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College of Engineering, Technology & Research, Bareilly

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E- NEWSLETTER

We must build up our national defense on such an unshakable foundation that never again in our history shall we lose our freedom.
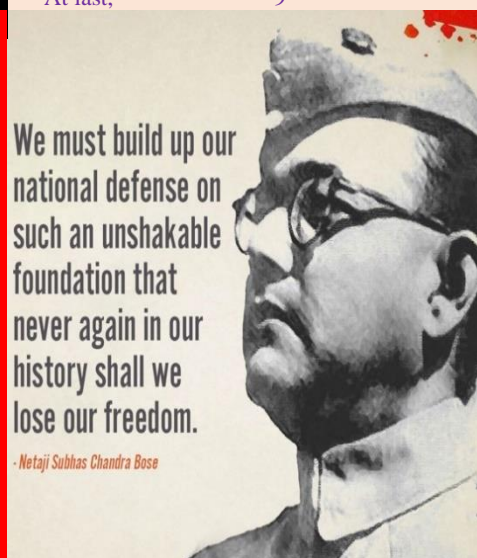- *Netaji Subhas Chandra Bose*

Dean's Desk

The current era is of fast changing technologies and to survive in this era we have to remain up-to-date with latest updates in the market. Also, we should be aware of current technologies, there working, there limits and limitations too.

As today is immensely competitive world, one has to be very much proficient and skilful in one's respective field. So, in Shri Ram Murti Smarak College of Engineering, Technology and Research, Bareilly, the teaching-learning process is so developed, so that student prepare well in multifaceted field & maintain their pace with industry requirements. We put the emphasis on both co-curriculum and extra- curriculum activities. We provide an environment & focus on each student and try to bring out the best from the students by exploring the hidden skills of student in multi fields by motivating and making them participate in multiple activities designed for their all-round development. The target of us as faculties is to mentor each student, so a concept of weekly mentor-mentee meeting along with Open Book Test is a collaborative initiative from us in nurturing students for there all round growth. Also, we provide high quality research-oriented education with value added courses & practical on go for the development of student's mental, technical, moral & soft skills, so that they keep pace with the fast-changing market.

The publication of the E- newsletter "Campus Anveshan" is to focus on monthly activities in college, including all related activities of faculties, students, staffs & stakeholders. I would like to appreciate and thank the editorial team and contributors of news and articles for the various sections of this monthly newsletter.

Mr. Ankur Kumar
Dean Academics

QUBIT

In quantum computing, a Qubit or quantum bit is the basic unit of quantum information—the quantum version of the classical binary bit physically realized with a two-state device. Qubit is a two-state quantum-mechanical system.

A quantum bit is the quantum mechanical analogue of a classical bit.

Binary Bit:

In classical computing the information is encoded in bits, where each bit can have only the value zero (0) or one (1). A binary digit, characterized as 0 or 1, is used to represent information in classical computers. When averaged over both of its states (0,1), a binary digit can represent up to one bit of Shannon information, where a bit is the basic unit of information.

Quantum Bit:

In quantum computing the information is encoded in qubits.

A Qubit is a two-level quantum system where the two basis Qubit states are usually written as $|0>$ and $|1>$. (These are representation of quantum state of system in Hilbert Space. These states are orthogonal)). There are two possible outcomes for the measurement of a Qubit—usually taken to have the value "0" and "1", like a bit or binary digit. However, whereas the state of a bit can only be either 0 or 1, the general state of a Qubit according to quantum mechanics can be a coherent superposition of both.[2] Moreover, whereas a measurement of a classical bit would not disturb its state, a measurement of a Qubit would destroy its coherence and irrevocably disturb the superposition state. It is possible to fully encode one bit in one Qubit. However, a Qubit can hold more information, e.g., up to two bits using superdense coding. A Qubit can be in state $|0>$ and $|1>$ or (unlike a classical bit) in a linear combination of both states $i.e,\ |0>$ and $|1>$. The name of this phenomenon is superposition.

