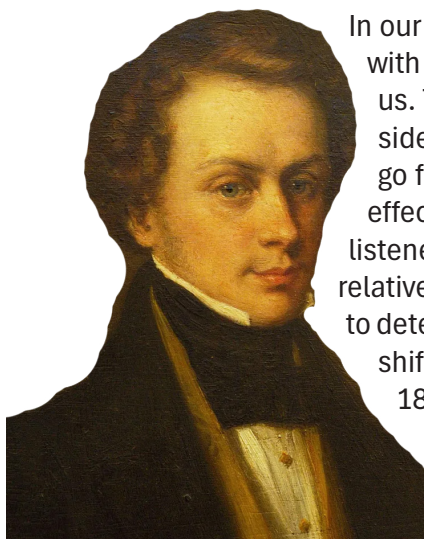


Celebrating the November Born Scientists

Bhupati Chakrabarti

These luminaries, born in the month of November, have each illuminated the path of human progress in their own right. Their discoveries have transcended the bounds of their respective fields, shaping the world as we know it. As we reflect on their lives and legacies, we are reminded of the boundless potential of the human spirit to inquire, innovate, and inspire. Through their work, these scientists have left an enduring legacy, a testament to the power of curiosity and the relentless pursuit of knowledge.

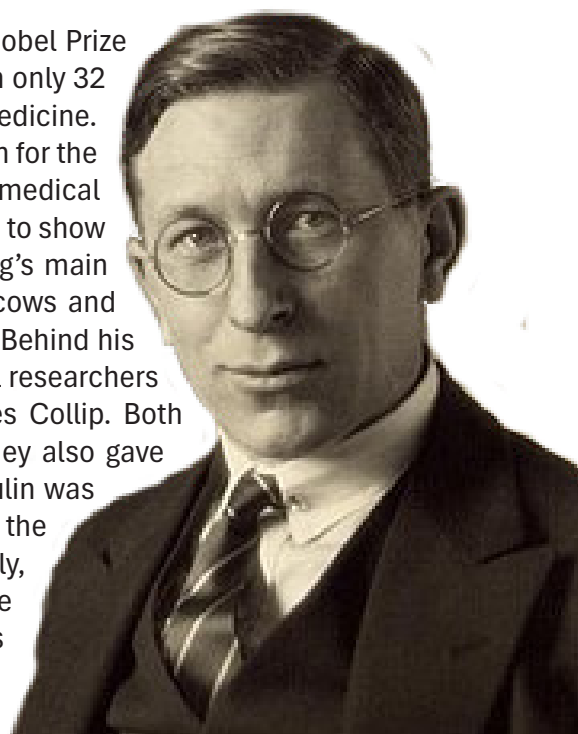


In our almost daily experience, we see how the sharp siren of an ambulance rushing by with its siren blaring becomes somewhat thicker and loses its sharpness as it passes us. The speed of our bus or car is displayed on a special digital board installed on the side of the road. Nowadays, many of us hear the term ‘Doppler ultrasound’ when we go for treatment. In fact, at the root of all of this is a phenomenon called the Doppler effect. When a sound or light wave of a certain frequency is emitted from a source, a listener or viewer experiences a decrease or increase in that frequency if there is any relative motion between the source and the viewer. This change in frequency is measured to determine the speed of the source or listener. In astronomy, we hear about the Doppler shift based on this Doppler effect. The phenomenon was discovered or observed in 1842 by the 19th-century Austrian physicist **Christian Doppler**. It is named the Doppler effect after him. Physicist Doppler was born on November 29, 1803, in Salzburg, Austria. His contribution is still considered essential not only in physics, but also in various branches of medicine, astronomy, and technology. The ‘Doppler Gun’ has even become a great tool for law enforcement, helping them fine overspeeding drivers.

