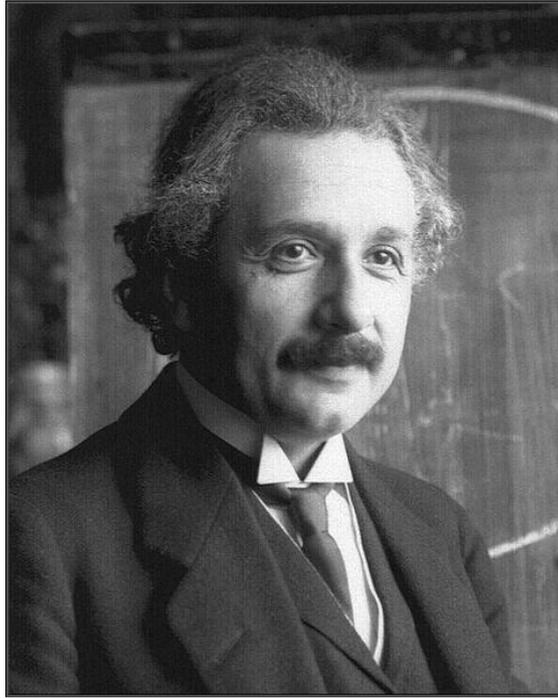# Athena Rare Books

LIST 18

ALBERT EINSTEIN

Twenty-One First Edition Journal Issues & Pamphlets
(1902 -1932)

1902

Kinetische Theorie des Warmegleichgewichtes und des zweiten Hauptsatzes der Thermodynamik (Kinetic theory of heat equilibrium and the Second Law of Thermodynamics), Presentation Offprint from *Annalen der Physik*, Series 4, Volume 9; Johann Ambrosius Barth, Leipzig, 1902, pp. 417-433. ***First Edition Offprint*** (Weil 3, Boni 3).

$ 950

NOTE: Weil incorrectly lists this article as being on pages 417-435. Boni has the correct pagination, as above.

"Almost all of Einstein's scientific work was published in periodicals. Offprints of these papers exist in almost every instance… These offprints are printed from the same setting as the text but often with new pagination. I have often been asked about the number of those offprints. It seems to be **certain that there were few before 1914**. They were given only to the author, and mostly 'Überreicht vom Verfasser' (Presented by the Author) is printed on the wrapper. Later on, I have no doubt, many more offprints were made, and also sold as such, especially by the Berlin Academy." (Weil, p. 4)

"'Lately I have been engrossed in Boltzmann's works on the kinetic theory of gases,' he wrote to Grossmann in September of 1901, 'and these last few days I wrote a short paper myself that provides the keystone in the chain of proofs that he had started"… After a fast start, however, he soon bogged down when he discovered that he had unwittingly replicated some of Boltzmann's alleged mistakes. His paper, the first of what would be three, wasn't done until the following June. Thus began what would ultimately be a three-year journey deep into the thickets of probability and statistics as Albert pursued his goal of a theory that would be so transparent that he would be able to see through it the dances of the atoms themselves, the stony firmament at the bottom of reality." (Overbye, p. 84)

This is the first of three papers published by Einstein in 1902-1904 (Weil/Boni 3-5) that recycled and expanded the work he had done in his rejected doctoral dissertation regarding statistical mechanics. "The first paper [Weil 3] used the atomic theory of gases to derive the famous second law of thermodynamics, correcting Boltzmann's alleged mistakes along the way. No sooner had he finished his paper however, than he set out again in a second paper [*Eine Theorie der Gurndlagen der Thermodynamik*], to derive the law again in a more general and powerful way that would apply to mechanical systems, not just gases. Then, after one of his patent office colleagues pointed out a flaw in his reasoning, he produced yet another [Weil 5], even more general, paper that extended his statistical legerdemain even to electromagnetic fields… It took Albert two years to finish these three papers and publish them in the *Annalen der Physik*, where the last one appeared in the sping of 1904, but they did not set the world of physics on fire. As it happened, an American physicist, Willard Gibbs, had already done the same work, laying what is generally considered the foundation of moder statistical mechanics and thermodynamics. Albert was unaware of Gibbs – those were the wages of working in isolation. But even if they did not shake up science, **the papers had a lasting influence on Albert's style as a scientist. The notion that one could start with a simple fact or supposition, such as the existence of atoms, and construct, on the basis of pure logic, a grand sweeping principle such as the second law of thermodynamics would remain with him for the rest of his life as the very model of what a physical theory should be."** (Overbye, pp. 96-97)

"Together [these three] papers [Weil/Boni 3-5] amounted to an attempt to reformulate much of classical nineteenth-century physics in twentieth-century terms. Albert had labored to show that the laws of thermodynamics, mystical precepts that governed the engines of industry and perhaps the universe, were simply a consequence of the statistics of atoms." (Overbye, p. 112)

A presentation offprint *without* the original printed wraps. Binding edge with five small "notches" – most likely from some interim binding from which this copy has been liberated. Overall, clean and bright. A fine copy of this text.

