

Qutub Minar is world's tallest brick minaret.

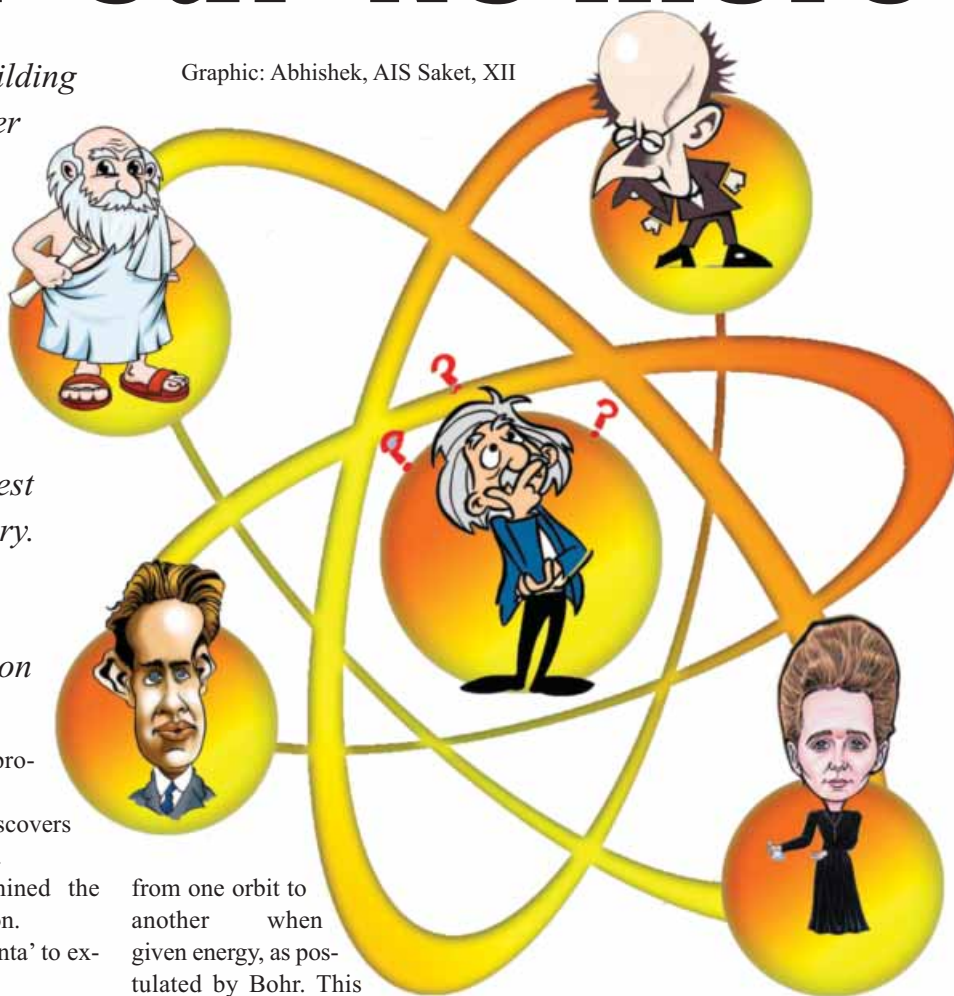


Delhi facts

# Bohr-ed? No more

The smallest building blocks of matter have always fascinated scientists and philosophers around the world. The awe inspiring thought that we all are made of star dust drove many on the quest to decipher this mystery. **Shobhit Ranjan, AIS Saket, XII** presents a timeline of the evolution of atom..

Graphic: Abhishek, AIS Saket, XII



**Greek Era:** Democritus proposed atom for the first time.  
**1879:** Sir William Crookes discovers the properties of cathode rays.  
**1897:** JJ Thomson determined the charge to mass ratio of electron.  
**1900:** Max Planck used 'quanta' to explain hot, glowing matter.  
**1909:** RA Millikan determined charge of electron through oil drop experiment.  
**1911:** Rutherford gave a model of the atom, unable to explain its stability.  
**1922:** Bohr explained atoms in terms of atomic orbitals and quantum jumps to explain the spectra.  
 Following this, there was a big tussle between Albert Einstein and Bohr. Einstein claimed that electrons cannot just jump

from one orbit to another when given energy, as postulated by Bohr. This infuriated Bohr. Nevertheless, the Uncertainty Principle proved by Heisenberg fell largely in support of Bohr. Einstein was a famous celebrity, his reputation was at stake, what was to be done?

