Beyond Dreams

编著/王金等

超越梦想
（英文版）

你最想了解的
科学艺术大师

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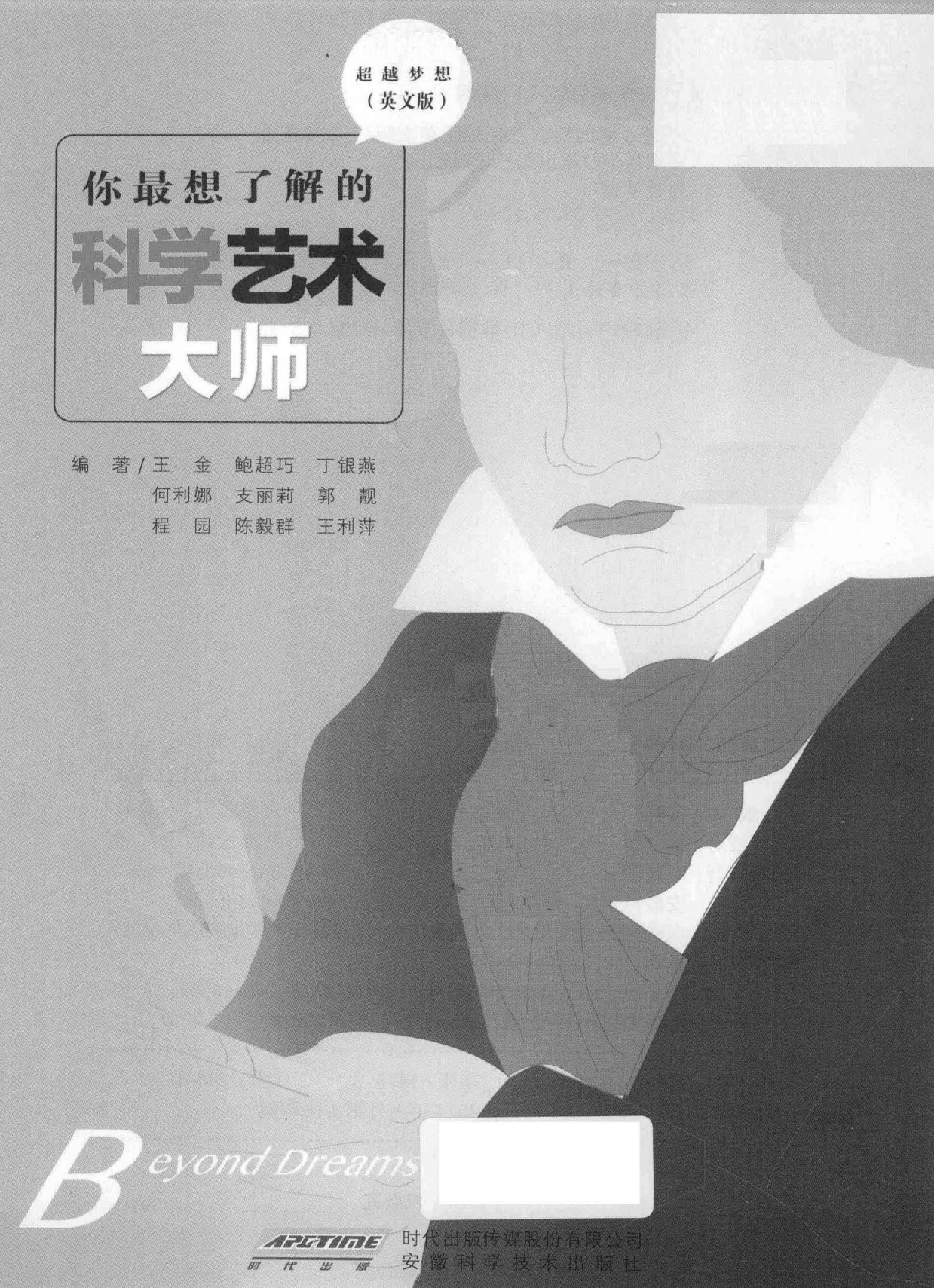
编　著／王　金　鲍超巧　丁银燕
何利娜　支丽莉　郭　靓
程　园　陈毅群　王利萍