1904

Zur allgemeinen molekularen Theorie der Wärme (Towards a general molecular Theory of Heat), Presentation Offprint from *Annalen der Physik*, Series 4, Volume 14; Johann Ambrosius Barth, Leipzig, 1904, pp. 354-362. ***First Edition Offprint*** (Weil 5, Boni 5).

$ 950

"By his third paper he had been ready to explore more precisely the consequences of the microscopic chaos that lay behind the façade of order and inevitability in nature. Due to the randomness of the motions of its components, even the most smoothly running systems were not completely stable but would fluctuate. Albert derived a formula describing the energy fluctuations in a system that was maintained at a constant temperature. As an exmpale of how sophisticated his statistical techniques had become, he applied this formula not to atoms in a gas but to light waves, and obtained a result that agreed roughly with an experimental and little-understood fact of the time: The intensity and color of the glow coming from the walls of a heated oven depended on the terperature of the oven. 'I believe that this agreement should not be ascribed to chance', he concluded." (Overbye, p. 112)

This is the last of three papers published by Einstein in 1902-1904 (Weil/Boni 3-5) that recycled and expanded the work he had done in his rejected doctoral dissertation regarding statistical mechanics. "The first paper [Weil 3] used the atomic theory of gases to derive the famous second law of thermodynamics, correcting Boltzmann's alleged mistakes along the way. No sooner had he finished his paper however, than he set out again in a second paper [*Eine Theorie der Gurndlagen der Thermodynamik*], to derive the law again in a more general and powerful way that would apply to mechanical systems, not just gases. Then, after one of his patent office colleagues pointed out a flaw in his reasoning, he produced yet another [Weil 5], even more general, paper that extended his statistical legerdemain even to electromagnetic fields… It took Albert two years to finish these three papers and publish them in the *Annalen der Physik*, where the last one appeared in the sping of 1904, but they did not set the world of physics on fire. As it happened, an American physicist, Willard Gibbs, had already done the same work, laying what is generally considered the foundation of moder statistical mechanics and thermodynamics. Albert was unaware of Gibbs – those were the wages of working in isolation. But even if they did not shake up science, **the papers had a lasting influence on Albert's style as a scientist. The notion that one could start with a simple fact or supposition, such as the existence of atoms, and construct, on the basis of pure logic, a grand sweeping principle such as the second law of thermodynamics would remain with him for the rest of his life as the very model of what a physical theory should be."** (Overbye, pp. 96-97)

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1913

Entwurf Einer Verallgemeinerten Relativitätstheorie und Einer Theorie der Gravitation (Sketch for a General Theory of Relativity and a Theory of Gravitation), B. G. Teubner, Leipzig und Berlin, 1913. Original Wraps + TP + 3-38, Octavo. ***First Edition, Monograph Issue*** (Weil *58a; Boni 50).

$ 2,000

A "principal work" as noted by Weil's use of the asterisk when listing this article. It is an offprint from *Zeitschrift für Mathematik und Physik*, Bd. 62, 1913. Separately printed simultaneous with the journal publication, but with new pagination.

This is Einstein's preliminary approach to his theory of General Relativity wherein he exhibits his growing appreciation for the centrality of mathematics in any working elaboration of his theory of Special Relativity offered just eight years earlier. Einstein's insight that gravity could be understood as the curvature of space-time driven by mass demanded a sophisticated mathematical explanation so he turned to his friend Marcel Grossmann for help with the complicated equations necessary to support his theory.

"Until then Einstein's scientific success had been based on his special talent for sniffing out the underlying physical principles of nature. He had left to others the task, which to him seemed less exalted, of finding the best mathematical expressions of those principles… But by 1912 Einstein had come to appreciate that math could be a tool for discovering–and not merely describing– nature's laws" (Isaacson, Einstein: His Life and Universe, p. 193).

