Towards the International Heliophysical Year 2007

This talk will briefly trace the steps of the space age and summarize the achievements over the past fifty years since the dawn of space age in 1957 and introduce the International Heliophysical Year that begins in 2007.

In 1957 a program of international research, known as the International Geophysical Year (IGY), was organized to study the global phenomena of Earth and the fluid envelope surrounding it. The IGY involved about 60,000 scientists from 67 nations, working at thousands of stations obtaining simultaneous, global observations on Earth and in space. The IGY witnessed the baby steps of humans towards venturing into space, and the dawn of the space age. On the fiftieth anniversary of the IGY an international program of scientific collaboration, the International Heliophysical Year (IHY) will commence. The IHY will focus on fundamental global questions regarding the processes taking place over the entire space surrounding the Sun where all planets reside.

The IHY is the logical extension of IGY not only in spirit but also in the real expansion of the physical space probed by the human kind. In 1957, we were attempting to probe the space surrounding Earth's atmosphere. In 2007, we will be studying the connection of the solar system to the interstellar medium. The term "Heliophysical" was coined to make this logical extension from "Geophysical".

It has been obvious for some time that events on the Sun can affect the climate on planets, including Earth. For humans, Earth is a special place because it is their home. How their home planet is affected by the Sun is of special importance. Sun puts of radiation at all wavelength, from radio waves to gamma rays. Sun also puts of mass as a steady solar wind, as coronal mass ejections, and as particle radiation. All these mass emissions can affect the human society in a multitude of ways. The objective of the IHY is to discover the physical mechanisms at work in this vast space known as heliosphere, especially the interconnectedness of the planets and the central star, the Sun. This will be accomplished by establishing and fostering interdisciplinary ties among solar, heliospheric, atmospheric, climate, planetary, cosmic-ray, and geospace communities.

The IHY will have four major elements. The first one is scientific research using specific campaigns known as the "Coordinated Investigation Programs" or CIPs for short. The focused, coordinated research programs, to be undertaken during 2007-2008, will inspire the next generation of space physicists, as the IGY inspired us. The second element is the deployment of small instrument arrays around the world that will provide opportunities for the scientists in emerging nations to engage in scientific research. IHY has teamed up with the United Nations Basic Space Sciences (UNBSS) to bring scientists from developed and developing countries together for such instrument deployment, data acquisition and analysis, and university-level education activities. The third element is the IGY Gold program. Under this program, IHY will identify the scientists who worked during IGY, and honor them for their pioneering scientific activities fifty years ago. The fourth element is the IHY outreach programs. The IHY will serve as a unique opportunity to organize an exciting range of education and outreach activities designed to stimulate and engage the public, who ultimately sponsor the exploration of space.

The IHY will also enhance existing programs like CAWSES (Climate and Weather of the Sun-Earth System), NASA's LWS (Living with a Star) program, and the space weather programs throughout the world. International space agencies have come together under the International Living with a Star (ILWS) program to do collaborative missions for space weather research, an important aspect of IHY.

The IHY will remind us that we are intimately connected with nature. The hydrogen formed as a consequence of the Big Bang is burning inside the Sun producing the energy that comes out of the Sun as light. This light is responsible for all life on Earth.