

The Collected Papers of Albert Einstein

(Documentary edition)

Volume 1

The Early Years: 1879-1902

Edited by John Stachel and Robert Schulmann

Volume 1 presents important new material on the young Einstein. Over half the documents made available here were discovered by the editors, including a significant group of over fifty letters that Einstein exchanged with Mileva Maric, his fellow student and future wife. These letters, together with other previously unpublished documents, provide an entirely new view of Einstein's youth. The documents in the volume also foreshadow the emergence of his extraordinary creative power. In them is manifested his intense commitment to scientific work and his interest in certain themes that proved to be central to his thinking during the next decade. We can follow, for example, the beginnings of his preoccupation with the electrodynamics of moving bodies that was to lead to the development of this special theory of relativity. For the first time it can be seen how closely he followed such contemporary developments in physics as Planck's work on radiation theory and Drude's work on the electron theory of metals. In addition to all of Einstein's known correspondence and other writings from this period, the volume includes the relevant portions of all third-party letters and other contemporary documents that provide additional information about his secondary schooling at the Aargau Cantonal School; his four years at the Swiss Federal Polytechnical School, or the ETH; and his search for a job after graduation. Included in the volume are those sections of an unpublished biography by Einstein's sister, Maja Winteler-Einstein, which deal with his early years; his extensive notes on a physics course he took at the ETH; and previously unpublished photographs of the young Einstein and his teachers and friends.

Documents in Volume 1 portray Einstein's experiences during the two stressful years after his graduation from the ETH in Zurich. Denied a position as an Assistant at the ETH, he lived a hand-to-mouth existence while he looked for a post at other universities; then he attempted to find a secondary-school post, and finally sought a nonacademic job. Tension with his parents over his plans to marry Mileva Maric is evident throughout this period. With the help of a friend, he finally found work at the Swiss Patent Office, the haven where he would spend the next seven years. Freed from his financial worries, he entered on one of the most productive periods of his life, as the next volume, *Writings (1901-1910)*, will document.

Volume 1

The Early Years: 1879-1902 (English translation supplement)

Translated by Anna Beck

Volume 2

The Swiss Years: Writings, 1900-1909

Edited by Jürgen Renn and Robert Schulmann

This volume of The Collected Papers of Albert Einstein contains the scientific work Einstein published during the first decade of his career, and includes some of the most significant achievements of twentieth-century physics. The first paper was written in 1900 by the twenty-one-year-old Einstein, newly graduated from the Swiss Federal Polytechnical School, or ETH, in Zurich and still searching in vain for a job. The last paper in this volume is the text of an invited lecture given in 1909 to a major scientific meeting by Einstein after he was appointed to his first academic post at the University of Zurich. He had already been recognized as an important theoretical physicist on the basis of the work reprinted here, particularly the three masterpieces that appeared in quick succession during 1905, Einstein's year of miracles. In one of these papers Einstein showed how one could finally confirm the ancient view that matter is composed of discrete atoms, and even measure the numbers and masses of these atoms. In a second paper, which even he referred to as "very revolutionary," he argued that the observed properties of thermal radiation suggest that it consists not of waves, but rather of localized particles of energy which he called energy quanta. The third and most famous paper set forth the special theory of relativity, solving some long-standing difficulties, but requiring a significant change in our understanding of those basic concepts, space and time.

Volume 2

The Swiss Years: Writings, 1900-1909 (English translation supplement)

Translated by Anna Beck

Every document in The Collected Papers of Albert Einstein appears in the language in which it was written, and this supplementary paperback volume presents the English translations of all non-English materials. This translation does not include notes or annotation of the documentary volume and is not intended for use without the original language documentary edition which provides the extensive editorial commentary necessary for a full historical and scientific understanding of the documents.