Thus, the paper is actually in two parts ("Physikalischer Teil" and "Mathematischer Teil") with Einstein's friend, Marcel Grossmann, supplying the mathematics needed to present Einstein's conception of gravity.

An uncut copy in original printed light green wraps. There is a small chip missing from the upper, rear, fore corner and a few closed tears to the wraps. Otherwise, a beautiful copy.

1916

Eine neue formale Deutung der MAXWELLschen Feldgleichungen der Elektrodynamik (A New Formal Interpretation of the Maxwellian Field Equations for Electrodynamics), Königlichen Akademie der Wissenschaften, Berlin, 1916, VII. Original wraps + 165-214, Octavo. ***First Edition Journal Issue*** (Weil 79; Boni 86).

$ 250

Einstein reformulates Maxwell's equations in the language of tensor calclus and in light of his recent discovery of the fild ewuations of general relativity. Latter in the year – in his landmark *Die Grundlage der allgemeinen Relativitatstheorie* – he would show how, in the weak-field limit, his own field equations of gravity would bear a close resemblance to this formulation of Maxwell's theory.

Original printed wraps. The entire pamphlet is in all but perfect shape. Uncut. Beautiful.

Gedächtnisrede auf KARL SCHWARZSCHILD (Memorial Speech on Karl Schwarzschild), Königlichen Akademie der Wissenschaften, Berlin, 1916, XXXIV. Original wraps + 739-773, Octavo. ***First Edition Journal Issue*** (Weil 87; Boni 89).

$ 150

Einstein's memorial speech for Karl Schwarzschild (1873-1916), a German physicist, best known for providing the first exact solution to his field equations of General Relativityin 1915 (the very same year that Einstein first introduced the concept of General Relativity). His work generated many original concepts which now bear his name, such as Schwarzschild coordinates, the Schwarzschild metric, the Schwarzschild radius, Schwarzschild black holes and Schwarzschild wormholes.

Original printed wraps. Front cover has been lightly creased and is just a bit soiled. Overall, a pretty copy.

1917

Über die spezielle und die allgemeine Relativitätstheorie (On the Special and the General Theory of Relativity), *Sammlung Vieweg, Tagesfragen aus den Gebieten der Naturwissenschaften und der Technik, Heft 38*, Friedrich Vieweg & Sohn, Braunschweig, 1917. Original Wraps + TP + [III]-IV = Vorwort + [1]-70, Octavo. ***First Edition*** (Weil 90; Boni 91).

$ 950

A "Gemeinverstandlich" publication, i.e. an edition geared for the general public. First Edition of "the only comprehensive survey by Einstein of his theory, and his most widely known work".

The book presents a popular account of relativity theory, both special and general. Finding it difficult to write at this level, Einstein felt he had no choice but to do so if his theories were to be understood. The book was intended "to give an exact insight into the theory of relativity to those readers who, from a general and philosophical point of view, are interested in the theory, but who are not conversant with the mathematical apparatus of theoretical physics." Rather than writing elegantly, Einstein repeated himself frequently "in the interest of clearness."

"Because paper was scarce in wartime Germany, the edition was small. But the book evidently filled a need." The book was a huge success, with fourteen editions appearing between 1917 and 1922 – and it is still available today – with only minor revisions made to subsequent edition.

Original lightly worn wraps printed inside and out. With four 1920 related newspaper articles laid in. Overall, a lovely and well-preserved copy.

Eine Ableitung des Theorem von JACOBI (A Derivation of Jocobi's Theorem), Königlichen Akademie der Wissenschaften, Berlin, 1917, XLV. XLVI. XLVII. Original wraps + 603-653, Octavo. *First Edition Journal Issue* (Weil 93; Boni 97).
$ 150

Original wraps printed inside and out. One light crease to the bottom of the front cover. Fore edge just a bit worn. Otherwise, a lovely copy.

1919

Bemerkung über periodische Schwankungen der Mondlänge, welche bisher nach der NEWTONschen Mechanik nicht erklärbar schienen (Remarks about the Periodic Fluctuations of the Moon's Length, Which Do Not Seem to Be Explained by Newtonian Mechanics) Akademie der Wissenschaften, Berlin, 1919, XXI. XXII. XXIII. Original wraps + 373-450, Octavo. *First Edition Journal Issue* (Weil 107; Boni 112).
$ 225

Original printed orange wraps with a pencil notation to the top of the rear wrap. Near fine.

