




# PHYSIKOS

DEPARTMENT OF PHYSICS

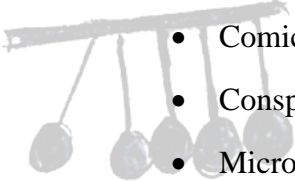


2018-2019

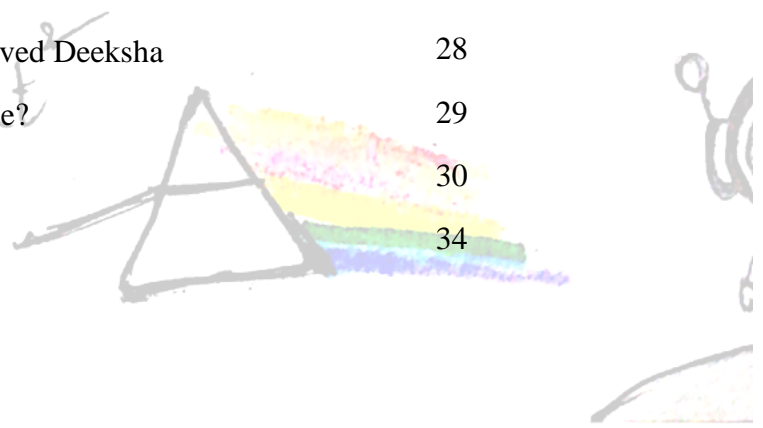


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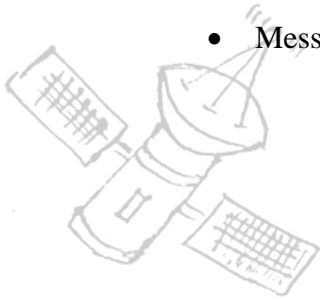
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## THE CREATIVE CORNER

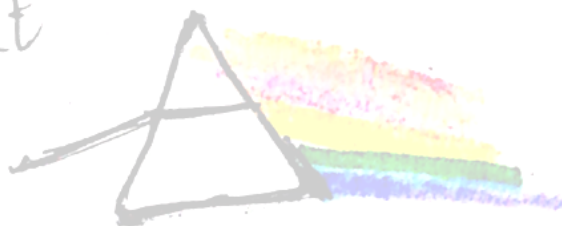
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$$S = ut + \frac{1}{2}at^2$$



## From the Principal's Desk ...



“

It gives me immense pleasure to know that the Department of Physics is releasing its annual magazine Physikos 2018-19.

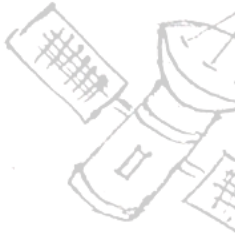
We at Gargi are committed to transform the young ones into wholly developed individuals symbolizing the spirit of enterprise and enquiry. The department of Physics has been performing remarkably well in both academics as well as extra-curricular activities. The department has whole heartedly participated in Scintillations: 2018, the annual science festival and various other departmental accomplishments throughout the year. Such endeavors empower our students with a strong sense of responsibility and well-being.

Ours is a caring community where students' needs are a priority and where traditional Indian and modern Western educational values are respected and encouraged to coexist. The talented and dedicated students and faculty at Gargi have always played a vital role in making Gargi an institution par excellence.

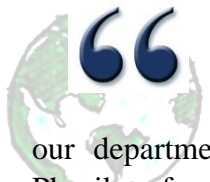
I congratulate the entire editorial team & contributors for the upcoming issue of Physikos and enthusiastically look forward to reading our students' perspective on various issues undertaken.

”

Dr. Promila Kumar  
Principal (Oftg)



## From the desk of the Teacher-in-Charge...



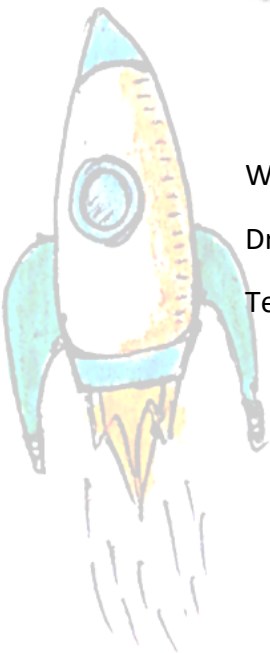
It is my pleasure to welcome the sixth issue of our departmental magazine, Physikos. I congratulate Team Physikos for providing a unique platform to the students for expressing themselves meaningfully through poetry, stories, articles and special features. Indeed, creativity leading to innovative thinking is the first step towards any accomplishment.



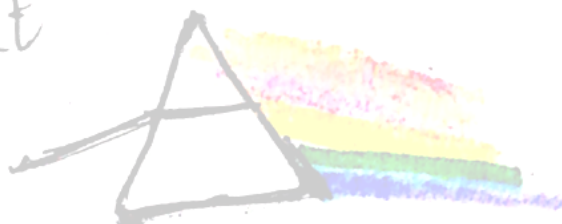
With best wishes,

Dr. Supreeti Das

Teacher-in-Charge, Physics Department



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# Message from the Teacher Convener - Physikos ...

“

Another year with a plethora of events, festivals and competitions has provided a basketful for this year's edition of Physikos. As well as that, this year has been full of joy and excitement as many students took part in these events to display their knowledge, creativity and curiosity. The dedicated team of our magazine has been active throughout the



year in bringing this issue which is a reflection of their sincerity and enthusiasm coupled with learnings such as report writing, content checking, designing, plagiarism checking, team work, patience from inception to the completion. The glimpses of the events, workshops, competitions, science festivals held during the year are displayed within.

The session commenced with the e-

polling for various posts of the union which was welcomed by the students and faculty members as an initiative to promote digital literacy amongst the students. Especially, new students from remote areas were helped by the peers to create their e-mail IDs. Once all the students had a valid e-mail ID, e-polling was done using a Google form.

The union members played an important role in organising a range of activities and events such as cover page designs, which were judged by the teachers of the department. This process helped the students to learn about plagiarism, designing and other traits, as well as be creative at the same time. A poster making competition provided an opportunity to the students for show-casing their talent. Two events were organized under Scintillations, the annual science festival. The Circuit Making completion and Sudoku event also had over-whelming participation.

A summer workshop was organized under DBT Star Scheme in which students attended lectures – cum- hands on sessions on a range of interdisciplinary topics. A talk by Prof. Binay Kumar from the Department of Physics & Astrophysics

was organized on Crystals: Understanding and Beyond, as inaugural talk. The whole department took a pledge towards the Own-A-Mug initiative of our department so as to reduce solid waste with many other environmental benefits. A talk was organized under the DBT Star Scheme by Dr. Atya Kapley from NEERI, Nagpur on "Waste water remediation" which was attended by faculty members and students from all the science departments. A drive for e-waste collection and awareness was also organized.

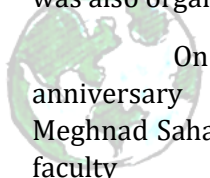
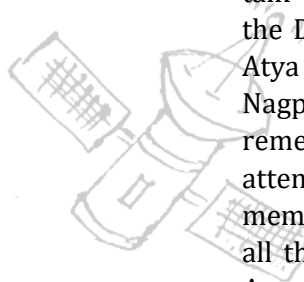
On 125<sup>th</sup> birth anniversary of Prof. Meghnad Saha, students and faculty members participated in seminars and participated in the poster making competition. It provided a unique opportunity for students to appreciate the remarkable contributions done by the legendary scientist of Indian Science. An image of the iconic furnace on which Prof. Saha had worked on for his world famous Ionization Formula, from Allahabad University has been included in this issue. On the birth anniversary of legendary Stephen Hawking, a lecture was organized "Remembering Stephen Hawking" by one of his students, Prof. Daksh Lohiya, a former Professor at Department of Physics & Astrophysics, University of Delhi. The life of Professor

Hawking will be ever inspiring for generations to come. This year also provided us another opportunity to celebrate the life of three geniuses of Indian Science: Prof. S. N. Bose, Prof. C.V. Raman and Prof. Meghnad Saha. A film screening- Quiz-Talk on Quantum Indians was organized under aegis of DBT Star Scheme. The session by esteemed Prof. P.K. Ahluwalia, a former Professor from Shimla University, HPU was attended enthusiastically by the faculty members and students. Many students and faculty members also visited Institutes such as Inter University Accelerator Centre and Nehru Planetarium.

We are thankful to Ms. Sakshi Kakkar and Ms. Arshia Ruina, who are our proud Alumni from batches 2013 and 2015. We can't thank them enough for the readiness to share their experiences and journey after Gargi. I am sure many students will be benefitted.

Hearty congratulations to all the winners of academic, sports, cultural events, societies and volunteers working for various NGOs. We are proud of you all!

The seeds of budding researchers are sown at the undergraduate level. The joy of doing science and research at UG level paves way for many students to



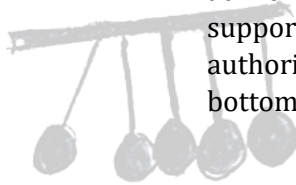
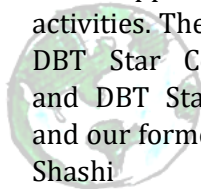
pursue Science at higher levels. Many students completed projects on a range of topics such as Material Sciences, Computational Physics, Interfacing of Physics Experiments and many more. Kudos to all of them.



We are thankful to our laboratory staff for their dedicated efforts. The Ph.D. students are also integral part of the department.



We thank our Principal Dr. Promila Kumar for her ever encouragement and support for all our activities. The support of the DBT Star College Scheme and DBT Star Co-ordinator and our former Principal, Dr. Shashi Tyagi is commendable. We acknowledge various other supports from the college authorities thank from the bottom of the heart.



**“Science is beautiful when it makes simple explanations of phenomena or connections between**



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**different observations “  
by Stephen Hawking**

We will look forward for the feedback and comments for improvement.