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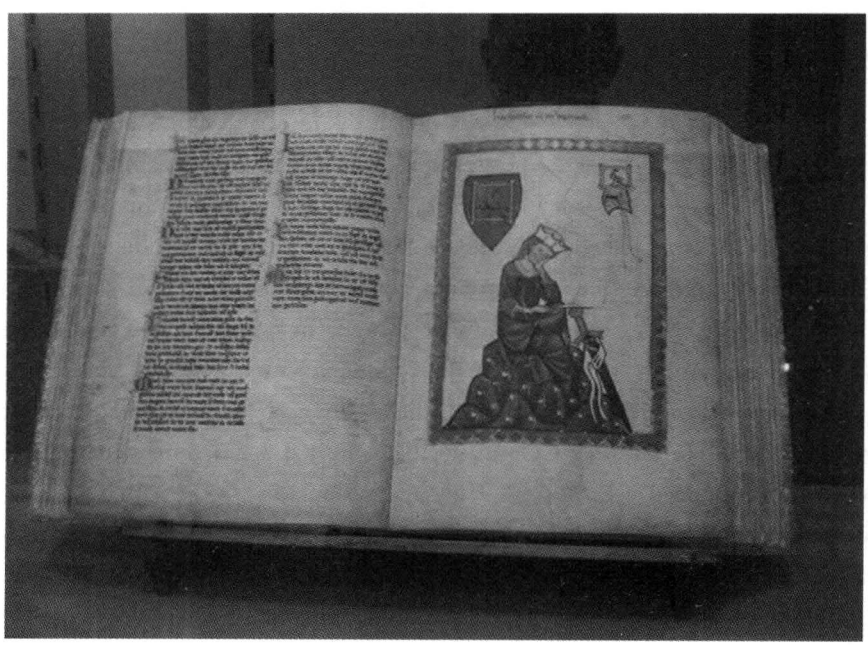
Chapter 1
Albert Einstein

第一章
阿尔伯特·爱因斯坦

一个抱有帝国主义野心的俄国贵族女刺客把枪口偷偷对准了他；德国右翼刺客们的黑名单上也出现了他的名字；希特勒悬赏两万马克要他的人头……究竟是怎样的一个人惹来了诸多的杀身之祸？他就是阿尔伯特·爱因斯坦——犹太人的骄傲，现代物理学的开创者和奠基人，相对论的提出者，20世纪最伟大的物理学家、思想家和哲学家，诺贝尔奖百余年历史上最受尊崇的3位获奖者之一。1999年12月26日，爱因斯坦被美国《时代周刊》评选为“世纪伟人”。



Biography

本文不仅会与你分享天才的智慧与成功秘诀，更会带你走进真实的、神秘的“爱因斯坦世界”。

Albert Einstein was born in Ulm（德国南部城市：乌尔姆），in the Kingdom of Württemberg in the German Empire on 14 March 1879.His father was Hermann Einstein，a salesman（售货员）and engineer.His mother was Pauline Einstein (née Koch).In 1880，the family moved to Munich（德国城市：慕尼黑），where his father and his uncle founded Elektrotechnische Fabrik J.Einstein & Cie，a company that manufactured electrical equipment based on direct current（直流电）.

Later，they moved to Italy and Albert continued his education at Aarau（瑞士一地名：阿劳），Switzerland and in 1896 he entered the Swiss Federal Polytechnic School in Zurich（苏黎世）to be trained as a teacher in physics and mathematics.In 1901，the year he gained his diploma，he acquired Swiss citizenship and，as he was unable to find a teaching post，he accepted a position as technical assistant in the Swiss Patent Office.In 1905 he obtained his doctor's degree. During his stay at the Patent Office，and in his spare time，he produced much of his remarkable work and in 1908 he was appointed Privatdozent (无薪大学教师) in Berne.In 1909 he became Professor Extraordinary at Zurich，in 1911 Professor of Theoretical Physics at Prague，returning to Zurich in the following year to fill a similar post.In 1914 he was appointed Director of the Kaiser Wilhelm Physical Institute and Professor in the University of Berlin.He became a German citizen in 1914 and remained in Berlin until 1933 when he renounced（断绝关系）his citizenship for political reasons and emigrated to America to take the position of Professor of Theoretical Physics at Princeton.He became a United States citizen in 1940 and retired from his post in 1945.

爱因斯坦出生于经营电器生意的小业主家庭，而后举家迁至意大利，他随后进入瑞士苏黎世联邦理工学院学习，毕业后未当老师，却成为了专利局的技术员。之后他获得博士学位，并走上了多个国家高等学府的讲台……

爱因斯坦因政治原因放弃了德国国籍，后迁居美国，任普林斯顿高级研究所教授直至退休，并加入美国国籍。

After World War II，Einstein was a leading figure in the World Government Movement，he was offered the

二战，是爱因斯坦人生的一个转折点。

Presidency of the State of Israel, which he declined, and he collaborated with Dr. Chaim Weizmann in establishing the Hebrew University of Jerusalem.