1920

Schallausbreitung in teilweise dissoziierten Gasen (The Propagation of Sound in Parially Dissociated Gases) Akademie der Wissenschaften, Berlin, 1920, XVIII. XIX. XX. XXI. XXII. Original wraps + 379-403, Octavo. *First Edition Journal Issue* (Weil 110; Boni 119).
$ 300

Original printed orange wraps with a pencil notation to the top of the rear wrap. Front edge lightly frayed and slightly oversized pages protruding ¼" below the wrappers. A very good copy.

1921

Geometrie und Erfahrung (Geometry and Experience), Akademie der Wissenschaften, Berlin, 1921, V. Original wraps + 103-166, Octavo. *First Edition Journal Issue* (Weil 114; Boni 122).
$ 350

This is the scarce first edition journal issue of this important lecture.

Weil lists four contemporary translations of this work.

An important lecture by Einstein on geometry and experience in which he summed up his views on the geometrization of physics and relativity and the relation of mathematics to the external world. He also gives the famous answer to the puzzling question as to why mathematics should be so well adapted to describing the external world: "Insofar as the Laws of Mathematics refer to the external world, they are not certain: and insofar as they are certain, they do not refer to reality." (DSB, 4, p. 330)

Original printed orange wraps with a pencil notation to the top of the rear wrap. Ever so lightly soiled along the spine, but still overall a very good copy.

Geometrie und Erfahrung (Geometry and Experience), Julius Springer, Berlin, 1921. Original wraps + TP + [3]-20, Octavo. ***First Edition Pamphlet*** (Weil 115).

$ 250

This is the first edition pamphlet form of this important lecture.

Weil lists four contemporary translations of this work.

An important lecture by Einstein on geometry and experience in which he summed up his views on the geometrization of physics and relativity and the relation of mathematics to the external world. He also gives the famous answer to the puzzling question as to why mathematics should be so well adapted to describing the external world: "Insofar as the Laws of Mathematics refer to the external world, they are not certain: and insofar as they are certain, they do not refer to reality." (DSB, 4, p. 330)

Original printed wraps with a neat, ornate ownership stamp (1" x 2") in blue ink to the front cover – beside the publisher's logo and not obscuring the text. There is an identical stamp in the same position on the TP. Very minor soiling. Otherwise, fine.

Über eine naheliegende Ergänzung des Fundamentes der allgemeinen Relativitätstheorie (Concerning an obvious supplement to the foundation of the General Theory of Relativity), Akademie der Wissenschaften, Berlin, 1921, XII. XIII. XIV. Original wraps + 259-290, Octavo. ***First Edition Journal Issue*** (Weil 116; Boni 125).

$ 300

Original printed orange wraps with a pencil notation to the top of the rear wrap. With one small closed tear to the top cover near the spine and a lightly bent lower right corner. With slightly oversized pages protruding ¼" below the wrappers. A very good copy.

1922

Vier Vorlesungen über Relativitätstheorie, gehalten im Mai 1921 and der Universität Princeton (Four Lectures on Relativity, delivered in May of 1921 at Princeton University), Friedrich Vieweg & Sohn, Braunschweig, 1922. Original wraps + TP + [i] = Vorwort + [1]-70 + [71]-[72] = publisher's ads, Octavo. ***First Edition*** (Weil 124; Boni 121A).

$ 300

Weil lists five contemporary translations of this work.

Original printed pebbled grey-green wraps with two light pencil markings and very light circular areas (looking something like light erasures) on the front cover. Slightly darkened circular marks (corresponding exactly to lightened areas on front cover) which look very much like coffee cup stains (although they are not) on the TP. Other than this fault, this is a pristine copy of the work.

1923

Zur allgemeinen Relativitätstheorie (Towards a General Theory of Relativity), Akademie der Wissenschaften, [Berlin], 1923. Original wraps + 32-38, Octavo. ***First Edition Journal Issue*** (Weil 131; Boni 140).

$ 300

Weil lists this as containing not only pp. 32-38 but also pages 76 & 77 with "*Bemerkung zu meiner Arbeit*" [Remarks on my work] which are not present here. This is the journal issue of an article that originally appeared in *Sitzungberichte der Preussischen Akademie der Wissenschaften*, XVII, 1923.