Difference between Bits and Qubits

S.No.	Classical Bits	Qubits
1	A bit can have only the value zero (0) or one (1).	A Qubit is a two-level quantum system where the two basis Qubit states are usually written as $|0>$ and $|1>$.
2	The device computes by manipulating those bits with the help of logical gates (AND, OR NOT)	The device computes by manipulating those bits with the help of quantum logic gates. Hadamard, C-Not, Pauli gates
3	Bits are used in classical computers. A classical computer has a memory made up of bits where each bit holds either a one or zero.	Qubits are use in quantum computer. A qubit (quantum bits) can hold a one, a zero or crucially a superposition of these.
4	Information is stored in bits, which take the discrete values 0 and 1.	Information is stored in quantum bits, or qubits. A qbit can be in states labelled as $|0>$ and $|1>$, but it can also be in a superposition of these states, as $a\ |0>+b|1>$, where a and b are complex numbers. If we think of the state of a qbit as a vector, then superposition of states is just vector addition.
5	Bits are slow.	Qubits are faster.
6	Its circuit behaviour based on classical physics.	Its circuit behavior based on quantum mechanics.
7	For a system of *n* components, a complete description of its state in classical physics requires only *n* bits. For example, if storing one number takes 64 bits, then storing N numbers takes N times 64 bits.	in quantum physics it requires $(2^n - 1)$ complex numbers (or a single point in a 2^n-dimensional vector space). For example, for every extra Qubit you get, you can store twice as many numbers. For example, with 3 qubits, you get coefficients for $|000>,|001>,|010>,|011\},|100>,|101>,|110>$ $and\ |111>$.

Compiled By:

Dr. Rajeev Pandey

Chief Proctor

QUANTUM COMPUTING: PARADIGM SHIFT TO COMPUTUING AGE

"If you are not completely confused by quantum mechanics, you do not understand it."

–John Wheeler

Introduction

As the computer evolution progressed, the computer parts became smaller and smaller day by day. Transistors are reduced day by day reaching atomic level. At atomic level things work differently due to unusual quantum properties. The size of the transistor is reduced to 14 nanometres that is 500 times smaller than the red blood cell.
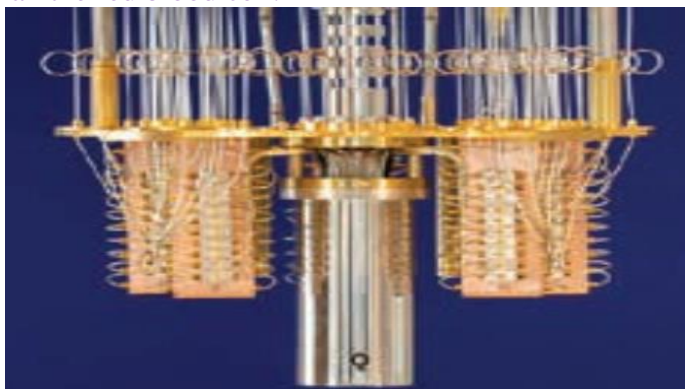

Figure 1: The IBM Q quantum computer

Now the transistors cannot be reduced further to perform its functionality. We reached the physical barrier in our technological progress. Even though computers hold good computational power to perform complex operations, there are problems that they cannot solve. Their computational power is still not enough to solve certain problems which would take huge time doomed to be impossible. There are problems like molecular simulations, optimization problems cannot be implemented with present computers. Here comes the Quantum computer, where a problem which might take thousands of years can be solved within minutes. Quantum computer are quite different compared to the classical computers. Computer which is worked based on the Quantum physics are called Quantum computers. Quantum physics describes the way our world works at most fundamental level. Quantum computers can solve the world's most complex problems that are not in the reach of the traditional computers even including super computers. They work in a different way which allows them to perform calculations that are not possible by the classical computers.
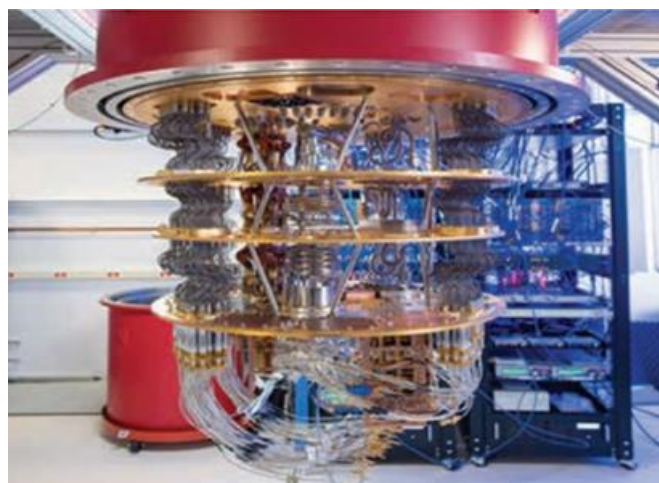

Figure 2: Sycamore (Quantum Computer) developed by Google

Quantum Computing – Recent Trends

IBM has developed 18 quantum computers. It has considerably larger share in quantum computers, with Google having 5 quantum computers and Honeywell having 6 such computers. The quantum computer developed at IBM is named as "IBM Q", which nowhere looks like a classical computer.

