

# EINSTEIN

The Man and His Mind

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SELECTIONS FROM  
THE BERGER COLLECTION  
CHAPEL HILL,  
NORTH CAROLINA

Gary S. Berger, MD, and Michael DiRuggiero

*This book is dedicated  
to the memory of Albert Einstein.*

*All royalties will be  
contributed to the Albert Einstein Archives  
at the Hebrew University of Jerusalem.*

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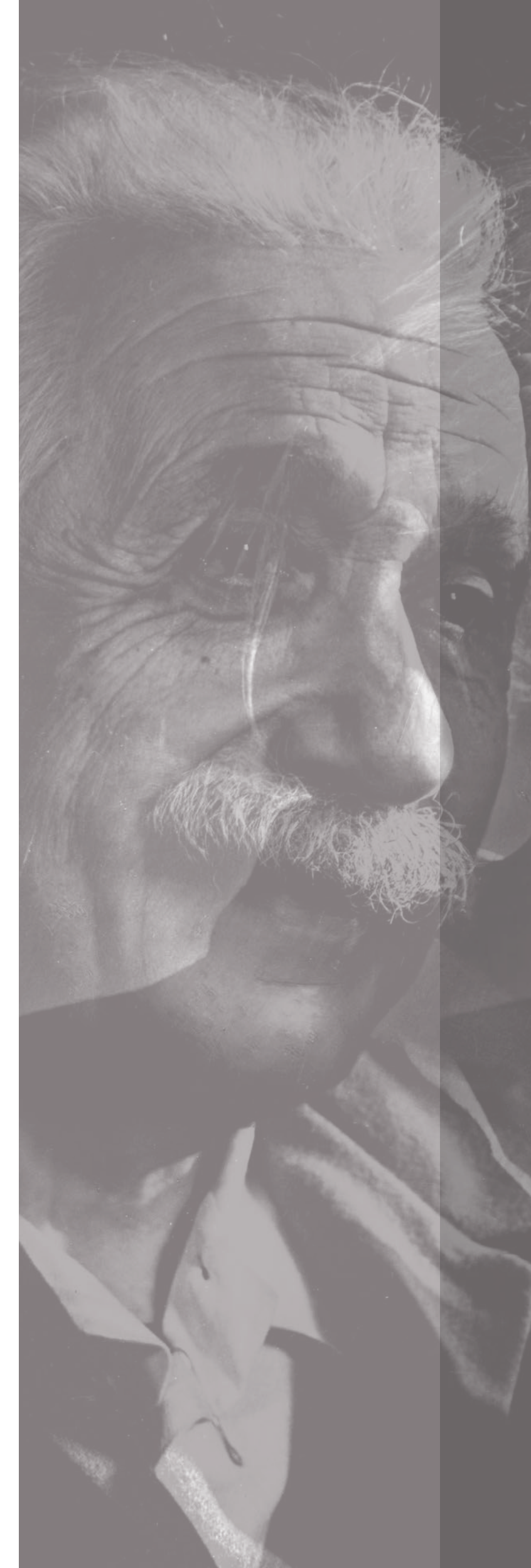
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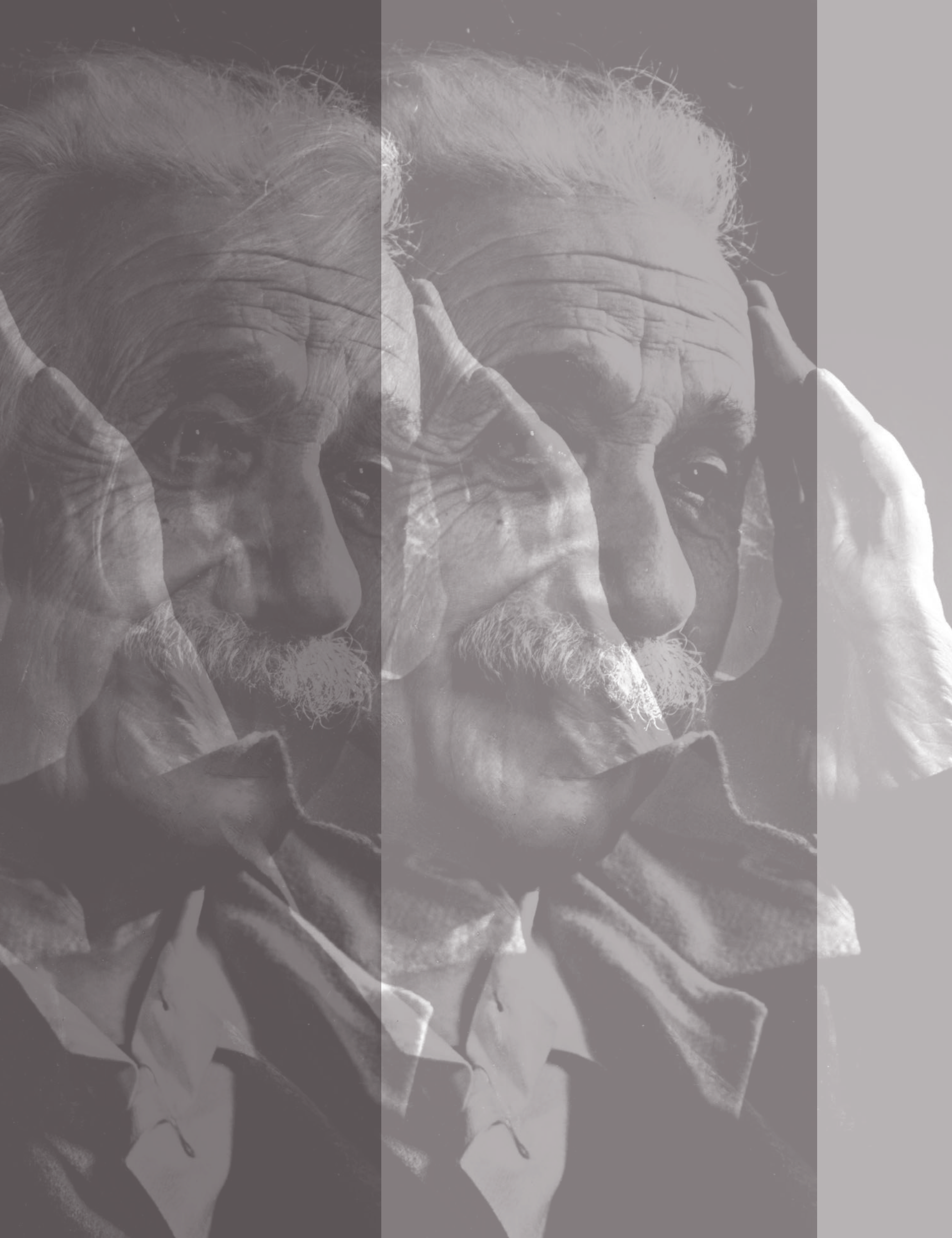
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***I*** *magination is more  
important than knowledge.  
Knowledge is limited.  
Imagination encircles  
the world.”*