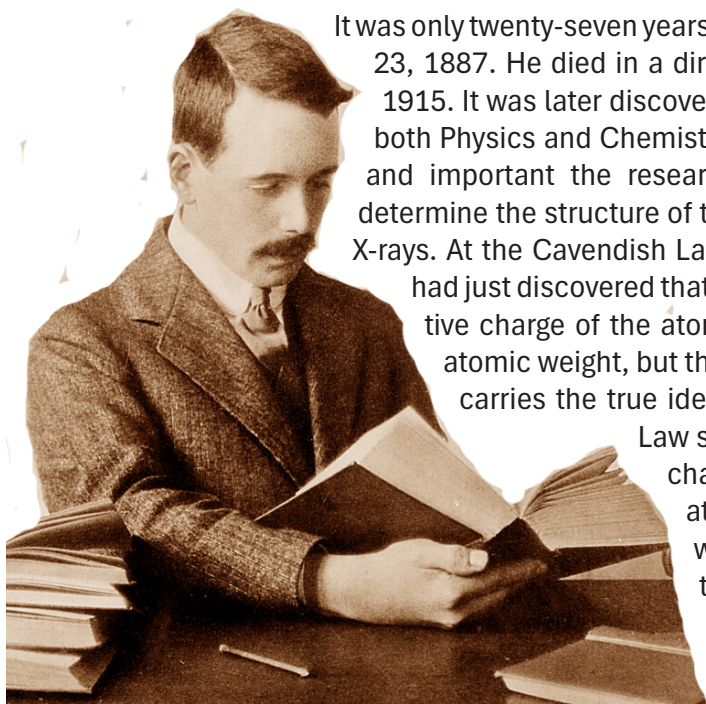
The name Halley’s Comet is very familiar to all of us. And many of us probably also know that the relationship between this astrophysicist and mathematician, a contemporary of Sir Isaac Newton, has been fraught with tension. **Edmond Halley** was born in England on November 8, 1656, and published his first paper at the age of just twenty. In 1676, he left England, leaving his university studies unfinished, to travel to Saint Helena, an island in the South Atlantic Ocean, to observe the sky. The aim was to create a map of the stars in the southern hemisphere sky. He was encouraged in this regard by King Charles II of England himself and the Astronomer Royal, John Flamsteed, the highest authority on astronomy in England. In fact, Halley succeeded Flamsteed as his successor. Halley financed the publication of Newton’s famous book *Principia*. Earlier, in 1682, Halley had observed and analyzed the orbit of Comet Halley, which played a significant role in Newton’s law of universal gravitation. In fact, based on this, Halley made a prediction of the regular arrival of the comet. According to his calculations, the comet was expected to reappear in 1758, 76 years after 1682. His calculations were proven correct and the comet reappeared at exactly the right time in 1758. He had died before that in 1741. It was the first of the comets to be discovered to follow a regular orbit. In 1758, this comet was identified as Halley’s Comet.



Canadian physician and scientist **Frederick Banting** shared the Nobel Prize in Physiology or Medicine with John Macleod in 1923. He was then only 32 years old and is still the youngest Nobel laureate in physiology or medicine. But more importantly, his research has benefited human civilization for the past hundred years, and his work occupies a unique place in the medical and social fields as a whole. Some of his contemporaries were able to show that insulin was necessary for the treatment of diabetes. Banting's main work was to isolate insulin from the pancreas of pigs, dogs, or cows and use it to treat diabetes. Banting was born on November 14, 1891. Behind his and MacLeod's Nobel Prizes, there are two other student and local researchers who contributed significantly. They were Charles Best and James Collip. Both Nobel laureates shared their prize money with their students; they also gave them other recognition. In the early days, the main source of insulin was material extracted from the pancreas of dogs, pigs, or cows. Since the late 20th century, it has been possible to produce insulin artificially, eliminating the need to take it from animals. However, it should be noted that when insulin was initially collected from dogs, it was done through animal sacrifice. Now, there is a huge ban on killing animals for research purposes. But we must not forget that it was through this seemingly abominable act that human civilization discovered not only diabetes but many other treatments.



It was only twenty-seven years of life. **Henry Gwyn Jeffrys Moseley** was born on November 23, 1887. He died in a direct battle on the battlefield of World War I, on August 10, 1915. It was later discovered that this scientist was nominated for the Nobel Prize in both Physics and Chemistry in 1915. This gives some indication of how fundamental and important the research contributions of Moseley were. Moseley attempted to determine the structure of the atomic nucleus of elements by analyzing the spectra of X-rays. At the Cavendish Laboratory, he was researching under Lord Rutherford, who had just discovered that there was a small region inside the atom where all the positive charge of the atom was stored. Moseley's research revealed that it is not the atomic weight, but the number of positive charges at the center of the atom that carries the true identity of the atom. Moseley's Law was discovered. Moseley's



Law states that the square root of the frequency of an element's characteristic X-ray is directly proportional to the element's atomic number (Z), expressed by the formula $\sqrt{\nu} = a(Z - b)$, where ν is the frequency, a is a universal constant related to the energy levels, and b is a screening constant accounting for inner electron shielding. This resulted in some changes in the periodic table of elements. His tragic death caused a stir in the scientific community of the time. The concerned authorities became aware. Later, it was recognized that it

would be more productive to employ scientists in research laboratories to develop war-related innovations rather than sending them directly to the battlefield.

Dr Bhupati Chakrabarti is a retired faculty from the Department of Physics, City College, Kolkata and was the General Secretary of IAPT from 2013 to 2018. He can be reached through chakrabhu@gmail.com