Physicists Cite Success Of Satellite Experiments

America's Explorer XI satellite, launched just a year ago, has proved the usefulness of gamma ray astronomy as a new scientific tool for exploring outer space.

Explorer XI was launched by the National Aeronautics and Space Administration from Cape Canaveral, Fl., April 27, 1961. It carried a gamma ray telescope, or detector, designed and built at MIT's Laboratory for Nuclear Science.

The two physicists who directed the experiment, MIT Professors George W. Clark and William L. Kraushaar, reported results Thursday in a paper presented by Dr. Clark before the annual spring meeting of the American Physical Society at the Sheraton-Harpo Hotel, Washington, D.C.

The Explorer XI telescope, they said, had a useful orbital life of about five months. So far, about half of the total metered data has been analyzed and reduced.

In this data, evidence was found that the telescope detected 64 individual high energy gamma rays that originated from collisions of cosmic rays and cosmic gases far out in galactic space. Hydrogen nuclei made up cosmic gas.

This rate is anywhere from three to ten times greater than what had been expected on the basis of earlier estimates about cosmic ray and cosmic gas concentrations in galactic space.

They said this finding is not particularly surprising, however, since earlier estimates have always tended to be made with a high degree of uncertainty. If observed gamma ray events had turned out to be 10 or so times greater than earlier estimates, they said, would have been starting. But the actual results, they believe, three to ten times more observations than had been predicted, are well within reason, considering uncertainties and variables with which predictions had to be made.

Dr. Clark and Kraushaar said the 64 events thus far analyzed indicate that a sort of uneven and uniform distribution of cosmic rays and cosmic gases throughout the galaxy. But they believe that more data taken over longer periods will show a non-uniform distribution pattern, with some areas of galactic space more rich in cosmic rays and cosmic gases than others.

The scientists said the amount of data obtained from Explorer XI is really meager when compared to the amounts needed in order to form firm judgments about the make-up of galactic space. An important role of gamma ray astronomy in the future probably will be in narrowing down many of the uncertainties which now obscure man's understanding about the makeup of galactic space and his knowledge of the size and shape of his own galaxy, the Milky Way.

Gamma ray astronomy takes advantage of phenomena that occur when cosmic rays collide with matter. One immediate product of such a collision is a short-lived subatomic particle called a neutral pi meson, which carries no electrical charge. The pi meson immediately decays, giving two high energy gamma rays—each with an energy of 50 million electron volts or more. (The Explorer XI telescope was sensitive only to gamma rays of 50 Mev or more.)

Unlike other products of the collision, the high energy gamma ray travels through space in a straight line, unaffected by magnetic fields. Hence, the direction from which a gamma ray arrives at a detector, like the Explorer XI telescope, gives an indication of the area in space where the cosmic ray-hydrogen nucleus collision occurred. From the rate of gamma rays received, one can determine the concentrations of cosmic rays and gases present in that area can be calculated.

General McCormack Addresses ROTC Meet

Major-General James McCormack, USAF Ret., speaks at a dinner for AFROTC cadet officers, aged 23 at the Faculty Club, Gen. McCormack, vice president of the MIT Defense Laboratories, lectures on mobility of Air Force thinking in our changing technological world.

---Photo by Harold Jussaume

MIT Will Aid In The Development Of Indian Institute Of Technology

MIT and eight other American universities, at India's request, will assist in developing the Indian Institute of Technology at Kanpur, India.

Education Service Incorporated (ESI) of Watertown is administering the project, financed by the United States Agency for International Development (AID).

The program provides three major areas of assistance.
1) Faculty numbers from participating institutions will go to Kanpur to develop curricula, develop research laboratories, and establish research programs based on Indian needs.
2) About an equal number of Kanpur faculty will attend participating institutions in the US.
3) Assistance will be given on laboratory equipment, facilities, and libraries unavailable in India.

In full operation there will be 20-25 faculty members at Kanpur. The first programs offered will be undergraduate physics, chemistry, mathematics, and civil, electrical, chemical, mechanical and materials engineering. Later, graduate courses will be added.

Norman Dahl, professor of mechanical engineering at MIT, is already in India with his family. He will be Program Director during the beginning phase.

---Photo by Harold Jussaume

GALA SPRING FESTIVAL

2:30 p.m. Children's folk singing
JACKIE WASHINGTON
Vanguard Recording Artist
Refreshments
Dinner $1.60
Evening Fall concert
8:15 p.m. In the AIKEN Club Yana - The Left
ROGER FROMER - Choraldey
Dinner $1.25
The Community Church
Art Center
545 Beacon St., Copley Sq.
CO 6-4710