—ALBERT EINSTEIN, 1929

## **PREFACE**

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Albert Einstein's name was familiar to me in childhood, as it was to all my friends. It was synonymous with genius. We knew Einstein made important discoveries about the universe that had something to do with space and time.

When I first learned about special relativity in college, I was bewildered. Having other interests, I put the subject out of my mind. But it must have lingered, because years later it seemed important to revisit these strange concepts of time slowing down and lengths contracting.

I read and reread Einstein's paper *On the Electrodynamics of Moving Bodies*, which presented the special theory of relativity. I read discussions about that famous paper as well as articles and books by and about Einstein, and I watched all the videos about him that I could find. The more I learned, the more fascinated I became with how Einstein could recognize what no one else had before about the nature of the universe.

With insights from simple thought experiments, Einstein discovered that space and time are malleable and are shaped by matter. His general theory of relativity explained the force of gravity. It predicted the bending of light waves, black holes,

gravitational waves, and the Big Bang. Einstein ushered in the era of quantum physics, having revealed light's dual wave/particle nature and the relationship between mass and energy. With thought and imagination, he transformed our understanding of the cosmos.

Eventually, I began collecting photographs and documents of the great scientist. Not being a physicist, I could appreciate his pictures, if not the complex mathematics in his writings. The photos gave me the feeling of a personal connection to Albert Einstein—the real, living man—almost as if I knew him.

In retrospect, there was an indirect connection. During weekends in my late teens, I frequented the home of a physicist, Max Herzberger, who had been Einstein's friend. On his living room wall was a beautiful portrait photograph of Einstein. Perhaps that image was the seed that led decades later to this collection.

