ASTRONOMY
WHAT IS ASTRONOMY?

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INTRODUCTION

Astronomy, science that encompasses the study of all extraterrestrial objects and phenomena.

OBJECTIVE

Introducing field astronomy and its scope for world space week celebration October 4, 2022. Definition of astronomy, history and development, concept of the science, origin of the word, scope and branch of astronomy is the main area to cover in this document.

The scope of astronomy

Since the late 19th century, astronomy has expanded to include astrophysics, the application of physical and chemical knowledge to an understanding of the nature of celestial objects and the physical processes that control their formation, evolution, and emission of radiation. In addition, the gasses and dust particles around and between the stars have become the subjects of much research. Study of the nuclear reactions that provide the energy radiated by stars has shown how the diversity of atoms found in nature can be derived from a universe that, following the first few minutes of its existence, consisted only of hydrogen, helium, and a trace of lithium.

Branches and Fields in astronomy

Field Description

1. **Astronomy**

   The general field of natural science concerned with celestial objects including Solar System, Galactic and Extragalactic objects. Most of the enrolled students in the field work in this overarching area.

2. **Astrobiology**

   The subfield concerned with the origin, evolution, distribution and future of life in the Universe. It comprises both observational and theoretical studies of the possibilities for life in the Universe.

3. **Astrophysics**

   The application of physics and related sciences to explain natural phenomena in the general field of Astronomy. Students that engage in substantial quantitative research in Astronomy generally work in this area.

4. **Astrostatistics**

   The subfield concerned with the analysis of data (relevant to Astronomy and Space Sciences) by the methods of statistics, data mining and machine learning.

5. Cosmology

The description of the Universe on large scales. Students that study the history and development of large scale features of the Universe like groups and clusters of galaxies and the cosmic microwave background are engaged in this area. The field also probes questions of fundamental physics via astronomical/astrophysical studies.

6. Data Science

The subfield concerned with the development of algorithms, computing methods, statistical techniques for the purpose of exploring data sets (relevant to Astronomy and Space Sciences).

7. Exoplanets

Study of planetary systems outside the Solar System. Students study the origin, evolution and observational properties of planets and host stars beyond the Solar System. The notion of a planet includes not only the solid part but also the atmosphere.

8. Instrumentation

The design and construction of instruments to measure and record physical properties (in Astronomy and Space Sciences). It includes laboratory studies to develop ground, air-borne and space-based instruments.

9. Planetary Sciences

Quantitative science of the Solar System and bodies in orbit about other stars including moons, rings, asteroids and comets. Students that analyze data from space missions are engaged in this area.

10. Space Sciences (General)

Scientific disciplines involving space exploration and phenomena taking place in space. Students involved with space missions and the exploration of the Solar system work in this area. Many enrolled students in the field are engaged in this area.

11. Theoretical Astrophysics

The mathematical modeling of natural phenomena in Astronomy and Astrophysics. Students that calculate model outcomes by simulating or solving the relevant physical laws are engaged in this area.

What is Astronomy?

Astronomy is the study of objects and phenomena beyond Earth. Astronomers study objects as close as the Moon and the rest of the solar system through the stars of the Milky Way Galaxy and out to distant galaxies billions of light-years away.

The word Astronomy derived from "Astron" means "Star" and "Nemein" means "law". So Astronomy means Star law.

The oldest science of all, around 5ooo years.

Ancient Ethiopians, Chinese, Egyptians and Babylonians are well Known in this science.

Until the 17th century before telescope invented and the discovery of laws of motion and gravity astronomy was primarily concerned with noting and predicting the positions of the Sun, Moon, and planets, originally for calendrical and astrological purposes and later for navigational uses and scientific interest.