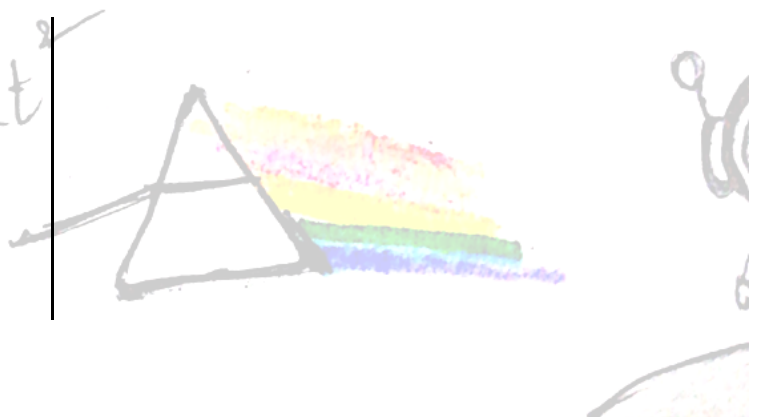
”

**Vandna Luthra**

**Co-ordinator - Physics Society**

**Teacher Editor- Physikos**

**Physics-Co-ordinator -  
Star College Scheme, Gargi College**





# D'INVESTI- TURE

## -The Inaugural Lecture



“Crystals are the living beings at the beginning of creation”. Quasar, the Physics Department of Gargi College organised a lecture on the topic: “Crystals – understanding and applications” on 12<sup>th</sup> September 2018. The lecture was delivered by Prof. Binay Kumar (Department of Physics and Astrophysics, Delhi University). The inaugural lecture convened at 12:30 pm with kindling of the lamp by our guest and all



Oath taking for the promotion of Own-a-Mug (Ongoing activity of the Physics Department)

the department teachers. He was felicitated by presenting a potted plant. The lecture aided students to grasp ineffable knowledge about crystals and their development. He delivered a commendable lecture which deeply appealed to the students. Many inquisitive questions were raised by students. Finally, the lecture came to an end, with the atmosphere besieged by an essence of learning. The faculty members and students took an oath to reduce the solid waste and promote Own-a-Mug initiative of the department by using their own mugs.



# PAINT THE SKY!

## -Poster Making Competition



The Physics Department of Gargi College organised a poster making competition on 28<sup>th</sup> September 2018 in the Physics Lab. The competition commenced at 12:30 pm. The programme was organised by the Students' Union of Physics Department and the Quasar team. The prompts for the

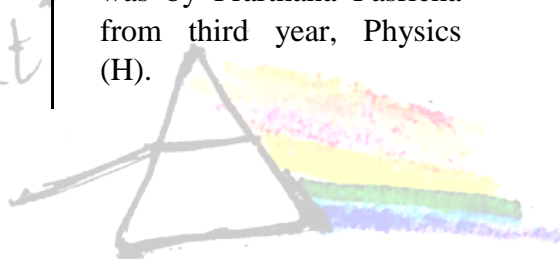


competition were quite interesting being-“If there was no gravity the world would look like”, “If you were an alien”, “Your favourite Physics phenomenon”. Many students from vivid streams including physics participated in the competition.

With broad smiles on their faces tacit of their enthusiasm, they drew their creativity on the sheets. Everyone painted their



artistic skills so well, that it was quite difficult to choose the winner. However the best portrayal was by Prarthana Pasricha from third year, Physics (H).





Finally the event was brought to an end with a group picture of the participants



he might be that genius with the robotic voice.

On January 11<sup>th</sup>, 2019 Prof. Daksh Lohiya, a member of Clare Hall, Cambridge and a student of Stephen Hawking, delivered a lecture in which he reminisced “When I met him for his 75<sup>th</sup> birthday, he seemed frail. There was a sense of urgency”.

“I will miss Stephen. His passing fills me with sadness.”

Prof. Lohiya went on to be Professor Hawking’s student at Cambridge from 1978 to 1982. Prof. Lohiya mentioned him as a ruthless examiner! He exclaimed that Professor Hawking grilled him for 11 hours on his PhD thesis —with two breaks.

It was a guru-shishya parampara that continued over the years.

He recalled Hawking’s visit



Stephen Hawking was the physicist who made his name with theories on black holes and relativity, but his personality was a spectrum for many people. Growing up, some might have known him best from ‘The Simpsons’. While to some



to India and how he managed his stay here. From disabled friendly toilets to ramps for his visit to Qutub Minar and Jantar Mantar, everything was arranged overnight.

Prof. Stephen was the man with strong will power, who instead of being confined to a wheelchair, took a flight that gave him a taste of the weightlessness of space. In a moving tribute to his teacher, interspersed with laughter and sadness, Prof. Lohiya also spoke of the man as a human with a brilliant mind.

## One Day Seminar on “Life and Works of Prof. M.N. Saha and Prof. S.N. Bose”

(September 15, 2018)

NASI in collaboration with IIIT Noida organised a one day seminar to honour great Indian scientists Prof. Saha and Prof. Bose to remind us

of their works. A series of lectures by some notable personalities including Prof. Ajoy Ghatak, Prof. Banerjee, Prof. Anirban Pathak were organised which gave the audience an insight into how these two Indian scientists contributed to the development of science in India in the past and made the nation proud.

Priyanka, Prarthana Pasricha, Tejaswi, Rupal and Prarthana Sharma, students of B.Sc Physics (H), third year, attended the lecture and also participated in poster making competition in which various UG and PG students participated. Our student Prarthana Pasricha bagged the first position there.

Not only our students enjoyed the lecture but got an opportunity to personally meet Prof M.N Saha’s daughter as well.



# Speak your heart in verses

## -Poetry Competition



“Light of my heavens  
Both particle and a wave,  
You illuminate”



The Department of Physics organized a poetry recitation competition in the month of November. Beauty is the realm of poetry; the audience enjoy the beauty of expression, thoughts, feeling, rhythm and music of the words. To recognize the talent of inducing metaphors and similes, the physics department gave an opportunity to the students of different courses to exhibit their talent and confidence, in the poetry recitation competition. A creative choice of topics like “College life”, “A strange conversation” etc. were given to the participants.



The final judgement was made by Mr. Munish and Dr. Deepti Lehri. Neha Sharma bagged the first position followed by Prarthana Sharma, Jahnabi and Deepa. Beside this, Dr. Deepti filled the air with rhyme by reciting her beautiful poetry.



# Prof. M.N.Saha: World famous for his ionization formula



Prof. MEGHNAD SAHA would always be remembered with the theory of thermal ionization and its application to the interpretation of stellar spectra. The theory had all the simplicity and inimitableness which usually characterize a fundamental and epochal contribution which came out of the thermodynamical laws and kinetic theory of gases. Apart from astrophysics, the theory later found numerous other important applications, such as, to mention some of them, in the study of the ionosphere, conductivity of flames, electric arcs and explosion phenol. He also worked on stellar spectra, thermal ionization, selective radiation pressure, spectroscopy, molecular dissociation, and

propagation of radio waves in the ionosphere, solar corona, radio emission from the sun, beta radioactivity, and the age of the rocks. Besides physics he took a keen interest, at times almost bordering on the professional, in ancient history and archaeology. He was a devoted and inspiring teacher, and he gave his time generously to his students. He organized active schools of research at Allahabad and Calcutta; and in establishing the Institute of Nuclear Physics at Calcutta, in building the laboratories of the Indian Association for the Cultivation of Science, and in founding academies of sciences in India, his role throughout was of the utmost importance.



Source: [www.saha.ac.in](http://www.saha.ac.in)



Prof. Saha's furnace at Allahabad University.

Image courtesy: Dr. Vandna Luthra taken from Allahabad University while attending National Seminar on 125<sup>th</sup> Birth Anniversary of Prof. Meghnad Saha" by National Academy of Science, India in October 2018.

technology of tomorrow"- Edward Teller.

To celebrate the same, the Science departments of Gargi College held their two day annual science fest beautifully penned down with the name- SCINTILLATIONS on 6th



and 7th March 2019. A number of creative events were organised by all the branches of science departments along with the department of mathematics. A great show was put up by the Physics department as well. The Physics department organised a Circuit Making competition in which Shivani Gangwar ,Priyanka and Jahnabi all from Physics (H) 3rd year bagged the first, second and the third position respectively. Sudoku, the

## Scintillations of a diamond-hard light....



"The Science of today is the



logic-based, combinatorial number-placement puzzle

solving competition was yet another interesting event organised by our department in which Rabina (BSc Maths (H) 3rd year), Akshita Somani (BSc Microbiology (H)) and Preeti (Physical Sciences) were the winners.

## The Quantum Indians- A film screening - Talk-Quiz



As the title suggests, the Department of Physics of Gargi College had an opportunity to organize a lecture cum movie screening event named THE QUANTUM INDIANS. This event was accomplished with a huge success due to the presence of the Chief Guest Prof. Ahluwalia, a former Professor in Physics from the Himachal Pradesh University. Based on the

screening of the movie, the esteemed Professor presented a thorough highlight on the lives of the three Indian pioneers in Physics: Prof Satyendranath Bose, Prof. Meghnad Saha and Prof. Chandrasekhar Venkataraman. It was then followed by a Quiz session which was based on their scientific works and ideologies.