As you explore these pages, I hope you enjoy the same feeling they have given me of affinity to one of the most extraordinary individuals who ever lived.

—GARY S. BERGER, MD

## FOREWORD

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*Einstein: The Man and His Mind* is a unique and valuable addition to the avalanche of books that have been published on different aspects of the Einstein phenomenon. The authors bring to this endeavor many years of intellectual, emotional, and professional kinship with Albert Einstein—the man and the scientist. Dr. Gary S. Berger is an avid collector of documents related to Einstein. The backbone of his collection, and the backbone of the present book, is signed photographs of the physicist. Michael DiRuggiero, an active player in the vibrant market of Einstein-related archival material, has been helping to curate the Berger collection.

Albert Einstein was twenty-one years old at the beginning of the twentieth century, just graduated from the Federal Institute of Technology in Zurich (ETH) and in desperate search of an academic position that would allow him to pursue his ideas about the burning problems on the agenda of physics. About twenty years later he received the Nobel Prize, after having profoundly changed the scientific community's understanding of the physical world. At the end of the century he was elected by the readers of *Time* magazine as the “Person of the Century” (see page 158), followed by Mahatma Gandhi and Franklin Roosevelt.

The twentieth century is gone and its memories are receding into history, but the memory of its great hero still reverberates with ever growing intensity. Einstein was, first and foremost, the architect and engineer of a new understanding of the physical world, the most revolutionary innovator since Newton. He remains the uncontested pioneer of the transition from classical to modern physics.

The papers he published in 1905, his “miracle year,” are the pillars of this transition. The technological consequences of these papers continue to affect our daily lives through myriad applications. In 1915, he formulated his masterpiece, a new theory of gravitation—the general theory of relativity—which became the genesis of modern cosmology and the basis of our understanding of the universe.

Einstein's fame stems from his fundamental, groundbreaking contributions to science. Yet they alone cannot explain his universal iconic status. One of the apparently unique aspects of the Einstein phenomenon is that his work left its mark on the cultural history of the twentieth century, far beyond his area of expertise. His presence in modern culture is all-encompassing—in art and literature, in movies and television programs, and in the digital media. He became one of the first media stars of science at a time when the world was eager to embrace such celebrities. Einstein was constantly in the public eye. In numerous articles and interviews, correspondence with peers, and public addresses, he expressed his views on a variety of political and moral issues—nationality and nationalism, war and peace, human liberty and dignity—and he launched relentless attacks on all forms of discrimination. Einstein's views and activities outside of physics were not simply add-ons to a life devoted to science. They were evidently driven by the same inner urge as his quest for scientific progress.

This humble dedication to human rights is probably the most profound reason why Einstein has become such a popular cultural icon; why centennials of the

landmarks of his creativity have been celebrated worldwide with public events, international conferences, workshops, and television programs; why his image decorates so many commercial products and is the most recognizable face on our planet.

The present book contains numerous signed photographs from the Berger collection, illustrating chronologically different chapters in Einstein's life. They are interwoven with signed letters, Einstein quotations, covers of selected articles, and canonical equations, and are accompanied by descriptive remarks that are always informative, often thought-provoking, and sometimes amusing (for example, Einstein's meeting with Charlie Chaplin, page 94). All these annotated items draw a fascinating portrait of Albert Einstein, a genuinely modest person. The photographs from the second half of his life, in particular, evoke an image of a friendly non-conformist. The fame that was his fate did not corrupt him. He remained a simple man who was not striving to please anybody, by either action or behavior, words or looks. He was an eccentric who defied authority and convention, to the extent that he did not wear socks when visiting President Roosevelt in the White House. His hair was usually in disarray, and one six-year-old girl wrote to him, "Dear Mr. Einstein, I saw your picture in the newspaper. You ought to have your hair cut so that you can look better."

The authors' gracious gesture to contribute the royalties from this book to the Albert Einstein Archives at the Hebrew University of Jerusalem is in line with their decision to dedicate their book to Einstein's memory. It reflects their commitment to maintaining and spreading Einstein's legacy in the public eye.