The idea of having a personal quantum computer is not feasible since these computers are equipped with hefty cooling equipment around them. Instead, we can remotely experience IBM's quantum computer via cloud services. The new business approach by IBM is called, "Circuits as a service". When quantum circuits are combined with ordinary software, quantum services can be made more accessible. The companies like Google, IBM, Microsoft, Intel and Honeywell along with the start-ups like IonQ, Rigetti etc. are working silently towards the development of quantum computers making it more realistic and available.

Advantages

Technological development will take a leap if quantum computers are developed. Quantum computers can solve optimization problems like finding the best route for performing deliveries more efficient than classical computers. Though today's data security techniques will threaten by quantum computer, new defensive mechanisms will be invented for data security. New insights and patterns from big data can be found by quantum computer which normally not possible for classical computers to detect. In other word data science will be revolutionized. Artificial intelligence and machine

FACULTY ARENA

learning domains will face rapid development with the help of quantum computers.

Complex Protein folding can be simulated in quantum computer which is not possible in classical computers. So new drugs can be found to cure diseases. Predictions like weather conditions and financial risk analysis can be done with ease.

Quantum Computer platforms

There are programming platforms available on cloud like :
Rigetti's pyquil (https:// www.rigetti.com/)

DWave's leap (https:// www.dwavesys.com/quantum-computing)

LIQUi> by Microsoft (https://www. microsoft.com/en-us/research/project/language-integrated-quantum-operations/liqui/) etc.

So, computer programmers can register in any quantum computing cloud environment and start writing quantum computing code. There is a Quantum algorithm Zoo (http://quantumalgorithmzoo.org) where one can find a comprehensive catalogue of quantum algorithms and their description.

Conclusion

The quantum computers improve the quality of people's lives by making way for the creation of better technologies. Quantum computing has crossed its infancy and is in its toddler hood. The upfront companies are working to bring quantum computing to the state of maturity. It is foreseen that in the next 2 to 3 years investments will happen in the areas of improving quantum computers, and the world will see the rise of even more powerful computers. Quantum computers do not replace the classical computers instead it helps to solve the difficult problems that are virtually impossible using classical computers.

References:

1. CSI Communications: Vol. No. 44, Issue: No.03
2. https://www.dwavesys.com/quantum-computing
3. https://www.microsoft.com/enus/research/project/language-integrated-quantum-operations/liqui/
4. https:// www.rigetti.com/
5. https:// quantum-computing.ibm.com/

Compiled By:

Dr. Jyotirmay Patel

Associate Professor – CS Department

WHY IS EDUCATION IMPORTANT IN INDIA?

India is a very vast and populated country but is still a developing nation. Hence, Education is one of the most vital components that will help in changing the status of India from a developing nation to a developed nation. Moreover, if we take a careful look at the demographics of India, we can observe that states and cities that have the highest literacy rates have superior infrastructure and advanced technology as compared to other states or cities. Hence, global organisations such as UNESCO and UNICEF are coming up with numerous educational projects in India to create a progressive and developed nation.

However, the importance of Education is not just limited to creating a progressive country. There are other reasons as to why education is very important in India, such as:

1. Education is the right of every Indian citizen, regardless of gender or social status.
2. It promotes a democracy that comprises a civilised and well-mannered society.
3. Education also aids in the upliftment of economically underprivileged groups and results in the creation of numerous job and employment opportunities.
4. Good education results in a peaceful exchange of ideas, knowledge and good practices.
5. Importantly, education secures a bright and prosperous future for educated individuals. It also helps in mitigating crime and terrorism.