Volume 3

The Swiss Years: Writings, 1909-1911

Edited by Robert Schulmann, A. J. Kox, and Jürgen Renn

This volume of The Collected Papers of Albert Einstein presents Einstein's writings for the two-year period starting in October 1909. The initial date marks Einstein's departure from the Swiss Patent Office at Bern, which had been his professional home for seven years, and the beginning of his first academic appointment, at the University of Zurich. The volume concludes with the masterful report that Einstein, by then a full professor at the German-language university in Prague, gave to the original Solvay Congress, the first international meeting devoted to the problems of radiation and the quantum theory. Most of Einstein's efforts during these years went into his struggle with these ever more perplexing problems of quanta, on which he made discouragingly little progress.

Einstein's new academic career naturally required him to teach, and almost half of this volume consists of the previously unpublished notes he wrote in preparation for his lectures on mechanics, on electricity and magnetism, and on kinetic theory and statistical mechanics. The last of these is particularly interesting in reflecting some of his research interests.

Several papers here are concerned with aspects of the special theory of relativity, but it is Einstein's article of June 1911 that is a harbinger of things to come: it contains his calculation of the bending of light in a gravitational field on the basis of his equivalence principle.

Martin J. Klein is Bass Professor of the History of Science and Professor of Physics at Yale University and Senior Editor of *The Collected Papers of Albert Einstein*. **A. J. Kox** teaches history of science at the University of Amsterdam, **Jürgen Renn** is Assistant Professor of Philosophy and Physics at Boston University, and **Robert Schulmann** is Assistant Professor of History at Boston University.

Volume 3

The Swiss Years: Writings, 1909-1911 (English translation supplement)

Translated by Anna Beck

Volume 4

The Swiss Years: Writings, 1912-1914

Edited by Robert Schulmann, A. J. Kox, and Jürgen Renn

This volume presents Einstein's writings from the final period of his work in Switzerland. Most of the material in Volume 4 documents Einstein's search for a relativistic theory of gravitation, a search that ended in Berlin in the fall of 1915 with the completion of the general theory of relativity.

Three scientific manuscripts, printed here for the first time, provide insights into Einstein's efforts to generalize his original relativity theory into a theory of gravitation. The first is a review article on the special theory of relativity. The second consists of notes that document Einstein's research on gravitation. The third manuscript contains calculations on the problem of the motion of the perihelion of Mercury. The explanation of the observed anomaly of this motion was to become one of the classical tests of general relativity. The existence of such a manuscript has not been known before now. All three of these manuscripts, along with other material in this volume, add significantly to our understanding of the creation of general relativity.

Volume 4

The Swiss Years: Writings, 1912-1914 (English translation supplement)

Translated by Anna Beck

This supplementary paperback volume presents only the English translations of non-English materials and is not intended for use without the original-language documentary edition.

Volume 5

The Swiss Years: Correspondence, 1902-1914

Edited by Martin J. Klein, A. J. Kox, and Robert Schulmann

This volume, the first in the series to be devoted to Einstein's correspondence, begins in June 1902, when he went to work at the Swiss Patent Office. It closes in March 1914, as Einstein left Switzerland to take up his appointment as a member of the Prussian Academy of Sciences in Berlin. The great majority of the more than 500 letters from and to Einstein presented here have not been published before, and some of them will be new even to most Einstein scholars. They give us a much richer picture of Einstein in his twenties and early thirties than we have ever had. We see him through his correspondence with his mother, his wife Mileva, and, from 1912 on, his cousin Elsa, who would later become his second wife. He maintains close ties with old friends, but his circle widens, particularly after 1906, to include a number of his contemporaries in physics such as Max Laue and Paul Ehrenfest. He also develops important relationships with older theorists—Max Planck, Arnold Sommerfeld, and especially H. A. Lorentz.

The letters in this volume clarify the development of his academic career once he leaves the Patent Office in 1909, and bring out the important parts played by such staunch supporters of Einstein as Alfred Kleiner, Fritz Haber, and, above all, Walther Nernst.

Most significant, however, is the way the letters document crucial aspects of Einstein's scientific activity: his concentration for years on the unfathomable problems of quanta and radiation, his extensive knowledge of experimental physics, his many fruitful interactions with experimentalists, and finally his long struggle to generalize the 1905 theory of relativity to include gravitation and accelerated frames of reference.

