

Astronomy for development

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Astronomy combines science and technology with inspiration and excitement

The year 2009 was celebrated as the International Year of Astronomy (IYA2009) by IAU and UNESCO. IAU-The International Astronomical Union is an organisation of professional astronomers, founded in 1919. Its mission is to promote and safeguard the science of astronomy in all its aspects.

The Union regards access to knowledge about the universe as a birth right of people of this planet and considers the dissemination of astronomical knowledge throughout the world. Recently, IAU made a decadal 'Strategic Plan' for stimulating astronomy in developing countries during the period 2010—2020. In this plan, it is visualised that astronomy lies at the central node of the development of human society for centuries. It is related with the development of 1) culture and society 2) science and research 3) technology and skills. Astronomy combines science and technology with inspiration and excitement. It provides an exciting gateway into physics, chemistry, biology and mathematics. The need to study the faintest celestial objects has driven advanced development of electronics, optics and information technology. The quest to explore the universe is the earnest desire of human species from the beginning of the civilization. It creates a sense of global citizenship. In some days, all countries will participate at some level in astronomical research. All children of this planet will be exposed to the knowledge of astronomy and the universe.

Now, we are living in a global village due to enormous internet facilities. Because of its combined inspirational, scientific and technological aspects, astronomy can play a unique role in education at all levels. It can raise public awareness about science globally. One can participate in frontier astronomical research, no matter where they are based. Many cutting-edge ground-based and space facilities developed for astronomy are available for use at no cost by scientists throughout the world.

From the dawn of history, astronomy played the vital role in the development of human civilisation. The prediction of motion of Sun, Moon and Stars were the decisive factor in the emergence agriculture and navigation in early civilisation. A thrust about our origin and root has resulted in deep curiosities about the origin of Sun, Moon, Stars, Galaxies and the Universe itself. It embodies a unique combination of science, technology and culture and plays an

important role in modern society. In one hand it leads to advanced technology; on the other hand, astronomers are the ultimate historian.

The universe is our best free laboratory to study the extreme conditions not accessible to Earth. Stars and the galaxies are environment that have produced the chemical elements, which are in our bodies and around us. Astronomical studies have lead to new discoveries in physics, chemistry, and biology and to the creation of new sciences of astrophysics, astrochemistry and astrobiology. Because of its mathematical basics, astronomy is also an excellent tool for teaching mathematics.

Astronomy is an important driver for the development of technology, such as the sensitive detectors of light, radio waves and fastest computers. To study the faintest objects requires sophisticated electronics, optics and state of art of engineering. Modern optical and radio telescopes are among the most advanced machines ever built.

There are five pathways for education and research in astronomy. They are: 1) Primary Education (ages 4 - 10), 2) Secondary Education (ages 11-18), 3) Tertiary Education and Research Training 4) Research Capabilities and Infrastructures, and 5) Public Outreach. Primary education with astronomy as a part is crucial in the development of human value system. At this age children can readily appreciate and enjoy the vastness of the universe, go to a rational thinking process, leading to universal thinking process. The scale and beauty of the universe, stimulate tolerance and awaken curiosity in science at a formative age when the value system of children is developed. In the secondary level, teaching of physics, chemistry, biology and mathematics provide a link teaching and engineering studies. Recently, educational network of telescopes have been developed that enable school children throughout the world to do astronomical observations by means of internet and so introduce students to exciting scientific research. Tertiary education and research training in astronomy provide an excellent preparation for many careers in technology and management, and develops problem-solving abilities. Nowadays, developed research capabilities and infrastructures are almost open to all. Many of the largest astronomical telescopes and satellites and their archive treasures can be used by astronomers throughout the world, no matter where they are based. It provides relatively inexpensive entry for developing countries into inspirational and visible world class international research. In the public outreach, astronomy is the most approachable of all sciences for general public. Everybody can gaze at the sky and appreciate its beauty. Stories about exotic cosmic objects and the evolution and origin of our universe can inspire, entertain and stretch the imagination.

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