Einstein always appeared to have a clear view of the problems of physics and the determination to solve them. He had a strategy of his own and was able to visualize the main stages on the way to his goal. He regarded his major achievements as mere stepping-stones（踏脚石）for the next advance. At the start of his scientific work, Einstein realized the inadequacies of Newtonian mechanics and his special theory of relativity stemmed from an attempt to reconcile the laws of mechanics with the laws of the electromagnetic（电磁的）field. He dealt with classical problems of statistical mechanics and problems in which they were merged with quantum theory（量子理论）: this led to an explanation of the Brownian movement of molecules（分子学）. He investigated the thermal（热量的）properties of light with a low radiation density and his observations laid the foundation of the photon（光子）theory of light.

1916年，广义相对论诞生。

In his early days in Berlin, Einstein postulated（假设）that the correct interpretation of the special theory of relativity must also furnish a theory of gravitation（地心引力）and in 1916 he published his paper on the general theory of relativity. During this time he also contributed to the problems of the theory of radiation and statistical mechanics.

In the 1920's, Einstein embarked on the construction of unified field theories, although he continued to work on the probabilistic（概率性的）interpretation of quantum theory（量子理论）, and he persevered with this work in America. He contributed to statistical mechanics by his development of the quantum theory of a monatomic（单原子的）gas and he has also accomplished valuable work in connection with atomic transition probabilities and relativistic cosmology（宇宙学）.

After his retirement, he continued to work towards the unification of the basic concepts of physics, taking the opposite approach, geometrisation, to the majority of physicists.

Albert Einstein received honorary doctorate degrees in science, medicine and philosophy from many European and American universities. During the 1920's he lectured in Europe, America and the Far East and he was awarded Fellowships or Memberships of all the leading scientific academies throughout the world. He gained numerous awards in recognition of his work, including the Copley Medal of the Royal Society of London in 1925, and the Franklin Medal of the Franklin Institute in 1935.

爱因斯坦的相对论虽受媒体炮轰，却激发了大众的想象力。他也是德国科学领域少数反战的和平主义者，并且拒绝恢复德国国籍。

Einstein's gifts inevitably resulted in his dwelling (踌躇) much in intellectual solitude and, for relaxation, music played an important part in his life. When British eclipse expeditions in 1919 confirmed his predictions about the general theory of relativity, Einstein was bombarded (炮轰) by the popular press. Einstein's personal ethics also fired public imagination. Einstein, who after returning to Germany in 1914 did not reapply for German citizenship, was one of only a handful of German professors who remained a pacifist (和平主义者) and did not support Germany's war aims. After the war, when the victorious allies sought to exclude German scientists from international meetings, Einstein—a Jew traveling with a Swiss passport—remained an acceptable German envoy. Einstein's political views as a pacifist and a Zionist(犹太复国运动的支持者或拥护者) pitted him against conservatives in Germany, who branded him a traitor and a defeatist. Just how controversial the theories of relativity remained for less flexibly-minded physicists is revealed in the circumstances surrounding Einstein's reception of a Nobel Prize in 1921—awarded not for relativity but for his 1905 work on the photoelectric effect.

爱因斯坦因光电效应而非因争议重重的相对论获得了1921年的诺贝尔物理学奖。

With the rise of fascism (法西斯主义) in Germany, Einstein moved to the United States in 1933. He reluctantly agreed that the new menace (威胁) had to be put down through force of arms. In this context Einstein sent a letter, in 1939, to President Franklin D. Roosevelt that urged that the United States proceed to develop an atomic bomb before Germany did, and it contributed to Roosevelt's decision to fund what became the Manhattan Project.

As much he appeared to the public as a champion of unpopular causes, Einstein's central concerns always revolved around physics. At the age of 59, when other theoretical physicists had abandoned original scientific research, Einstein and his co-workers Leopold Infeld and Banesh Hoffmann achieved a major new result in the general theory of relativity.

Until the end of his life, Einstein sought a unified field theory, whereby the phenomena of gravitation and electromagnetism (电磁学) could be derived from one set of equations. After 1920, however, while retaining relativity as a fundamental concept, theoretical physicists focused more attention on the theory of quantum mechanics, as

elaborated by Max Planck, Niels Bohr, Werner Heisenberg, and others, and Einstein's later thoughts went somewhat neglected for decades. This picture has changed in more recent years. Physicists are now striving to combine Einstein's relativity theory with quantum theory in a "theory of everything", by means of such highly advanced mathematical models as superstring theories(超弦理论).

