Rice space scientists launch rockets, fly balloons

By Rich Reimke

It has been rumored recently that the new $25 million Space Science and Technology Building houses mysterious rooms for the development of space warfare devices, recently banned by an international treaty.

At the very least, the new building does house a department but four years old, the first of its kind in the country, now grown to include twelve faculty members, six research associates, and over forty graduate students.

Space Science may be defined as the study of the behavior of matter on the macroscopic scale (i.e., the physics of space phenomena). This means the space scientist is interested in satellites, rocket payloads, balloon payloads, or whatever only for the things they enable him to do or "see."

No Buck Rogers

He has nothing at all to do with the engineering problems of rocket design, space flight, etc. Rice University has nothing to do with putting a man on the moon, although once he's there, hopefully he can be put to work helping our research projects.

The present areas of research at Rice are in four broadly defined areas: 1) Fluids and Fields; 2) Planetary Atmospheres; 3) Meteorites and Planetary Structure; and 4) Astrophysics.

Space Lights

Professor Brian J. O'Brien and his group, for example, are continuing their well-known study of auroras and airglow. During 1964 and 1965 Dr. O'Brien designed and flew from Wallops Island, Va. and Pt.-Churchill, Canada, a series of rocket payloads (the Sammy rockets and the Owl satellites).

Recently a four-stage jettlev rocket was launched in Canada. More are planned.

Search for Causes

The scientific aims of the experiments are to search for the causes of auroras and airglow, to study the particles that bombard the atmosphere and to increase knowledge of the dynamical phenomena occurring in the magnetosphere (that part of space in which the earth creates a magnetic field roughly like that of a bar magnet).

On December 6, 1966, an Atlas-Agena rocket launched the TAS satellite on which Dr. John Freeman and his group have a low-energy ion detector. The aim of the experiment is to study the distribution of low-energy plasma in the magnetosphere and its variation with time.

Dr. Freeman also is preparing a solar plasma detector which is to be placed on the lunar surface by the astronauts.

Radiation

Dr. H. R. Anderson and his group are completing a study of the distribution of galactic cosmic radiation in the sun system data obtained from Mariner IV.

Through the polar orbiting OGO satellites, they are also studying solar and galactic cosmic ray distributions over the polar caps. Dr. Anderson also has proposed an experiment in which he hopes to measure the lunar electric field.

Balloons

Under the direction of Dr. R. C. Haynes a gamma ray "telescope" has been built which is carried by giant balloons to altitudes of about 130,000 feet. The balloons, launched in Pelosino, Texas, are as tall as fifty-five story buildings.

The group is searching for radioactivity associated with the Crab Nebula. Future flights will search for radioactivity in the X-ray source in Scorpio and, eventually, in quasars.

Cosmology

The findings of the experiments will bear significantly on our understanding of stellar evolutions and cosmology—two fields not exactly noted for their abundance of experimental facts.

Rice, through Dr. W. E. Gordon, is also associated with the world's largest radio-telescope in Arecibo, Puerto Rico. Though he and his graduate students study the earth's ionosphere using radar techniques.

Astronaut

In addition, Dr. A. J. Desalvo does extensive fundamental theoretical work in geomagnetism and the solar wind, and the department has an astronaut, Dr. F. C. Michel. Dr. Frank Low and graduate student Bruce Smith are doing exciting infra-red astronomy work (Time Magazine, Dec. 23, 1966) and when the astronauts bring pieces of the moon back you'll be able to find some in Dr. Dietl Heyman's lab.

Because of its many mutual interests with NASA, the Space Science department is often thought to be a part of that immense organization. Such is not true: the connection between Rice and NASA is solely one of scientific objectives and financial support.

Independent

NASA played an essential role in both the founding of the department and its continuing research programs. Most proposals for scientific research are submitted to NASA or the Air Force where they are funded according to their scientific merit. After this scrutiny, however, the research programs are the sole responsibility of the university scientist.

Unlike the classical forms of laboratory science, where several variables are under the control of the experimenter, the space scientist is a helpless observer of a large and complex system with many internal interactions that make the separation of variables extremely difficult. Thus the research programs must include as much of space science as possible so that these interactions can be fully appreciated and exploited.

Basic Research

Besides their obvious scientific interest, low-ray Desalvo, chairman of the department, emphasizes the importance of these research programs to the graduate student. They provide the primary tool of the graduate's education, closely akin to course work for the undergraduate. Thus, the education of the graduate student, the primary reason for the existence of the department, both necessities and hinges on active and distinguished basic research programs.