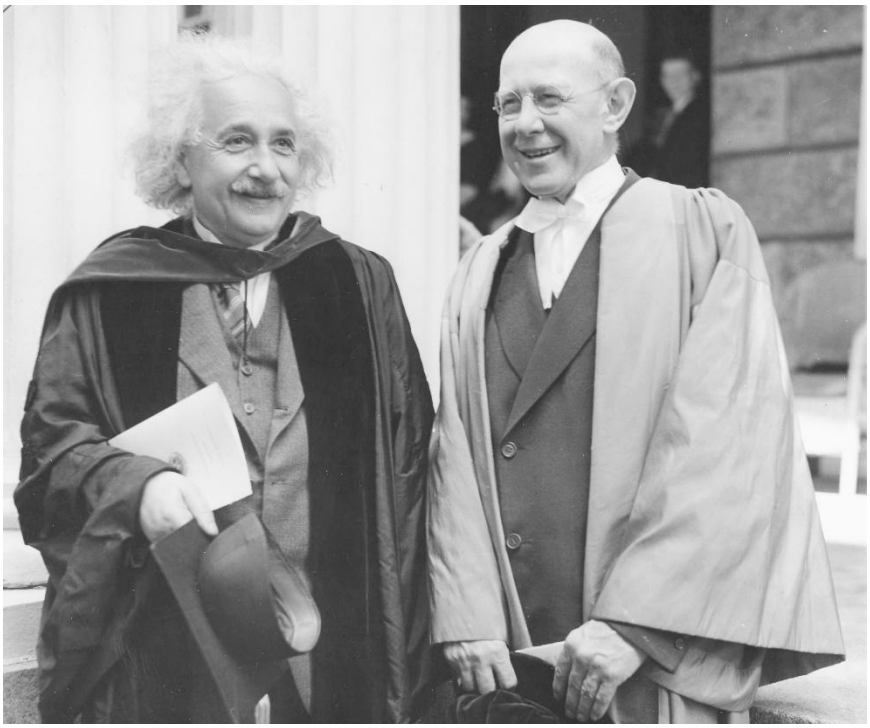
# More Friends

So widespread were Albert Einstein's friends, reflecting the richness of his social life, I could not comfortably fit all their stories into *Invisibilities*. So, herewith 62 more. No one has bothered to summarize the totality of his friends, many of whom are world famous, Nobelists and the like  This constitutes almost all original research, and includes fresh stories, like his encounters with Werner Heisenberg, head of the German atomic program in WWII.

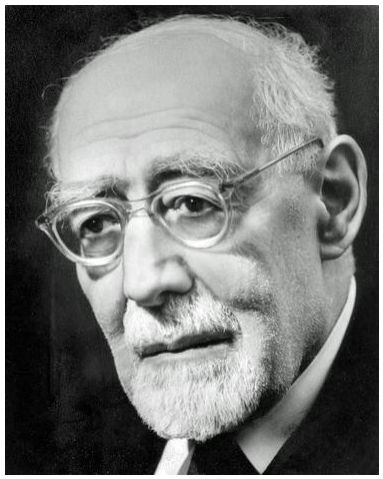
**William Zev Abrams** (1913--2007). Brother of Einstein physician Henry Abrams, he was Einstein's dentist from the of WWII to his death. The two bonded over their common membership in Princeton's small, tight-knit Jewish community.

**Franklin Ridgeway Aydelotte** (1880—1956). Graduate of Indiana and Harvard. Rhodes Scholar. He taught at MIT, was president of Swarthmore. October, 1939 started as Institute director. Later, made Knight of the British Empire. A blend of optimism, energy and friendliness and zest. He had a lame right arm and thus shook hands with his left hand.  He overcame a stammer as a kid. He joined the Quakers in 1939.



**Einstein and Aydelotte**

**Dr. Leo Baeck** (1873—1956). Chief Rabbi of Berlin. He only visited Einstein once. In 1939, he brought a trainload of Jewish children to England. Then he exhibited incredible courage: he voluntarily accompanied his fellow Jews to the Theresienstadt concentration camp in Czechoslovakia, where he managed to survive.



**Leo Baeck**

**Louis Bamberger** (1855—1944). Shy. Bamberger and Einstein both loved music. Both shared in the value of social justice. Both broke with traditional Judaism and were active in the Ethical Culture Society. Both lived more modestly than their peers. Einstein was a frequent Bamberger guest on the Shark River town of Avon, New Jersey. He would sit scribbling notes and mathematical formulas at Bamberger's desk.

**John Bardeen** (1908—1991). The only one to win two Nobel Prizes in physics. One for co-inventing the transistor while at Bell Labs. He was known as the father of the information age. His second Nobel was for superconductivity. He was unassuming, and spoke so quietly he was known as "Whispering John." Modest, thoughtful, brilliant. When asked a question, he often lapsed into a sort of trance while pondering his response. He started college at the age of 15. Got a doctorate in physics from Princeton in 1936. While at Princeton for his PhD he was hoping he'd meet Einstein. In the summer of 1942, he visited Einstein in his study. Einstein had an idea for the Navy for an induction coil placed inside a torpedo. Bardeen was impressed that Einstein had thought deeply about the problem. "Princeton was an exciting place to be. It was an exciting period in the development of quantum theory. von Neumann and others were trying to put quantum theory on a firm mathematical basis."

He taught at the University of Illinois for 40 years.

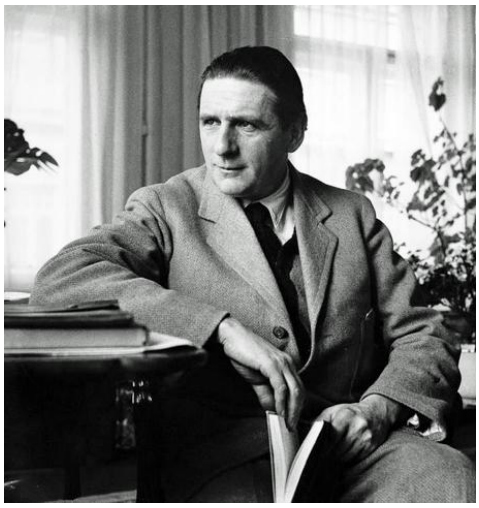
**John Bardeen**

**Rolf William Bauhan** (1859—1938). Architect and member of the New Hope Art Colony.

**Hermann Bondi** (1919—2005). Austrian-British mathematician and cosmologist. He met Einstein the summer of 1947. "He was entirely patient, extremely courteous and very interested. What I remember most clearly was that when I put down a suggestion that seemed to be cogent and reasonable, he did not in the least contest this, but he only said, "Oh, how ugly!" Bondi was the first to explicate correctly the nature of gravitational waves. After escaping from Germany, settled in New York. Lectured at Cambridge and Trinity College Awarded the Einstein Society Gold Medal in 1963.

**Hermann Bondi**

**Hermann Broch** (1886—1951). Austrian poet and novelist, was a friend. Well known in Germany, not in the U.S. Left Austria July, 1938 with just a suitcase. He lived at Einstein's house from August 15, 1939 to September 15, 1939, when the Einsteins were on vacation. Then he rented a room at 11 Alexander Street. That's when he met Erich Kahler who became his best friend. Einstein paid for Erich Kahler and Hermann Broch's home at 1 Evelyn Place in Princeton. Broch wrote *The Sleepwalkers* and *The Death of Virgil*.



**Hermann Broch**

**Martin Buber** (1878—1965). Philosopher. Grew up in Vienna. He knew Einstein for 40 years, starting in Germany, but then via correspondence. A great scholar. Diminutive, under five feet tall, but stocky. Imposing. A white beard which made him look like a prophet. He spoke German, Greek, Polish, Hebrew, French, Dutch, Spanish, Latin and Italian. Ardent Zionist. Religious philosopher. *I and Thou*, his major book. He co-wrote a new translation of the Bible from Hebrew—into German. Education reformist. Widespread leadership of Jewish education in the 1930s. Chair of Sociology at the Hebrew University. He developed philosophical anthropology and wrote books and novels.

He used to walk along Unter den Linden in Berlin with Einstein. He once asked, "Einstein, my friend, what are you looking for in your work?" Einstein answered, "Here is the face of the cosmos. I want to cover it with transparent paper and draw on that paper the coordinates of the universe. I lack only one thing, and that is what I am seeking: The formula." At the time Buber just thought, "Chutzpah!"

**Martin Buber**

When he left Germany, Nazis destroyed 3,000 books in his home. When awarded the Peace Prize of the German Book Trade, they called Buber "A humane spirit, suffering all living things, interpreter of his people's destiny, in history, philosopher of dialogue, theologian and educator."

He and Einstein met for the last time in 1952. They were delighted to mutually learn they both enjoyed Ellery Queen mystery novels. Einstein said of him, "I felt such closeness and admiration for him that each new meeting was a great joy." After Einstein's death, Buber said "I think of Einstein often and from the depth of my heart."