Compiled By:

Mr. Sachin Raj Saxena

Assistant Professor – CS Department

FEBRUARY: IMPORTANT DATES AND DAYS

Date	Name of important Days
1-Feb	Indian Coast Guard Day
4-Feb	World Cancer Day
5 to13 February	Kala Ghoda Festival (Mumbai)
6-Feb	International Day of Zero Tolerance for Female Genital Mutilation
6 to 12 February	International Development Week
8-Feb	Safer Internet Day (second day of the second week of February)
10-Feb	National De-Worming Day
11-Feb	World Day of the Sick
11-Feb	International Day of Women and Girls in Science
12-Feb	Darwin Day
12-Feb	Abraham Lincoln's Birthday
12-Feb	National Productivity Day
13-Feb	World Radio Day
13-Feb	Sarojini Naidu Birth Anniversary
14-Feb	Saint Valentine's Day
18 to 27 February	Taj Mahotsav
20-Feb	Arunachal Pradesh Foundation Day
20-Feb	World Day of Social Justice
21-Feb	International Mother Language Day
27-Feb	World NGO Day
28-Feb	National Science Day
28-Feb	Rare Disease Day

Compiled By:

Mr. Umesh Kumar

Lab Instructor – CS Department

WHAT IS BETTER – KNOWLEDGE OR MARKS

Though the is controversial, the conclusion is as clear as water that knowledge is better, in fact the best. It has been rightly said "it is knowledge that ultimately gives salvation. The relation between marks and knowledge is like a lock and key, as knowledge is the key to the lock of the marks to open the doors of our future. But it is very important to understand that how can we conclude that knowledge is better than marks. From our early childhood, we are burdened with the aspiration to get good marks and to be a shining star of our class. But, at that early age, no one makes us aware that we also need to gain knowledge and not just marks. For a long time, we just keep on running after marks and for that we all behave like parrots and keep on cramming our books and notes that is the reason er forget everything just after the exam and the fact do not stay in our mind. This is what happens when we study only for marks and not for knowledge.

But when we become aware of the fact that cramming is not sufficient enough to be successful, we start trying to gain knowledge. But we must remember that knowledge is not something that we can buy from money, rather is can be acquire only when we focus, determine and trying to learn things by doing and this knowledge remains with till our last breath.

Now, when we have come to know about knowledge and marks, let us conclude what is better?

We all know that marks are very easy to score if we are knowledgeable, but we must remember that marks are never measurement of person's knowledge or capability.it is because even a person with less marks may be more knowledgeable than a person with good marks. Nowadays, marks have a lot of importance, but knowledge is always superior.so, ultimately the conclusion is that we must focus on knowledge when we do so, marks re obtained automatically.

Utkarsh Jaiswal
B. Tech (First Year) CS

VIRTUAL REALITY SICKNESS

Virtual reality (VR) is simulated experience that can be similar to or completely different from the real world application of virtual reality include entertainment (particularly gaming videos), education (such as medical or military training) and business (such as virtual meetings).

Other distinct types of VR-style technology include augmented reality and mixed reality sometimes referred to as extended reality or XR Virtual reality is most commonly used in entertainment applications such as video games, 3D cinema, and social virtual world.

There are many health and safety considerations of virtual reality. A number of unwanted symptoms have been caused by prolonged use of virtual reality, and these may have slowed proliferation of the technology. Most virtual reality systems come with consumer warnings, including: seizures; developmental issues in children; trip-and-fall and collision warnings; discomfort; repetitive stress injury; and interference with medical devices. Some users may experience twitches, seizures or blackouts while using VR headsets, even if they do not have a history of epilepsy and have never had blackouts or seizures before. One in 4,000 people, or .025%, may experience these symptoms. Since these symptoms are more common among people under the age of 20, children are advised against using VR headsets. Other problems may occur in physical interactions with one's environment. While wearing VR headsets, people quickly lose awareness of their real-world surroundings and may injure themselves by tripping over, or colliding with real-world objects, VR headsets may regularly cause eye fatigue, as does all screened technology, because people tend to blink less when watching screens, causing their eyes to become more dried out.

Do not use it too much, it can harm you.

Ifham Husain Zaidi
B. Tech (First Year) CS

STUDENT CORNER

How easy...

