The Month at Caltech

Leaders of America

The Rt. Rev. James Pike, Bishop of the Diocese of California of the Protestant Episcopal Church, visited the Caltech campus from February 13-15 as the first guest in this year's Leaders of America program, sponsored by the Caltech YMCA.

During his visit, the Bishop's talks included "Radical Left, Radical Right, Radical Center," "Family Planning," "The Future of Civilization," and "Religion, Science, and Technology."

The next guest on this program will be Sydney Hook, chairman of the graduate division of philosophy at NYU, who will be here from April 11-13. Also, two of the three Leaders who will be here in 1962-63 have now been confirmed: Barry Goldwater, U.S. Senator from Arizona, for November 1962; and David Riesman, author of *The Lonely Crowd*, in May 1963.

JPL's Space Simulator

Caltech's Jet Propulsion Laboratory has just completed a 4-million-dollar space simulator which will be used to determine the ultimate design of lunar and planetary spacecraft that JPL is developing for the National Aeronautics and Space Administration.

The first spacecraft to be tested in the simulator is the Mariner, a 450-pound Venus probe. The Mariner is 10 feet high and measures 14½ feet across with its

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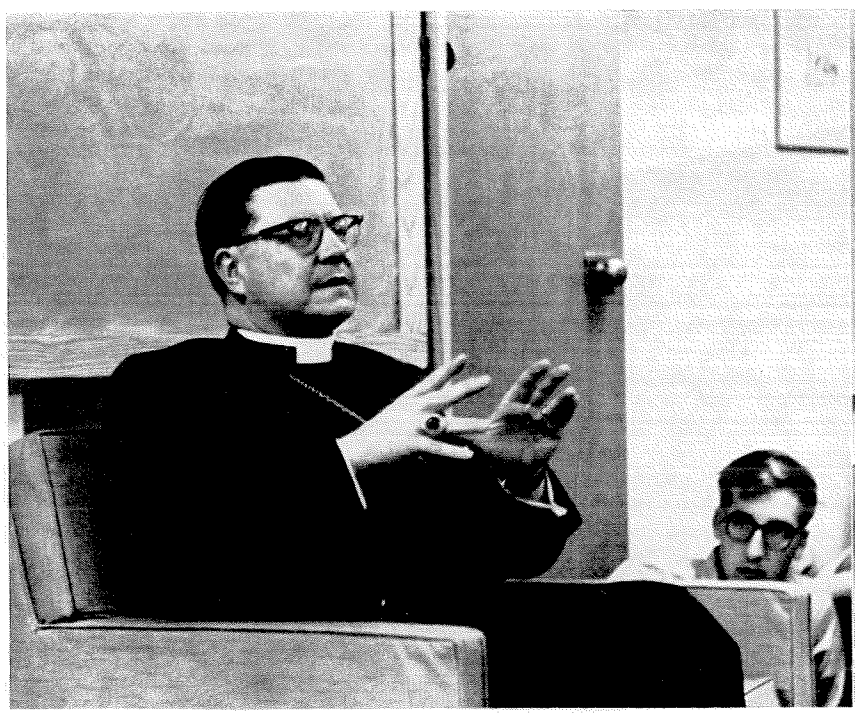
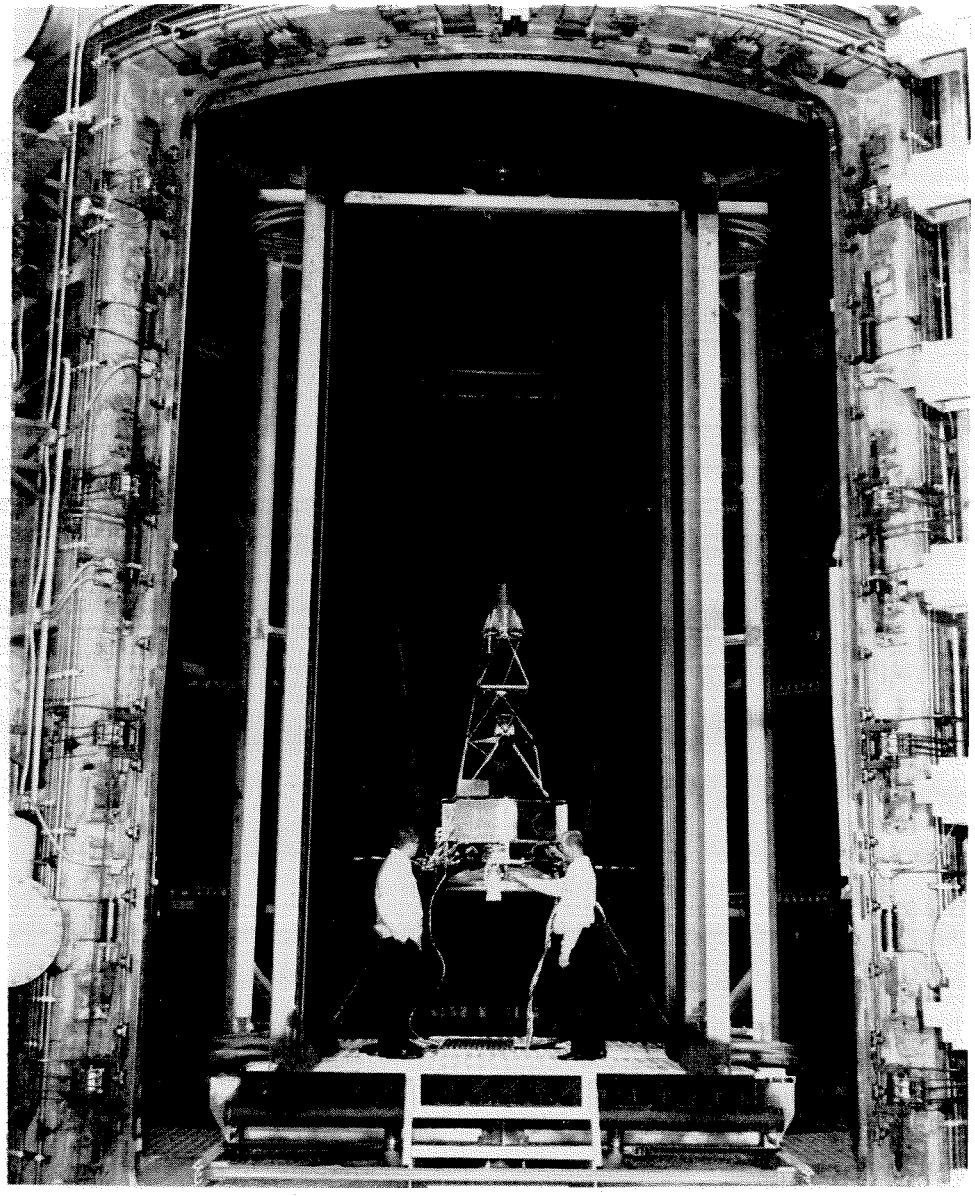