**Arthur Holly Compton** (1892—1962). American physicist. PhD at Princeton. (His two brothers, Karl and Wilson, also earned Princeton PhD's. Karl became president of MIT and Wilson president of Washington State University). Nobel Prize in 1927 for the Compton Effect. Compton first met Einstein in 1927 in Berlin. He worked on the Manhattan Project out of University of Chicago as Head of Metallurgical Laboratory, responsible for producing nuclear reactors that would convert uranium to plutonium. He was also a part of the executive committee of the project. In June of 1942, he was the one to assign Robert Oppenheimer his position at Los Alamos. His wife Betty had been his research assistant for all the cosmic ray expeditions all over the world. They met variously in Berlin, France, Chicago and Princeton. He later served as Chancellor of Washington University in St. Louis.


**Einstein and Compton in Chicago, 1933**

**Dr. Edward Uhler Condon** (1902—1974). Friend of Einstein. An expert in the field of quantum mechanics, he created the Franck-Condon Principle. While a student at the University of California at Berkeley, he studied under Oppenheimer. In 1927 he worked at Bell Labs. He taught at Columbia University in 1928, at the University of Minnesota in 1929, and Princeton University from 1928 to 1937. Associate Director of Research at Westinghouse in the consultant to the National Defense Research Committee during World War II, and as Director of the National Bureau of Standards in 1945. Briefly worked on Manhattan Project in 1943 as second-in-command. Then taught at MIT. Head of the National Institute of Standards and Technology. 1945—1951. As a defender of civil liberties, free speech, and peace—he was a Quaker—he ran afoul of the House Un-American Activities Committee in 1948. They revoked his security clearance. One major finding against him? He and his wife once attended a Yugoslav cocktail party. They even held the fact he was born in Alamogordo (where the Trinity test occurred) against him! Einstein came to his defense. The entire physics department of Harvard and numerous professional organizations wrote Truman on Condon's behalf.

**Edward Condon**

He was elected President of the American Association for the Advancement of Science. Also, president of the American Institute of Physics. In 1954, his security clearance was restored. He developed a missile nose cone used to prevent intense temperatures of re-entry of missiles used in astronaut programs. In short, a major force in science.

**Paul Adrian Maurice Dirac** (1902—1984). Numbered as one of the greatest physicists of all time. A pre-eminent pioneer. He shared the Nobel Prize in 1933 for quantum mechanics with Erwin Schrödinger. One of founders of quantum theory. He has a plaque in Westminster Abbey. He posited the positron, which was proven around 1933 by experimentation. He came up with the idea of a centrifuge that is now common in uranium development. In 1928 he discovered the relativistic equation for the electron, the Dirac Equation. This equation governs most of physics. He predicted anti-matter which makes up half the material created by the Big Bang. He coined the word “graviton” for gravitational waves. He created the first honest marriage between relativity and quantum theory. In the 1950s, Dirac came up with idea of strings.

**Paul Dirac**

*Portrait by Carola Hauschka*

He was close friends with Oppenheimer starting in Gottingen, Germany in 1927. Dirac first met Einstein at the 1927 Solvay Conference in Brussels. In 1932 he was elected Lucasian Professor of Mathematics, at Cambridge, an office once held by Sir Isaac Newton. At the Institute from 1934—1935 and 1947—1948 and in the 1960s.

Einstein on Dirac: “the most logically perfect presentation of quantum mechanics.” But also: “I have trouble with Dirac. This balancing on the dizzying path between genius and madness is awful.” Einstein once stated that Dirac was “Either a genius or a madman.” Dirac and Einstein respected each other but shared no special warmth. Einstein did, however, visit the Diracs from time to time for afternoon tea. Nils Bohr described him as “The strangest man”. He had no had sense of fun. An introvert, who lacked emotion. Probably autistic. He was so taciturn, physicists came up with a measurement called a “Dirac” which was “an average of one word per hour.” It has been said in jest that his spoken vocabulary consisted of "Yes," "No," and "I don't know." He always wore a dark suit. Indifferent to comfort or to food. No alcohol or smoking. He preferred listening to talking.

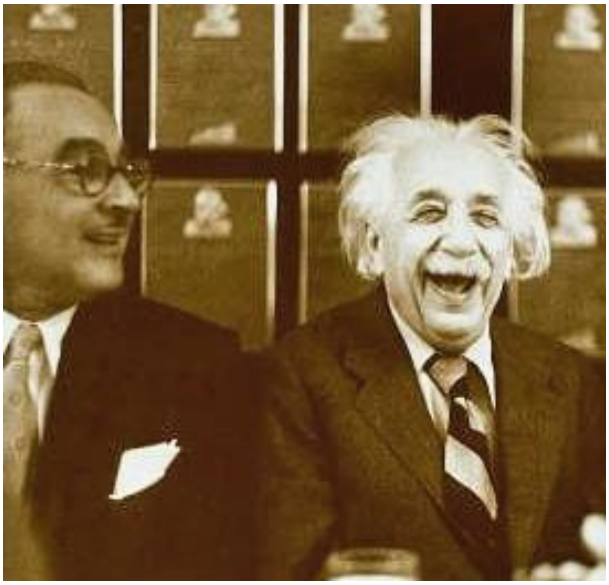
He had an unnerving idiosyncrasy, trying to find the right word in the middle of a speech or lecture. He would just stop cold for ten seconds or so. He was profoundly

eccentric, even by the standards of introverted physicists. Louise Morse once asked Paul Dirac how he was settling in, in Princeton. He looked dumbfounded and leaned sharply away from her as if she were a leak in a sewer. She remembers, “Without saying a word, his whole body seemed to ask ‘Why on earth are you talking to me?’ ”

Once Peter Kapitza, the Russian physicist, gave Dirac an English translation of Dostoevsky's *Crime and Punishment*. "Well, how do you like it?" asked Kapitza when Dirac returned the book. “It is nice,” said Dirac, “but in one of the chapters the author made a mistake. He describes the sun rising twice on the same day.” This was his one and only comment on Dostoevsky's novel.

Oppenheimer was working at Gottingen and the great mathematical physicist One day, Dirac came to him one day and said: “Oppenheimer, they tell me you are writing poetry. I do not see how a man can work on the frontiers of physics and write a poetry at the same time. They are in opposition. In science you want to say something that nobody knew before, in words which everyone can understand. In poetry you are bound to say...something that everybody knows already in words that nobody can understand.” In his later career he taught at Florida State.

**Abba Eban** (1915—2002). He was ambassador to the U.S. from Israel from 1950 to 1959. In 1952, Eban lived in Princeton at 13 Edgehill Street, a block away from 112, so it was just quick stroll for him on the official occasion to invite Einstein to be president of Israel.



**Abba Eban and Einstein, 1952**

**Luther Pfohler Eisenhart** (1876--1965. World famous mathematician and known for being "one of the few men who could talk intelligently with Albert Einstein.". Chairman of the Math Department at Princeton, Dean of the Princeton Faculty. At a dinner, he asked Einstein what historical person he would like to meet, expecting Einstein to say Newton or Archimedes. But he chose Moses. "I would like to ask him if he ever thought his people would obey his law so long."

**Luther Eisenhart**

**Gerhard Fankhauser** (1901—1981) and **Erna Fankhauser** (1894--1954) Swiss. Close family friends of Einstein's. The socialized often. Herr Professor enjoyed playing with their two girls, Anne and Marjie. Gerhard was a pioneering genetic researcher and embryologist at Princeton University. Erna was the first female teacher at Princeton University, in the Department of Modern Languages, starting in 1946, teaching German. She later taught German and Latin at the Hun School starting September 1, 1952. Around 1940, the Einsteins invited them to their house at Saranac Lake. He took Erna out on his sailboat one evening on a moonlight ride, which she very much enjoyed. On another occasion, Gerhard and Albert had an engaging conversation about the chromosomes of amphibian embryos. Every Thursday night, Erna would go to 112 Mercer and play four hands piano with Maja Einstein. At 10 P.M., Herr Professor would come downstairs and listen to the latest foreign news. Erna was the Hun School's first female teacher. She was tragically killed in an auto accident in Princeton on November 6, 1954.

**Gerhard and Erna Fankhauser**

**Val Logdson Fitch** (1923—2015). Physicist, co-winner of Nobel Prize. PhD from Columbia. Princeton faculty member for many years. At Los Alamos, Fitch, spent his days "biting sand" and setting up devices to take measurements on The Gadget (the Trinity atomic bomb). To test the recording instruments, "we set off a 100- ton charge of TNT, which looked like a pretty big explosion at the time." The last thirty seconds of the countdown operated automatically, so Fitch left the bunker. Prone in the sand, he viewed the blast through a piece of glass from a welding helmet. He still has the glass and uses it to observe solar eclipses. "The explosion was beyond anything you can possibly conceive. The scale of the thing! It's

indescribable. It took about 30 millionths of a second for the flash of light to reach us. It took the blast wave about 30 seconds. Apparently no one had told the military policeman in the bunker what to expect. He was absolutely pale and a look of incredible alarm was on his face as he came away from the bunker to stand beside me and view the sight. I said, 'The war will soon be over.' "

Later, Fitch worked in the particle physics laboratory run by George Reynolds.

