

EXPLORER IV, FOR INTENSIVE STUDY OF COSMIC RADIATION

THE heaviest American satellite, Explorer IV, launched on 26 July, has a period 110.2 minutes, apogee 1,380 miles and perigee 157 miles. Though of the same size, 80" as Explorers I and III, its weight, 38.43 lb., is heavier by 7 lb. The added weight is in instrumentation. Earlier instruments of previous satellites for temperature and micrometeorite data have been eliminated and the entire payload is devoted to cosmic ray equipment that will provide the most detailed radiation data yet obtained by a U.S. IGY satellite. Included in the instruments are four separate cosmic ray detectors, two radio beacons, one high-power and one low-power, subcarrier oscillators and battery packs.

Of the two GM tubes and two scintillation counters, one of each is shielded to eliminate data below certain energy levels, and the unshielded scintillation counter's data are directed into two radio channels reporting different levels of energy. This gives ground radio stations five channels of information. Thus, it will give not only a wider range of cosmic ray data but will break the information down into levels of intensity. Explorers I and III reported

only the gross amount of radiation they encountered, but did not differentiate between the high-energy and low-energy particles. Thus, out of the 20,000 counts per second reported by them in the high altitude portions of their orbits, it was suspected that a small percentage of these counts was due to high energy particles, but it could not be proved.

Now in Explorer IV, the shielded counters will respond only to the high energy particles, while the unshielded counters will "see" everything. Furthermore, the unshielded scintillation counter is provided with special pick-ups which can further differentiate between energy levels.

Both the high-power and low-power radio beacons will transmit continuously for an expected life of two months. The low-power beacon radiates 10 milliwatts energy and will be used mainly for tracking, but it will also report the same data as the high-power transmitter which radiates 30 milliwatts energy.

Thus the data from Explorer IV, when made available will lead to greater precise knowledge in the study of corpuscular radiation in space. (*Science*, 15 August 1958.)

OBITUARY PROF. W. PAULI

PROFESSOR WOLFGANG PAULI, whose death took place in Zurich, on December 15, 1958, was Professor of Theoretical Physics at Eidgenössische Technische Hochschule, Zurich, since 1928. He was also a member of the Institute for Advanced Study, Princeton, New Jersey, U.S.A., since 1940. He became a naturalized United States citizen in 1946. He was awarded the Nobel Prize in Physics for 1945, for the discovery of the exclusion principle, also called the Pauli principle.

Prof. Pauli was born in Vienna on April 25, 1900. He obtained the Ph.D. from Munich in 1921. Between 1921 and 1928, he was connected with the Universities of Göttingen, Copenhagen and Hamburg. He was a close associate of Prof. Niels Bohr for some time. He also held Visiting Lecturer's post in the Universities of Michigan and Purdue.

The "exclusion principle" for which he was awarded the Nobel Prize was discovered in 1925. "It is to a certain extent supplementary to the quantum theory, but at the same time it occupies an independent position. In its original form, the principle was built on the older quantum theory, which assumed fixed paths for the electrons in the atom. It stated that in every

type of orbit determined by a definite combination of quantum numbers there can be only two electrons and that they must have opposite spins. This principle has proved to be of fundamental importance, not merely as an expression of the empirically discovered distribution of the electrons in the atom, but also for the interpretation of a number of other phenomena, such as the electric conductivity of metals and the properties of magnetic substances. It has been amply confirmed by its applications to the comprehensive observation material concerning the radiation of atoms and has become particularly valuable for the interpretation of the properties of atomic nuclei, as well as the primary particles, protons and neutrons, which make up the nucleus. After the formulation of the new quantum mechanics, Pauli's principle has been given a more general form, and its importance has become more and more obvious."

Prof. Pauli occupied a leading position in theoretical physics and made many outstanding contributions on quantum mechanics and nuclear physics. He received many honours and medals and was elected to learned societies. He was an Honorary Fellow of the Indian Academy of Sciences to which he was elected in 1947.