"The scientist is not a person who gives the right answers, he's one who asks the right questions." — C.L. Strauss

STEM

# QUANTUM QUILL


THE HYDERABAD PUBLIC SCHOOL, BEGUMPET

CHIEF EDITORS

Shaanvi Karri, 11A

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$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

# CONTENTS

# COORDINATOR'S Report

At The Hyderabad Public School, Begumpet, we have always believed that the strongest ideas are born when curiosity is nurtured, when perseverance is encouraged and when passion is allowed to shine. STEM Publications is a living example of this belief. What began as the dream of two young students of Grade 11A–who dared to imagine a space where young minds could express, explore, and celebrate their journeys in Science, Technology, Engineering and Mathematics–has now blossomed into a movement that inspires our entire school.

As a Senior School Coordinator and a lifelong lover of science, I feel a profound sense of pride and joy watching this vision take root and grow. What was once a simple proposal has now become a school-wide initiative–an initiative that mirrors the very soul of HPS: a spirit of inquiry, innovation and fearless imagination.

STEM Publications is not just a newsletter. It is a storybook of our learners' courage, creativity and resilience. It captures not just their achievements but the journeys behind them–the experiments that failed, the reflections that followed, the collaborations that bloomed and the discoveries that made their eyes light up. It is proof that learning is not about rushing to the right answer but about embracing the process with heart and grit. At HPS, education has always been about more than books and exams. It has been about preparing children to thrive in a complex, ever-changing world by giving them the confidence to question, to create and to dream big

**DR. PREET KAUR**

**SENIOR SCHOOL COORDINATOR**

STEM Publications reflects this very ethos. It bridges tradition with innovation, reminding us that our rich legacy gains even more meaning when it fuels the possibilities of tomorrow.

This initiative is not just for a few, but for all–students, teachers, parents and every member of the HPS family. It is an open invitation to celebrate curiosity and to see learning as a lifelong adventure.

From the depths of my heart, I extend my gratitude to our leadership, our dedicated faculty and the larger HPS community for believing in this idea and nurturing it into reality. With this collaborative spirit, a student's dream has grown into something much larger–a legacy that will continue to inspire generations to come.

# COSMOS...

ugust isn't just Independence Month, it's when India made history on the Moon. From satellites that map our Earth's pulse to a gentle touchdown on lunar soil, we're exploring space with purpose and curiosity.

## NISAR

A joint NASA-ISRO mission, NISAR launched on July 30, 2025 aboard GSLV-F16.

It carries dual radars (L-band & S-band) to track Earth's surface every 12 days even through clouds or darkness.

It monitors earthquakes, glaciers, forests, crops, floods and detects changes as tiny as 1 cm & is vital for climate action.

## Shiv Shakti Point

On August 23, 2023, Chandrayaan-3's Vikram lander made history with a soft landing near the lunar south pole, a first for any nation. The site, named Shiv Shakti Point by PM Modi, symbolizes strength and energy.

With the Pragyan rover, India studied lunar soil and temperature. The date is now celebrated as National Space Day, inspiring generations to "shoot for the moon and beyond."

## FACT FILE

The Moon rings like a bell when hit- NASA learned this when it crashed a module during Apollo 12.

# STEMTEMBER

## 1831 SEPT 1

Botanist **Robert Brown** names the **cell nucleus**, one of the **foundational** discoveries in **cell biology.**

## 1855 SEPT 28

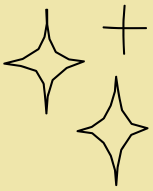
**Claude Bernard** presents the discovery of **glycogen** storage in the liver.

## 1859 SEPT 1 AND 2

The **Carrington Event**, largest geomagnetic storm, caused **aurora borealis at low latitudes.**