The lecture also included some information on hidden spectrum of the personal lives and ideologies of the three legendary scientists, the hardships they had to conquer in order to shake the whole world with their scientific discoveries and the way they dedicated their lives to make science available for the common Indians. The lecture session was really inspiring and it was amazing to know how we, the students and all the

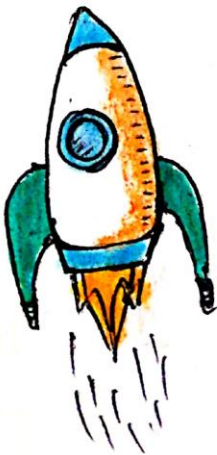


young scientists of present India should be grateful to our pioneers

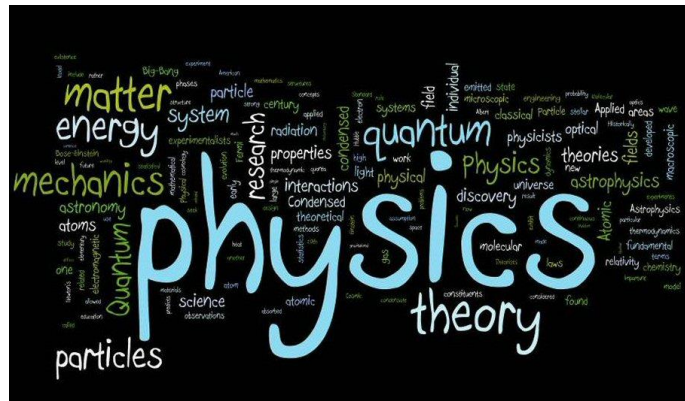
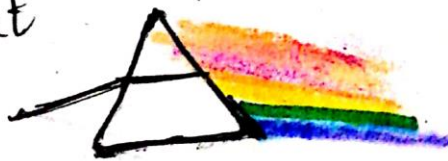


# The Creative Corner

Doodle by Tejasvi Sharolia (Physics (H) 3<sup>rd</sup> Year)



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Source

[https://d4fcp1q4cnzm9.cloudfront.net/post\\_headers/d0/bc/x1500\\_d0bcdb6764b00b96.jpg](https://d4fcp1q4cnzm9.cloudfront.net/post_headers/d0/bc/x1500_d0bcdb6764b00b96.jpg)

.....because physics is nothing but a creative endeavour!

# Comic Times of India

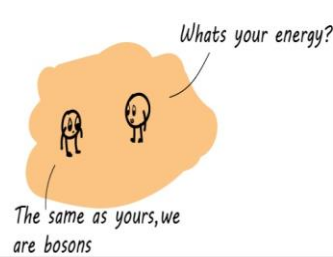
BY ANADI AND PRARTHANA PASRICHA

## SI BOSE'S WORK - BOSE EINSTEIN CONDENSATE

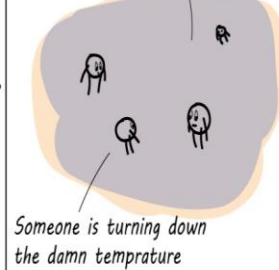
In a gas each atom has energy and can move freely



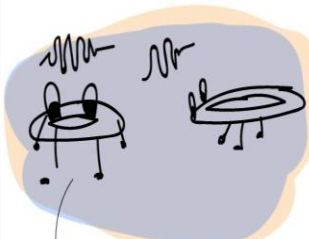
When atoms are bosons, they have the same energy at the same time



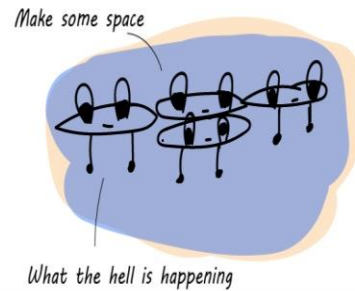
When gas cools down atoms slow down  
Why are we moving in slow motion?



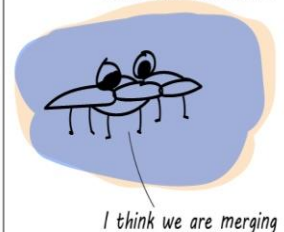
Because of Quantum nature atoms start behaving like waves



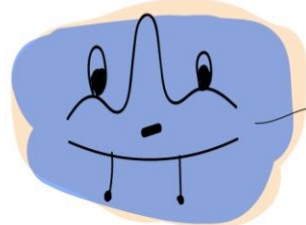
Size of wave becomes larger than distance between them as temperature goes down



At very low temperature: All bosons have same quantum state  
What have we become

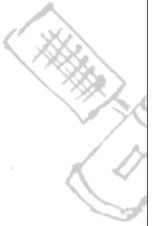


Meet the Bose-Einstein condensate



I never wanted this  
But someone kept lowering the temperature

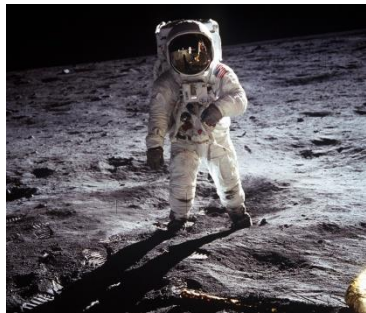
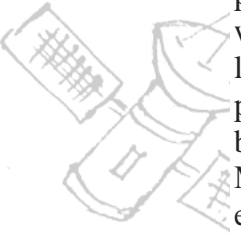
$$S = ut + \frac{1}{2}at^2$$



# Conspiracy Theories



1. Photographs of the Apollo Moon landing (20th July, 1969) were faked by NASA in a TV studio. Conspiracy theorists have produced evidence such as a wrong sort of shadow and a lack of stars in the photographs, which were to be supposedly taken on the Moon's surface. They have even suggested that some of the astronauts were killed as a part of a cover up.



Source: [https://upload.wikimedia.org/wikipedia/commons/9/9c/Aldrin\\_Apollo\\_11.jpg](https://upload.wikimedia.org/wikipedia/commons/9/9c/Aldrin_Apollo_11.jpg)



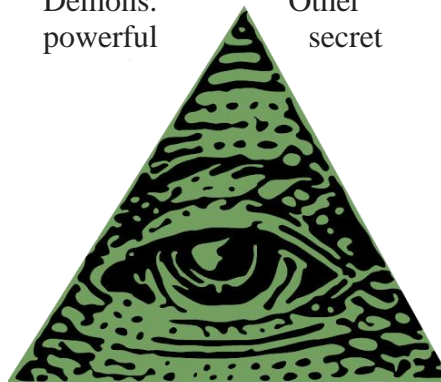
2. Aliens from other planets have crashed on Earth at Roswell, New Mexico. Their bodies and spacecraft have been secretly examined in a place in Nevada, USA, known as Area 51 and the US government has acquired advanced weapons



Source: [https://live.staticflickr.com/1674/24867637362\\_20086c0f35\\_b.jpg](https://live.staticflickr.com/1674/24867637362_20086c0f35_b.jpg)

and space technology from them

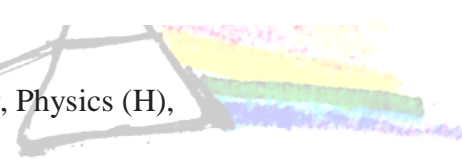
3. A secret society called the Illuminati controls the world. This shadowy organisation features in Dan Brown's novel *Angels and Demons*. Other powerful secret societies, including Opus Dei and the Priory of Sion, features in his bestselling *The Da Vinci Code*.



Source: [https://upload.wikimedia.org/wikipedia/commons/d/d5/Mlg\\_illuminati.png](https://upload.wikimedia.org/wikipedia/commons/d/d5/Mlg_illuminati.png)

societies, including Opus Dei and the Priory of Sion, features in his bestselling *The Da Vinci Code*.

By Reha, First Year, Physics (H),



## Microchip Implants: Is it the next future trend?



Implants for humans are not something very new. We've seen them in the form of pacemakers etc.



Recently, microchip implants were embedded inside the human body, for the purpose of lifetime unique identifiers. This means you can unlock your door's lock, Bitcoin account or your car or your bank's pin simply with the chip embedded in your hand. **NO KEYS REQUIRED!**



A human microchip implant is an IC device or radio frequency identification transponder encased in a silicate glass, usually size of a rice grain. It contains a 16 digit identification number that can be linked to information contained in an external database like personal ID, medical history, medications, and contact information etc.



Pros:

1. Easy identification
2. Institutional membership and access control
3. Easy tracking of person
4. Tracking of biological system inside us
5. No worry to loose cards
6. Ability to automatically



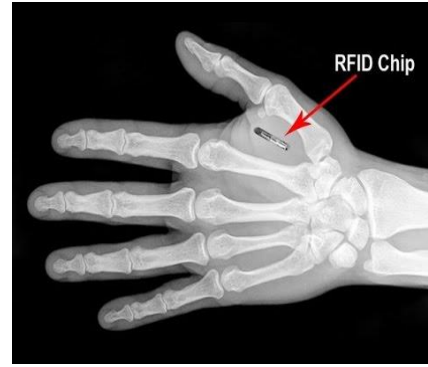
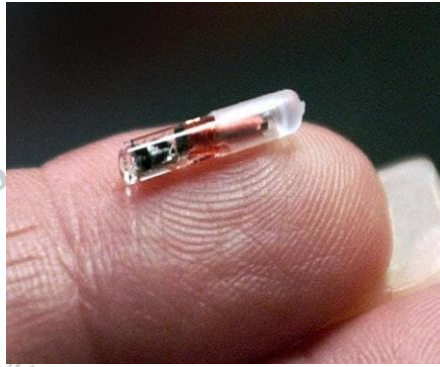
control many devices

Cons:

1. Possible health risks
2. Privacy and consent related issues
3. Chips can get hacked

Final thought: The future of microchips look exciting, with the likelihood of many interesting potential applications which can become common. With growth and development in nanotechnology and solid states physics, one can expect microchips being implanted in the human body for locating and tracking person, controlling human biological functions etc. But there are questions which are yet to be answered. For instance, what does it mean for technology to be embedded beneath the skin in a perfectly healthy human for purpose of easy identification? Is an implant for nonmedical purposes a basic breach of human rights? What happens if the chip gets intertwined with the tissue? How will we know if our chips are being hacked? These questions need to be answered.





**By Prarthana Pasricha**  
**Physics (H) Third Year**  
**Sources: Electronics for you**



## CPT SYMMETRY AND WU'S EXPERIMENT

WHAT IS CPT SYMMETRY?

In particle physics, there are three major symmetries that were always expected to be hold by all the particle interactions: charge(C), parity(P) and time(T) symmetry.

