



Millennium discoveries

Illustration: Deepak Sharma, GT Network

Every year, thousands of scientific discoveries are made. While some of them may not change much, others alter the course of history, reiterating how humans are the smartest species on Earth. **Anirban Biswas, AIS Gur 46, XII** discusses.

New prime number

Mathematics. Often considered the closest one can go to the writing of God. The subject never ceases to amaze anybody, especially when mathematicians discover a new prime number. The number is $2^{74,207,281} - 1$, was found through an internet project Great Internet Mersenne Prime Search. So what is its use? Actually a very 'spooky' one! Modern code writing and breaking requires the use of Mersenne Prime numbers (prime number that is one less than a power of two and can be written as $M_n = 2^n - 1$) and other complex numbers to encode data. Talk about numbers meeting James Bond.

The evolutionary link

Until recently in 2015, scientists had been looking for the missing link between apes and humans. But now they



think there is reason to believe their search has ended. In March 2015, scientists discovered a 2.8 million year old jaw bone in Ethiopiathus, extending timeline of the Genus Homo by 400,000 years. Again later, scientists found a set

of bones in a cave. They were so different that scientist have classified them as a completely different species now known as 'Homo Naledi'. They stood just five foot tall and weighed 100 pounds. Their skulls are like early

humans, but their brains are tiny, just the size of an orange. There is an ongoing debate whether the bodies were deliberately left in the cave, for the behaviour reflected the burying rituals of our own ancestors Homo sapiens.

The futuristic vision

We are on the next frontier of human-technology amalgamation. A recent example is the Ocumetics Bionic Lens developed by Dr. Garth Webb, an optometrist in British Columbia. These lens will give patients a perfect vision and removes the chance of cataracts because the new lens replaces the natural one. The surgery would take merely eight minutes and would completely correct the patient's vision. The lens is first folded like a taco and then inserted into our eye with the help of a saline filled syringe. Once inserted, it unfolds within 10 minutes. Depending upon trials, this product could very well be available in the markets very soon.

Fight with bacteria

Everyone knows about antibiotics. Ask a sixth grader, s/he will tell you that it is used to fight bacterial infections. But what many people don't know is that the same antibiotics made by scientists decades back are still being used. No new antibiotic had been created or discovered. In the meantime, bacteria developed strains resistant to many antibiotics. Early in 2015, a team from Northeastern University in Massachusetts put a notch in the win column for medicine when it discovered Teixobactin, the first new antibiotic in 30 years. If those human trials go well, Teixobactin could be instrumental in dealing with tuberculosis, septicemia and various other diseases which are currently difficult to treat.

All things matter

Look around you. There are tables, chairs, bottles, air, water etc. Have you ever thought about what they are made up of? What would you see when it is brought closer to a microscope? You would see tiny particles, similar in nature. You would see Matter.

Saurabh Jha, AIS PV, X peers through a microscope.

Matter is ...
Any object or entity that takes up space and has mass.
Everything around you is made up of matter. Chocolate cake is made up of matter. You are made up of matter.

Look closer...
We see Matter being made up of smaller elements called Atoms. Anything you see and can feel is made of atoms. The naked eye cannot see an atom but with the help of a microscopes, atoms can now be seen.

Matter is classified into
Physical classification
-Solid, liquid, gas
Chemical classification
-Pure substance, mixture

Matter

Physical Classification

Solids

Liquids

Gaseous

Chemical Classification

Pure Substance

Mixtures

Matter Can Change It's State

Solid State

Heat

↔

Cool

Liquid State

Heat

↔

Cool

Gaseous state

Solids Matter has...

- Definite shape.
- Distinct boundaries
- Fixed volumes
- Tendency to maintain their shape

Liquid matter has ...

- No fixed shape
- Takes the shape of the vessel
- They flow
- Not rigid

Gaseous matter has...

- Large space between particles
- High speed of particles
- They flow in all directions
- Hence, no definite shape