**Val Fitch in Los Alamos 1945**

**Werner Heisenberg** (1901—1976). He was the creator of quantum mechanics and a Nobel Laureate in 1932. He and Einstein first met in 1926, when Heisenberg gave a lecture in Berlin and Einstein was in the audience. Einstein invited him to come home with him to talk about quantum theory. In 1927, they met at Solvay Conference in 1927 in Brussels, then again in 1930 at the same conference.

He wrote 200 papers. He analyzed the quantum theoretical interpretation of ferromagnetism. With Wolfgang Pauli he pioneered the quantization of field theories. His giant contribution was the uncertainty theorem. Also known as stra principle, a fundamental concept in quantum mechanics. It states that there is a limit to the precision with which certain pairs of physical properties, such as position and momentum can be simultaneously known.

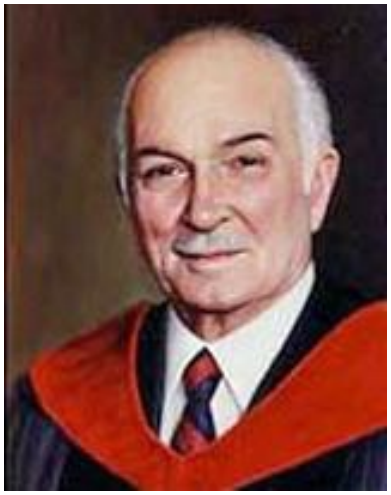
While not a friend of Einstein's, his work in WWII merits mention. On September 1, 1939, the very start of WWII, Heisenberg was ordered to lead the "The Uranium Project" (Germany's atomic bomb project). One major obstacle? Hitler would not allow development

of any ordnance that did not promise results in six months. The members could not solve how to separate uranium 235 from uranium 238, a key process in the production of an atomic bomb. The only thing they could think of was a graphite- or heavy water-moderated nuclear reactor. The heavy water option was nixed by, first a raid by Norwegian commandos in February of 1943, causing significant damage to the German occupied Vermork Norsk Hydro plant in Rjukan, Norway. (Dramatized later in the movie *The Heroes of Telemark*.) The plant was rebuilt and restarted in six months. Then, on November 16, 1943, 140 U.S. bombers swooped down on the plant and destroyed it.

Due to more allied bombings in 1944, they moved the atomic bomb project to Haigerloch, in the far southwest of Germany. They built a reactor, but it turned out they only had a primitive understanding of nuclear physics. It was only after the war that Oppenheimer's group learned that there had been no danger of Hitler being able to deploy an atomic bomb.

Einstein met Heisenberg in Princeton just once, in 1954. They had coffee and cakes and disagreed on quantum mechanics. Einstein's only comment, "He is a great physicist, but not a very pleasant man."

**Dr. Elmer George Homrighausen** (1900—1982). Professor of Christian Education at the Princeton Theological Seminary 1938—1954. Dean from 1955—1964. Wrote some books and many articles. A highly influential writer. He used to walk with Einstein to the Institute. He lived just a few doors down from him at 82 Mercer Street on the Seminary campus. He also served as vice moderator of the United Presbyterian Church, and on the World Council of Christian Education, Princeton Board of Education, World Council of Churches.



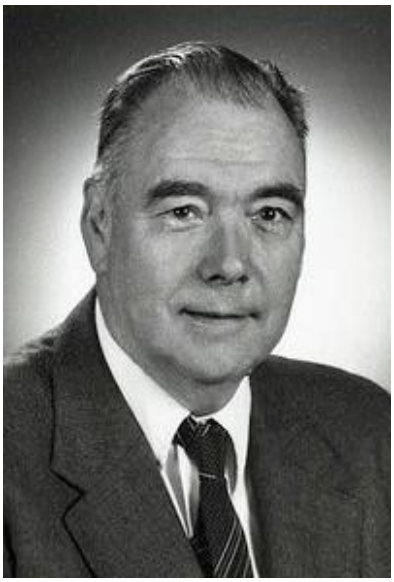
**Elmer Homrighausen**

Out of this exposure to the German situation he became involved with the Friends of Europe movement, an involvement that led to his later contact with Albert Einstein in relief work for Europe after the war. After tours of Princeton's historic sites, German refugees "got the big surprise of their life by meeting Dr. Einstein in Miller Chapel. He would sit up in the chancel and answer their questions. They were a very discouraged lot. They couldn't go home again. This was a strange land and their future was problematic, but he encouraged them, this great man, marvelous. He was just clothed in what you call human simplicity."

**Max Jammer** (1915—2010). Israeli physicist, PhD and colleague of Einstein's in Princeton. Also studied philosophy and the history of science. He wrote a book, *Einstein and Religion: Physics and Theology*, 1999. Former president and emeritus professor of Bar-Ilan University in Israel.

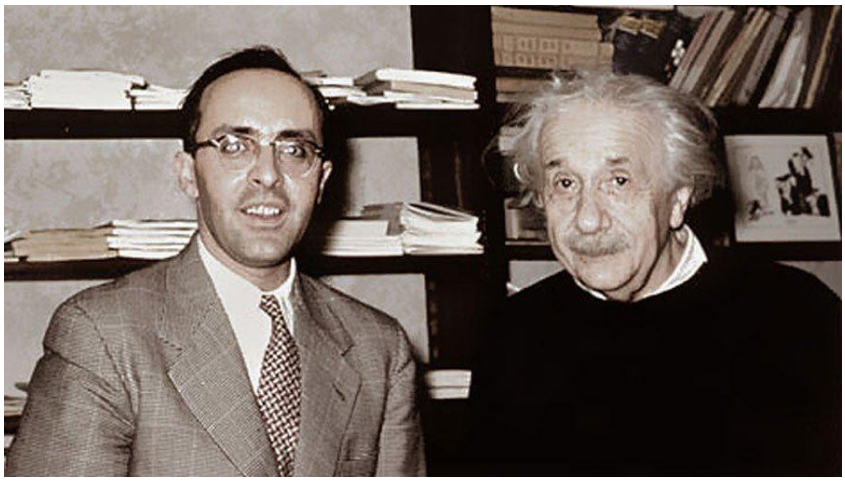
**Max Jammer**

**Wilhelm Res Jost** (1918—1990). Swiss theoretical physicist in quantum field theory. A colleague of Einstein's at the Institute.



**Res Jost**

**Behram Korşunağlu** (1922—2003). Born on March 14th. Turkish physicist, he worked on unified field theory. Dirac was a mentor of his. Extensive correspondence with Einstein. In 1953 gave a colloquium at Princeton, followed by a three-hour meeting with Einstein. His achievements: the prediction of the existence of four different neutrinos (1959); the proposal of the generalization of internal and external symmetries for the elementary particles (1964); a unified theory of hadrons and leptons, which led to the concept of supersymmetry (1968); a postulation of the orbiton, which brings weak and strong interactions to his unified field theory (1975); and the prediction of massivity of neutrinos using the unified field theory (1976). He published his classic treatise *Modern Quantum Theory* in 1962, which brought wide critical acclaim from Werner Heisenberg and many others. He participated in the Manhattan Project. During the McCarthy era, for suspected communist connections, he was forced to move to Ireland. He developed a number of breakthroughs in digital computing. They kept up, from time to time, on each other's careers.



**Korşunağlu and Einstein**

**Cornelius Lanczos** (1893—1974). Close friend of Einstein's from the 1910s. Hungarian-Jewish mathematician and physicist. Assistant to Einstein 1928—1929. In 1924, he discovered an exact solution of the Einstein field equation representing a cylindrically symmetric rigidly rotating configuration of dust particles. Working in Washington, DC at the U.S. National Bureau of Standards after 1949, Lanczos developed a variety of techniques for mathematical calculations using digital computers, including:

--The Lanczos algorithm for finding eigenvalues of large symmetric matrices

--The Lanczos approximation for the gamma function

--The conjugate gradient method for solving systems of linear equations

He worked on the Manhattan Project. During the McCarthy era, for suspected communist connections, he was forced to move to Ireland. He developed a series of breakthroughs in digital computing. They kept up, though not a lot, in their careers.

**Cornelius Lanczos**

**Jacob Landau** (1893—1952). While Landau and Einstein were close enough that Einstein became Jacob's son's godfather. The son was named Albert Einstein Landau. Einstein presented Jacob with a photo and poem for little Albert.

**Einstein cradling Albert Einstein Landau**

**To Little Albert Landau on the occasion of his entering the world:**

**If others often plague thee**

**And do or say evil of thee**
**Think also they came here**
**Without having asked for it**
**Think, though you may not like it,**
**You, too, plagued others often.**
**As this cannot be altered,**
**Think gently of everyone.**

**Albert Einstein**
**March, 1933**
**[original in German]**

Landau was a journalist who founded the influential Jewish Telegraph Agency newspaper in 1917. In 1944 he worked as a representative of the War Refugee Board, touring South America to help place homeless Jews. He was a principal correspondent of the American Jewish Committee 1944—1945. His involvement with Einstein including a fair amount of correspondence associated with his role as managing director of the Overseas News Agency, a war-time propaganda subsidiary of the Jewish Telegraph Agency. Frank Aydelotte (director of the Institute for Advanced Study) was a director of the agency.