The Albert Einstein Archives constitutes an extremely valuable historical resource. Considered one of the most significant sources for the history of modern physics, the Archives is additionally an extremely important source for German, European, Jewish, and American intellectual, political, and social history of the first half of the twentieth century. Its documents include materials relating to Einstein's lifelong scientific odyssey, and outside of physics there is also extensive documentation on pacifism, militarism, fascism, nationalism, McCarthyism, world government, and nuclear disarmament. Documents on antisemitism, the Holocaust, Israel, and the Arab-Israeli conflict are related to Einstein's Jewish identity. The Albert Einstein Archives also includes subcollections of non-textual materials: photographs, medals, honorary diplomas, Einstein trivia and collectibles, sound recordings, and film footage.

Einstein was one of the founding fathers of the Hebrew University of Jerusalem. Therefore, it was natural that he made it the eternal home of his intellectual legacy. The Archives, together with the Einstein Papers Project in Pasadena and with Princeton University Press, have produced a scientific publication of the documents in the archives and made it freely accessible online. The Archives has also shared this material with the general public by presenting selected documents from its holdings in various exhibitions and events related to Einstein's legacy worldwide. Therefore, the authors' gesture is certainly appropriate, and it is accepted with appreciation and gratitude.

—HANOCH GUTFREUND  
*Professor (Emeritus) of Physics, The Hebrew University of Jerusalem,  
and Academic Head of the Albert Einstein Archives*



### LOVE AND LIGHT

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This is the earliest known signed photograph of Albert Einstein. We believe it was taken when he was seventeen years old to commemorate his graduation from the cantonal school of Aarau, Switzerland.

Einstein's year in Aarau was one of the happiest years of his life. At this school independent thought was encouraged, in sharp contrast to the authoritarian education he received in Germany, which he had hated. Einstein later recalled, "In Aarau I made my first rather childish experiments in thinking that had a direct bearing on the Special Theory. . . . If a person could run after a light wave with the same speed as light, you would have a wave arrangement which could be completely independent of time. Of course, such a thing is impossible."

The year 1896 was memorable for Einstein in other ways as well. While boarding with the Winteler family, he fell in love for the first time with eighteen-year-old Marie Winteler. And, to avoid mandatory German military service, which he detested, Einstein renounced his German citizenship (for the first time; he would renounce it for the second time in 1933). He was stateless for the next five years, finally becoming a Swiss citizen in 1901.

This photograph, a formal studio portrait in the *carte-de-visite* style, printed on card stock, was designed for presentation. Einstein gave it to his lifelong friend Albert Karr-Karusi and inscribed the back (in German): "To my dear Albert / Your Albert." It was a memento of their friendship, given in the spirit of today's high school students who sign each other's yearbooks.

Upon graduating with high marks from the Aarau secondary school, Einstein was admitted to the Polytechnic Institute of Zurich, where he embarked on his scientific education in earnest—and a most extraordinary life.

#### UNKNOWN PHOTOGRAPHER,

*Aarau, Switzerland, ca. 1896. Signed and inscribed by Einstein to Albert Karr-Karusi: "Meinem [lieben] Albert / Dein Albert" ("To my dear Albert / Your Albert").*



**EINSTEIN'S "MIRACLE YEAR":  
THE REVOLUTIONARY PAPERS OF 1905**

Albert Einstein published four papers in rapid succession at age twenty-six in the authoritative journal *Annalen der Physik* (the first three of which are in this collection, shown here). They shook the foundations of modern physics. He was working as a clerk third-class at the patent office in Bern, ironically having failed to obtain a position at a university.