In an informal discussion with Caltech students . . .

Bishop Pike makes a point . . .

JPL's new space simulator starts its first tests — on a Mariner temperature-control model. Here, technicians are making a last minute check before a giant door closes the model inside a vacuum for rigorous testing.



elaborates on it . . .

and appreciates the result as much as anyone.

solar panels extended. The space environment simulator is large enough to test the complete spacecraft in its flight configuration. It has a lighting system that duplicates all the visible and invisible rays of the sun in a parallel beam. It comes as close to the perfect vacuum of space as possible, and it is designed so that the inner walls do not emit heat, and absorb heat and light radiated by the spacecraft.

The entire simulator facility, largest of its kind in the United States, consists of a 10,000-square-foot building to house offices, a control room, an equipment area, and the space simulator. The simulator is a cylindrical tower 80 feet high and 27 feet in diameter. In the lower part of the structure is a stainless steel vacuum chamber that measures 47 feet high by 25 feet in diameter – the area which holds the spacecraft. The upper part of the tower contains a solar simulation unit which is designed to simulate the varying intensity of sunlight that a spacecraft might be expected to encounter as near to the sun as Venus or as far away as Mars.

During a test in the simulator, engineers in the control room monitor the reactions to the space environment of the spacecraft's transmitting and receiving equipment, guidance and control system, and scientific instruments. This is accomplished with electrical circuits which are attached to the spacecraft and lead into the control room.

An optional unit will be added later which will simulate vibrations that a spacecraft would encounter during mid-course maneuvers or when retro-rockets fire.

Before the spacecraft is assembled and tested in the simulator, all of the component parts are subjected to individual tests in another new laboratory for their reactions to vibration such as rocket takeoff, pressures, heat, light, the vacuum of space, and other conditions which might be anticipated in space.

Many of the features incorporated in the new simulator have been developed from experience in using a small simulator which JPL has had in operation for the past 18 months.

A temperature-control model of the Mariner spacecraft is now being tested in the simulator. The Mariner itself, the unmanned spacecraft designed for a three-month bypass exploration of the planet Venus, will soon enter the chamber for many weeks of testing before the actual launching.