**Jacob Landau and Herr Professor**

**Emanuel Lasker** (1868—1941). He was a German mathematician and philosopher and a world chess champion for 27 years. He was a close friend of Einstein's. In the 1920s, he lived around the corner in Berlin at Aschafferburgerstrasse. They took many a walk together. Einstein wrote an introduction to his biography, *Emanuel Lasker, The Life of a Chess Master*. Einstein wrote, "His real interest involved penetrating into science in the beauty of its logical constructs." Lasker moved to the U.S. in 1937. Lasker was a great debater. Einstein said of him, "Emmanuel Laker is one of the strongest minds I ever met in my life. A Renaissance man. He loved deduction." They played chess together.

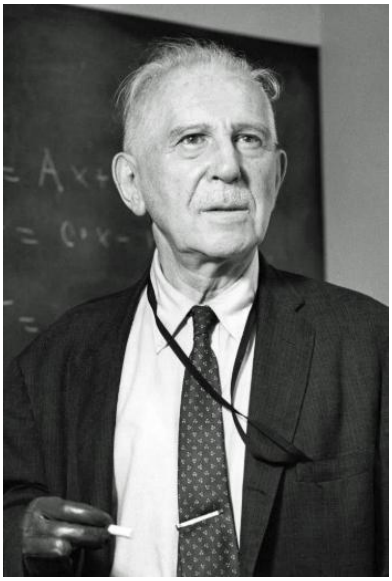
**Emanuel Lasker**

On one occasion, Lasker visited Einstein and presented him with an autographed copy of *Go and Gomoku*. In exchange, Einstein gave Lasker an autographed copy of one of his papers on relativity. Several years later, the autographed copy of *Go and Gomoku* showed up in a used bookstore in Baltimore. When told about this Lasker replied: “That's all right. I left his relativity paper on the subway.” Sadly, he died penniless in Mt. Sinai Hospital.

**William Langson Lathrop** (1859--1938). Friend of Einstein’s. American impressionist landscape painter, founder of the New Hope Art Colony.

**William Lathrop**

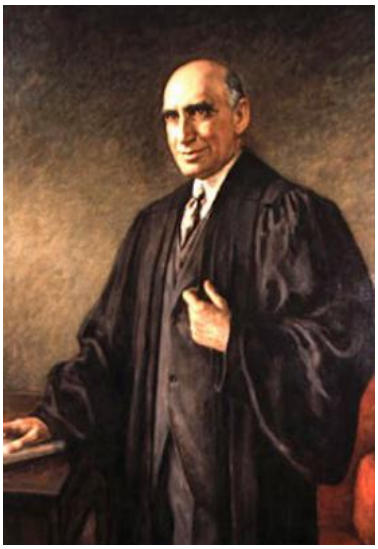
**Solomon Lefschetz** (1884—1972). Russian-born Einstein friend and Chairman of the Princeton Mathematics Department. One of the most influential mathematicians of the mid-20th century. He coined the term "topology" and developed the fixed-point theorem. He had two false hands, burned off when he was engaged in experimental work at the Westinghouse plant in Pittsburgh. An assistant had thrown a switch, sending a high voltage current through the apparatus on which he'd been working.



**Solomon Lefschetz**

In speaking to Lefschetz, Einstein said there was one thing really did not like, namely that people stopped him on the street and asked him for signatures. He was always recognized. Lefschetz turned to Einstein and said, "Well, Herr Einstein, I can tell you how to stop that". Einstein said, "Oh, Professor Lefschetz, I would be so grateful. What can I do about it?" Lefschetz said, "Cut your hair."

**Irving Lehman** (1876—1945). A friend. Chief Judge of the New York Court of Appeals. A Columbia Law grad. Once president of the YMHA in New York City.



**Irving Lehman**

Einstein went frequently to visit him in Port Chester. Once, Einstein, along with Lehman's wife Sissie, visited the beautiful Richardson Courtroom of the New York Court of Appeals in Albany to attend a case that was before Lehman.

**Einstein and Lehman in 1934**

**Tullio Levi-Civita** (1873—1941). Old friend, Italian mathematician. Most famous for his work on absolute differential calculus and its applications to the theory of relativity. They exchanged correspondence 1915—1917. He helped Einstein master the tensor calculus.

**Tullio Levi-Civita**

In 1936, receiving an invitation from Einstein, Levi-Civita traveled to Princeton, and stayed at Einstein's abode for a year. In the fall of 1936, he was at the Institute. In that year, he also lectured at Princeton, Harvard and Rice. On September 5, 1938, while Levi-Civita was in Italy, the Racial Laws were passed excluding all of Jewish background from universities. He was expelled from Pontifical Academy of Sciences. After some grudging resistance, Einstein admitted that Tullio had found an error in one of Einstein's relativity papers. Thus, Einstein wrote "I admire the elegance of your method of computation; it must be nice to ride through these fields upon the horse of true mathematics while the like of us have to make our way laboriously on foot." Partly due to the stress of his expulsion, he died prematurely in 1941. Years later, when asked what he liked best about Italy, Einstein is reputed to have said "spaghetti" and "Levi-Civita."

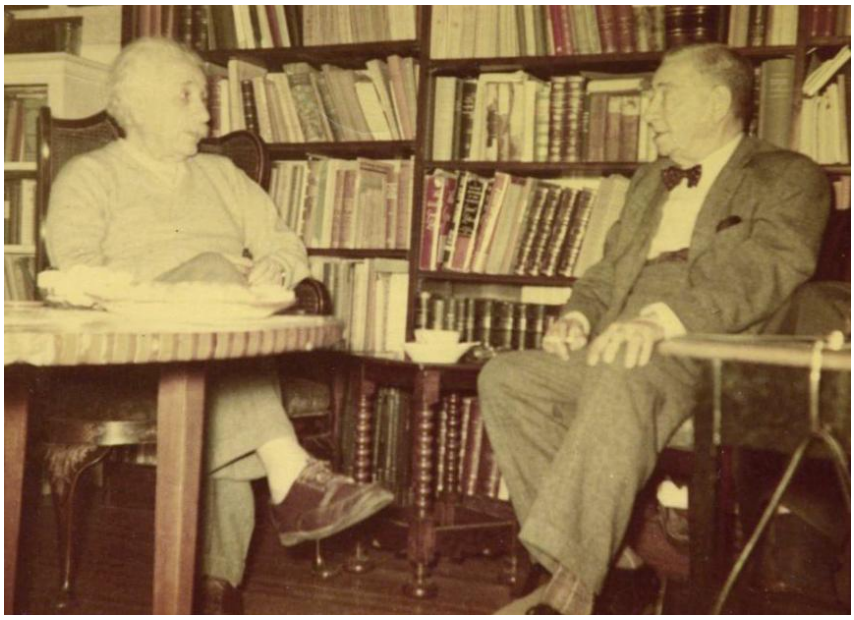
**Isaac Don Levine** (1892—1981. Born in Russia. He first met Einstein in Berlin in 1904. It appears that they only met twice in person. Levine was an aggressively anti-communist columnist in the 20s and 30s for Hearst papers. They exchanged a fair amount of correspondence over decades. Einstein once wrote that Levine's book *Stalin* was "undoubtedly the best concerning this great and most profound drama…and this book [conveys] that freedom is the prerequisite of everything." In 1948 Levine provided testimony to HUAC about communists in US government. That caused a permanent rupture in their relationship.

**Isaac Don Levine**

**David J. Levy** was an attorney for the Einstein estate.  CCNY, Brooklyn Law School.

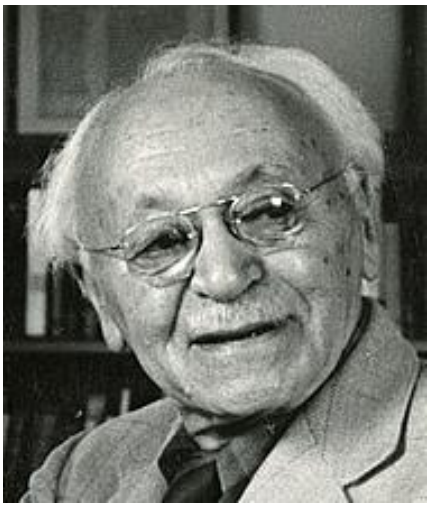
**Otto Loewi** (1873—1961). German Nobel prize winner in 1936 for medicine. He dreamed about a chemical transmission which became the basis for neurobiology. “The night before Easter Sunday of [1920] I awoke, turned on the light and jotted down a few notes on a tiny slip of thin paper. Then I fell asleep again. It occurred to me at six o’clock in the morning that during the night I had written down something important, but I was unable to decipher the scrawl. The next night, at three o’clock, the idea returned. It was the design of an experiment to determine whether the hypothesis of chemical transmission that I had uttered 17 years ago was correct. I got up immediately, went to the laboratory, and performed a simple experiment on a frog heart according to the nocturnal design.”  This led to the discovery that the primary language of nerve cell communication is chemical, not electrical, and won dreamer Loewi the Nobel Prize.