## 1886 SEPT 10

Astronomer **J. Valderrama** records a **white-light solar flare.**

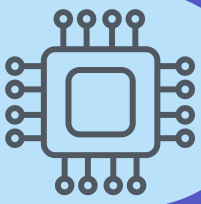


## 1928 SEPT 28

**Alexander Fleming**'s serendipity of discovery of **penicillin.**

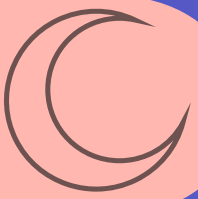
## 1958 SEPT 12

**Jack Kilby** demonstrates the first **integrated circuit.**



## 1959 SEPT 14

USSR's **Luna 2** becomes the **first spacecraft to reach the Moon.**

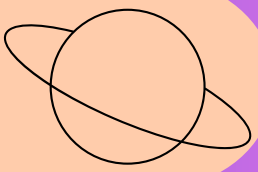


## 1984 SEPT 10

**Alec Jeffreys** discovers **DNA fingerprinting.**

## 2009 SEPT 3

**Saturn's rings cross Earth's orbital** plane in a rare alignment.

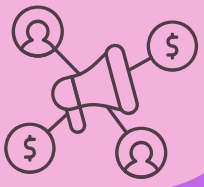


## 2012 SEPT 3

NASA's **Curiosity rover** finds evidence of an **ancient streambed on Mars.**

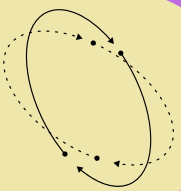
## 2013 SEPT 12

**Voyager I** officially **exits the solar system, farthest** reaching satellite.



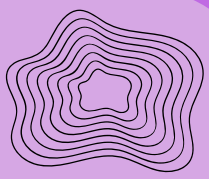
## 2014 SEPT 24

**India's Mangalyaan** enters Mars orbit, making **ISRO the first to reach** on its **first attempt.**



## 2015 SEPT 14

**LIGO** announces first **direct detection of gravitational waves.**



## 2018 SEPT 20

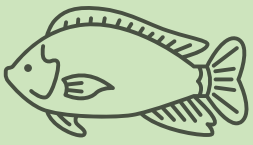
**First human esophageal tissue grown** in a lab, fuelling regenerative medicine.

## 2024 SEPT 4

ESA's **BepiColombo flyby of Mercury** at **unprecedented** close distance **(~165 km)**

## 2024 SEPT 11

Self-awareness studied in **cleaner wrasse fish**, raising **neuroscience questions.**



# CLUB CORNER

## SCIENCE AND RESEARCH CLUB

This club is primarily focused on engaging students in science and research. It sparks curiosity and a passion for science, preparing the next generation to face challenges using logic and knowledge. Students will learn to think critically and logically, question meaningfully, conduct various experiments, analyse data and draw inferences, communicate their findings effectively and work collaboratively with fellow members. The students take up research projects spread across four main phases. Foundational research, experimental design, real world applications, original research component and student-led investigations are encompassed in the research project. This is a medium of simplifying science while preserving its technical appeal and fosters the spirit of inquiry, innovation, reasoning and understanding.

## STEM CLUB

The School STEM Club is committed to cultivating a spirit of curiosity and innovation while deepening students' engagement with science, technology, engineering and mathematics. Its objective is to provide a platform where learners can apply logical reasoning, critical thinking and collaborative skills to explore ideas with rigor and creativity. By encouraging inquiry-driven learning, the club emphasizes the value of questioning, analysis and evidence-based understanding. It bridges classroom knowledge with real-world relevance, inspiring students to view STEM as both intellectually rewarding and socially meaningful. Our aim is to spark a love for discovery by showing that STEM is the way of understanding the world around us. We strive to encourage creative thinking, teamwork and problem-solving while nurturing confidence in seeking scientific answers. This club hopes to inspire young minds to dream big and believe in their ability to shape the future.

# ROBOTICS AND INNOVATION CLUB

The Robotics and Innovation Club ignited a revolution of creativity as 76 passionate students transformed simple popsicle sticks, syringes and masking tape into battle-ready HydroBots during the electrifying "Robotics World" challenge. What began as humble materials evolved into engineering masterpieces through intense teamwork and innovative problem-solving, culminating in a thrilling "Judo Fight" where robots clashed in an arena of pure innovation. This transformative experience didn't just teach engineering concepts - it forged the next generation of innovators, proving that when extraordinary minds meet simple tools, the results are nothing short of revolutionary.

# STEM SMILES


BANANAS ARE BERRIES, BUT STRAWBERRIES AREN'T

WITHOUT GEOMETRY, LIFE IS... POINTLESS!

WHY DID THE MUSHROOM GET INVITED TO EVERY PARTY?

