



Douglas

NUCLEAR "GUN"—The 150,000-volt nuclear ray "gun" or particle accelerator is used by Douglas Missile and Space Systems Division to duplicate space radiation hazards in the laboratory. Radiochemist Ted Mills places a shield on its terminal. The accelerator is used also for neutron activation analysis.

ASTRONOMY

Polarization Measured

► THE POLARIZATION of radio waves from space has been successfully measured by two University of Michigan radio astronomers.

They reported to the American Astronomical Society meeting in White Sulphur Springs, W. Va., that their findings may help to resolve one of astronomy's latest and most puzzling questions—why and how do certain sources of radio waves generate such staggeringly large amounts of energy.

The measurements of Prof. Fred T. Haddock, director of the University's radio astronomy observatory, and Robert W. Hobbs also confirm previous findings on the polarization of radio waves. Polarization refers to the orientation of space of the plane in which the radio waves oscillate.

Their measurements of polarization help reveal the orientation in space of the magnetic field of the source, an important part of the puzzle of the tremendous energy required to account for the intensity of radio waves from such sources.

Polarization of the signals is created by radiation-emitting electrons spiraling around lines of force in the radio galaxy's magnetic field. The orientation of the field as it appears at the earth can then be calculated.

The total energy in these radio sources is so great that it cannot be satisfactorily explained. However, the British astronomer, Dr. Geoffrey Burbidge, has suggested that it comes from a chain reaction of supernova explosions in the center of a galaxy.

Prof. Haddock also reported that University of Michigan radio astronomers had

greatly extended the range of measurements of radio frequency intensity of the Milky Way galaxy, to which the sun, earth and planets belong. One result of this will be that the accuracy of scientific deductions from physical data on the Milky Way's radio emissions will be greatly increased.

For example, they determined that in the local spiral arm of this galaxy, there is an average of not more than 15 electrons in every 100 cubic centimeters of space, one centimeter being about four-tenths of an inch.

The measurements were made during a 1,050-mile-high rocket-borne experiment last September in which the Milky Way's galactic radiation was measured on three frequencies, 750, 1,200 and 2,000 kilocycles.

• Science News Letter, 83:22 January 12, 1963

ASTRONOMY

Two Billion Tons Of Water on Mars

► THERE ARE about two billion tons of water vapor on Mars, two Russian scientists have estimated.

Although the amount of free water cannot be observed directly, it can be estimated from the degree of cloudiness of the Martian atmosphere and, independently, from the rate of evaporation of the polar ice caps.

The Russians have said that their Mars probe, now speeding toward its rendezvous next June 25, is equipped to study the ice caps, so the new estimate of two billion

tons of free water may be verified in a little more than six months.

Even though two billion tons sounds like a lot of water in an atmosphere, it is actually a mere drop in a bucket compared to the water in the earth's atmosphere: ten thousand billion tons, or more than five thousand times as much.

Drs. A. I. Lebedinskii and G. I. Salova of Moscow State University made the estimates, which were reported in New York in English translation by the American Institute of Physics in Soviet Astronomy, 6:390, 1962.

They also reported that the thickness of the snow layer in the polar ice caps is one-hundredth of a gram per square centimeter.

• Science News Letter, 83:22 January 12, 1963

COMMUNICATION

Western Institutions Can "Talk" via Computer

► LINKING seven western institutions electronically, the nation's first educational computer network is now in operation, reported Dr. George Brown, director of the Western Data Processing Center at the University of California, Los Angeles.

Computers of the Air Force Academy, California Institute of Technology, University of California, San Diego; Stanford University, University of Southern California, and University of Utah can "talk" directly with the powerful IBM 7090 computer at UCLA via newly installed IBM 1009 transmission units.

Earlier computer networks involving high-speed tele-processing have been limited to such applications as the Mercury control system for space flight and defense and industrial installations.

UCLA's WDPC, which serves 77 other colleges and universities in 12 western states by mail, plans to expand its telephone network to a total of 10 or 12 participants during the year.

San Fernando Valley State College and Claremont College will be added in the spring, and negotiations are nearly complete for the addition of the University of Oregon.

Caltech, Stanford, USC, and U.C., San Diego, all have computing centers of their own, but each benefits from the additional computer time available on the UCLA equipment.

WDPC, which is sponsored jointly by UCLA and IBM, has loaned IBM 1401 computers and data transmission units to the business schools of both Stanford and USC. Although WDPC is oriented toward business research, the cooperating schools use the computer network for teaching and research problem in other fields.

Typical of the network operation are these problems: from the Air Force Academy, 1. theoretical testing of three different propellants in a solid fuel rocket engine, and 2. computation of space trajectories for students' classwork; from USC, 1. determination of crystal structure by X-ray diffraction, and 2. prediction of credit risks at the retail level from comparison of personal history information.

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