

PHYSICS

New Theory of Relativity Devised by M.I.T. Scientist

Makes Space Flat Instead of Curved and Explains Long-Mystifying Ether Drift Experiments of Miller

THE HEADS of the much-mentioned ten men who understand Prof. Einstein's theory of relativity, and physicists generally throughout the world, will soon be buzzing with a new and improved theory of relativity developed by a young scientist at Massachusetts Institute of Technology, Dr. N. Rosen.

Dr. Rosen, at one time assistant to Prof. Einstein at Princeton, has put into the intricate equations of relativity an additional element which corresponds to flat space. This flat space is superimposed on the curved space of standard Einstein relativity.

The new theory, which takes three separate scientific reports (*Physical Review*, Jan. 15) shows that calculations based on a flat kind of space found in school-boy Euclidian geometry have no "internal contradictions."

While the new theory is relativity, all right, it "involves less relativity" than

Einstein's, to quote Dr. Rosen. Moreover, by doing the calculations in the new fashion of the young scientist the same crucial predicitions of relativity—on whose confirmation has been based acceptance of the Einstein theory—are likewise achieved.

What may well become an important advance of the new Rosen relativity is that it appears to give an explanation of the long-baffling results of Prof. D. C. Miller, reporting a measurement of the motion of the earth through a hypothetical ether.

Even before Einstein's theory famous scientists like Prof. Albert Michelson had attempted without success to detect this "ether drift," as it was called. When Prof. Einstein developed his relativity theory he gave a reasonable—and now accepted—explanation of why Michelson obtained a negative result.

But Prof. Miller, at the Case School of

Applied Science at Cleveland, for years continued the original "ether drift" experiments and, using extreme care and every precaution and refinement of research, finally came to the conclusion that a small motion of the earth with respect to a hypothetical ether could really be measured.

Prof. Miller's results have won scant acceptance in the face of Einstein's relativity but his world-wide reputation as a most careful scientist, and the tremendous mass of data which he obtained over a period of many years, have always made his results a great question mark in the face of scientific knowledge. If Dr. Rosen with his new theory can do no more than interpret Prof. Miller's results—as he claims he can—then the work of the young M.I.T. scientist will be outstanding.

The reason Prof. Miller appears to obtain evidence of a motion of the earth and a "drag" as it drifts, says the new Rosen theory, is that "a static gravitational field provides a frame of reference with respect to which the uniform motion of an observer can be determined by experiments on light performed within his own system." The Einstein theory in its original form does not permit such a possibility.

In the new Rosen relativity theory par-

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Neutrino Has No Weight at All Yet Can Carry Off Energy

DISCOVERY that the neutrino, science's most elusive atomic particle, in all probability has no weight whatever when at rest has resulted from the first important experiments with the Westinghouse giant 4,000,000-volt atom smasher, in research by Dr. E. U. Condon and his associates.

The very existence of the neutrino has been considered doubtful. The new experiments show its reality, and they make probable that it actually weighs nothing, yet does carry away energy when moving rapidly. Paradoxical as it may sound, a very high velocity of a massless particle will give it energy.

The measurements show that any mass that the neutrino may have is certainly less than 7% of the mass of the electron, the fundamental particle of nega-

tive electricity. The neutrino, like its big brother the neutron, has no electrical charge.

The determination of the neutrino's lack of mass was made by finding the least energy with which carbon atoms have to be struck by protons in order to knock out neutrons. The result of such a transmutation is to give radioactive nitrogen. By combining the new data with other energies already measured for nitrogen, it is possible to tell that the neutrino has extremely little or no mass.

Associated with Dr. Condon in the experiments were Dr. W. H. Wells, who designed the large generator, and Drs. W. E. Shoupp, R. O. Haxby and W. E. Stephens, who carried out many of the experiments.

Science News Letter, February 10, 1940



NEON TUBE TEST

At the National Bureau of Standards, A. Bernstein is cautiously examining a tube that has burned out. The new fluorescent lighting tubes may be tested for length of life in this same way.