BECAUSE HE WAS A FUN-GUY

A NEUTRON WALKS INTO A CAFE AND ASKS, "HOW MUCH FOR A COFFEE?

THE BARISTA REPLIES: "FOR YOU? NO CHARGE."

WHY WAS THE OBTUSE TRIANGLE ALWAYS SO FRUSTRATED?

BECAUSE IT WAS NEVER RIGHT.

# STEM STORIES

## STEM THROUGH OUR STUDENT'S EYES!

From June 23rd to August 8th, 2025, I attended the **Harvard Secondary Summer School** in Cambridge, Massachusetts. I enrolled in Principles of Organic Chemistry and Principles of Physics – Mechanics, both undergraduate-level courses.

In chemistry, I explored reaction mechanisms and **various chemical techniques**. In physics, I studied vectors and mechanics through **real-world applications**.

As **1 of only 3 high school students**, the experience was both **challenging** and **transformative.** I learned **advanced concepts,** worked in professional labs and gained valuable **hands-on research experience**. This journey reaffirmed my goal of becoming a **scientist** and marked my **first true step toward that dream.**


**TANAV TARLAPALLI 12A**


**AKSHITH CHANDRA 12A**

When I was selected for the AFS STEM Academy in China, I knew it was a **once-in-a-lifetime opportunity**. From July 7th to August 4th, China became my classroom, a blend of **ancient traditions** and **cutting-edge technology**.

Our STEM workshops **focused on sustainability,** where we **designed renewable energy projects** and **green urban cities**, exploring how **innovation shapes daily life.** What inspired me the most was the **cultural diversity,** with minds from across the world **bringing unique perspectives to shared challenges.**

I returned with lasting memories, **a broader understanding of the world** and **lessons that will resonate throughout my life.**

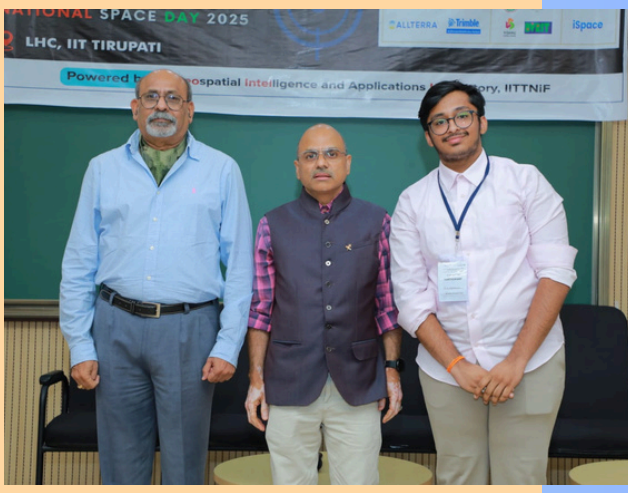
# STEM THROUGH OUR STUDENT'S EYES!

As teammates, **Shaanvi and Dilisha**, we secured first place at this prestigious competition held on August 16-17, 2025, at **IIT Tirupati–competing against more than 500 teams** from across India.
The two-day event, jointly organized by **ISRO-NRSC, IIT Tirupati Navavishkar I-Hub Foundation, Indian Society of Remote Sensing (ISRS) and IN-SPACe** with support from GeoIntelLab, was both **challenging** and **rewarding.** From over 500 initial applications, only 100 teams were shortlisted for Day 1 presentations. On Day 2, just **15 teams advanced to the finals**–and we were **honored to emerge as champions.**

Our project, **PRAYAAS** (**Precision Reconnaissance for Agriculture and Yield using AI and Satellites)**, is a dual-purpose *CubeSat Swarm solution*. It addresses two **challenges we are deeply passionate about**: **space debris removal and AI-powered precision agriculture.** By combining **sustainability** in space exploration with **enhanced agricultural productivity**, we believe PRAYAAS offers a unique path toward **building a better future for both Earth and beyond**.