Works

成功的秘诀

有一次，一个美国记者问爱因斯坦关于他成功的秘诀。他回答："早在1901年，我还是22岁的青年时，我已经发现了成功的公式。我可以把这公式的秘密告诉你，那就是A=X+Y+Z！A就是成功，X就是努力工作，Y是懂得休息，Z是少说废话！这公式对我有用，我想对许多人也一样有用。"

The 1905 Papers

In the first of three seminal (有重大意义的) papers that were published in 1905, Einstein examined the phenomenon discovered by Max Planck, according to which electromagnetic energy seemed to be emitted from radiating objects in quantities that were ultimately discrete(分离的).

狭义相对论在此时诞生。

The second of Einstein's 1905 papers proposed what is today called the special theory of relativity.

The third of Einstein's seminal papers of 1905 concerned statistical mechanics, a field of study that had been elaborated by, among others, Ludwig Boltzmann and Josiah Willard Gibbs.

General Theory of Relativity

相对论的提出是物理学领域的一次重大革命。它否定了经典力学的绝对时空观，深刻地揭示了时间和空间的本质属性。它也发展了牛顿力学，将其概括在相对论力学之中，推动物理学发展达到一个新的高度。

After 1905, Einstein continued working in all three of his works in the 1905 papers.

He made important contributions to the quantum theory, but increasingly he sought to extend the special theory of relativity to phenomena involving acceleration. Einstein elevated the identity, which is implicit in the work of Isaac Newton, to a guiding principle in his attempts to explain both electromagnetic and gravitational acceleration according to one set of physical laws. In 1907 he proposed that if mass were equivalent to energy, then the principle of equivalence required that gravitational mass would interact with the apparent mass of electromagnetic radiation, which includes light. By 1911, Einstein was able to make preliminary predictions about how a ray of light from a distant star, passing near the Sun, would appear to be attracted, or bent slightly, in the direction of the Sun's mass. At the same time, light radiated from the Sun would interact with the Sun's mass, resulting in a slight change toward the infrared(红外线) end of the Sun's optical spectrum(光谱). At this juncture(接合点) Einstein also knew that any new theory of gravitation(万有引力定律) would have to account for a small but persistent anomaly (不规则) in the perihelion(近日点) motion of the planet Mercury(水星).

Anecdote

爱因斯坦，这个科学界泰斗，却被大家认为是傻乎乎的、不修边幅的人。除此之外，不穿袜子、发音不准、不玩费脑子的游戏、“大烟囱”、爱拉小提琴、爱情不忠等也是他的诸多“标签”……

1.He Liked His Feet Naked(光脚科学家)

“When I was young, I found out that the big toe always ends up making a hole in the sock,” he once said. “So I stopped wearing socks.” Einstein was also a fanatical slob (懒惰而邋遢的人), refusing to “dress properly” for anyone. Either people knew him or they didn't, he reasoned—so it didn't matter either way.

2.He Hated Scrabble

Aside from his favourite past-time sailing (“the sport which demands the least energy”), Einstein shunned (避开) any recreational activity that required mental agility (敏捷). As he told the *New York Times*, “When I get through with work, I don't want anything that requires the working of the mind.”

大科学家讨厌拼字游戏只因不想再费脑子了。

3.He Was A Rotten Speller(发音不准)

Although he lived for many years in the United States and was fully bilingual, Einstein claimed never to be able to write in English because of "the treacherous(不可信任的) spelling".He never lost his distinctive German accent either,summed up by his catch-phrase "I vill a little t'ink".

4.He Loathed(厌恶) Science Fiction

Lest it distort pure science and give people the false illusion of scientific understanding,he recommended complete abstinence (节制) from any type of science fiction."I never think of the future.It comes soon enough." He also thought people who claimed to have seen flying saucers should keep it to themselves.

5.He Smoked Like A Chimney

A life member of the Montreal Pipe Smokers Club,Einstein was quoted as saying: "Pipe smoking contributes to a somewhat calm and objective judgment of human affairs." He once fell into the water during a boating expedition but managed heroically to hold on to his pipe(烟管).

6.He Wasn't Much Of A Musician

Einstein would relax in his kitchen with his trusty violin,stubbornly trying to improvise something of a tune.When that didn't work,he'd have a crack at Mozart.

7.Alcohol Was Not His Preferred Drug

At a press conference upon his arrival to New York in 1930,he said jokingly of Prohibition: "I don't drink,so it's all the same to me." In fact,Einstein had been an outspoken critic of "passing laws which cannot be enforced".