**1927:** The biggies of science, Einstein, Max Planck, Marie Curie and Niels Bohr met each other at the Solvay Conference. There, Einstein hurled questions

at Bohr about his atomic theory and Bohr answered each and every one of them satisfactorily.

Although, the debate between Bohr and Einstein was the battle ground between Quantum Theory (Bohr) and Theory of Relativity (Einstein) because of their disagreements with each other, it's the next big thing physicists are working on. Coincidence? Maybe not. 🇮🇳

Scientist



Watch

## Celestial Cinderella

Anshika Pradhan  
 AIS Gur 46, XII

**Who:** Caroline Herschel  
**Born:** March 16, 1750 in Hanover  
**Died:** January 9, 1848 (at age 97) in Hanover, Germany  
**Nationality:** German  
**Field of expertise:** Astronomy  
**Famous For:** Discovering comets  
**Awards:**

- RAS Gold Medal (1828)
- Prussian Gold Medal (1846)

**Early life:** The daughter of Isaac Herschel, she received rudimentary education. She suffered from severe diseases from childhood and her inabilities led her mother to thinking that she could do no better than a maid. But her life changed when her older brother, William, brought her to England in 1772. She first mastered the art of singing and later on ventured into astronomy. Caroline went on to become a renowned astronomer.

**Her greatest invention:** Caroline and her brother were credited with discovering the planet Uranus. However, after he got married and was tied up with duties, Caroline Herschel got time to work on her own. Observing the skies alone, she discovered 35P/Herschel Rigollet, a comet which was later named after her. She became the first woman to discover a comet. Herschel went on to discover seven new comets, five of which she is given full credit for. The then ruler of England, King



George III recognised her work and started paying her a salary of £50.

**Other notable achievements:**

- She discovered 14 new nebulae (a cloud of gas and dust in outer space).
- She was the first woman to be a member of the Royal Society.
- She was the first woman to be paid for her contribution to science.

**Trivia:**

• Caroline Herschel was quite in demand as a soloist during her musical career.

• Her nephew John Herschel, a researcher, is known for his contributions to astronomy, photography and colour blindness.

# Where's my water?

As you read this, nearly one third of the world's population is battling water scarcity. And we might just join them, considering we too are guilty of wasting those precious drops

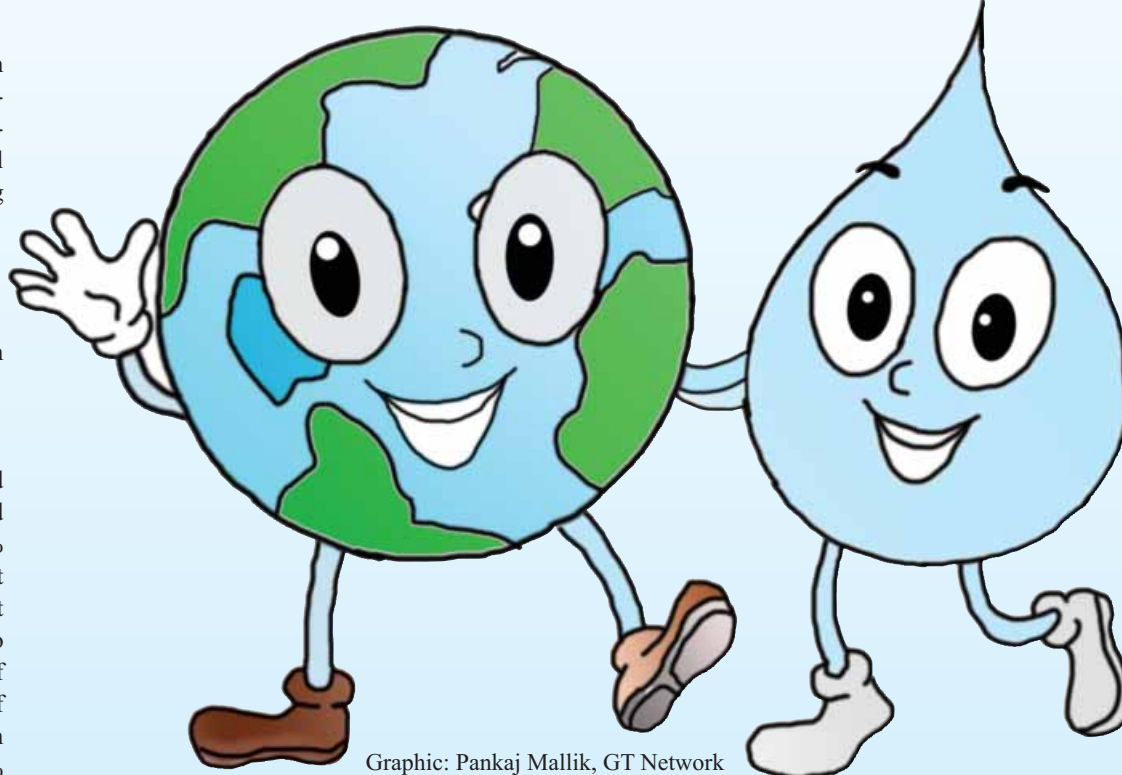
According to a report by UNICEF on Indian Water Scarcity (2007), "There will be constant competition over water, between farming families and urban dwellers, environmental conservationists and industrialists, minorities living off natural resources and entrepreneurs seeking to commodify the resource base for commercial gain." And yet, we continue to waste water. This article aims to wake you up to shockingly dry realities with the hope that you will do your bit to save water, often dubbed as the 'elixir of life'.