Original printed orange wraps with a single pencil marking to the top of both the front and the rear cover. Very minor soiling. Otherwise, a very good copy.

Zur affinen Feldtheorie (Theory of the Affine Field), Akademie der Wissenschaften, [Berlin], 1923. Original wraps + 137-140, Octavo. ***First Edition Journal Issue*** (Weil *132; Boni 141).

$ 400

A "principal work" as noted by Weil's use of the asterisk when listing this article. This is a journal issue of an article that originally appeared in *Sitzungberichte der Preussischen Akademie der Wissenschaften*, XVII, 1923.

Einstein's attempts to formulate a unified field theory stemmed from his dissatisfaction with the general relativity theory, which did not adequately incorporate the electromagnetic field theory into the geometry of space-time. In 1918 Hermann Weyl had begun investigating the possibility of constructing a unified field theory preserving the dimensionality of space time while formally altering its geometry, making it a special case of the class known as affine geometrics. Einstein's first investigation of Weyl's ideas, published in the present paper, introduced the notion of distant parallelism; however, Einstein later rejected Weyl's theory.

Original printed orange wraps with a single pencil marking to the top of both the front and the rear cover. Very minor soiling. Otherwise, a very good copy.

1927

Allgemeine Relativitätstheorie und Bewegungsgesetz (The General Theory of Relativity and the Laws of Motion), Akademie der Wissenschaften, [Berlin], 1927. Original wraps + 235-245, Octavo. *First Edition Journal Issue* (Weil 155; Boni 171).

$ 300

Weil lists this a piece with reset type and pagination from 2 through 12. This is a *true* journal issue of the original article which appeared in *Sitzungberichte der Preussischen Akademie der Wissenschaften*, XXXII, 1927.

Original printed orange wraps with a single pencil marking to the top of both the front and the rear cover. Very minor soiling. Otherwise, a very good copy.

1930

Zwei Strenge Statische Lösungen der Feldgleichungen der Einheitlichen Feldtheorie (Two Strict Static Solutions to the Field Equations of the Unified Field Theory) Akademie der Wissenschafften, Berlin, 1930. Original wraps + TP + [3]-13, Octavo. *First Edition Journal Issue* (Weil 170; Boni 196).

$ 200

Co-authored with W. Mayer.

Original printed orange wraps. Absolutely fine.

1931

Zum Kosmologischen Problem der Allgemeinen Relativitätstheorie (The Cosmoligical Problem and the General Theory of Relativity), Akademie der Wissenschaften, Berlin, 1931. Original wraps + TP + [3]-5, Octavo. *First Edition Journal Issue* (Weil 179; Boni 205).

$ 225

Original printed orange wraps with a single pencil marking to the top of both the front and the rear cover. Very minor soiling. Otherwise, a very good copy.

Einheitliche Theorie von Gravitation und Elektrizität (Unified Theory of Gravitation and Electricity), Akademie der Wissenschafften, Berlin, 1931. Original wraps + TP + [3]-19, Octavo. *First Edition Journal Issue* (Weil *182; Boni 207).

$ 350

A "principal work" as noted by Weil's use of the asterisk when listing this article. This is a journal issue of an article that originally appeared in *Sitzungberichte der Preussischen Akademie der Wissenschaften*.

Co-authored with W. Mayer.

Original printed orange wraps. Absolutely fine.

1932

Einheitliche Theorie von Gravitation und Electrizität, Zweite Abhandlung, (Unified Theory of Gravitation and Electricity, Second Treatise), Akademie der Wissenschafften, Berlin, 1932. Original wraps + TP + [3]-10, Octavo. ***First Edition Journal Issue*** (Weil *185; Boni 207.1).

$ 350

A "principal work" as noted by Weil's use of the asterisk when listing this article. This is a journal issue of an article that originally appeared in *Sitzungberichte der Preussischen Akademie der Wissenschaften*.

Co-authored with W. Mayer.

Original printed orange wraps with a single small chip from the lower right front corner and the wraps lightly soiled on the edges. Else, a very good copy.

Semi-Vektoren und Spinoren, (Semi-Vectors and Spinors) Akademie der Wissenschafften, Berlin, 1932. Original wraps + TP + [3]-31, Octavo. ***First Edition Journal Issue*** (Weil 186; Boni 217).

$ 250

Co-authored with W. Mayer.

Original printed orange wraps. Absolutely fine.