Volume 5

The Swiss Years: Correspondence, 1902-1914 (English translation supplement)

Translated by Anna Beck

Every document in *The Collected Papers of Albert Einstein* appears in the language in which it was written, and supplementary paperback volumes present the English translations of all non-English materials. For those desiring a supplement to Volume 5, for instance, this paperback includes translations of correspondence that give a much richer picture of Einstein in his twenties and thirties than we ever had. In addition to illuminating the personal aspects of his life, the letters document his scientific activity: his concentration for years on the unfathomable problems of quanta and radiation, his extensive knowledge of experimental physics, his many fruitful interactions with experimentalists, and finally his long struggle to generalize the 1905 theory of relativity to include gravitation and accelerated frames of reference. This paperback translation does not include notes or annotation of the documentary volume and is not intended for use without the original language documentary edition, which provides the extensive editorial commentary necessary for a full historical and scientific understanding of the documents.

Volume 6

The Berlin Years: Writings, 1914-1917

Edited by A. J. Kox and Robert Schulmann

Presented in this volume are Albert Einstein's writings from his arrival in Berlin in the spring of 1914 to take up his new position at the Prussian Academy of Sciences through the end of 1917. During these years he completed the general theory of relativity—the relativistic theory of gravitation—and this was surely the high point of his scientific life. His writings on relativity in this volume range from general treatments of the theory to detailed calculations of specific consequences and his first attempt at a relativistic account of cosmology. They also include his popular exposition of the special and general theories, first published in 1917 and still a valuable account for the general reader.

As soon as the difficulties on the path to general relativity had been overcome, Einstein returned to the riddles of the quantum theory. His major clarification of the quantum theory of radiation appears here along with his lesser known contribution to the formulation of quantum conditions. This volume also contains the papers describing Einstein's only experimental investigation, a study of Ampère's molecular currents, which he carried out with the Dutch physicist W. J. de Haas.

Before the beginning of World War I, Einstein had never expressed his views on nonscientific subjects. Yet one of his first reactions to this previously unthinkable general war was to sign an "Appeal to Europeans" urging an immediate end to hostilities.

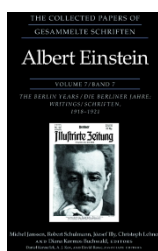
Every document in *The Collected Papers of Albert Einstein* appears in the language in which it was written.

Volume 6

The Berlin Years: Writings, 1914-1917 (English translation supplement)

Translated by Alfred Engel

Every document in *The Collected Papers of Albert Einstein* appears in the language in which it was written, and this supplementary paperback volume presents the English translations of all non-English materials. This translation does not include notes or annotation of the documentary volume and is not intended for use without the original language documentary edition which provides the extensive editorial commentary necessary for a full historical and scientific understanding of the documents.



Volume 7

The Berlin Years: Writings, 1918-1921

Edited by Diana K. Buchwald, Robert Schulmann, József Illy, and Christoph Lehner

In the spring of 1919, two British solar eclipse expeditions confirmed the correctness of general relativity theory and propelled Albert Einstein to instant celebrity. Before this major turning point, the majority of Einstein's writings published in this volume dealt with the clarification of general relativistic problems, such as the status of the metric field, the character of gravitational waves, the problem of energy-

momentum conservation, and questions of cosmology, such as the nature and size of the universe and the distribution of matter within it. After his rise to international fame, Einstein's publications changed markedly. He faced an increasing demand for popular articles and lectures on relativity, its development and meaning. He also felt compelled to respond to a host of commentators, ranging from skeptical physicists to philosophers trying to reconcile his revolutionary theory with their views. For the first time, he also responded in print to outspoken anti-relativists, some of them fueled by cultural conservatism and, frequently, anti-Semitism.