Charge symmetry means the interactions are unaffected if all the charges are swapped; i.e., nature treat indifferent to both the charges. Parity symmetry means laws of physics are indifferent to left or right

handedness. To visualize this we can take a mirror held up to a system having some interactions within it. In the mirror z direction of the coordinate is reversed. According to this symmetry, the laws of physics should work the same way in the mirror world as they do in the real world. This suggests that there is no experiment we can do that would tell us whether we are in the mirror world or in the real one. These two symmetries are a part of a larger symmetry called CP (charge parity) symmetry.

The time symmetry implies that the interactions of fundamental particles should be unable to tell the difference between going forwards and backwards in time; i.e. we should not be



able to tell whether the interaction is taking place in forward or in reverse direction. This symmetry is also a part of greater symmetry called combined CPT symmetry.

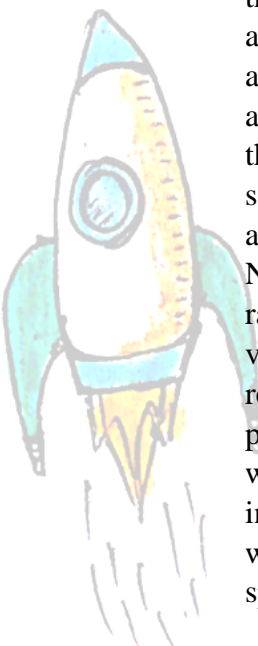
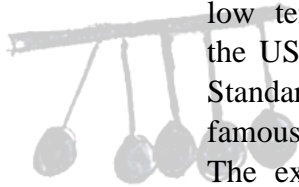
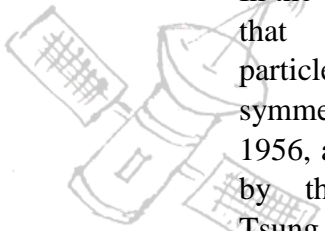
#### WU'S EXPERIMENT:

In the 1950's it was thought that all fundamental particles obey these symmetries. But then in 1956, a review and analysis by theoretical physicists Tsung Dao Lee and Chen Ning Yang claimed that parity conservation was yet to be verified for weak force of particles. Based on this analysis, in the same year, Chinese American physicist Chien Shiung Wu in collaboration with the low temperature group of the US National Bureau of Standards conducted the famous Wu Experiment.

The experiment monitored the decay of cobalt-60 atoms, cooled to near absolute zero temperature and aligned the nuclei with their spin pointing in the same direction by applying a uniform magnetic field. Now, cobalt-60 is radioactive and it decays via the weak nuclear force releasing a beta particle/electron. So the aim was to monitor the direction in which these electrons were emitted relative to the spin of the cobalt-60 nuclei.

To visualize how this would work under parity symmetry let us take the mirror image version of this experiment. Here let the direction of z-axis to be reversed but direction of nuclear spin is not as the spin movement is along x-y co-ordinate only. That means the spins of real and mirror nuclei are aligned. If the parity symmetry is respected, the electrons emitted from the nuclei should be equally likely to go in positive and negative z direction; i.e., a 50-50 situation. That way both the normal and mirror experiment would give the same results.

But what professor Wu's team saw was this: the electrons were emitted from the nuclei in one direction preferentially. They were predominantly emitting in opposite nuclear spin (say +ve z direction). So in the mirror version electrons should also have to fly off in the mirror +ve z direction. That would imply that electrons will be emitted in the mirror world in the same direction as nuclear spin (as the spin is not reversed in the mirror world). But how would that make any sense? If the electrons go in one way we would know we are in the real world and if they go in the other way we are in the mirror world. It would

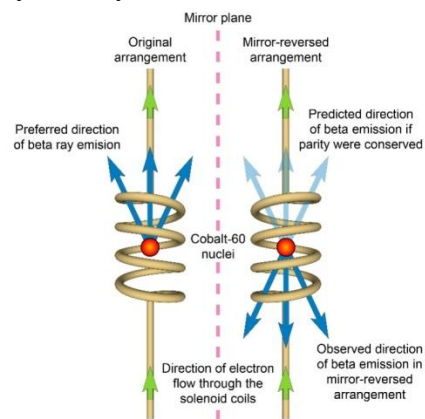


allow us to determine whether we were in the mirror world or in the real one; like the spinning top from 'Inception' did!

This destroyed a basic assumption of theoretical physics-the parity symmetry that had been around for decades. But if we consider the CP symmetry combined, i.e., swapping the particles with antiparticles or swapping the charges with their opposite ones and flipping the axis, then the symmetry would be restored for weak force. So the physicists made a workaround- maybe it was okay for weak force to break parity symmetry, because it is not a real symmetry of the universe but a part of the CP symmetry.

But in 1964 it was found that some particles can also violate combined CP symmetry. Since two fundamental laws were already broken, scientists retreated behind the last set of defense- the combined CPT symmetry. They made this work around that some particles may break all the other symmetries but not the combined CPT together. There is no experiment been found till date that would violate this law, but we cannot say that CPT is the ultimate unbreakable theory. Maybe someday

some scientist would come up with a result of violation of this grand theory too. But if CPT is violated, we would have to rewrite a lot of important laws of modern physics like special relativity and quantum field theory since they were all established on the CPT symmetry.



JAHNABI HAZARIKA  
Physics (H), Third Year.

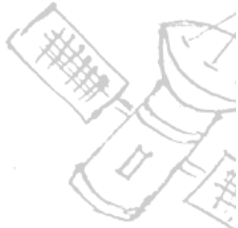
Sources:

[https://en.m.wikipedia.org/wiki/Wu\\_experiment](https://en.m.wikipedia.org/wiki/Wu_experiment)  
<https://youtu.be/yArprk0q9eE>: "This Particle Breaks Time Symmetry" video by Veritasium

## OPUSCULUM



With my left hand  
underneath my chin,  
My elbow residing on the  
corner table of the physics  
lab,  
My retina projected  
everything rushing past me,  
Just as those roads in the  
movies in Bombay's map.  
My brain incessantly mused,  
Why 0 is 0 and 1 is 1,  
Why 0 is not 1 and 1 is not 0?  
I sat impeccably baffled and  
confused.  
Why only A as A and B as B,  
the English alphabets used?  
Strange.



The invention of alphabets by  
Phoenicians,  
The falling of an apple  
reproducing the Law of  
Gravitation,  
The progression from mere  
symbols to opusculum.



How the tungsten filament  
could glow a bulb,  
How the woofer and speaker  
transformed any place into a  
pub.



The instruments, musical or  
surgical,  
were no less than a miracle.  
From mere leaves, how we  
spurred into these clothes,  
How water wasn't any  
normal liquid, but  $H_2O$ .  
Strange.



The existence of nowhere  
called infinity,  
Sinking of the rockets and  
satellites into earth's vicinity.  
Imagination beyond dreams,  
thoughts beyond facts  
And ideas beyond the brain,  
Besieged by - if and whether,  
Galileo, Einstein, Newton,  
Stephen, Tesla, Marie  
And many are the inventors,



Of this 7 lettered word  
PHYSICS.

Whispering into my ears,  
"Don't fathom, there's even a  
limit"

Then suddenly with a click  
of someone's fingers,  
My pupils enlarged and I  
realized that since long in my  
thoughts I lingered.

To my left, a face stared at  
me,

I was asked, since an hour,  
Why was I sitting free?

Imagination and thoughts  
ma'am

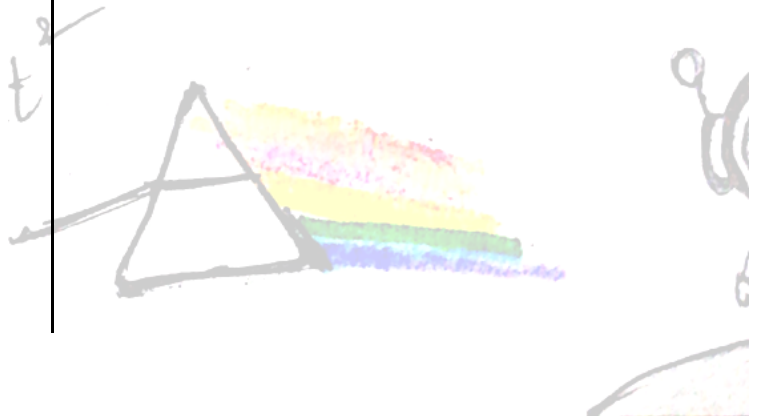
I wanted to say...

but I ended up saying  
"Sorry!"

Kashish Bhatia

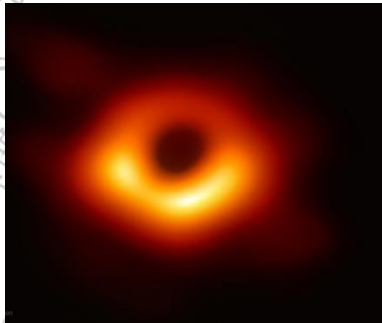
First Year,

Physics (H).





# FIRST IMAGE OF COSMIC SINKHOLE REVEALED



Source  
[https://lh3.googleusercontent.com/2U0tGvMQDIEgzUVMCeliP3wq\\_jygSnv8YM4q11RKC19AVt5hm6sdc93L](https://lh3.googleusercontent.com/2U0tGvMQDIEgzUVMCeliP3wq_jygSnv8YM4q11RKC19AVt5hm6sdc93L)

On 10th April, 2019 scientists revealed the first direct image of a black hole. Now, what is a black hole? A black hole is a cosmic trapdoor from which neither light nor matter can escape. Despite the name, they are not empty but instead consist of a huge amount of matter packed densely into a small area, giving it an immense gravitational pull. There is a region of space beyond the black hole called the event horizon, also known as the "point of no return", beyond which it is impossible to escape the gravitational effects of the black hole.