We are also proud that our fellow innovator, **PVN Yashaswi of grade 12, secured fourth place** with his project **"KRISHI CHAKSHU** - Viksit Bharat's **Third Eye of the AgriTech Revolution."**

What made this journey even more **meaningful** were the **expert lectures and mentoring sessions by ISRO scientists**, IIT Tirupati faculty, and industry leaders. **Sessions on Space Situational Awareness, Remote Sensing Applications** and **hands-on training** with ISRO's Bhuvan platform gave us **valuable real-world context** and **validated the practicality of our solution**. Most importantly, it **inspires us to continue** working on solutions that **strengthen India's agricultural sector** while contributing to **global space sustainability.**






SHAANVI KARRI 11A

RAMIREDDY DILISHA REDDY 11A

# CURIO CITY!

## EXPT 1- MAGIC GRIP

***Materials:***

Ice cube, Table salt, A piece of thread or string, Water

***Procedure:***

Place ice in a bowl and lay the thread across it.
Sprinkle some salt over the thread.
Wait 30 seconds, then gently lift the thread.
The ice lifts along with the thread!

***What happens?***

Salt lowers the melting point of ice. It melts, then refreezes, locking the thread in place like glue!

***Biomimicry:***

It mimics how Arctic fish produce proteins that control freezing and thawing of ice inside their bodies.

## SYNTHETIC ORGAN DESIGNING:

It is a frontier in medicine, biology and engineering, focused on creating artificial organs that mimic the structure and function of the natural organs. This innovation could provide custom-built, transplantable organs for the patients in need

## EXPT 3 - SALT BATTERY

***Materials:***

Copper wire, iron nail, bowl of salt water, LED light.

***Procedure:***

Fill the bowl with salt water, place both metals in (not touching), then connect to the LED.

***What happens?***

Salt water acts as an electrolyte, moving ions between metals to generate a small current, your mini battery!

***Biomimicry:***

Like electric eels use ion channels for current, your setup mimics that ionic flow.

## QUANTUM CRYPTOGRAPHY:

It uses the principles of quantum mechanics to secure communication. Unlike traditional cryptography methods, security is guaranteed by the laws of physics, making it a future-proof approach to cybersecurity.

## EXPT 2- CORAL PAPER

***Materials:***

Paper/cardboard, white crayon, watercolor/food color, salt, water.

***Procedure:***

Draw coral-like patterns with the crayon. Mix salt, water, and colour, brush over, let dry, and watch crystals form!

***What happens?***

Salt crystallizes as water evaporates, while wax resists water, forming “coral reefs.”

***Biomimicry:***

Like real reefs grow in salty seas, your paper “reef” forms with art and chemistry.

## EXPT 4- COIN SPARKLE

***Materials:***

Dirty coins, ½ cup vinegar, 1 tsp salt, bowl.

***Procedure:***

Mix vinegar and salt, drop in coins for 2 minutes, then rinse to see them shine!

***What happens?***

The mix forms a weak acid that dissolves dull copper oxide, revealing shiny metal.

***Biomimicry:***

Like snail mucus enzymes break down shells, acids break down tough layers.

# DEBUNKED

*Myth Busted!*

1

## LIGHTNING NEVER STRIKES THE SAME PLACE TWICE

Lightning is an **electrical discharge** that follows the **path of least resistance to the ground.** Conductive structures like skyscrapers or trees can be **struck by lightning dozens of times each year.** It happens when electrical charges build up between clouds or between a cloud and the ground.
So, the saying **"lightning never strikes the same place twice" is a myth**. The **Empire State Building** alone is struck **20–25 times a year!**

## SWALLOWED CHEWING GUM STAYS IN THE BODY FOR 7 YEARS

2

Swallowed chewing gum **does not stay in your body for 7 years**. While gum is not digestible like regular food, your body **still passes it through the digestive system** and eliminates it, usually within 24-48 hours. Gum contains **synthetic resins, elastomers and waxes** that your body **doesn't usually break down**, that doesn't mean it stays inside. Your digestive system is incredibly efficient at moving things along, **your gut muscles will push the gum through your intestinal tract in a few days time at the most.**