Einstein used his newly won fame to lend prestige to political causes, especially to the reconciliation among European nations and to Zionism. In the early years of Weimar Germany, Einstein spoke out vigorously for the young republic, emphasizing the rights of the individual. He agonized over the misery of the Central Europeans in the grip of starvation and economic collapse, praised the support of individuals and groups such as the Quakers, and championed the cause of Eastern European Jews. His rejection of assimilation, combined with a fierce defense of the right of Jews to higher education, led Einstein to campaign for the establishment of a university in Palestine, the land which he conceived of as a cultural center for all Jews.

Volume 7 (English)

The Berlin Years: Writings, 1918-1921 (English translation of selected texts)

Translated by Alfred Engel

Since this supplementary paperback includes only select portions of Volume 7, it is not recommended for purchase without the main volume.

Volume 8

The Berlin Years: Correspondence, 1914-1918

Edited by Robert Schulmann, József Illy, and Michel Janssen

This volume opens in spring 1914 when Einstein takes up a research professorship at the Prussian Academy of Sciences in Berlin and closes with the collapse of the German Empire four and one-half years later. A good portion of the documentation, which comprises more than 675 letters, has only recently been discovered by the editors. The letters touch on all aspects of Einstein's activities and shed new light on his inner life, while enriching our understanding of his published papers, presented in volumes 6 and 7 of this series.

The breakup of Einstein's first marriage and the divorce are presented here for the first time in all their complexity. New material shows Einstein maintaining a strong sense of moral urgency throughout the war. The scientific correspondence documents Einstein's struggle to find satisfactory field equations for his new gravitational theory—the general theory of relativity—and his continued discussion with leading physicists and mathematicians about the implications and further development of the theory.

Volume 8 (English)

The Berlin Years: Correspondence, 1914-April 1918 (English supplement translation)

Translated by Ann M. Hentschel

Volume 9

The Berlin Years: Correspondence, January 1919-April 1920

Edited by Diana K. Buchwald, Robert Schulmann, József Illy, Daniel Kennefick, and Tilman Sauer

The present volume, set in the turbulent post-World War I period, finds Einstein awaiting news of the 1919 British eclipse expedition to test the general relativistic prediction of the deflection of starlight by the sun. With the expedition's success, he becomes the first science celebrity of our age. Deeply interested in the other, stellar redshift test of his theory, Einstein supports astronomers engaged in experimental work on the issue. Piqued by early suggestions of a unified field theory, he ponders how to unify gravitation and electromagnetic field theory and also works to resolve contradictions between the new quantum physics and relativity. His open-minded exchanges with colleagues may challenge his later image as the stubborn critic of quantum mechanics.

We see Einstein deeply engaged in discussing social and political issues, participating in humanitarian efforts, and intervening on behalf of intellectuals condemned to death after the fall of the Bavarian Soviet republic. He faced anti-Semitic outbursts, reflected increasingly on his own identity as a Jew and assisted in efforts toward the establishment of the Hebrew University. As an internationalist opponent of war, and a German-speaking Swiss citizen whose renown was sealed by the Englishman Eddington's confirmation of relativity, Einstein mitigated postwar hostility toward German scholars.

Correspondence with family and friends documents his divorce, remarriage to his cousin, and his closeness to his two sons. Notwithstanding evidence in newly uncovered material concerning efforts to lure Einstein back to Switzerland, and also to the Netherlands, Einstein, entertaining high hopes for the young Weimar Republic, remained in Berlin. This volume reveals new facets of Einstein as he constructively participated in German and European scientific, academic, and cultural life.

Volume 9 (English)

The Berlin Years: Correspondence, January 1919-April 1920 (English translation of selected texts)

Translated by Ann M. Hentschel

Since this translation includes only select portions of Volume 9, it is not recommended for purchase without the main volume.

Volume 10

The Berlin Years: Correspondence, May-December 1920, and Supplementary Correspondence, 1909-1921

Edited by Diana K. Buchwald, Tilman Sauer, József Illy, and Virginia Iris Holmes

The first half of this volume presents a substantial amount of heretofore unavailable correspondence. From among family letters closed for twenty years after the death of Margot Einstein, who donated them to the Albert Einstein Archives in Jerusalem, the volume presents, for the first time, letters written by Einstein's sons, the adolescent Hans Albert and little Eduard, and numerous letters written by Einstein to his cousin

and future second wife Elsa Einstein. Combined with newly available correspondence with his close friend Heinrich Zangger, this supplementary correspondence provides vivid and intimate details of Einstein's private life. It documents the emotional bonds to his family and friends; the severe deprivations caused by the war to family members in Berlin and Zurich; the fragile health of Mileva Einstein-Maric during these years of separation and divorce; the worries and joys of caring for the sons; and Einstein's views on German and international politics during this turbulent period.