### The global picture

Even though 71% of the Earth's surface is covered with water, only 2.5% of the same is fresh water and fit for consumption purposes. The remaining 97.5% water comes from oceans, which is not potable. But the challenges are not just confined to less amount of potable water, the distribution of fresh water also remains an issue. A meagre 8% of the population of North and Central America has access to 15% of fresh water reserves. In a striking contrast, more than 60% of the Asian population has access to only 36% fresh water supply; hence the scarcity.

### Situation at home

India has access to only 4.3% of the world's fresh water resources, even though it supports more than 17% of the world's population. In simple words, the per capita availability of water in our country is very low. And the situation is worsening with the ever increasing population. While in 1951, India had more than 5000 cubic metre per capita water reserve, it has now come down to an alarming, little more than 1000 cubic metre per capita. While the entire country struggles with water crisis, it is metropolitans like Delhi that are the worst hit. Delhi has a huge population which requires almost 950 million gallons of water per day.



Graphic: Pankaj Mallik, GT Network

However, the seven water treatment plants of Delhi Jal Board are able to generate only 895 million gallons per day. To make matters worse, the inefficient water management system results in only an estimated 700 million gallons available for use.

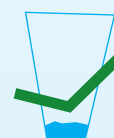
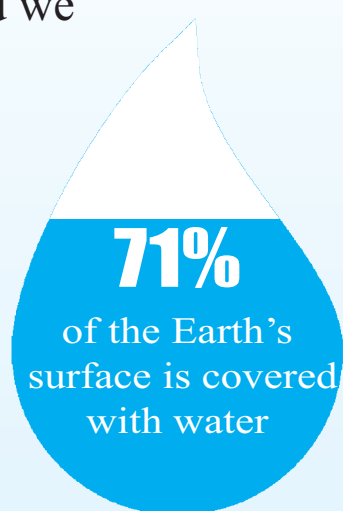
### Every drop counts

Water conservation is the need of the hour. Perhaps India needs to take a cue from a country like Israel that has a commendable per capita water capacity of 276 cubic metre owing to its efficient water management system. The government has already started taking steps in that direction. For instance, it has become mandatory for the construction of rain water harvest-

ing reserves in certain areas. Several storage dams on the river Yamuna are in the pipeline. We, as citizens, also need to step up if we don't want a water deprived future. Building rooftop rain water harvesting structures can be a significant step towards saving water as 65% of the rainwater is discharged into the sea, which can otherwise be harnessed. Other than that, simple things like taking a shorter shower, turning off the tap as you brush your teeth, using a bucket to water plants are things that we can do at our level. So, don't wait; do your bit today, for every drop counts.



This article has been derived from a lecture delivered by A K Bajaj at Arya Samaj Mandir, Defence Colony. Bajaj is the former chairman of the Central Water Commission.



2.5%  
Potable water



97.5%  
Non potable water

Delhi consumes  
**70,00,00,000**  
 MGD water everyday