In 1938, he was arrested at gunpoint by the Gestapo with two of his sons, forcing him out of  Austria. They confiscated all his belongings and he had to leave without a penny. He got to the U.S. in 1940 and became a research professor in college of medicine at NYU. He developed Loewi’s test for pancreatic disease. He followed his 11th commandment, which was “Don’t talk or write about something you don’t know about.” Over his lifetime, he met with Einstein about six times.



**Otto Loewi and Einstein**

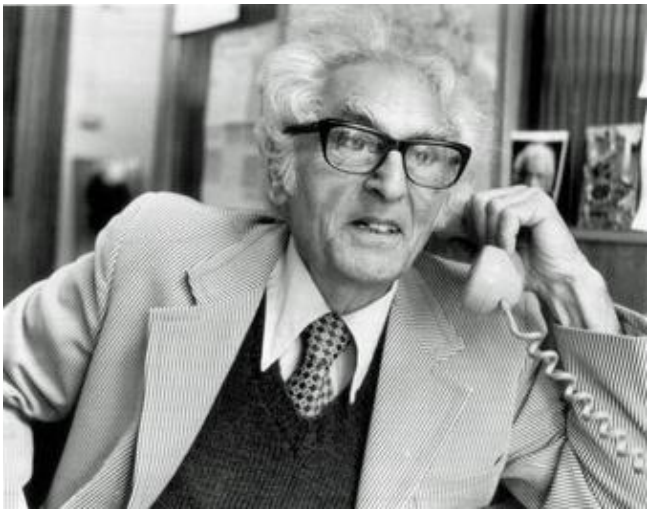
**Elias Avery Lowe** (1879—1969). Lithuanian-American paleologist. He was an occasional Einstein walking companion. He deciphered and described ancient writings. Among other achievements, he wrote an 11-volume guide to Latin literary manuscripts. He had taught at Oxford and Cornell before coming to Princeton in 1936 to work at the Institute. His wife Helen Tracey Lowe-Porter was a poet and worked as a translator for Einstein, who held her in high esteem. She was also a translator for Thomas Mann, translating *all* his works. He could not have won the Nobel prize without these translations. Their daughter Suki became a favorite of Einstein's.



**Elias Avery Lowe**

**Julius Sumner Miller** (1909—1987). Initially, he sought out Einstein. Re his first encounter with Einstein, Miller said, "I overtook Einstein 100 yards from the house. As I got in stride with him, I said 'Good morning, professor.' He greeted me with a smile and a gentle 'Good morning' and the pleasant expression on his face put me instantly at ease. "It was a deep religious experience that I had. I know that nothing I have ever felt has even approximated it; I doubt that any experience of my projected life can transcend it."

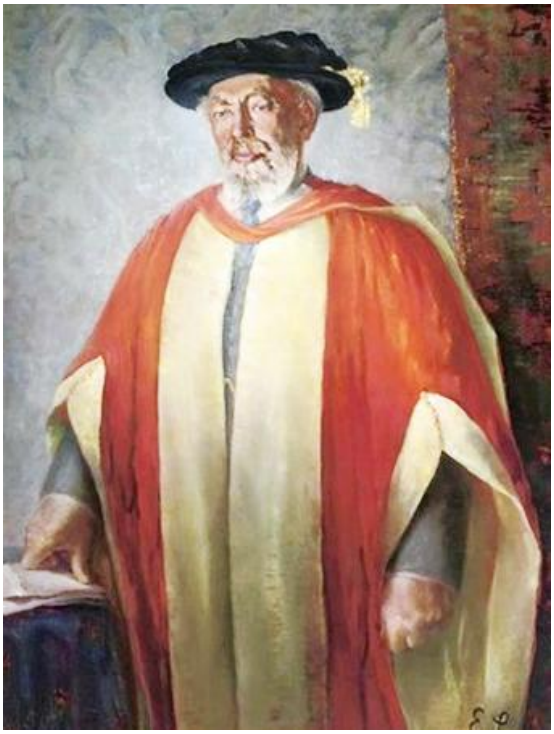
A physicist who worked at the Institute, Miller played Professor Wonderful on the Mickey Mouse Club show in the 1950s, watched by millions of children. He also starred in the Disney series "Great Moments in Science and Science and its Magic." He also appeared on the Steve Allen and Johnny Carson shows and wrote 300 papers. He and Einstein conducted extensive correspondence.



**Julius Sumner Miller**

**David Mitrany** (1888---1975). A Romanian political scientist and close personal friend of Einstein's. PhD in economics. On September 1, 1933, Mitrany joined the original faculty of the School of Economics and Politics at the Institute. He is considered the creator of the theory of functionalism in international relations and pioneered modern integrative theory.

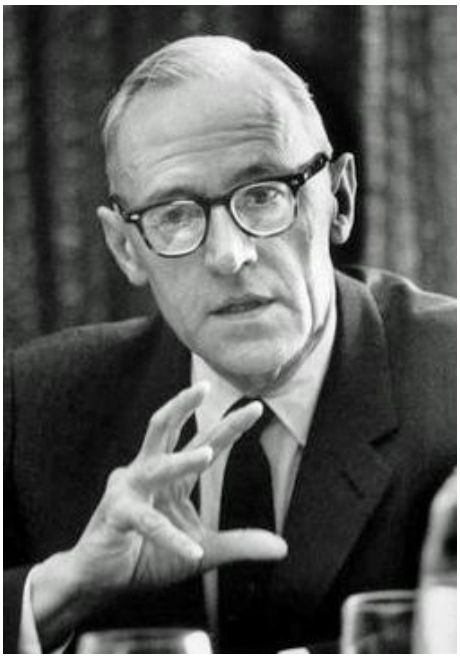
For some time, he lived at 142 Mercer Street. "I used to tease Einstein with the



**David Mitrany**

suggestion he had chosen me as a walking companion because I had no mathematics at all and so he was safe from prying questions, but in fact now and then he did used to tell me about what he was doing—and how clear it all seemed when he spoke! There was the boyish good humour of the man which survived to the end through many private and public tribulations and which occasionally blossomed in doggerel verse, for which he had a great facility and which sometimes had a malicious point to it."

**Oskar Morgenstern** (1902—1977). German friend. Economist. He wrote the book *Dialogues with Einstein*. He taught at Princeton and was a member of the Institute. He co-wrote, with his friend, John von Neumann, a 640-page treatise on game theory that would change economics, political science, psychology and evolutionary biology. Companies he served as founder or co-founder of included Market Research Corporation of America and the original Mathematica Inc.



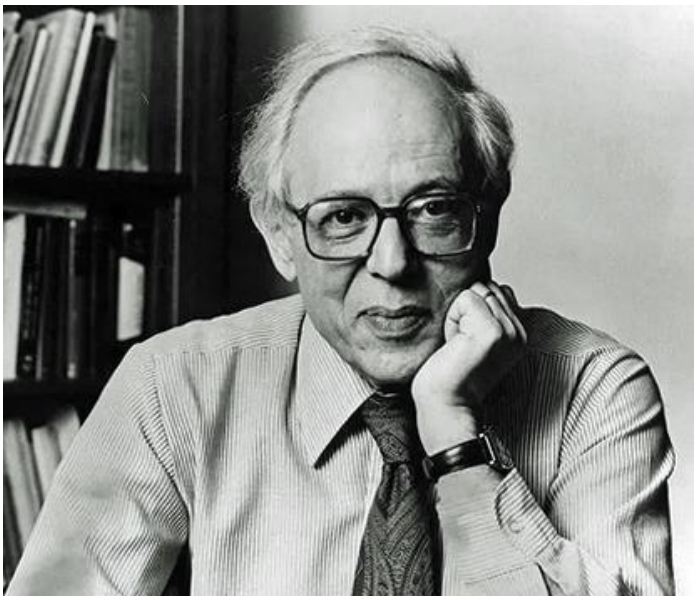
**Oskar Morgenstern**

**Norman Steinhardt Muller** (1903—1985). A friend. Stockbroker. He visited Einstein many times for Saturday night dinners in the 1930s. He found Einstein a "funny duckling."

**Dr. Otto Nathan** (1893—1987). Economist. Einstein's very close friend, his literary executor and managed his finances. Nathan left Germany after Hitler's rise to power. He

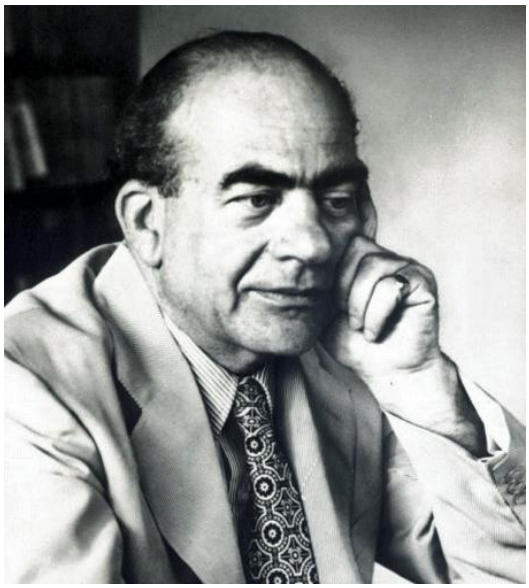
came to the U.S. and taught at Princeton, (1933—1935), NYU (1935—1942), Vassar (1942-1944) and Howard University (1946—1952). Nathan wanted to present Einstein in the greatest light and fought for years to keep his love letters and other information away from writers and researchers. Only 5 feet two inches tall, he could be prickly and was opinionated. Thomas Bucky described him as "a contrary, tactless fellow who went off like a shotgun at the slightest thing." He never married. Nathan was targeted by HUAC as a communist in 1952 and suffered badly. Despite this closeness to Albert, not a single anecdote could be found about him and Einstein.

