzers, and long-distance teleportation using fiber optics and free-space transmission. This has significant implications for quantum computing, cryptography, and quantum networks, potentially leading to a quantum internet.

Though human teleportation remains speculative, quantum teleportation continues to push technological boundaries, revolutionizing secure communication and computation. As research progresses, it promises to make quantum mechanics an integral part of future technology.

By~
Harshal Chauhan - (CSE-DS)
Sukhmeet Kaur - (CSE-DS)
Vishal Verma - (CSE-AIML)



CONVENER'S COLUMN

Cosmic rays are high-energy particles, primarily protons, that travel through space at nearly the speed of light. Constantly bombarding Earth's atmosphere, they originate from various cosmic sources, including the Sun (low-energy cosmic rays) and more extreme events like supernovae, active galactic nuclei, and gamma-ray bursts, which generate the highest-energy cosmic rays. However, the precise origins of the most energetic cosmic rays remain a mystery.

When cosmic rays collide with Earth's atmosphere, they create cascades of secondary particles, forming cosmic ray showers. While these particles are harmless at ground level, they pose significant risks to astronauts and spacecraft due to increased radiation exposure. This is a major concern for long-term space missions, such as those to Mars, where shielding against cosmic radiation remains a critical challenge.

Beyond their impact on space travel, cosmic rays could offer insights into dark matter, the mysterious substance thought to constitute a significant portion of the universe's mass. Some scientists believe cosmic rays might provide indirect evidence of dark matter interactions, though this remains an open area of research.

As messengers from the farthest reaches of space, cosmic rays carry information about the universe's most violent and energetic events. Ongoing research and technological advancements continue to unlock their secrets, deepening our understanding of astrophysics, space exploration, and fundamental physics.

By~

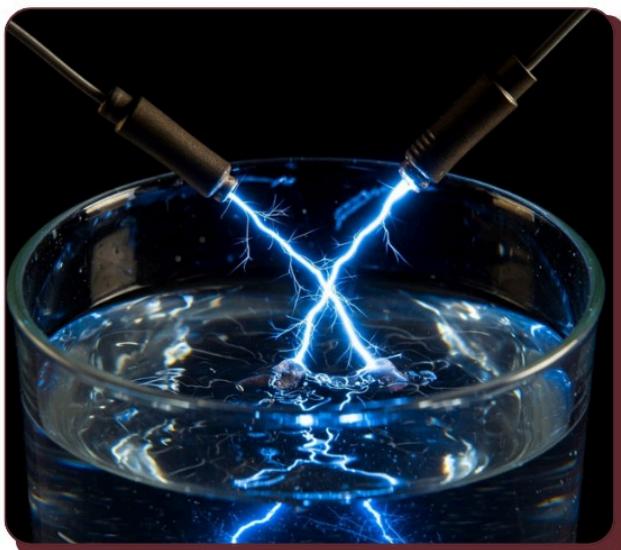
DR. Daljeet Kaur
Associate Professor

MYTHBUSTERS



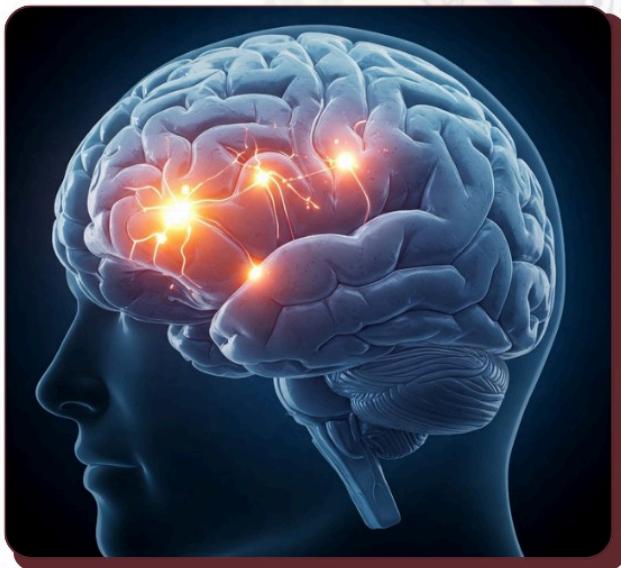
Myth no. - 1

Lightning Never Strikes the Same Place Twice
Busted! Lightning frequently strikes the same place multiple times. Tall buildings, like the Empire State Building, get hit by lightning dozens of times a year!