How easy it is to tell someone
that they deserve better
While struggling to accept
the same for self
How easy it is to ask someone
to not hold onto things
While struggling to accept
the same for self
How easy it is to ask someone
to remember their worth
While struggling to accept
the same for self
How easy it is to tell someone
to be courageous enough
to ask for better and leave
that which not serves
While struggling to accept
the same for self

-Roshan Pathak
B. Tech (Fouth Year) CS

FLAWS

In Today's Society, while everyone living in their story, it really becomes difficult to think from others perspective. This leads to unnecessary judgements and blame games. While in a fast-moving world it's tough to keep up with all people and things around us, we can slightly make each other's life by thinking from others aspects also instead of just focusing on their failures, flaws or achievements.
Here is just a small poem on Flaws:

In a world full of flaws
Still, judging others by your own laws?
What they have suffered
How many times they have shattered?
What they have sacrificed
Leaving people and things highly prioritize
What reality they have seen
How to survive in today's world which is so mean
What they have become
They know Nothing can be achieved by being dumb
What they do
Is somewhat a result they have been through?
So why judge others by our own laws?
Because everyone and everything has some flaws.

Vishu Saxena
B. Tech (First Year) CS

FUN ZONE

Dance lessons for Engineers

PUZZLE

Can You Solve This

$9 = 72$
$8 = 56$
$7 = 42$
$6 = 30$
$5 = 20$
$3 = ?$

HAPPENING AT THE COLLEGE

THURSDAY ACTIVITY

- 6 Jan 2022 sports Volleyball boys first year versus second year
- Carrom
- Chess

It was a practice match won by second-year boys whereas first-year boys were runner-up.

PARTICIPATION

Nanika Awasthi CS-2(2021) participated in Rangoli Making Competition an initiative by Ministry of Culture to make Azadi Ka Amrit Mahotsav.

REPUBLIC DAY: 26 January 2022

On Jan 26, 2022 the Institute celebrated its 73rd Republic Day in the college premises. Hon'ble Chairman Sir Shri Dev Murti Ji along with other dignitaries hoisted the flag. It was followed by choir performance and patriotic songs by the students. Later, Dean Academics Mr. Ankur Kumar given speech on happenings on Republic Day in country and finally Hon'ble Chairman Sir blessed the students with his words. The program ended with distribution of sweets to students.

GLIMPSES OF REPUBLIC DAY

HEALTH TIPS

Milk is Good
Drinking a warm glass of milk before you sleep helps regulate sleep-wake cycle.

Early to Eat, Early to Bed
Eating dinner early keeps our body weight in check and sleep cycle in the correct form. Keep a three-hour gap between your dinner and bedtime.

AYURVED

वाल्मीकि रामायण में अनेक प्रकार की चिकित्सापद्दातियों का वर्णन मिलता है| राम - रावण युद्ध के समय लक्ष्मण जी के मूर्छित हो जाने पर वैद्यराज सुषेण संजीवकरणी (संजीवनी) औषधि लाने के लिए श्री हनुमान जी को पर्वत पर भेजते हैं| वाल्मीकि रामायण में संजीवनी के साथ तीन और औषधियों का वर्णन आता है|

" हे वीर! तुम हिमालय पर्वत के दक्षिण शिखर पर उत्पन्न होने वाली विशल्यकरणी, सावर्ण्यकरणी, संजीवकरणी और संधानी नामक महौषधियों लेकर आओ, ताकि लक्ष्मण को मूर्छना से मुक्ति दिलाई जा सके|"

(वा० रा० ६/१०१/३१,३२)

मूर्छा में संजीवनी, बाण या भाले के प्रहार से घायल होने पर विशल्यकरणी, घावों के निशान भी न रहने पाएँ, इसके लिए सावर्ण्यकरणी तथा टूटी हड्डियों को जोड़ने के लिए संधानी नामक औषधि का प्रयोग होता था| इससे ज्ञात होता है की आयुर्वेद का इतिहास व माहात्म्य कितना पुराना है|
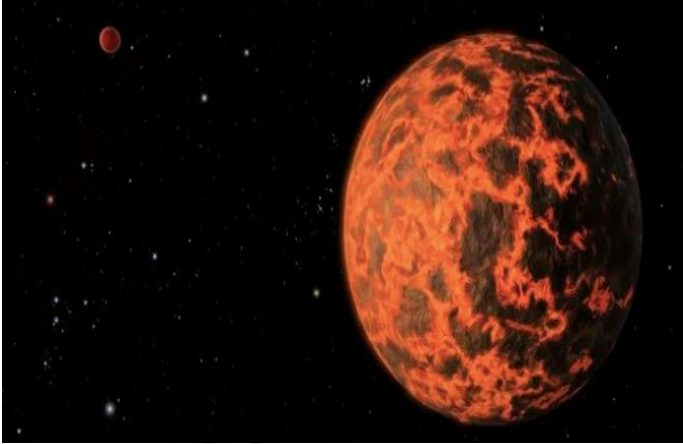
MOTIVATIONAL STORY