## WORD SEARCH

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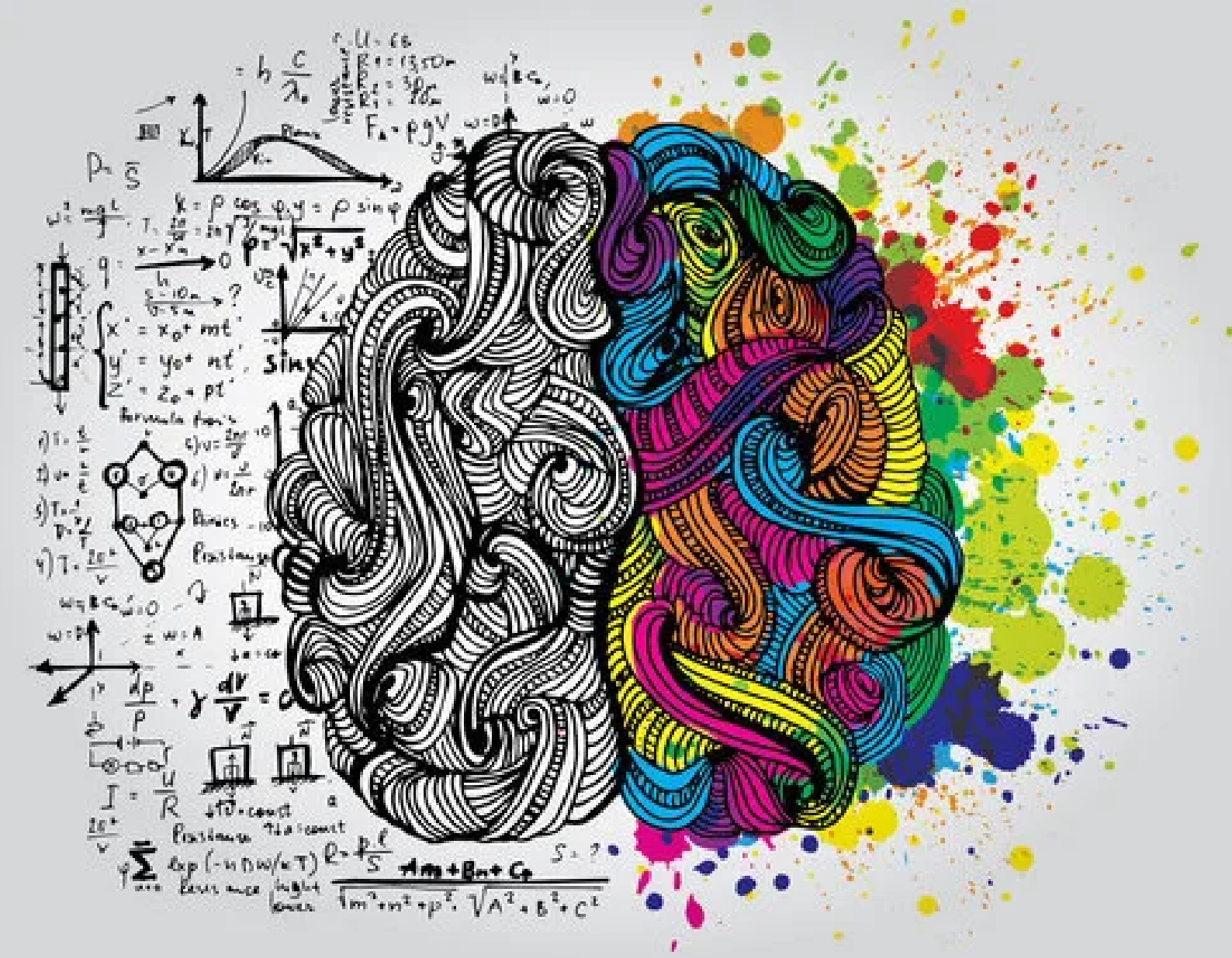
| | |
|---|---|
| THEOREM | PROTOTYPE |
| DESIGN | FUNCTION |
| EQUATION | ENERGY |
| ALGORITHM | GEOMETRY |
| INVENTION | VARIABLE |
| MOLECULE | CELL |
| REACTION | CIRCUIT |
| HYPOTHESIS | DNA |
| GRAVITY | SENSOR |



Here's your sign to stay curious!
Keep up with the latest in STEM as we bring you fresh ideas and discoveries. Until our next issue, never let anything dull your spirit of curiosity, innovation and learning.

"Research is what I'm doing when I don't know what I'm doing." — W.V. Braun


## Brought to you by:

Shaanvi Karri, 11A
Vaibhavi Iyengar, 11A


## Special mention to our teachers

Mrs. Kavitha Kakumanu
Dr. Preet Kaur
(Senior School Coordinator)