**Abraham Pais** (1918—2000). Rockefeller University Dutch physicist and friend. He started at the Institute in 1946. He walked with Einstein once every two weeks for nine years from 1946—1955 as they talked about quantum theory. He'd sometimes walk with Gödel once every few weeks, speaking in German. He wrote a biography of both Einstein and of Oppenheimer. For the next 25 years he worked on elementary particle theory with a primary interest in quantum field theory and symmetry. Pais was widely regarded as the "house psychiatrist of the Institute community." His comment on Einstein: "He responded with one of the most extraordinary kinds of laughter…It was rather like the barking of a seal. It was happy laughter".



**Abraham Pais**

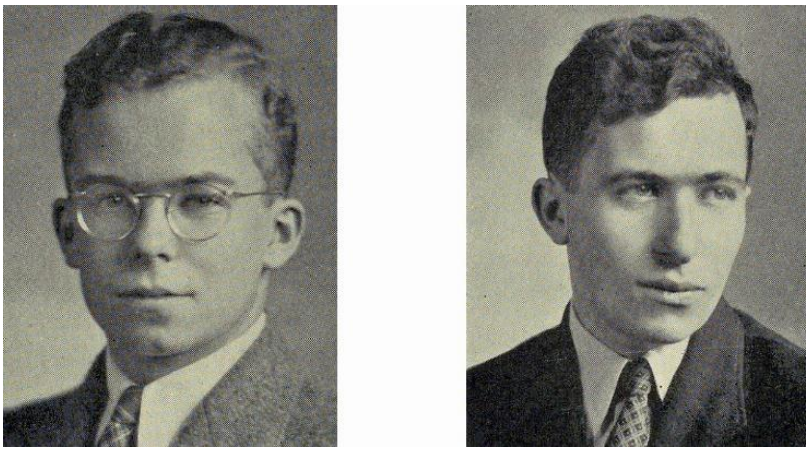
**Erwin Panofsky** (1892---1968). German-Jewish art historian. He was a friend and colleague at the Institute, having first taught at Princeton. Panofsky was considered one of the most influential art historians of the 20th century for his professionalism in the field. Panofsky's knowledge of Renaissance art was legendary.



**Erwin Panofsky**

Erwin had two sons, Wolfgang Panofsky (later, a renowned physicist), salutatorian of the class of 1938 at Princeton and Hans Panofsky (later an atmospheric scientist) who was also in the same class at Princeton. Wolfgang and Hans used to drive Einstein and their father around. Wolfgang was known as "The Smart Panofksky" and Hans was known as "The Dumb Panofsky" because Wolfgang finished second in the class of 1938 at Princeton, and Hans third. Wolfgang: "I recall driving along Route 1 near Princeton, with Einstein and my father talking in the back seat. A traffic cop stopped us. I was afraid that something was wrong with my driving, but the cop said 'I just wanted to look at the great man.' "

Panofsky Lane near the Institute is named after Erwin.

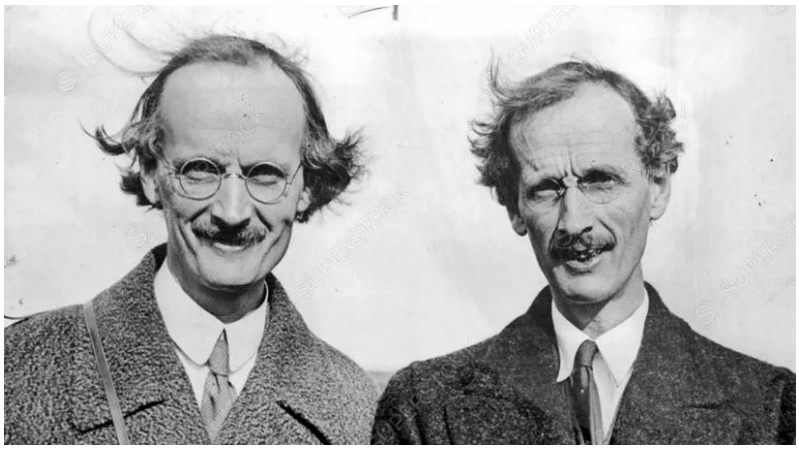


**Wolfgang Panofsky (Smart) and Hans Panofsky (Dumb)**

**Louis Pensak** (1912—1970). American physicist, who worked at RCA laboratories. He held 19 patents and developed aluminized picture tubes for television. He worked on design of kinescopes and oscilloscopes. Einstein regularly dined at their house and enjoyed Pensak's wife Charlotte's suppers.

Louis Pensak built tools for examinations and cuttings for Dr. Thomas Harvey, helping him with microtomes, ways of slicing a sample of brain very thin, putting it in paraffin, floating it on water, then putting them on a slide. Later, Harvey performed these procedures on Einstein's brain.

**Auguste Piccard** (1884—1962) and **Jean-Felix Piccard** (1884—1963). Swiss twins who were both highly accomplished and pioneering. Both worked with Einstein in a variety of capacities. Auguste became a leading pioneer in high altitude and deep-sea research. Jean Felix was a chemist and a leading pioneer in high-altitude ballooning.



**Piccard twins Auguste and Jean-Felix**

Auguste was an ETH Zurich when Einstein was there back in 1913. Einstein was his thesis advisor, and Auguste became a professor of Experimental Physics. He first got into ballooning in the 1920s, to study cosmic rays at high altitudes. In 1926, he ascended to 15,000 feet for Albert Einstein in an experiment to confirm that the speed of light is the same at high altitudes. On May 27, 1931, he ascended to 51,775 feet, in a pressurized gondola, the first ascent to the stratosphere. He kept up a lifetime of correspondence with Einstein and met him frequently at physics conferences. Here they are in 1927 during the Solvay Conference in Brussels.

**Einstein and Auguste Piccard (tallest)**

Niels Bohr is to the right of Einstein. Queen Elisabeth of Belgium is partially seen to the right of Piccard. The Queen had a warm and longstanding friendship, rooted in shared interests in music, science and humanitarianism. She played violin, he piano, together. They maintained a long correspondence. Before and during WWII, she protected Jews in Belgium. A lifelong explorer to places high and low, Auguste and his son Jacques descended two miles into the sea.

Jean-Felix Piccard was an equally adventurous balloonist, explorer, physicist and inventor. He translated Albert Einstein's paper: "Physics and Reality" in 1935. His wife, Jeannette, was also a twin, earned a masters in chemistry and a PhD in education. She solo ballooned herself in 1934 and became the first female licensed balloonist. He developed high-altitude plastic balloons. On July 17, 1946, he ascended via balloon 105,600 feet miles up. Jean-Felix taught at the University of Minnesota, MIT and Swarthmore. He once visited Einstein in Princeton, where they walked in the Institute Woods.

**Fritz Reiche** (1883—1969). Theoretical physicist, student of Roentgen and Planck. Met Einstein for the first time in 1909. Reiche walked often with Einstein, through the Tiergarten to the Physical Institute of the University of Berlin on the Reichstagsufer to participate in the physics colloquia. His position at Breslau ended abruptly with the Nazi dismissal of Jewish scientists in 1933.He then escaped from Germany in 1941. Einstein let him and his wife Bertha stay in his house in Princeton for the summer holidays of 1941. Then again in 1942. He worked with NASA and the Navy on projects having to do with supersonic flow. Over his lifetime, he made important contributions to quantum mechanics. He served in an adjunct position at NYU until his retirement.

**Fritz Reiche**

**Hans Reichenbach** (1891-1953). German mathematician and philosopher of science. After serving in the German army from 1915 to 1917, Reichenbach attended Albert Einstein's lectures on relativity and statistical mechanics in Berlin. He was greatly influenced by Einstein and became a life-long friend of the Nobel laureate. In 1920, he published *The Theory of Relativity and A Priori Knowledge*, which demonstrated the influence of Einstein's work. Reichenbach taught natural philosophy at the University of Berlin from 1926 to 1933, when he was forced to flee Germany under the Hitler regime. He subsequently taught in Istanbul, Turkey, and at UCLA in the United States. Reichenbach obtained his American citizenship in 1943.

**Hans Reichenbach**

**Howard Percy Robertson** (1903—1961). A friend. Speaking German helped. Mathematician and physicist. Professor at Princeton for 20 years from 1928 through 1938. Later at Cal Tech. Contributions to cosmology and uncertainty. Independently developed the notion of the expanding universe. He studied at Gottingen and Munich, along the way meeting Einstein, von Neumann, Wigner, Heisenberg and Schrodinger. Robertson's name is most often associated with the Poynting-Robertson effect, the process by which solar radiation causes a dust mote orbiting a star to lose angular momentum. During WWII, he was a science advisor to Eisenhower. After the war, his fluency in German helped him interrogate German scientists, including rocket scientists involved in the V-2 rocket program.