The black hole itself is invisible. But the latest observations take

astronomers right to its threshold for the first time, illuminating the event horizon beyond which all known physical laws collapse. The breakthrough image was captured by the Event Horizon Telescope (EHT), a network of eight radio telescopes spanning locations from Antarctica to Spain and Chile, in an effort involving more than 200 scientists.

The cosmic sinkhole measures 40 billion km across, which is about three million times the size of the Earth. It had been described by scientists as a "monster". The black hole is 500 million trillion km away. Prof. Heino Falcke, of Radboud University in the Netherlands, who proposed the experiment, stated that the black hole was found in a distant galaxy called M87. According to Prof Heino Falcke it has a mass 6.5 billion times that of the Sun. It is one of the heaviest black holes that the scientists think exists.

He described the image of black hole as an intensely bright "ring of fire" surrounding a perfectly circular dark hole. The bright halo is caused due to superheated gas falling into the hole.

Black holes were first predicted by Einstein's theory of relativity – although Einstein himself was sceptical that they actually existed. Since then, astronomers have

been constantly researching and have accumulated overwhelming evidence that black holes actually exist. But these are extremely small, dark and distant objects that observing them directly requires a telescope with a very high resolution. However, the EHT achieved this, which was once thought to be an insurmountable challenge, by combining data from eight of the world's leading radio observatories, including the Atacama Large Millimetre Array (Alma) in Chile and the South Pole Telescope, and creating an effective telescope. The collaboration is still working on producing an image of the Milky Way's black hole.

Prof Heino Falcke said, "You've been thinking about this for 20 years and now you finally see it and it looks like in your dreams."

Preetisha Goswami,  
First Year,  
Physics (H).

Sources:

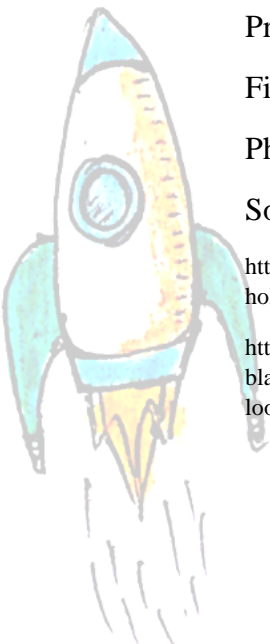
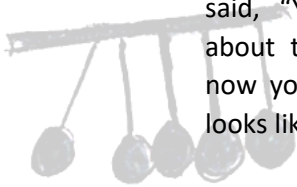
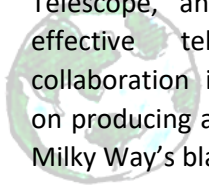
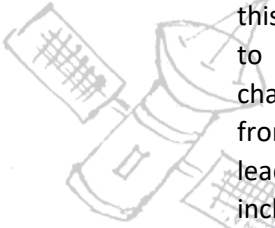
<https://www.sciencealert.com/black-holes>

<https://www.cnet.com/news/first-black-hole-picture-a-breakthrough-look-from-across-the-universe/>

## DECEPTION

Appearances are deceptive

In the mid 80s there lived a scientist in the midst of a forest, near the frontiers of India and Nepal in the former's land. He had transformed a deserted army camp into his lab. Since a year he had been residing there. Before that he was ousted from his place in Kochi, Delhi and Ahmedabad. He was a strange and shady personality, short and stout, his scalp was overshadowed by grey curls, his eyes always appeared swollen with nerves busted in there. Wherever he went people used to consider him a psychopath due to his astonishing looks and life treated him badly. One day, as usual he was working on his research project, suddenly he felt someone's presence around. He immediately got up to check who was there. Then a cat meowed from behind. But the cat wasn't alone. A four year old little girl held it in her arms. He rushed to her and sternly questioned her about who she was and where did she live. But the girl didn't seem to know anything. Instead, she laughed at the old man, finding his expressions and gestures quite amusing. Now this science geek was baffled and taking the girl along with him, he searched for her parents in the forest. But there was no one to be found, so he took the girl to his lab



$$s = ut + \frac{1}{2}at^2$$

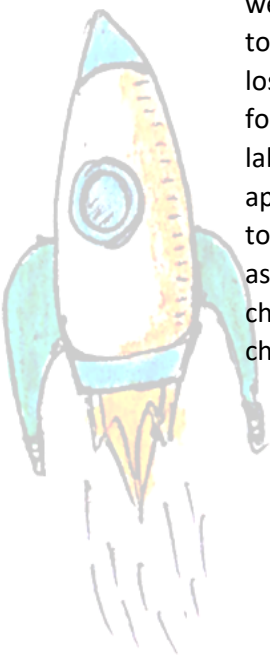
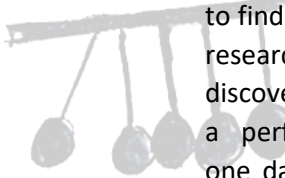
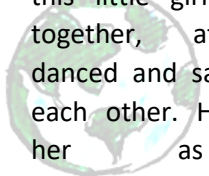
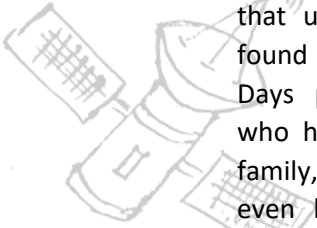


and gave her some supper to satisfy her appetite. While she ate the food he mused that how could the girl laugh on seeing him, the man from whom everybody else struck aghast. This little girl talked to her cat in such an innocent manner that he couldn't think of hurting her. So he thought that until her parents were found he would tend her. Days passed.. This scientist who had lost everything, his family, his home, his respect, even his sleep was coming back to life. He had become the mother and the father for this little girl. They played together, ate together, danced and sang along with each other. He had named her as Chutki. Even Chutki loved him immensely. Now he was able to find new dimensions for his research and was nearing his discovery. Chutki and he were a perfect family. However, one day while Chutki and he were playing hide and seek, to his amazement Chutki got lost. She was nowhere to be found. He sat weeping in the lab when he heard footsteps approaching. He rushed out to see if Chutki was there, and astonishingly a bullet chiselled straight into his chest. His body was

surrounded by the policemen who mentioned him as a kidnapper. Chutki shrieked and cried seeing her father's body on the ground. She got out of the shackles of one of the policeman's arms and the last words she heard were "I LOVE YOU CHUTKI" from her father's mouth. Later on researching past his documents the police realised that he wasn't any criminal but a scientist who was researching on making hygienic sanitary napkins for women. A genuinely great discoverer, Ramakrishna, who had completed 90 percent of his research work and wished to contribute towards sanitation, was murdered. Their hands were stained and their uniform blotted with his blood. While Chutki got back to her original parents, she never mentioned them as her Mamma Papa...How could she even?

This story reveals that nobody should be judged by one's appearance. Appearances are often deceptive.

-Kashish Bhatia  
1st year  
Physics (H)

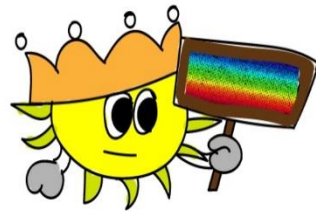


$$s = ut + \frac{1}{2}at^2$$



# Fun With FIZIKS!

Meghnad Saha's best-known work concerned the thermal ionisation of elements, and it led him to formulate what is known as the Saha equation. This equation is one of the basic tools for interpretation of the spectra of stars in astrophysics



Why is he showing his spectrum  
What is he trying to say



Use the Saha Equation  
to interpret



By studying the spectra of various stars, one can find their temperature and from that using Saha's equation, determine the ionisation state of the various elements making up the star.

BY PRARTHANA AND ANADI



## I'll never yell!



My dignity, my tears must last

That is what I ask.

That is what I ask!



In nature killing, bomb blast,

You must be happy,

But the joy doesn't long last.

Leaving all this behind,

You are now approaching me

Wanna kill me, crush me

Not letting me free?

Is this the Earth for which many dignitaries fight?

Is this the Earth for which Superheroes show their might?

If yes, then o' my mumma!

I have no interest, in this creepy aroma.

From now on, I'll never yell

To be born, And breathe in this hell...

-Rishu Jakhar

First Year,

Phy (H)

## In the memory of our beloved Deeksha....

### नामौजूदगी तेरी

अजनबी सफर , दिल्ली शहर  
,कॉलेज की चार दीवारी,  
मे अंजान सी मिली थी ..

बचपन साथ तो नहीं गुजरा था,  
पर पुरानी जींस सी लगी थी  
नजर से नजर मिलते ही, दिल की  
धड़कनों तक बह चली थी  
बस चंद पलों की मुलाकात मे ही,  
ज़िंदगी का जरूरी हिस्साब न गई  
थी

तुम साथ थी तो ,कभी-कभी वजह  
बेवजह मुस्कुरा भी लेते थे  
कुछ टूट अटूट, वादे कर और करा  
भी लेते थे

कुछ कहे अनकहे किस्से सुन, और  
सुना भी लेते थे

सुबह का नाश्ता तो नहीं, पर  
दोपहर का लंच मिल बाँट के खा  
भी लेते थे

ज्यादा तो नहीं पर इस तरह ,मिल  
बाँट के दिन बिता भी लेते थे  
फिर नजाने क्यो तुम ,चुपचाप  
रहने लगी थी

सब कुछ कहते हुये भी, तुम्हारी  
बातें अनकही सी लगने लगी थी  
कुछ तो बता सकती थी ,मैं तुमसे  
इतनी बेखबर भी नहीं थी

दुआ कर मेरे लिए सब सही हो,  
 अचानक ऐसे क्यों कहने लगी थी  
 आखिरी बार तो मैं तुमसे ,अच्छे से  
 मिली भी नहीं थी  
 तुम्हारी यादें तो ,तुम्हारी तरह ही  
 बहुत ही खूबसूरत है  
 तुम्हारी सूरत तो दिल में ,तुम्हारे  
 साथे की तरह दिल में बसी है  
 व्हात्सप्प इंस्टा एफ़बी से लेकर,  
 फोन की गैलरी तक बसतू ही  
 दिखती है  
 काश कहीं से आज ओ फिरसे, कुछ  
 किस्से सुना जाओ  
 साथ मिलके कुछ उल्टी सीधी  
 फोटो, खींच और खिचा जाओ  
 पास आकर इन उदास होठों पर  
 ,फिर से मुस्कान बिखेर जाओ...