The second half finds Einstein full of optimism about Germany's new democracy. He vigorously promotes general relativity and the endeavors of other scientists toward its further confirmation. He responds to the rising interest in his work among philosophers, as attested by correspondence with M. Schlick, H. Reichenbach, R. Carnap, E. Cassirer, and H. Vaihinger. And yet he is embroiled in vociferous, politically tinged, public attacks on his theory of relativity. He considers leaving Berlin, which would have deprived the Weimar Republic of its most famous scientist. In many letters, colleagues, friends, and unknown admirers offer support. Einstein travels to Leyden, where he is appointed a visiting professor and where, in the circle of friends such as P. Ehrenfest, H. A. Lorentz, and H. Kamerlingh Onnes, he is involved in lively debates on issues related to quantum physics. He visits Oslo and Copenhagen, where he meets with N. Bohr, and receives invitations to the United States, anticipating his first visit to the New World in 1921.

Volume 10 (English)

The Berlin Years: Correspondence, May-December 1920, and Supplementary Correspondence, 1909-1920 (English translation of selected texts)

Translated by Ann Hentschel

A translation of selected non-English texts included in Volume 10 is available in paperback, <https://press.princeton.edu/titles/8332.html>. Since this supplementary paperback includes only select portions of Volume 10, it is not recommended for purchase without the main volume.

Volume 11

Cumulative Index, Bibliography, List of Correspondence, Chronology, and Errata to Volumes 1-10

Edited by A. J. Kox, Tilman Sauer, Diana K. Buchwald, Rudy Hirschmann, Osik Moses, Benjamin Aronin, and Jennifer Stolper

This index volume provides quick access to the most authoritative compilation of documents and information concerning Einstein's work and correspondence for the first half of his life. It offers readers a Cumulative Index to the first ten volumes of the collected papers, the first complete bibliography of Einstein's scientific and nonscientific writings until 1921, and a succinct biographical time line. This volume is an invaluable research tool for delving into Einstein's written legacy; his interactions with colleagues, institutions, friends, and family; and his scientific, political, educational, and social activities.

Volume 11 presents three important and unique bibliographies: the List of Writings, 1891-1921; the Einstein Bibliography, 1901-1921; and a Cumulative Bibliography and Index of Citations for Volumes 1-10. The List of Writings includes all of Einstein's

manuscripts that remained unpublished by 1921, while the Einstein Bibliography includes documents that were republished during this period. The Cumulative Bibliography and Index of Citations lists all literature written by authors cited in at least one of the first ten volumes of the series.

This volume also contains two complete lists of Einstein's correspondence up through 1920, and a Chronology of Einstein's life for the years 1879-1921. The first list presents the correspondence in chronological order, while the second list presents the correspondence in alphabetical order by correspondent. The indexes and bibliographies implicitly correct inconsistencies and errata across the different volumes. Other corrections are explicitly collected in a List of Errata for the first ten volumes of the series.

Awards and Recognition: Winner of the 2009 Wheatley Medal, Society of Indexers

Volume 12

The Berlin Years: Correspondence, January-December 1921

Edited by Diana K. Buchwald, Ze'ev Rosenkranz, József Illy, and Virginia Iris Holmes

In this latest volume, Einstein's visible public persona is amply documented in his correspondence, honors and prizes, lectures and travels, articles, and the many solicitations asking him to join public initiatives. Einstein joins a Zionist fundraising mission led by Ch. Weizmann, and he visits the United States for the first time. Einstein travels to major cities, including New York, Boston, and Chicago, and he delivers his now famous Princeton Lectures.

