



13.10.2026 NEWS

TWO AMERICAN ECONOMISTS AWARDED THE NOBEL PRIZE IN ECONOMICS

- Two American economists, Michael Woodford and Robert E. Hall, have been selected for this year's Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, commonly known as the Nobel Prize in Economics.
- According to the Nobel Committee, the economists demonstrated that economic models could be developed based on the decisions of individuals and institutions, rather than relying solely on statistical relationships between variables such as inflation, production, and consumption.
- The committee praised their contributions for providing a fresh approach to policies aimed at stabilising the economy.
- In other words, they developed a framework to explain the functioning of the overall economy by examining how individuals and businesses make economic decisions.
- The official name of the award is the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel.
- The prize was established in 1968 by Sweden's central bank, Sveriges Riksbank, in memory of Alfred Nobel, the 19th-century Swedish industrialist and chemist who invented dynamite and established the five original Nobel Prizes.

SECRETS OF THE UNIVERSE HIDDEN IN ANTARCTIC ICE

- All matter is made up of atoms. However, science tells us that even within atoms, there are smaller particles, including electrons, protons and neutrons.
- An electron within an atom cannot be divided further. Therefore, it is considered an elementary particle. However, protons and neutrons inside an atom are not elementary particles.

INS MANGROL INDUCTED INTO THE INDIAN NAVY

- The ship, built by Cochin Shipyard Limited in Kochi, is capable of detecting and destroying submarine threats. It can also operate in coordination with maritime patrol aircraft, helicopters, and other warships.
- The ship has been named after Mangrol, a coastal fishing town located in the Junagadh district of Gujarat.
- The new ship carries forward the legacy of the earlier INS Mangrol, a minesweeper-class warship that served in the Indian Navy until April 2004.
- The name has been retained in accordance with the Indian Navy's tradition of passing on the names and distinguished legacies of older warships to the next generation of naval vessels.
- The warship has been built with more than 80% indigenous components. It demonstrates India's growing self-reliance in modern warship design, construction, and the integration of advanced weapons and sensors.

- This is because they can be divided into even smaller particles. Scientists believe that there are 17 elementary particles.
- The branch of science that studies these particles is called Particle Physics.
- A neutrino is an elementary particle. Neutrinos have no electric charge, and their mass is almost zero.
- Because of these properties, neutrinos can easily pass through almost all types of matter. Every second, without our knowledge, hundreds of trillions of neutrinos pass through our bodies!
- Francis Halzen, this year's Nobel Prize winner in Physics, has succeeded in the challenging task of detecting neutrinos that pass through us and the Earth in enormous numbers every second.
- Halzen has been awarded this year's Nobel Prize in Physics for his significant contributions to establishing the IceCube Neutrino Observatory and conducting research on high-energy neutrinos originating from extraterrestrial sources, that is, beyond our Solar System.

» Halzen's IceCube

- Francis Halzen is from Belgium. Developments in particle physics during the 1960s attracted him to this field.
- After completing his doctoral degree, he moved to the University of Wisconsin–Madison in the United States. We may have heard of the term cosmic rays. These cosmic rays consist of various particles, such as neutrinos and protons.
- Cosmic rays travel millions of miles through space before reaching Earth. Some of these particles even penetrate the Earth and pass through our bodies.
- Thus, by studying these particles from Earth, scientists can understand the mysteries of the universe. This objective motivated Halzen to conduct research in this field.
- Detecting neutrino particles associated with cosmic rays is extremely difficult because these electrically neutral particles do not interact easily with other forms of matter.
- During the 1980s, while Halzen was researching cosmic rays, he came up with an idea for a method to detect neutrinos.
- Very rarely, a neutrino collides with an atomic nucleus. When such a collision occurs, an electrically charged particle is produced.
- This charged particle travels in approximately the same direction as the incoming neutrino and emits blue light.
- Halzen believed that by capturing this light, scientists could understand the properties of neutrinos. However, detecting this light is not easy. For example, during winter, the light from a bulb burning in a neighbouring house may not be visible because of the snow covering the surroundings.
- However, if the snow were absent, the same bulb's light would be clearly visible.
- Similarly, the light emitted when a neutrino collides with an atomic nucleus is extremely faint.
- Therefore, to detect this light, an extremely transparent environment is required. During that period, scientists conducted neutrino research using highly purified water.
- To detect a single neutrino, hundreds of thousands of litres of pure water are required. Hence, it was an extremely difficult task.

Today News...

- Under these circumstances, Halzen proposed an idea in 1988:
- "In the Antarctic region, there is clean, dust-free and transparent ice extending thousands of feet below the surface. There are also no living organisms at such depths.
- This provides a rare natural opportunity for neutrino research. Therefore, let us establish a neutrino observatory at a depth of approximately 2,000 metres in this region."
- It is worth remembering that when constructing a deep borewell for a house, we generally drill to a depth of only about 100 metres.

» IceCube Neutrino Observatory

- To test whether Halzen's idea of establishing an observatory within Antarctic ice would work, a smaller project called AMANDA was initially launched.
- Halzen carefully supervised every stage of the project, from learning from fellow researchers that hot water could be used to drill through ice more easily to ensuring that the optical sensors installed beneath the ice were properly positioned.
- Construction of AMANDA continued until 2000, and scientific research began there.
- Later, in 2005, construction of the IceCube Neutrino Observatory began.
- The project progressed gradually, and in 2011, the observatory reached its full size, covering approximately one cubic kilometre of Antarctic ice and containing light-detecting sensors. It then began collecting data at full capacity.

» Neutrino Research and the Mysteries of the Universe

- Even after the neutrino observatory was established, neutrinos did not simply appear before scientists as if to announce, "Here I am!"
- Various particles present in cosmic rays can interact with atomic nuclei and produce light.
- Furthermore, scientists must have the ability and patience to distinguish between neutrinos originating from the Sun, those produced in the Earth's atmosphere, and those arriving from beyond our Solar System.
- Halzen and hundreds of researchers working with him carried out this challenging task successfully.
- Since neutrinos have no electric charge, their paths are not deflected by magnetic fields in space.
- Therefore, by studying these particles, scientists can identify where they originated and which astronomical events may have produced them.
- By studying a fundamental particle, we can gain a deeper understanding of the scientific wonders of the universe. Thus, according to the passage, this research was recognised with the Nobel Prize. Particle Physics Research Institutions in India
- India has several institutions where students and researchers can study and conduct research in particle physics. These include : Tata Institute of Fundamental Research (TIFR) – Mumbai, Bhabha Atomic Research Centre (BARC) – Mumbai, Indira Gandhi Centre for Atomic Research (IGCAR) – Kalpakkam, Tamil Nadu, Institute of Mathematical Sciences (IMSc) – Chennai, Saha Institute of Nuclear Physics (SINP) – Kolkata, Indian Institutes of Technology (IITs) – Various locations across India.
- In the future, our own scientific research may also help unravel the mysteries of the universe!