-Deepa,  
 Third Year,  
 Physics (H).

## Isn't it too early to leave?

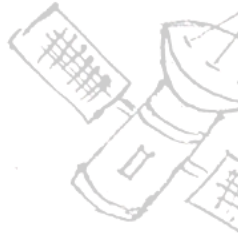
Last thing I remember is:  
 your smiling face,  
 Standing in the lab, asking  
 for help in some  
 experiment,  
 But what I couldn't see was,  
 the pain you were  
 suffering.  
 Standing empty stomach  
 but saying 'I'm fine'.  
 I wish I could have known  
 earlier,  
 At least I would have  
 brought you lunch,  
 I never asked 'How are you  
 doing?'  
 You will leave us forever  
 was the last thing that I  
 could ever imagined  
 Our college farewell is in a  
 few days...  
 But our group photo is  
 incomplete without you  
 ,Deeksha.

Maybe this is life.  
 You will always remain in  
 our memories and in our  
 hearts.

-Rupal Chauhan

Physics (H)

Third year



et



## Students' Achievements

S. No.	Name	Batch	Achievements
1	Ayushi Saxena	2016-2019	<ul style="list-style-type: none"> <li>❖ Quasar President</li> <li>❖ NCC member</li> <li>❖ CATC camp in NCC.</li> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
2	Himani Sharma	2016-2019	<ul style="list-style-type: none"> <li>❖ Ek Bharat Shresth Bharat National camp with Sikkim and Calcutta Directorate</li> <li>❖ Project in material science with Dr. Alka Garg.</li> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
3	Mahima Rathi	2016-2019	<ul style="list-style-type: none"> <li>❖ CATC camp in NCC.</li> <li>❖ Secured first position in the Physics quiz competition.</li> </ul>
4	Pratibha Singh	2016-2019	<ul style="list-style-type: none"> <li>❖ In college volley ball team</li> <li>❖ Gold medal at Bits Pilani BOSM2018.</li> <li>❖ Silver medal in relay race 4×400m at sports day</li> <li>❖ Gold medal at IIIT, Noida</li> </ul>
5	Prarthana Sharma	2016-2019	<ul style="list-style-type: none"> <li>❖ Secured second position in poetry competition.</li> <li>❖ Project on Density Functional Theory with Dr. Archana.</li> </ul>
6	Sangeeta Yadav	2016-2019	<ul style="list-style-type: none"> <li>• Gold medal in Kho-Kho against Commerce Dept. in Gargi Olympiad , 2018.</li> <li>• Gold medal in Kho-Kho against Arts Dept. in Gargi Olympiad , 2018.</li> <li>• Project on Density Functional Theory with Dr. Archana.</li> </ul>
7	Neha Sharma	2016-2019	<ul style="list-style-type: none"> <li>❖ Secured first position in poetry competition</li> <li>❖ INSPIRE scholarship(2016-2019)</li> </ul>
8	Ayushi Tyagi	2016-2019	<ul style="list-style-type: none"> <li>❖ Project on the study of capacitors with Dr. Vandna</li> </ul>

9	Prarthana Pasricha	2016-2019	<p>Luthra.</p> <ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
			<ul style="list-style-type: none"> <li>❖ First at poster presentation on life of Prof. M.N. Saha and Prof. S.N. Bose at IIIT, Noida.</li> <li>❖ First at poster making competition by physics department.</li> <li>❖ Project on disease modelling using SCILAB under the guidance of Dr. Vandna Luthra and Dr. Narender Kumar.</li> <li>❖ Runner up- talent hunt by Physical Sciences.</li> <li>❖ Consolation- poster making by Gandhi fellow foundation.</li> <li>❖ Magazine –Physikos, Editorial head (18-19).</li> <li>❖ Student Mentorship Program at AIIMS.</li> </ul>
10	Priyanka	2016-2019	<ul style="list-style-type: none"> <li>❖ Member of the Eco club (Avni) of Gargi College.</li> <li>❖ Unmukti(Women development cell)member.</li> <li>❖ Physikos designing head.</li> <li>❖ Second position in physics charades.</li> <li>❖ Second position in circuit making competition.</li> <li>❖ Donated blood in blood donation camp at Gargi College.</li> <li>❖ Project making of propeller display under the guidance of Dr. Vandna Luthra.</li> </ul>
11	Saifali	2017-2020	<ul style="list-style-type: none"> <li>❖ Face painting (Sri Venkateswara College):1st position.</li> <li>❖ Costume designing (IIT Roorkee): 2nd position.</li> <li>❖ Best out of waste (Chemistry Department Gargi College): 3rd position.</li> <li>❖ Kaagaz-ae- kaarigari (Khalsa College): 2nd position.</li> <li>❖ Costume designing</li> </ul>



			(Dyalsingh college): 3rd position. ❖ Best out of waste (DTU): 1st position.
12	Nikita Saini	2017-2020	❖ Botanical Card Making Competition (Botany Department Gargi College) :1st position.
13	Ruchi	2017-2020	❖ Intercollege game silver medal in heptathlon event.
14	Reha Thongam	2018-2021	❖ 2nd prize in Pop Quiz by Quizzito in Gargi College. ❖ Winner of the online quiz question in Zistatva. ❖ Member of creative writing team of Physikos.
15	Rishu Jakhar	2018-2021	❖ Union Volunteer in Zistatva and Reverie. ❖ Main stage performance of slam poetry at Reverie'19. ❖ 3rd prize in March Past competition held on Sports Day in Gargi College.
16	Kashish Bhatia	2018-2021	❖ Winner of the creative writing competition organised by the college magazine team. ❖ A member of the Physics magazine team- Physikos ❖ Participated as a poet in the Busking team for Zistatva and Reverie.
17	Megha Kandari	2018-2021	❖ A member of college editing board team VOICES ❖ Volunteer at Reverie. ❖ 3rd prize in March Past competition held on Sports Day in Gargi College.
18	Preetisha Goswami	2018-2021	❖ A member of the Physics magazine team- Physikos. ❖ 3 <sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.
19	Ananya Shankar	2018-2021	❖ Second place in Costume Designing in Thomso'18, Roorkee. Participated as a calligrapher in the busking team for Zistatva.

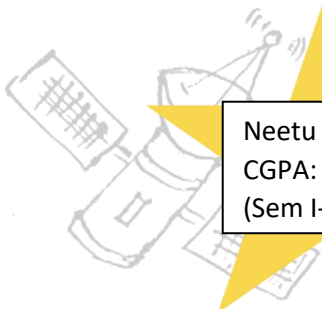
20	Ripundhi Lepcha	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in IIT-D Rendezvous in western singing.</li> <li>❖ 3<sup>rd</sup> in Lady Shri Ram College in western singing.</li> <li>❖ 2<sup>nd</sup> in Shiv Nadar University in western singing.</li> <li>❖ 1<sup>st</sup> in Ramjas College in Western Singing.</li> <li>❖ 1<sup>st</sup> in Hindu College in Western Acapella Music Event.</li> </ul>
21	Shivani Gangwar	2016-2019	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
22	Priya	2016-2019	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
23	Ruchika	2017-2020	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
24	Mansi	2017-2020	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
25	Neha Pandey	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
26	Navita Yadav	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
27	Mansi Saini	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
28	Priya	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
29	Anju Sharma	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
30	Prachi Rauthan	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>
31	Vinita Prajapat	2018-2021	<ul style="list-style-type: none"> <li>❖ 3<sup>rd</sup> prize in March Past competition held on Sports Day in Gargi College.</li> </ul>

# STAR ACHIEVERS!

Toppers Shining Bright



## Batch 2015-2018

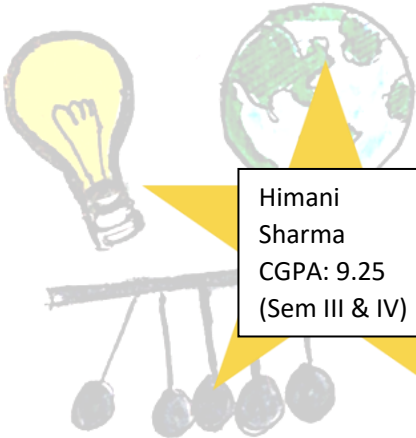


Neetu  
CGPA: 9.149  
(Sem I-VI)

Garima  
CGPA: 9.041  
(Sem I-VI)

Suniti  
CGPA: 9.014  
(Sem I-VI)

## Batch 2016-2019



Himani  
Sharma  
CGPA: 9.25  
(Sem III & IV)

Shivani Sharma  
CGPA: 9.29  
&  
Sangeeta  
CGPA: 9.29  
(Sem III & IV)

Ayushi Tyagi  
CGPA: 8.96  
(Sem III & IV)

## Batch 2017-2020

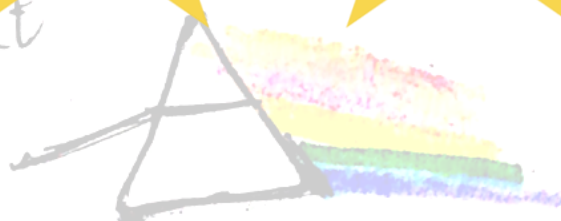


Muskan  
Khanna  
CGPA: 9.68  
(Sem I & II)

Arjyama  
Bordoloi  
CGPA: 9.55  
(Sem I & II)

Sakshi Jaglan  
CGPA: 9.32  
(Sem I & II)

$$s = ut + \frac{1}{2}at$$



# What's Next for Me

*-Advice from the seniors!*

From Gargi to Bonn — My Journey So Far



Throughout our school lives, we live in a bubble. In a warm and secure bubble, oblivious to the struggles of the world outside of it. Nothing is more important to us than getting good grades on the term exams, getting selected in the annual function's dance drama, making it through the sports day prelims and being our best selves in front of our crushes. And then, out of nowhere, we reach the final year and this little bubble of ours bursts! Soon enough, we are left to face our lives by ourselves, far away from our comfort zones — often in new cities, in shared rooms, in colleges where no one knows our names and getting top grades in exams or getting selected even to the dance society is no more as easy as it used to be.

Somehow, we fight and scramble and make our way through all of this and we just begin to call this new place our “home”... when suddenly after a few years, it happens all over again! Another “final year” arrives and another bubble just bursts! Once again we are left to fend for ourselves in a world with even more competitors than we ever thought there could be. However, what's different this time is we are equipped with something more powerful than last time — a passion, a goal, a dream and knowledge! But be careful — we need to take utmost care of these equipment because these are what will help us pick up ourselves every time we fall and guide us on our journey henceforth.

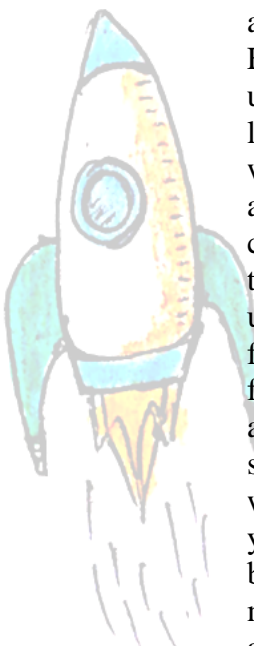
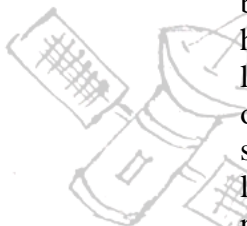
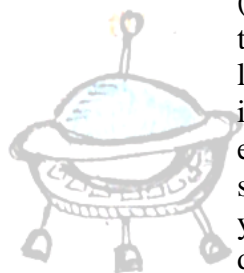
I, too, had my dreams. Throughout my time at Gargi, I took every chance I could get to nourish them. One such opportunity presented itself to me in the final year of my undergraduate studies when my application for graduate studies at the Bonn-Cologne Graduate School (BCGS) of Physics and Astronomy in the Honors branch got accepted. And that has made all the difference.


So at this point, I'd like to first congratulate

you on having come this far (both, in life as well as in this article)! And then I'd like to share some information and my experience with graduate school applications with you. So, if you have a dream of sticking with physics even after your bachelors (you're a brave-heart, my girl!) and are looking for options outside of India (ok, that's another step up the bravery-ladder!), then please remember that these applications are super time-consuming. You will have to do thorough research into individual application processes of each university you apply to, their requirements and eligibility criteria etc. You will often need to provide language proficiency scores (e.g. from TOEFL or IELTS) and/or GRE scores, all of which have to be planned well ahead of time. And mind you, they might burn a hole in your pocket too! Following this, you will usually have to arrange for letters of recommendation, write statements of purpose and make a CV. In most cases, you might also have to take a look at the university's webpages to find out what their research foci are and how well they align with your interests. I strongly suggest you to start working on these *at least* a year (preferably more) before you'd start your masters as the earliest application deadlines are

about year before the start of session.

That's as far general information about making graduate applications abroad will go in this article. If you're now interested to get some specific information about the Honors branch in BCGS and my experience with it, then please, read on. The Honors branch is nothing but a scholarship program, applications to which are due in January<sup>1</sup> of the year in which you would start your graduate studies (a new academic year usually begins in October). A selected candidate gets invited to the BCGS Admissions Academy held in March/April in Bonn and Cologne. This turned out to be a highly interesting experience for me and about 30 other selected candidates from around the globe. This was not only a way to assess the candidates but also to give them an exposure to the research taking place in various sub-fields of physics in the universities of Bonn and of Cologne. During one half of the day, candidates are assessed by way of a presentation that they make on any topic of their choice — it could be a project that they worked on or a topic that they are interested in and have studied about. This is then followed by a personal interview where the candidate is given a chance to showcase his/her





technical breadth and depth of knowledge, understanding of basic concepts and their applications, and the ability to work out things from first principles. The other half of the day is usually spent in university- and laboratory-tours, making friends out of competitors, enjoying meals in the university canteens (called *Mensa*), learning first words in German (given that you haven't learnt the language already!), getting your first taste of German punctuality and efficiency and of course, enjoying the beautiful European spring! Candidates have the opportunity to interact with university professors and students, thereby getting a first-hand account of student-life, from both of their perspectives. Candidates selected for the scholarship will receive an email about their acceptance within a week or so after their return from the Admissions Academy.

Students who could not make it to the Honors program but would still prefer BCGS to any other university where they've applied can still join the course at Bonn/Cologne in physics/astrophysics, provided they have their financial support sorted. Once that's done, all they have to do is follow the instructions given by the university in order to complete the application process — application for a

visa, student housing and opening a “blocked” bank account (according to my experience, students with scholarships did not need this). Some words of advice at this point: during this process, make sure to keep note of important deadlines, have all required documents arranged for and never hesitate to ask questions — be it to the bank officials, the university admissions office or the visa/embassy officials.

An important thing to remember before one arrives in Germany is cash! Within the first few days of arrival, one will have to pay for miscellaneous things — house rent, with security deposit, health insurance, semester fee etc. — and in most cases, if not all, card payments are not possible. You can find online a whole bunch of checklists for Indian students doing abroad! However, no matter where you go, Germany or elsewhere, besides learning physics, make sure to learn about the local culture, the people, the cuisine and the language and remember, most of all, to be tolerant and respectful towards the differences and diversity.

And as far as my own journey is concerned, being a masters in physics student as part the BCGS Honors programme at the University of Bonn has been really awesome! However, by “awesome” I don't mean that it was a cakewalk and I glided

through it all with flying colours. Very much on the contrary, I was welcomed to my first semester by classmates (including students in their bachelors) who were way smarter than me, physics concepts that flew right over my head and the gloom of a chilly winter. After a miserable first semester, I realised the importance of self-discipline and the fact that I was in an academic system where there was nothing to push me except myself. So gradually, over the course of three years instead of two, I competed with myself and aimed at making myself better than I was a day or month ago. I participated in various schools and workshops to learn more and get hands-on experiences in particle physics, meet other students and experts in the field from around the world and of course, see new places!

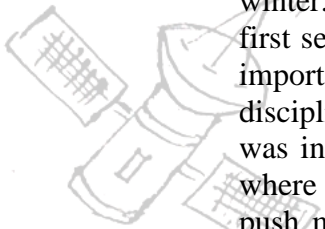
Currently, after having finished my thesis in high-energy particle physics (in the ATLAS<sup>2</sup> experiment) at Uni Bonn, I am working as a research intern here (in the CAST<sup>3</sup> experiment) and very soon will be embarking upon a Ph.D! But the journey is far from over — in fact, it has just begun. And this time, no bubbles will burst. Because I am not getting out of my comfort zone anymore, I am expanding it.

In the unlikely case that you don't wish to have a scholarship, you can also apply later around May/June of the same year.

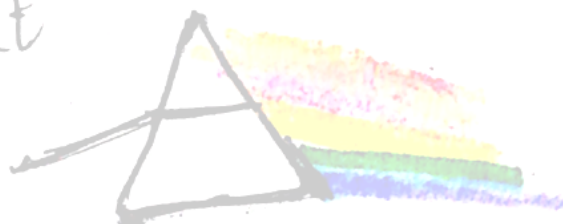
<sup>1</sup><https://atlas.cern/>

<sup>2</sup><http://cast.web.cern.ch/CAST/>

**ARSHIA RUINA**



$$s = ut + \frac{1}{2}at^2$$



## *Pieces of advice from the seniors!*



Hi! I am Sakshi Kakkar, a proud alumnus of Gargi College. I completed my graduation in BSc(H) - Physics from this college and did my Masters in Physics, from NIT Rourkela. I am currently pursuing PhD in Particle Physics from University Of Manitoba, Canada. The major part of my thesis is on the detectors that are used in Particle Colliders. Presently, I am working on the MOLLER detectors, the experiment involved: study of HV Maps, designing of PCB Boards and various PMT bench tests and analysis. This experiment is mainly in collaboration with the Jefferson Lab, USA.

During my Masters, I started contacting professors from different

universities, who were working on the similar projects. I had done two projects in Particle Physics at Delhi University, focussing on Silicon detectors mainly. These projects were a big help to understand the basics and work on something that is being done in International Labs like CERN. This really helped me present my work to the Professors abroad and make myself considerate as a PhD student. The selection procedure involved all the academic details, from graduate studies onwards, transcripts, CV, statement of purpose (SOP), Power point presentations online, involving the projects that I had done, and a couple of Skype interviews with the professor and the Department faculty.

I owe a lot to my Alma mater, Gargi College, as the teachers encouraged me to pursue undergraduate research in the College, as well as at the main Delhi University campus. It was through Gargi Pathfinder competition that I realized my love for Particle Physics even more and the enthusiasm to learn and understand things actually, beyond the periphery of





syllabus, which is very important!! It is the extra effort, the extra mile you go, outside your comfort zone, that pays; along with the academic results, that are equally important and at the same time, enjoy what you do. One of the quotes by Dr. APJ Abdul Kalam is the best to describe this and the appropriate message for the youth. It says –

“My message, especially to young people is to have courage to think differently, courage to invent, to travel the unexplored path, courage to discover the impossible and to conquer the problems and succeed. These are great qualities that they must work

towards. This is my message to the young people.”