Scientific issues remain at the core of Einstein's preoccupations. Correspondence with N. Bohr, W. Bothe, P. Ehrenfest, H. Geiger, H. A. Lorentz, L. Meitner, and A. Sommerfeld records Einstein's interest in and contributions to the emerging modern quantum theory. He addresses conceptual problems, such as the fundamental nature of light and its emission mechanism, in a proposed experiment with canal rays. Einstein continues to engage in original research, other expert opinions, and patent applications.

Throughout the year, Einstein navigates complex territory in his professional and personal life. He travels with his older son to Bologna, yet turns down repeated invitations to Munich. He mends his friendship with M. Born, but receives stinging criticism from F. Haber for traveling to the United States. He supports the nomination of Masaryk for a Nobel Peace Prize, travels to Amsterdam in order to intervene on behalf of Germany at the Paris reparations conference, and assists Russian physicists in their efforts to rebuild and develop Russian science. Einstein's letters reveal his Social Democratic political positions.

Volume 12 (English)

The Berlin Years: Correspondence, January-December 1921 (English translation supplement)

Translated by Ann Hentschel

Every document in The Collected Papers of Albert Einstein appears in the language in which it was written, and this supplementary paperback volume presents the English translations of all non-English materials. This translation does not include notes or annotation of the documentary volume and is not intended for use without the original language documentary edition which provides the extensive editorial commentary necessary for a full historical and scientific understanding of the documents.

Volume 13

The Berlin Years: Writings and correspondence, January 1922-March 1923

Edited by Diana K. Buchwald, Ze'ev Rosenkranz, and Tilman Sauer

In April 1922, we find Einstein lecturing in Paris, engaged in reestablishing ties among scientists in former enemy nations. Meanwhile, back in Berlin, political tensions are rising. In June, the brutal murder of his friend, Germany's foreign minister, Walther Rathenau, heavily affects Einstein who, for a while, fears for his own safety and briefly contemplates leaving Berlin and abandoning academic life altogether. When only a few months later it is announced that he will be awarded the Nobel Prize, after more than a decade of nominations, Einstein is on a steamer heading from Europe to Japan. As we learn in this volume, although he knew in advance of the coming prize, he nevertheless embarked on his longest voyage yet. His travel diary, published here for the first time, recounts in poetic prose the hectic schedule on land, the contemplative rest at sea, and his musings on science, philosophy, and art during his first encounter with the Far East, Palestine, and Spain.

Einstein's work and intense scientific exchanges—with N. Bohr, P. Ehrenfest, A. Sommerfeld, M. Born, and others—during these fifteen months result in remarkable publications and intellectual developments. A paper written with Ehrenfest shows with uncompromising clarity that the outcome of the recent Stern-Gerlach experiment could not be explained by either classical or quantum theory. In a similar vein, he analyzes the phenomenon of superconductivity. Clearly among the leading quantum theorists, he focuses on its conceptual bases, tirelessly proposing crucial experiments that could decide between classical and quantum physics. We also see foundational interests develop in his concerns with a unified field theory of electromagnetism and gravitation.

A translation of selected non-English texts included in Volume 13 is available in paperback at <http://press.princeton.edu/titles/9874.html>

Volume 13 (English)

The Berlin Years: Writings and correspondence, January 1922-March 1923 (English translation supplement)

Translated by Ann M. and Osik

A translation of selected non-English texts included in Volume 13 is available in paperback. Since this supplementary paperback includes only select portions of Volume 13, it is not recommended for purchase without the main volume.

Volume 14

The Berlin Years: Writings and correspondence, April 1923-May 1925

Edited by Diana K. Buchwald, József Illy, Ze'ev Rosenkranz, Tilman Sauer, and Osik Moses

The more than one thousand letters and several dozen writings included in this volume cover the years immediately before the final formulation of new quantum mechanics. The discovery

of the Compton effect in 1923 vindicates Einstein's light quantum hypothesis. Niels Bohr still criticizes Einstein's conception of light quanta and advances an alternative theory, but Walther Bothe and Hans Geiger perform a difficult experiment that decides in favor of Einstein's theory. At the same time, Satyendranath Bose sends a new quantum theoretical derivation of Planck's law to Einstein and he discovers what is now known as Bose-Einstein condensation. Einstein attempts to reformulate a unified theory of the gravitational and electromagnetic fields.