Myth no. - 2

Water Conducts Electricity
Busted! Pure water doesn't conduct electricity well. It's the minerals and impurities in water that make it conductive. Distilled water, with all impurities removed, barely conducts electricity at all.



Myth no. - 3

We Only Use 10% of Our Brain
Busted! Brain scans show that almost all parts of our brain are active throughout the day, even when we're sleeping. No part of the brain is entirely unused—it's just that different areas handle different functions.

HALL OF PHOTONS

Physics Toppers



Manpreet Singh
CSE-AIML
99/100



Saurav Kumar
IT EVENING
98/100



Anushi Bisht
CSE EVENING
97/100



Divakar Patel
CSE MORNING
95/100



Palak Thakur
IT MORNING
90/100



Rishabh Sharma
CSE-DS
85/100



Anvi Jain
CSE-Ds
85/100



Mauli Arora
ECE
85/100

KEEPING UP WITH Q²

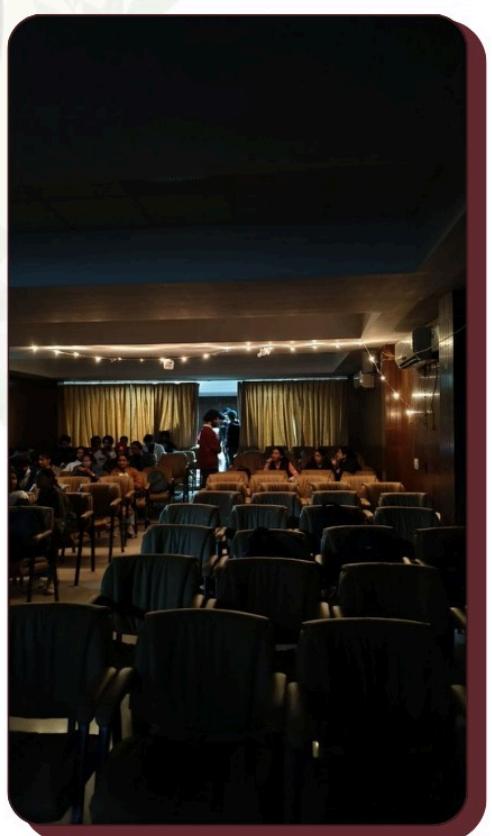


As we are rapidly progressing with our society, we felt the need of like-minded people to expand the horizons of our thinking and implement our vision. This need led to the next step in our journey that was our audition rounds. We conducted our first ever audition on 29th January 2025 which witnessed a huge turnout we met many innovative minds and were impressed by their zeal and knowledge. Our members selected the best suitable candidates for their respective roles by rigorous yet fun questioning and interviewing and were shortlisted for the group discussion round. From there our core members selected the final members.

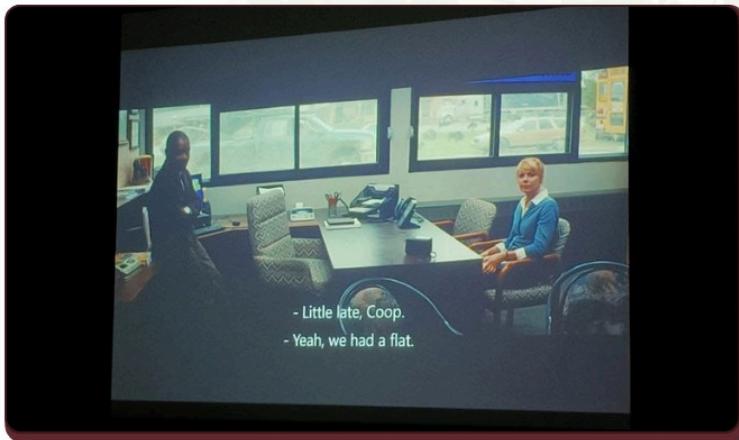
Wanting to encourage the scientific curiosity of the students, members and fellow teachers altogether we wanted to organize an event that encompassed all this together with a noble cause. As seeing the rising interest in the society on the occasion of the re-release of the sci fi magnum opus of the visionary director Christopher Nolan's "interstellar" we organized a special screening in our campus whose proceeds were donated to the charity and intrigue the students into the visual prowess of science and cinema. This screening witnessed a huge turnout and was well received by enthusiastic presence.



AUDITIONS



MOVIE SCREENING





Meet Our Team

This society aims to unite like-minded individuals to explore physics, solve real-world problems, and make impactful contributions, envisioning a future where physics advances technology and improves lives.



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for
more:

