

PHYSICS

Einstein's Last Revision

Simplified version of Einstein's generalized theory of gravitation, sent to publisher before the scientist's death, now available. Only time will reveal its influence.

► THE LATE Albert Einstein, in the last months before his death in April, 1955, completed a revised version of his generalized theory of gravitation.

This simplified version is published as an appendix to the fifth and final edition of his book, "The Meaning of Relativity." (See p. 172.)

Prof. Einstein said his simplification is "the logically simplest relativistic field theory which is at all possible." He called it the "Relativistic Theory of the Non-Symmetric Field."

Its aim is a complete description of the physical universe—gravitational and electromagnetic forces—by a single theory.

Einstein believed his theory holds the key to the universe, unifying in one concept the tiny world of the atom and the vast reaches of star-filled space.

The final revision reaffirms Einstein's belief that God does not play dice with the cosmos. It runs directly against the main current of modern physical thought, since it is a "field" theory rather than a "particle" theory such as is favored by most other physicists.

Einstein pointed out in his conclusion that "almost everybody" will disagree with his belief that a field theory will allow understanding of the "atomistic and quantum structure" of reality.

"Nobody knows anything reliable about it," Einstein stated, and only by "significant progress" in mathematical methods will an understanding be reached.

These mathematical difficulties have so far prevented checking any version of Einstein's generalized field theory against known experimental facts.

Development of a single theory to explain both gravitational and electromagnetic forces has been a major goal of physicists since 1920. At the time of his death Einstein believed the two forces are simply different manifestations of a unified cosmic field.

The new 166-page book contains 132 pages substantially the same as the first edition, published in 1922, consisting of the text of Einstein's Stafford Little lectures, delivered in May, 1921, at Princeton University. For the second edition, published in 1945, Einstein added an appendix discussing certain advances in the theory of relativity since 1921.

For the third edition in 1950, Einstein added appendix II on his Generalized Theory of Gravitation. The fourth edition appeared in 1953, with a revised appendix. In 1954 he changed the basis for choosing

a particular set of equations based on their "strength," having made an error in counting the number of applicable equations in the fourth edition.

In the fifth edition, published posthumously, the 34 pages of appendix II were completely revised.

In 1905 Einstein published his famous special theory of relativity, which set forth the equivalence of mass and energy and led to the well-known equation, $E=mc^2$, or energy equals mass times the square of the velocity of light.

The world will have to wait to see if Einstein's final revision, the "Relativistic Theory of the Non-Symmetric Field," will influence the present half century as profoundly as his theory of relativity did the first half.

Science News Letter, March 17, 1956

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Tiny Solid Capacitor Will Cut Missile Weight

► AN ALL-SOLID, completely dry electrolytic capacitor made of the rare metal, tantalum, has been produced by Sprague Electric Company, North Adams, Mass.

The tiny metal cylinder, the first of its kind to be made available commercially, represents a wide departure in the field of electrolytic units. Its development means the reduction in both volume and weight of devices using electronic circuits.

The tantalum capacitor is a quarter of an inch long and slightly less than an eighth of an inch in diameter. Twenty of them can be placed on a penny. The performance rating of the new electronic device is equal to that of 1,000 Leyden jars, the grandfather of all condensers or capacitors.

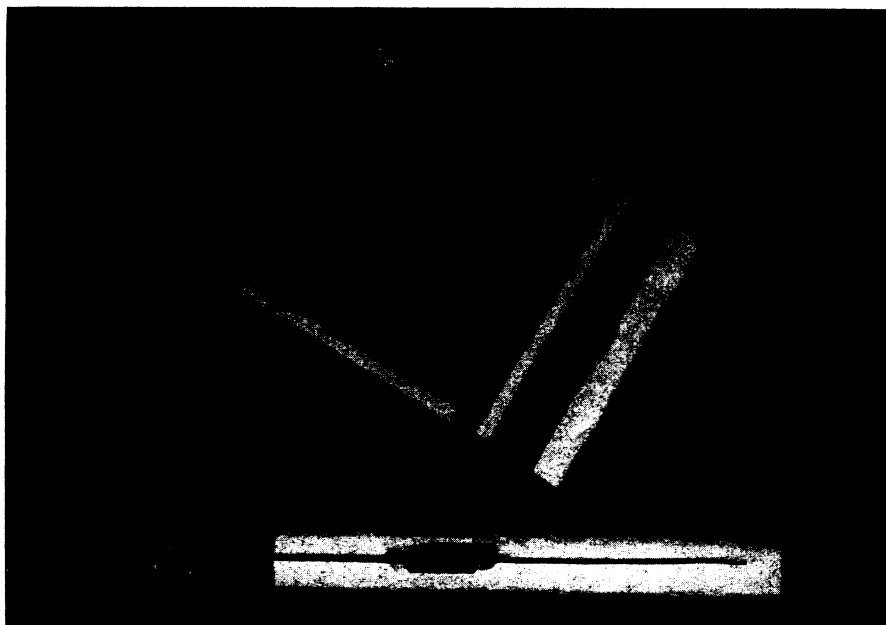
It will be of particular importance for use in guided missiles and earth satellites, Sprague scientists believe. An intercontinental ballistic missile will require as many as 1,000 capacitors. The new device, cuts the weight of each capacitor one-twentieth of the aluminum capacitors now used commercially.

Because it is made of a solid metal, it cannot boil, freeze or leak, as do those now made with either liquids or pastes. In tests conducted at Sprague, the capacitor was found to work efficiently in a temperature range of from minus 85 degrees Centigrade to more than 100 degrees Centigrade.

The tantalum capacitor, which stores an electrical charge, is being shown publicly for the first time at the meeting of the Institute of Radio Engineers in New York on March 19.

The electrical ratings in which the capacitors may be made, together with tiny transistors, resistors and batteries, may make possible miniature circuits to be fit into a container the size of a package of cigarettes.

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SOLID CAPACITOR—This tiny solid tantalum capacitor, barely visible atop a cigarette, is a development of Sprague Electric Company, North Adams, Mass. The completely dry electrolytic condenser is slated for an important role in cutting the weight and volume of electronic circuits.