In early November 1923, Einstein flees overnight to the Netherlands in the wake of threats on his life and anti-Semitic rioting in Berlin. He rejoins the International Committee on Intellectual Cooperation in June 1924, and supports the idea of a European union. He joins the board of governors of Hebrew University, which opens in April 1925, and celebrates the event in Buenos Aires while on a seven-week lecture tour of Argentina, Uruguay, and Brazil. During this period, he delivers lectures, meets with heads of state, visits major institutions, and attends receptions hosted by the local Jewish and German communities. He has a serious, but short-lived, falling out with his son Hans Albert and his first wife Mileva Maric-Einstein over how to invest part of the Nobel Prize money and he rescues his sister Maja and her husband from debt on their house. Einstein has a fourteen-month romantic relationship with his secretary, Betty Neumann, which he ends in October 1924.

Volume 14 (English)

The Berlin Years: Writings and correspondence, April 1923-May 1925 (English translation supplement)

Translated by Ann M. Hentschel and Jeniffer Nollar James

A translation of selected non-English texts included in Volume 14 is available in paperback. Since this supplementary paperback includes only select portions of Volume 14, it is not recommended for purchase without the main volume.

Volume 15

The Berlin Years: Writings and correspondence, June 1925-May 1927

Edited by Diana K. Buchwald, Ze'ev Rosenkranz, Dennis Lehmkuhl, and Jennifer Nollar James

This volume covers one of the most thrilling two-year periods in twentieth-century physics, as matrix mechanics—developed chiefly by W. Heisenberg, M. Born, and P. Jordan—and wave mechanics—developed by E. Schrödinger—supplanted the earlier quantum theory. The almost one hundred writings by Einstein, of which a third have never been published, and the more than thirteen hundred letters show Einstein's immense productivity and hectic pace of life.

Einstein quickly grasps the conceptual peculiarities involved in the new quantum mechanics, such as the difference between Schrödinger's wave function and a field defined in spacetime, or the emerging statistical interpretation of both matrix and wave mechanics. Inspired by correspondence with G. Y. Rainich, he investigates with Jakob Grommer the problem of motion in general relativity, hoping for a hint at a new avenue to unified field theory.

Einstein falls victim to scientific fraud when, in a collaboration with E. Rupp, he becomes convinced that the latter's experiments, aimed at deciding whether excited atoms emit light instantaneously (in quanta) or in a finite time (in waves), confirm a wave-theoretic explanation.

While it was known that the teenage Einstein had been romantically involved with Marie Winteler in 1895, newly discovered documents reveal that his love for Marie was rekindled in 1909–10 while he was still married to Mileva Marić.

The 1925 Locarno Treaties renew Einstein's optimism in European reconciliation. He backs the "International manifesto against compulsory military service" and continues his participation in the League of Nations' International Committee on Intellectual Cooperation. He remains intensely committed to the shaping of the Hebrew University in Jerusalem, although his enthusiasm for this cause is sorely tested.

Volume 15 (English)

The Berlin Years: Writings and correspondence, June 1925-May 1927 (Translation supplement)

Translated by Jennifer Nollar Jame, Ann M. Hentschel, and Mary Jane

A translation of selected non-English texts included in Volume 15 is available in paperback. Since this supplementary paperback includes only select portions of Volume 15, it is not recommended for purchase without the main volume.

Volume 16

The Berlin Years: Writings and correspondence, June 1927-May 1929

Edited by Diana K. Buchwald

During the period covered by this volume, Einstein aims to discover whether one can derive the electron's equations of motion directly from the field equations of general relativity, and he embarks on a new approach to unified field theory founded on teleparallel geometry. On these topics, he engages in exchanges with J. Grommer, C. Lanczos, and particularly with C. H. Müntz, and corresponds with mathematicians like R. Weitzenböck and É. Cartan.