**Howard Robertson**

In 1936, Robertson famously shot down an Einstein article on gravitational waves as a referee for the *Physical Review.* The paper submitted by Nathan Rosen and Einstein was entitled *Do Gravitational Waves Exist?* He wrote a 10-page letter to the editor, saying that gravitational waves, were, in fact, physically real, not mathematical quirks. Einstein was upset that he should be handled in a way he felt was high-handed, and wrote the editor back saying he was withdrawing the paper and resubmitting it to *The Journal of the Frankling Institute*. Soon after, Einstein acknowledged his mistake and wrote "I wish to thank my colleague Professor Robertson for his friendly assistance in the clarification of the original error." The first detection of these waves was announced 80 years later, in 2016.

In the 1950s he was science advisor to head of NATO. In the 1960s, Robertson was a science advisor to President Kennedy.

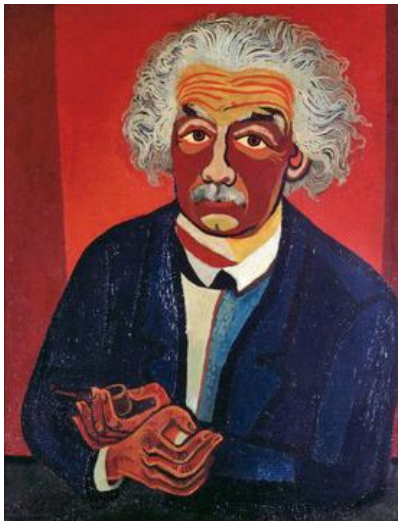
**Arthur Rubinstein** (1887-1982) Polish. At age two he exhibited perfect pitch. At age four considered a piano prodigy. Regarded as one of the greatest pianists of all time. He and Einstein played together a few times as chamber music partners. He held much of his repertoire in his photographic memory. He spoke eight languages fluently.

**Arthur Rubinstein**

**Josef F.  Scharl** (1896—1954). Friend. Painter and graphic designer. Scharl had met Einstein in Berlin, in the 1920s. Einstein supported him financially and helped him to organize various exhibitions. Some of Scharl's paintings were damaged and smeared by Nazi hoodlums before Scharl fled the country.

**Josef Scharl**

He came to the U.S. in 1939. Einstein visited Scharl frequently. Scharl drew and painted him multiple times, in one case for an oil portrait in 1944.



**Portrait of Einstein**

Einstein sent in a eulogy for Scharl's funeral: "Few to whom art is essential will come to understand more and more what Josef Scharl has given to the world."

**Erwin Rudolf Josef Alexander Schrödinger** (1887—1961). Austrian-Irish Nobel-prize-winning physicist, and one of the founders of quantum mechanics. A colleague of Einstein's at the Institute. He left Austria in 1933, then lectured in Princeton in 1934. He is recognized for postulating the Schrödinger equation. He coined the term "quantum entanglement" and wrote on many topics, including electrodynamics, general relativity, cosmology and thermodynamics.

Famous for Schrödinger's cat thought experiment which, in 1935, he developed in a discussion with Einstein. In his original formulation, a cat, a flask of poison and a radioactive source are placed in a sealed box. If an internal radiation monitor (e.g., a Geiger counter) detects radioactivity (i.e., a single atom decaying), the flask is shattered, releasing the poison, which kills the cat.

He maintained extensive correspondence with Einstein. In a back-and-forth with Einstein, Einstein was prompted to create the first description of what became dark energy. He spent the rest of his days in Ireland.

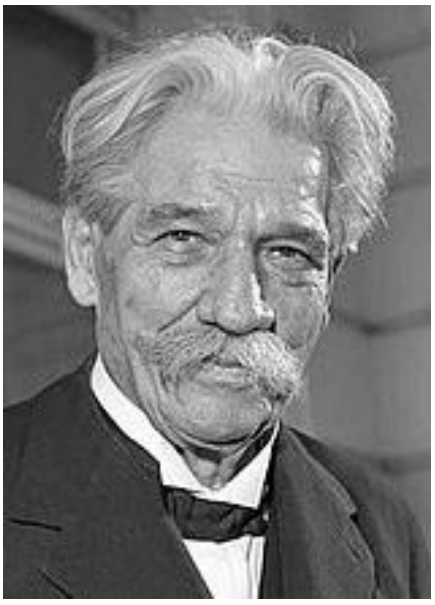
**Erwin Schrödinger**

**Paul Schwarz** (1892—1951). German Consul in New York City, long-time friend, going back to Germany. He was dismissed when Hitler took power in 1933. He became an American citizen in 1939. He wrote book in 1943 *This Man Ribbentrop, His Life and Times*.

**Dr. Paul Schwarz and the Einsteins in Caputh**

**Albert Schweitzer** (1875—1965). German/French polymath from Alsace. Theologian, organist, musicologist, writer, humanitarian, physician. Famous for tending to thousands of

patients in what is now Gabon. Nobel Prize, 1952. He and Einstein's only documented meeting was in Berlin, in 1928. Only other reported meeting in Oxford in 1934. They worked together in the 1950s railing against nuclear testing. They exchanged eight letters, but greatly admired one another from afar.



**Albert Schweitzer**

**Upton Sinclair** (1878—1968). American author, muckracker and political activist. He penned 100 books. *The Jungle* (1906) exposed labor and sanitary conditions in the meatpacking industry that resulted in a public uproar and the passage of the Pure Food and Drug Act. He won the Pulitzer Prize for fiction in 1943. The Sinclairs moved to Pasadena, California in 1916 and lived there for four decades. Einstein arrived in Pasadena in 1931, at which point Sinclair had been corresponding with Einstein for years (and continued to do so after Einstein's Pasadena stint).

**Upton Sinclair**

Their first meeting started with his step-daughter Dolly saying to his wife, Craig, "There's an old man walking up and down the street and he keeps looking at the house." Craig said "Go out and see what he wants. Dolly went out and came back, reporting, "He says he's Albert Einstein." Craig said, "Go bring him in." The Einsteins and Sinclairs socialized for the two years Einstein was in Pasadena. Together, Upton played piano and Einstein played violin. In retrospect, Sinclair wrote of Einstein "Such was the beginning of as lovely a friendship as anyone could have in this world. I report him as the kindest gentlest, sweetest of men."

"To the most beautiful joys of my life belongs your wicked tongue", Einstein wrote of Sinclair. "His tongue could be sharp—but only for the evils of the world". In 1937 Einstein read three of Sinclair's books.

Once Einstein presented Sinclair with a large, photo of himself, inscribed with the following verse in German:

Whom does the dirtiest pot not attack?
Who hits the world in the hollow tooth?
Who spurns the now and swears by the morrow?
Who takes no care about being undignified?
The Sinclair is the valiant man,
If anyone, then I can attest,
In heartiness,

Albert Einstein

**Otto Stern** (1988—1969). German-American physicist. An old friend. He spent two years with with Einstein in Prague and Zurich. Albert Einstein was a post-doc advisor to him at the University of Zurich. Otto visited Einstein in Princeton several times, including 1933 and 1950. They exchanged letters throughout their lives.

**Otto Stern (second from left) with Einstein in Prague**

Stern was involved in the Manhattan project working with the Chicago group on the dynamics of the implosion dynamics. He even got a classified patent for it. He received 82 nominations for the Nobel Prize, finally winning it in 1943 for his contribution towards the spin quantization theory. He was at the Carnegie Institute of Technology from 1933—1969.

**Otto Stern**

*Portrait by Carola Hauschka*

**Joseph Ross Stevenson** (1866—1939). A friend. President of the Princeton Theological Seminary 1914—1936. Ross Stevenson Circle in Princeton is named after him.

**Ross Stevenson**

**John Quincy Stewart** (1894—1972). Neighbor and friend. Astrophysicist at Princeton University from 1894—1972. He was a prolific writer of articles documenting his investigations in the areas of astronomy, astrophysics, cartography, demography, geography, gyromagnetic effect, hurricanes, ionized gases, lunar craters, meteorology, navigational

methods, philosophy of science, physics, sociology, solar eclipses, space travel, speech and hearing, stellar atmospheres, sunspots and weather cycles. He is credited with designed the first electronically synthesized "voice."

**John Quincy Stewart**

**Isidor Feinstein "I. F."/"Izzy" Stone** (1907—2000). Penn graduate. The 20th century's premier independent journalist. His publication "I. F. Stone's Weekly" was one of greatest hits of 20th century, and Einstein was a charter member. His focus was to expose collusion between commercial media and governments. The FBI collected a massive, five-thousand-page file on him. His phone was bugged and agents pawed through his garbage. He called J. Edgar Hoover "a glorified Dick Tracy." 70 years of writing and speaking. He was known for his capacious memory, erudition and historical acumen. He and his sons Chris and Jeremy only met Einstein once around 1950, so their friendship was primarily via correspondence.

**I.F. Stone**

"He said that Einstein's emanation of benevolence was palpable. Christopher remembers, "Einstein…having realized he hadn't paid any attention to us, who were intimidated and awed, was to say 'Do the boys haff any questions? I will answer them if I can.' I couldn't answer. I've never been so deeply moved in my life." On his death bed, Einstein asked to see *I.F. Stone's Weekly*.

**Max Talmey** (né Talmud) (1869—1941). Lithuanian-born American ophthalmologist. Seminal friend from childhood. Max, who was fluent in six languages, was Einstein's tutor when Einstein was 11. Max was 21, a young medical student, and introduced him to popular scientific literature and started to discuss scientific and philosophical issues with the ten-year-old boy. For five years, from 1889 to 1894, Talmey was a weekly lunch guest of Einstein's family. They used to discuss themes of interest to Albert Einstein, and Talmey lent him a number of books about science. He wrote a book, *The Relativity Theory Simplified.* In 1905, he founded the Esperanto Society of New York. He lived in New York City and practiced at Mount Sinai Hospital. The Talmeys visited Einstein in 1938 in Princeton.

**Max Talmey**

**Homer Armstrong Thompson** (1906—2000). Neighbor and colleague. Greek archaeologist at the Institute. Daughter Hope and her twin Hilary remember being at Einstein's many times.

**Hope Thompson Kerr and**

**Hilary Thompson Demarest**

Homer's wife Dorothy was herself a world authority on classical archaeology.

**Homer Thompson**

**Arnold Toynbee** (1889—1985). World-renowned historian. Best known for his 12-volume *A Study of History.* His compass moments: at bedtime his mother would read to him the book *A History of Scotland*. He was at Institute from 1947—1954. He went to the Institute three or four months a year. Little known about his interactions with Einstein other than a get-together at 112 Mercer in 1947.

**Toynbee, William Rappard and Einstein**

**Alan Mathison Turing** (1912—1954). English mathematician, computer scientist, logician, cryptanalyst, philosopher and theoretical biologist. He was highly influential in the development of theoretical computer science, providing a formalization of the concepts of algorithm and computation with the Turing machine, which is considered a model of a general-purpose computer. Turing is widely considered to be the father of theoretical computer science. The machine Turing built at Bletchley Park was called "The Colossus," which enabled the decryption of the Enigma machine. His famous Turing test (how to determine if you're communicating with a human or a machine) was a significant, characteristically provocative, and lasting contribution to the debate regarding artificial intelligence, which continues to this day. His compass moments were, as a child, at the age of six, stopping at every lamppost to identify its serial number.

In 1928, *Turing* encountered *the theory of relativity and* grasped it at a mere 16 years of age, even extrapolating Einstein's Law of Motion from a text in which it was never made explicit. In 1933, he read von Neumann's book and met him in Cambridge in 1935. At the same time as Princeton professor Alonzo Church, Turing he came up with similar mathematical ideas. Turing's became more complete. This was a trigger to send him to Princeton.

One question many have had is whether Einstein and Turing ever met. He arrived at Princeton in 1936. He did have an office in Princeton in Fine Hall near von Neumann's in 1937--1938. So, he passed Einstein often in the halls, but never socialized with him. He could have button-holed him at one of the afternoon teas, but never went. Classic ships in the night. In a letter to his mother, he wrote, "There is a great number of the most distinguished mathematicians here..Einstein...and lots of smaller fry." And as Turing himself put it in a note home to his mother, solving the *Entsheidungsproblem* was not so much a big deal when Einstein was just down the hall. (The *Entscheidungsproblem*, as defined by Kurt Gödel, refers to the question of whether there exists a universal method to determine the truth or falsity of any given proposition within a mathematical system.)

In 1937 at Princeton, he developed an electric multiplier. His "Computable Numbers" paper already demonstrated a "0" and a "1" binary method. Studying under Alonzo Church, he earned his PhD in 1938. Turing once drove a car into Lake Carnegie. He used to wander at random into von Neumann's home, take a book off the shelf, then leave without even

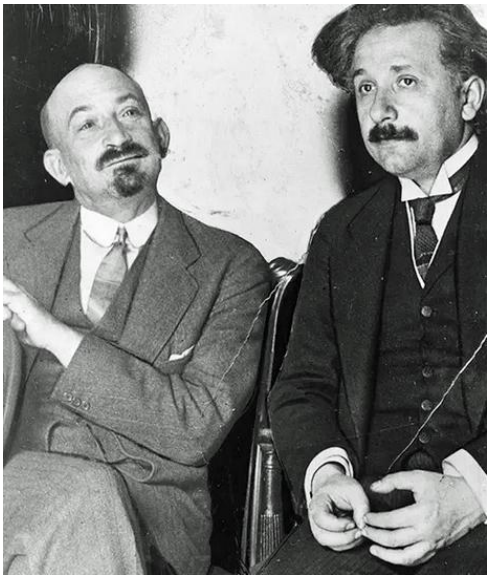
alerting von Neuman's wife. Einstein never had a chance to contemplate or comment on Turing as his fame was only revealed when the Bletchley Park project was declassified after Einstein had died.

**Alan Turing**

**Samuel Untermyer** (1858—1940). One of Einstein's attorneys. A major force in the U.S. judicial system. He won cases against Standard Oil, the steel industry and as a special attorney for New York State, brought over 600 indictments for fraud in the building trades resulting in 200 convictions. He was the first attorney to earn a million dollars on a single case. He took an active part in preparing the Federal Reserve Act, the Clayton Antitrust Act, the Federal Trade Commission Act and other legislation curbing trusts. Einstein once left him on a New York dock. He felt guilty about leaving him in the dust.

**Samuel Untermyer**

**Chaim Weizmann** (1874—1952). Russian born, one of 15 children. A biochemist. An Einstein friend. Re the *New York American* newspaper, "The brow of his massive bald head was finely etched with veins, his eyes were piercing, his mustache and goatee elegant, his clothing superbly tailored." They traveled across Atlantic together in 1921 on the way to an American fund-raising tour. They met in Berlin in 1922 and 1925. Again in 1931. They met at 112 Mercer on November 11, 1947 with Oppenheimer. At the meeting Weizmann suggested constructing a nuclear reactor in the Yishuv (pre-Israel Palestine). This was before Israel was even a state. Oppie thought it was a bad idea. In the following days, Weizmann also pressed his case for nuclear power with David Lilienthal, chairman of the Atomic Energy Commission and Felix Frankfurter in Washington, D.C. In January, 1949, they met at the Waldorf Astoria at a meeting that included Harry Truman. He became the first President of Israel in 1949.



**Weizmann and Einstein**

Although friends for life, they had disagreements, e.g. Weizmann saw Einstein as an impractical idealist, and Einstein disagreed with Weizmann's overly nationalistic Zionism.

**John Archibald Wheeler** (1911—2008). Friend and colleague. Theoretical physicist and long term in the faculty at Princeton. Compass moment: when he was three or four, he learned that if you put a marble inside an empty light socket then turn on the switch, it shoots out with a pop. "Somewhere in the child, that urge is born." Wheeler first saw and heard Einstein at a seminar in the fall of 1933. He worked on quantum gravity, and popularized the term "black hole." And coined the term "worm hole." He had wonderful conversations with Herr Professor in his home. His quote re Einstein, "He was actually a very down-to-earth person, warm and charming, with a puckish sense of humor." He worked with Bohr and with Feynman. Wheeler also socialized with Vladimir Zworykin and Hermann Weyl.

**John Wheeler**

He was away from Princeton 1942—1945, to work on the Manhattan Project in Chicago, Wilmington and Richland, Washington. In the years 1953 to 1955, Einstein invited Wheeler and his students to tea. In the early 1950s, Wheeler worked on the H-bomb. Despite knowing Einstein well and he didn't whisper a word to him about it or the A-bomb. He was one of Einstein's last collaborators.

**Stephen Samuel Wise** (1874—1949). Born in Budapest. Close friend of Einstein's going back to 1933. A 7th-generation rabbi, he was rabbi of the Free Synagogue in New York. He graduated from Columbia at age of 18, then later earned a PhD there. He maintained an extensive correspondence with Einstein. He was a powerful orator with a commanding baritone voice. He was often compared to William Jennings Bryan for his rhetorical brilliance and power. Fluent in German. A pacifist. A supporter of unions. Master builder of religious, social, welfare, educational and political institutions in NYC and the U.S. In 1922, he founded the Jewish Institute of Religion. Also founded the World Jewish Congress. He helped build the ACLU. Vigorously and successfully fought Tammany Hall. He fought Big Steel companies with their abuses like 12-hour days.

With Wise and FDR, Einstein created The War Refugee Board in January of 1944. 20,000 Jews were rescued to the U.S., according to James Rudin, Wise was of medium height, with shiny black hair "..one or two unruly locks constantly demanding attention". The *New Yorker* described him as "...an Old Testament Prophet in a business suit".

Einstein spoke at least once to his Free Synagogue in New York City (usually at Carnegie Hall).

**Stephen Wise with Einstein**