लाल बहादुर शास्त्री जी से किसी ने पूछा - "आप सदैव प्रशंसा से दूर रहा करते हैं, स्वागत सत्कार के कार्यक्रम में भी भागीदार नहीं होते, ऐसा क्यों ?" शास्त्री जी हँसकर बोले - " एक बार लाल लाजपतराय ने मुझसे कहा था - " लालबहादुर! ताजमहल बनाने में दो तरह के पत्थरों का उपयोग हुआ है| एक तो संगमरमर, जिसका उपयोग गुंबद बनाने में और यात्र - तत्र किया गया है| दूसरा साधारण पत्थर, जिसका उपयोग ताजमहल की नीव बनाने में किया गया है| संगमरमर सब देखते हैं, पर नीव के पत्थर की ओर किसी का ध्यान नहीं जाता | हमें भी उसी की तरह बनना चाहिए| " तब से उनकी इसी सीख का जीवन भर अनुकरण करता आ रहा हूँ और सद्य नीव का पत्थर बनने के प्रयास में लगा रहा हूँ|
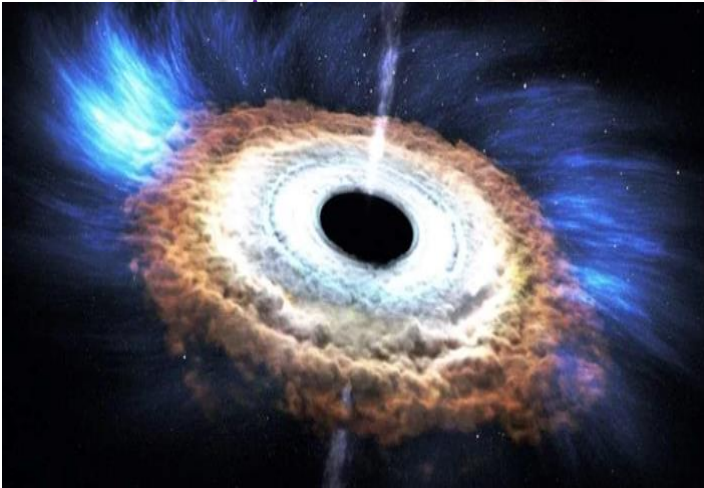
अखंड ज्योति, मई २०१८

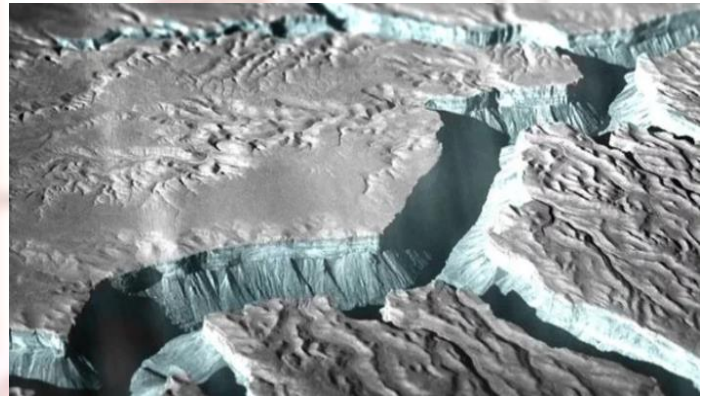# DO YOU KNOW?

INTERESTING FACTS OF UNIVERSE

- Mercury & Venus are the only 2 planets in our solar system that have no moons.

- If a star passes too close to a black hole, it can be torn apart.

- The hottest planet in our solar system is Venus.

- Our solar system is 4.57 billion years old.

- Enceladus, one of Saturn's smaller moons, reflects 90% of the Sun's light.

AT LAST

CONGRATULATIONS

In the month of January 2022, following students of our college get placed in multiple companies. We congratulate the students on getting placed.

AJEET KUMAR CS (2018), AFREEN KHAN CS (2018) got placed in Digit General Insurance.

AFREEN KHAN CS (2018), AYUSH CHAUDHARY CS (2018) AND UTKARSH GUPTA CS (2018) placed in Wipro Technologies.