Einstein attends what will be considered a historic 1927 Solvay Conference where the new quantum mechanics is discussed, but in fact he makes very few remarks.

In an important prelude to his eventual emigration to the United States, he is invited in September 1927 to accept a research professorship at Princeton University.

Despite the sudden onset of a severe heart ailment in 1928, followed by an almost year-long period of convalescence, Einstein maintains a sustained engagement with scientific work, correspondence, and social and political issues. He publishes many articles and interviews designed for a popular audience and continues various technical preoccupations, including publishing a patent for a novel "people's" refrigerator and being intimately involved in the design of his famous sailboat.

Einstein advocates for domestic legislative reform, gay and minority rights, European rapprochement, and conscientious objection to military service. He resigns from his positions at the Hebrew University. He also tries to avoid the fanfare marking his fiftieth birthday in March 1929 yet is "buried under a paper avalanche" from the tributes.

His hiring of Helen Dukas as his assistant, who accompanies Einstein to the end of his life, is of great significance for the ultimate preservation of his written legacy.

Volume 16 (English)

The Berlin Years: Writings and correspondence, June 1927-May 1929 (Translation supplement)

Translated by Jennifer Nollar James, William D. Brewer, and Steven Rendall

A translation of selected non-English texts included in Volume 16 is available in paperback. Since this supplementary paperback includes only select portions of Volume 16, it is not recommended for purchase without the main volume.

Volume 17

The Berlin Years: Writings and correspondence, June 1929-November 1930

Edited by Diana K. Buchwald

This volume finds Einstein recovered and traveling again after a prolonged illness, to Paris, London, and Zurich to receive three honorary doctorates; to the Sixth Solvay Congress in Brussels and to Leyden; and to attend the Constituent Meeting of the Jewish Agency Council in Zurich and the twelfth session of the ICIC in Geneva. By the end of the volume, Einstein embarks on a transatlantic voyage for the first time in five years to spend an academic term at the California Institute of Technology in Pasadena.

Einstein's work focuses on the teleparallel approach to unified field theory, on which he engages in intensive correspondence with Élie Cartan and begins his collaboration with Walther Mayer. He also presents popular accounts of his work, surveying the historical progression from classical to twentieth-century physics leading up to the latest developments in unified field theory. He also engages in lively exchanges on both technical and foundational issues in quantum mechanics with W. Pauli, M. Born, M. Schlick, and others.

His personal correspondence reflects eventful changes: the Einsteins realize their dream of owning a summer house outside Berlin, Einstein becomes a grandfather, his younger son Eduard commences his university studies and has his first serious mental health crisis, and his younger stepdaughter Margot gets married.

Einstein's ties to the Zionist movement are seriously tested in the wake of the violence that erupts in British Mandate Palestine in 1929, to which he reacts with forceful calls for a genuine symbiosis between Jews and Arabs, proposing the establishment of joint administrative, economic, and social organizations. He warns that without finding "the path to honest cooperation and honest negotiations with the Arabs," "we [Jews] have learned nothing from our two-thousand-year ordeal and deserve the fate that will befall us."

In Germany, too, Einstein champions democracy in the face of rising support for the Nazi Party, is active on behalf of Jewish refugees, opposes the death penalty, and supports abortion rights and the decriminalization of homosexuality.

Einstein promotes pacifism more vigorously. His efforts to promote peace follow three distinct transnational avenues: disarmament, conscientious objection, and apolitical pacifism, aimed "to find practical mechanisms to restrict the nation state."

Volume 17 (English)

The Berlin Years: Writings and correspondence, June 1929-November 1930 (Translation supplement)

Translated by Jaquelyn Bussone, William D. Brewer, Jennifer Nollar James, Steven Rendall, and Jennifer Wunn

A translation of selected non-English texts included in Volume 17 is available in paperback. Since this supplementary paperback includes only select portions of Volume 17, it is not recommended for purchase without the main volume.