

RESEARCH FACILITIES AND PROGRAMS

Astronomy

An experimental program under which an attempt will be made to photograph planets and stellar nebulae from an observation post in the Earth's stratosphere is entering the testing stage, according to a joint announcement by the National Science Foundation, the Navy, and Princeton University. Called Stratoscope II, the project will employ equipment consisting mainly of a balloon-borne, 30-inch telescope system, which will be lifted to 80 000 feet, well above major atmospheric disturbances that hinder observations from the ground. The project is under the direction of Martin Schwarzschild of Princeton, who also directed the successful flights of a 12-inch solar telescope, Stratoscope I, in 1957 and 1959. The Stratoscope II program is sponsored by the Foundation and the Office of Naval Research, with additional support from the National Aeronautics and Space Administration.

Designed and developed by the Perkin-Elmer Co. of Norwalk, Conn., the telescope has an L-shaped structure. One arm measures about 25 feet, the other nearly 19. Its 36-inch quartz mirror was fabricated by the Corning Glass Works, Corning, N. Y., and was ground to within one-millionth of an inch of a true parabolic shape from the largest quartz blank ever successfully cast. It is expected to have a resolving power of 1/10th of a second of arc.

Princeton has awarded a contract to a private research organization, Vitro Laboratories in Silver Spring, Md., to supervise the development of the balloon system, to evolve launching and recovery techniques, and to plan and conduct the launches. A balloon for lifting the 4300-pound payload is under development by the G. T. Schjeldahl Co., Northfield, Minn., and will be made of a new plastic material (known as S-10) which was developed by Schjeldahl for the Office of Naval Research. A helicopter-towed device for retrieving the balloon has been tested by the Naval Air Development Test Unit, South Weymouth, Mass. While the telescope is aloft, it will be focused and monitored by means of a remote-control television system and a 70-station command channel developed by RCA Laboratories, Princeton, N. J., and using RCA's new high-resolution image orthicon tube. A telemetry system will be provided by the Sierra Research Laboratory, Buffalo, N. Y.

The first test launch of the Stratoscope II system (with a dummy payload) will be held early this year. The target period for the first full-scale launching of the telescope has been set for sometime next fall. Information will be sought on the divisions of Saturn's rings, possibly revealing new information on the factors that determine the orbits of their particles. Studies will be made of the sudden atmospheric changes occurring

on Jupiter (which may help explain that planet's Red Spot) and on Venus, and of the possible relationship of such phenomena to solar magnetic storms. Close examination of the gaseous nebulae will be undertaken in an attempt to gather information on star formation. If conditions are favorable, an attempt will also be made to photograph the surface of Venus through rifts in its cloud cover.

Northwestern University is building a new observatory at Organ Pass, N. M., to supplement work being done at its Dearborn Observatory on the Evanston campus, according to an announcement by J. Allen Hynek, chairman of the Astronomy Department. The Organ Pass site, chosen because it is the location of one of the US satellite tracking stations, is near El Paso, Texas. Support for the new observatory's work comes from the Marshall Space Flight Center of the National Aeronautics and Space Administration at Huntsville, Ala. A new "cat-eye" telescope and an electronic image-conversion process are being developed at Organ Pass and may result in an increase of image brightness by a factor of 100. This would enable the dimensions of telescopes to be reduced by a factor of 10, a feat which would have valuable applications in the planning of future space-platform observatories.

Atomic Energy Commission

A radiation engineering laboratory designed to advance the Atomic Energy Commission's program for process radiation development is being constructed at the AEC's Brookhaven National Laboratory, Upton, Long Island, N. Y. The new installation, to be known as the High Intensity Radiation Development Laboratory (HIRDL), is expected to cost \$1.85 million to build and equip and should be finished by the end of the year.

The laboratory will be used to obtain engineering data on a variety of radiation sources in the million-curie range, to develop more efficient techniques for handling large-scale radiation sources and to train scientists and engineers in the uses of such radiation sources for research purposes and ultimately for industrial applications. This information is essential for the design of future irradiation facilities which would be useful in various applications of radiation energy. Those currently under development include the production of plastics and chemicals, cold sterilization of drugs and medical supplies, and preservation of perishable food.

The total level of radiation expected to be employed is approximately two million curies. Most of the sources will consist of cobalt-60 and cesium-137, although spent reactor fuel elements will also be used as sources.

Panoramic Physics Research

The single goal of a contract research laboratory is to be continuously engaged in significant research programs. Because the support for such research comes from industrial and government laboratories having diverse interests, the scope of activities is necessarily panoramic, as shown in this abbreviated list of research programs currently underway in the Physics Division of Armour Research Foundation.