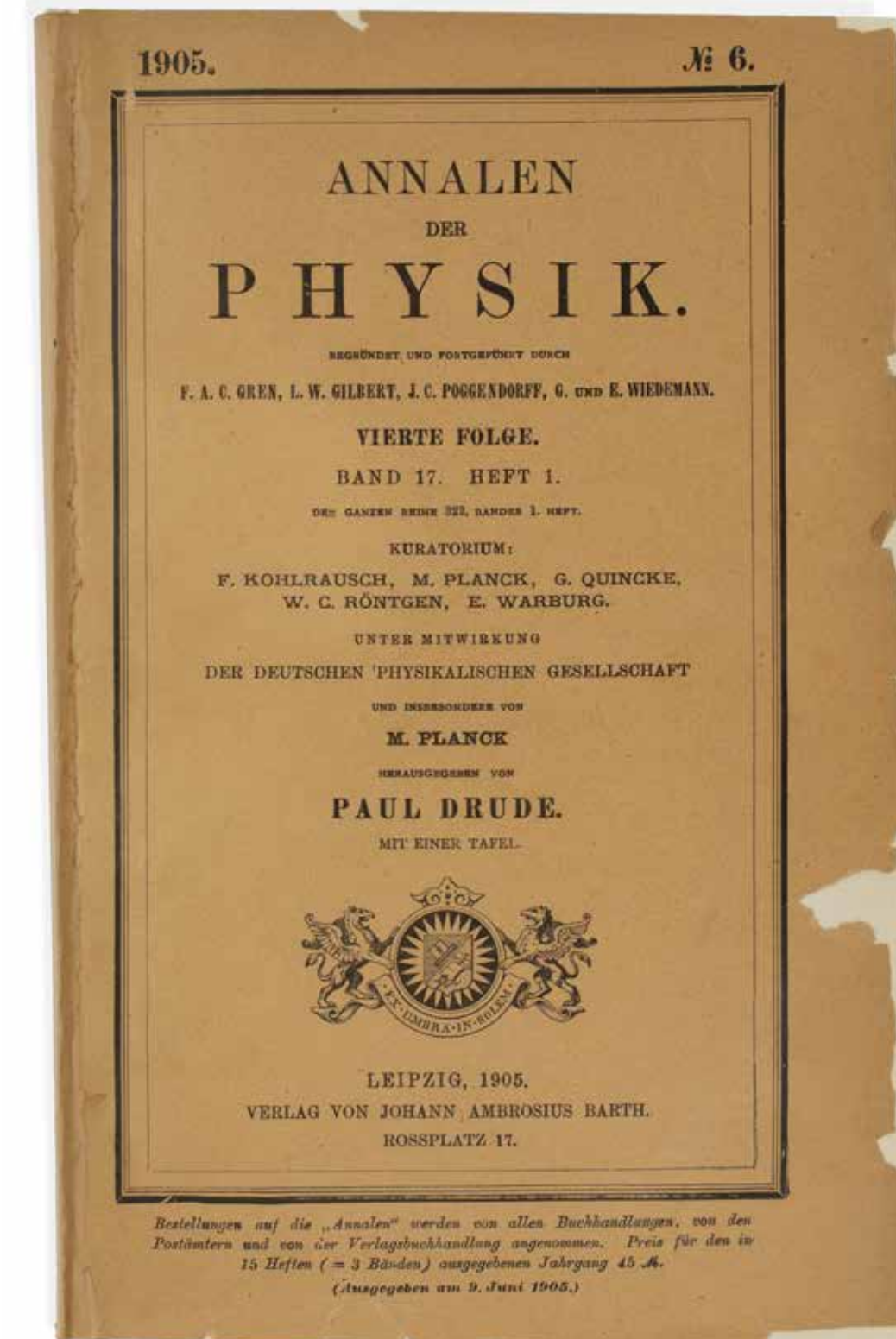
In the first paper, Einstein accepted as real the quantization of radiation, conceived by Max Planck strictly as a mathematical tool. By proposing that light energy is carried as discrete quanta (later to be named photons), Einstein explained the mysterious photoelectric effect. His paper became a foundation of quantum theory. For this work, Einstein received the 1921 Nobel Prize in Physics.

In the second paper, Einstein explained Brownian motion. This paper is generally regarded as the first proof that molecules exist. Subsequent experiments confirmed Einstein's statistical derivation, providing solid evidence for the reality of atomic theory.