A. P. J. Abdul Kala

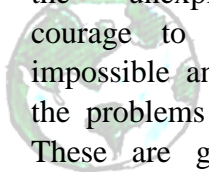
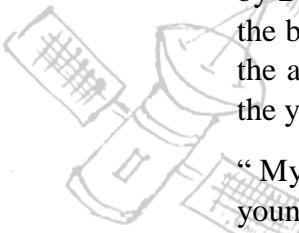
The following is the link to University Of Manitoba, Physics & Astronomy page -

<http://www.physics.umanitoba.ca/> . Kindly visit this to look for Undergraduate, Graduate and Ph.D related details. You can contact me on my email – Id: [sakshi\\_kakkar3291@yahoo.com](mailto:sakshi_kakkar3291@yahoo.com) . I would be more than happy to help and guide through the procedures.

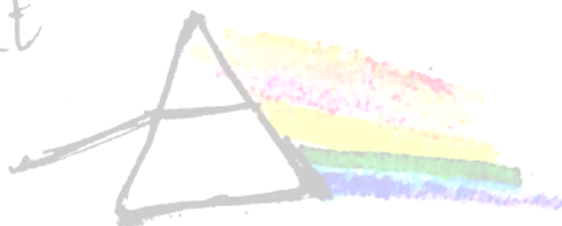
Keep exploring & smiling.

Cheers!

**Sakshi Kakkar**



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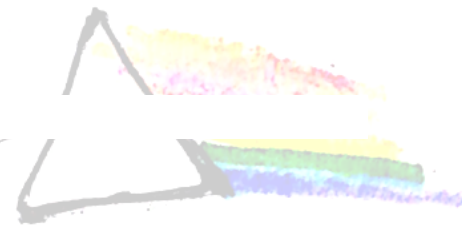


# Students' Union 2018-19



NAME	POST
Ayushi Saxena	President
Kalpana Sharma	Vice - President
Saifali	General Secretary
Ananya Gupta	Treasurer
Prachi Rauthan	Joint Secretary

$$s = ut + \frac{1}{2}at^2$$



# OUR TEACHING FACULTY



Dr. Indu Dutt



Dr. Deepti Lehri



Dr. Alka Garg



Dr. Vandna Luthra



Dr. Supreeti Das



Dr. N. Chandrika Devi



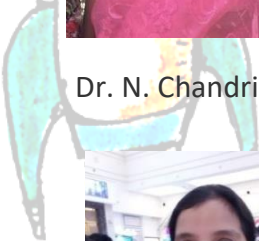
Ms. Anita



Dr. Hira Joshi



Mr. Munish



Dr. Archana Tripathi



Ms. Mansi Agrawal



Mr. Lovedeep Sahota



Dr. Disha Wadhawan





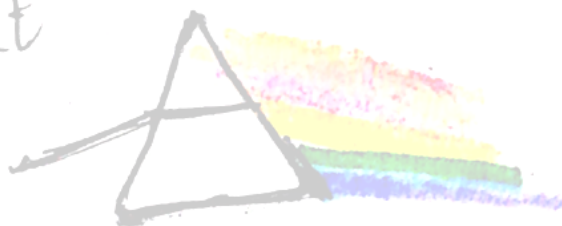
## NON-TEACHING STAFF



Mr. Shekhar Chand, Mr. Santosh, Mr. Sushil, Mr. Vinod Dubey, Mr. Sher Bhadur, Mr. Baleshwar Prasad, Mr. Hemraj, Mr. Sanjeev Kumar (From left to right)



$$S = ut + \frac{1}{2}at^2$$



# Ph.D. SCHOLARS



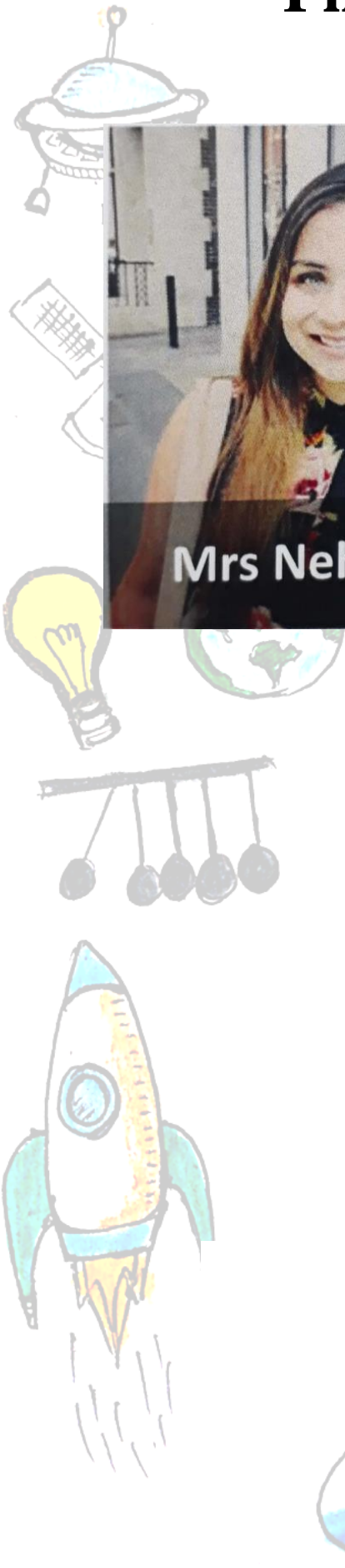
**Mrs Neha Sarin**



**Mr. Sachin Kumar**



**Param Shivam Singh**



# BATCH 2016-2019



AKANSHA GOEL



ANGOM AMY



ASMA JAVID



AYUSHI SAXENA



AYUSHI TYAGI



BHAWNA SINGH



DEEPA PRAJAPATI



EKTAPREET KAUR



HIMANI SHARMA



JAHNABI HAZARIKA



KALYANI SINGH



KHUSHBOO MEENA



KOMAL



MAHIMA RATHI



PRARTHNA



NEHA



PRIYA



PRIYANKA



PRARTHNA  
PASRICHA



PRATIBHA



ROLY SINGH



RUPAL CHAUHAN



SANGEETA



SHIVANI GANGWAR



SHIVANI SHARMA



SRISHTI BISHNOI



SUDHA YADAV



TANISHA



TEJASWI SHAROLIA

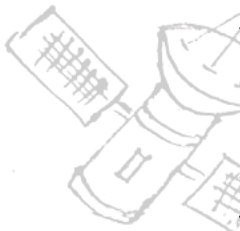


VANI MALIK

## Message from the Editor and Designing Head



We are very proud to present our sixth edition to you. The vision which was developed a few years ago has been nurtured and has made its way for a better path ahead. This edition holds a lot of new stuff. The journey and experiences of the students are the highlights. College has been a lifetime experience for each one of us and its essence has been well captured in this magazine. We've tried to make the best compilation of creativity and intelligence. We hope it truly captures your heart.



From learning MS word to editing and graphic designing, Lots of meetings and planning, We had the spirits kept high to produce this piece. This is the signature of QUASAR.

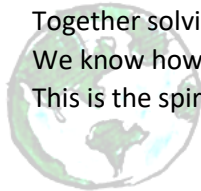
And this is Physikos.

From creative writers to toppers scoring 10/10

Together solving the problems of galaxies and Universe

We know how to strive higher, together.

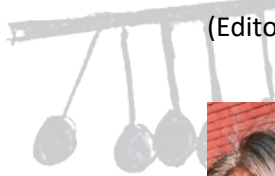
This is the spirit, we the students of Gargi hold.



Best Wishes

Prarthana and Priyanka

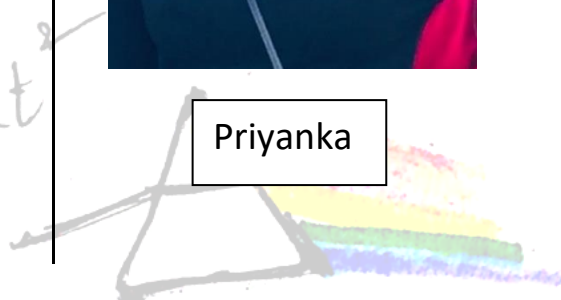
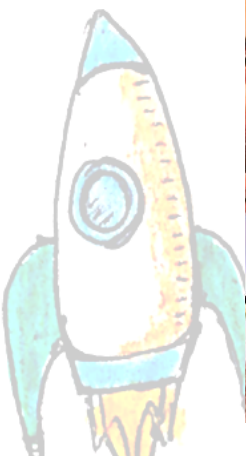
(Editor and Designing Head)



Prarthana



Priyanka





# Message from the Physikos team



## 1. TEJASWI SHAROLIA

Physikos is a reflection of the students' creativity and achievements throughout the year 2018-19. Students have put forth their ideas and thoughts that are beyond expression. Working as a member of the Designing team of Physikos was an unparalleled learning experience for me. I have developed a sense of responsibility and become a pro at meeting deadlines. Being a part of the Physikos team has taught me how to be more open and self-assured inexplicably acquainting me with my own originality. I take the opportunity to thank Physikos teacher co-ordinator, Dr. Vandna Luthra and all the Teachers for their constant support, encouragement and esteemed supervision throughout the making of the edition of Physikos.



## 2. AYUSHI TYAGI

Hello, it's been great year while working as designing team member with full of joy and satisfaction. I got to learn many things. It provided an opportunity to explore many things along with academics. Learn to work with team in effective manner.



## 3. PREETISHA GOSWAMI

Publishing a magazine provides the members an opportunity to work in a team, to learn from the other members, to showcase their talents and also provides the other students a launch pad for their creative urges to blossom. Being a part of the Designing Team of Physikos was a similar experience for me this year. I hope you have fun going through this compilation.



#### 4. KASHISH BHATIA



Physikos offers all the team members an impeccably great experience. We learn and work in an atmosphere oozing with enthusiasm and team work. Everybody has a say in the ideas from the beginning of making the magazine till compiling it. I personally love being a part of Physikos as a member of the creative writing team.

#### 5. REHA THONGAM

Pondering and then giving my thoughts into a piece of paper always gets my adrenaline going. I am grateful to be a part of Physikos. It helped me to boost my confidence and flexing my skills through writing. It has been a great opportunity to be a member of the creative writing team of Physikos.