More than half of all research programs in the Physics Division are initiated as a direct result of staff-generated research ideas which are of personal interest to the scientist. Such Project Suggestions are encouraged and even expected of our senior physicists since through them we are able to make our interests known to the many organizations that support external research.

In this very real sense, staff scientists are free to pursue research problems of their own choosing. If he wishes, a senior staff member may lead a small group of physicists in these programs, thus having the capability of effectively pursuing the technical aspects without acquiring severe administrative burdens. The opportunity to contribute to interdisciplinary research is greatly enhanced by the diversity of our interests and because the Division's 130-man staff is concentrated in a single modern laboratory building with excellent experimental and computational facilities. These advantages are coupled with significant fringe benefits including competitive salaries, four-week vacations and tuition-free graduate study.

Openings are available for intermediate and senior level scientists who feel they wish this opportunity to advance professionally in research.

ACOUSTICS

- Shear waves in solids
- Kilomegacycle ultrasonics
- Non-linear magnetostriction
- Sound velocity in liquid-gas mixture
- Sound propagation and weather

CHEMICAL PHYSICS

- Radiation induced polymerization
- Structural effects in radiation chemistry
- Radiation produced free radicals
- Reactions in organic halogen compounds
- Ionization cross sections

NUCLEAR PHYSICS

- K-shell ionization by mesons
- Neutron imaging detectors
- Beta-excited x-ray sources
- Gamma-ray backscattering
- Low Temperature scintillations

OPTICS

- Image structure and information theory
- Fiber optics research
- IR and UV backgrounds
- Studies in frustrated total reflection
- Ultraviolet photon counters

PLASMA PHYSICS

- Stability of finite plasmas
- Shock wave reactions
- High resolution electron guns
- Gas discharge neutron source
- Luminescence in shocks

SOLID STATE PHYSICS

- Excess noise in semiconductors
- Organic semiconductors
- High temperature thermoelectricity
- Microwave absorption in solids
- Radiation effects on solid surfaces

REACTOR PHYSICS

- Plutonium recycle
- Dust fuel reactor studies
- Resonance integrals and fission
- Shielding and radiation streaming
- Weapons effects

ALL REPLIES CONFIDENTIAL:
WRITE TO DR. L. REIFFEL,
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The HIRDL will have an irradiation cell for experimental work with radiation sources and a work preparation cell where various types of sources will be prepared for experimental use. A shielded area will be provided for radiation sources that are not being used.

The Atomic Energy Commission has reorganized its Division of Licensing and Regulation. The former Licensing Branch has been split into two branches, both directed by Lyall E. Johnson. They are the Facilities Branch, responsible for reactor licensing matters, export of reactors, and issuance of operators' licenses; and the Nuclear Materials Branch, which will have charge of applications for licenses to receive, possess, use, and transfer natural uranium and thorium and the fissionable materials uranium-233, uranium-235, and plutonium, and the allocation of these materials to licensees. The Radiation Safety and Isotopes Licensing Branches, under Lester R. Rogers, remain unchanged.

The functions of the Hazards Evaluation Branch will be divided among the following five branches under the direction of Clifford K. Beck: Research and Power Reactor Safety, Test and Power Reactor Safety, Special Projects, Criticality Evaluation, and Site-Environmental. The Research and Power Reactor Safety Branch will be responsible for hazards evaluation of boiling-water, pressurized-water, graphite-production, organic-moderated, research, and training reactors, and critical assemblies. The Test and Power Reactor Safety Branch will have charge of test reactors, sodium-cooled, gas-cooled, and heavy-water-production reactors, and of the administration of examinations to applicants for reactor operators' licenses.

Industry

Hoffman Electronics Corporation of Los Angeles recently dedicated a new division, the Hoffman Science Center, located in Santa Barbara. The center will be concerned with research in solid-state physics, military systems, and new industrial electronic devices, and will have a staff of some 50 scientists and supporting personnel.

A new corporation, Magnion, Inc., of Cambridge, Mass., has been formed to work on research and development of magnetic systems and products. Emphasis will be given to plasma and thermonuclear studies, nuclear research, magnetobiology and magnetochemistry, and the generation of very high magnetic fluxes. The company, whose president is William E. Barbour, Jr., is located opposite MIT's Magnet Laboratory.

Control Data Corporation has announced the establishment of a research laboratory in St. Louis Park, Minn., for the purpose of conducting advanced investigations in digital electronic computing equipment. The laboratory is equipped with extremely high-vacuum facilities for space-environmental studies and ultra-clean areas for decontamination procedures and the assembly of components.