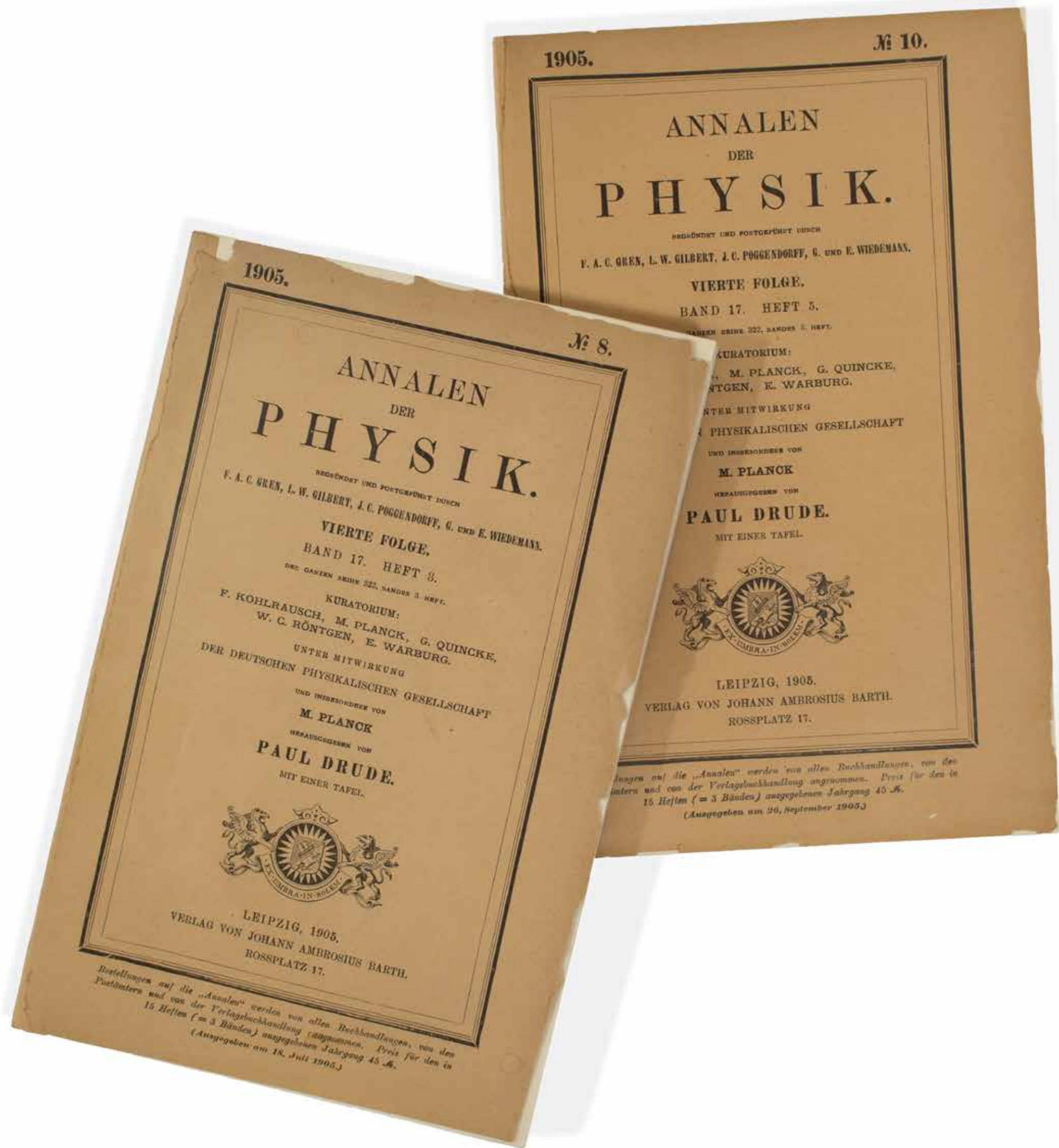
In the third paper, Einstein introduced the special theory of relativity. Einstein framed it as a "heuristic" argument, showing that if the speed of light is constant, and the laws of physics are the same for all frames of reference in uniform motion with respect to each other, then time and space are relative to the observer. Having overturned Isaac Newton's concept of absolute space and absolute time, Einstein expanded the theory to include accelerated motion in his general theory of relativity, which he published in 1916.

Einstein's fourth paper was a short derivation that he noticed as a consequence of his special relativity paper. It established the equivalence of mass and energy, leading to the most famous equation of twentieth-century science:  $E=mc^2$ .

Einstein's "miracle year" papers were so novel that they were met with silence at first, much to his disappointment. But soon, *Annalen der Physik's* editor, Max Planck, sent his assistant to Bern to find out who this unknown author was. Einstein was on his way to being recognized, not just as a theoretical physicist deserving of an academic appointment, but as a scientist of exceptional genius.



Pages 19–21: VARIOUS AUTHORS,  
Annalen der Physik (Annals of Physics), 1905.



*If a person could run after a light wave with the same speed as light, you would have a wave arrangement which could be completely independent of time. Of course, such a thing is impossible.”*

—ALBERT EINSTEIN, 1949