8.He Equated Monogamy(一夫一妻制) With Monotony(单调)

"All marriages are dangerous," he once told an interviewer. "Marriage is the unsuccessful attempt to make something lasting out of an incident." He was notoriously (臭名昭著的) unfaithful as a husband,prone to falling in love with somebody else directly after the exchanging of vows(誓言).

只是因为专注于科学，他甚至记不住女朋友的生日。

9.His Memory Was Shot(用尽的)

Believing that birthdays were for children, his attitude is summed up in a letter he wrote to his girlfriend Mileva Maric: "My dear little sweetheart ...first, my belated(迟来的) cordial(诚恳的) congratulations on your birthday yesterday, which I forgot once again."

10.His Cat Suffered Depression

Fond of animals, Einstein kept a housecat which tended to get depressed whenever it rained. Ernst Straus recalls him saying to the melancholy cat: "I know what's wrong, dear fellow, but I don't know how to turn it off(避开)."

Speech

本文为爱因斯坦的著名演讲稿《我的世界观》。文中提到"要让每一个人都作为个人而受到尊重，而不让任何人成为崇拜的偶像"；"只有个人才能创造出高尚的和卓越的东西"、崇尚简朴等观点以及对"孤独"的理解，对青少年具有启示意义。

The World as I See it

How strange is the lot of us mortals (凡人)! Each of us is here for a brief sojourn (逗留); for what purpose he knows not, though he sometimes thinks he senses it. But without deeper reflection one knows from daily life that one exists for other people—first of all for those upon whose smiles and well-being our own happiness is wholly dependent, and then for the many, unknown to us, to whose destinies we are bound by the ties of sympathy. A hundred times every day I remind myself that my inner and outer life are based on the labors of other men, living and dead, and that I must exert myself in order to give in the same measure as I have received and am still receiving...

I have never looked upon ease and happiness as ends in themselves—this critical basis I call the "ideal of a pigsty"(猪圈). The ideals that have lighted my way, and time after time have given me new courage to face life cheerfully, have been Kindness, Beauty, and Truth. Without the sense of kinship (亲属关系) with men of like mind, without the occupation with the objective world, the eternally unattainable field of art and scientific endeavors, life would have seemed empty to me. The trite (陈腐的) objects of human efforts—possessions, outward success, luxury—have always seemed to me contemptible(可鄙的).

My passionate sense of social justice and social responsibility has always contrasted oddly with my pronounced lack of need for direct contact with other human beings and human communities.I am truly a "lone traveler" and have never belonged to my country, my home,my friends,or even my immediate family,with my whole heart; in the face of all these ties,I have never lost a sense of distance and a need for solitude(孤独)...

My political ideal is democracy.Let every man be respected as an individual and no man idolized (被偶像化).It is an irony of fate that I myself have been the recipient of excessive admiration and reverence from my fellow-beings,through no fault,and no merit,of my own.The cause of this may well be the desire,unattainable for many,to understand the few ideas to which I have with my feeble powers attained through ceaseless(不停的) struggle.I am quite aware that for any organization to reach its goals,one man must do the thinking and directing and generally bear the responsibility.But the lead must not be coerced (强迫),they must be able to choose their leader.In my opinion,an autocratic (专制的) system of coercion soon degenerates; force attracts men of low morality...The really valuable thing in the pageant of human life seems to me not the political state,but the creative,sentient (感觉灵敏的) individual,the personality; it alone creates the noble(贵族) and the sublime(极端主义),while the herd as such remains dull in thought and dull in feeling.

This topic brings me to that worst outcrop (突出特点) of herd (群众) life,the military system,which I abhor (憎恶)...This plague-spot of civilization ought to be abolished with all possible speed.Heroism on command,senseless violence,and all the loathsome nonsense that goes by the name of patriotism (爱国主义)—how passionately I hate them!

The most beautiful experience we can have is the mysterious.It is the fundamental emotion that stands at the cradle of true art and true science.Whoever does not know it and can no longer wonder,no longer marvel,is as good as dead,and his eyes are dimmed. It was the experience of mystery—even if mixed with fear—that engendered (产生) religion.A knowledge of the existence of something we cannot penetrate,our perceptions of the profoundest reason and the most radiant beauty,which only in their most primitive forms are accessible to our minds:it is this knowledge and this emotion that constitute true religiosity.In this sense,and only this sense,I am a deeply religious man...I am satisfied with the mystery of life's eternity and with a knowledge,a sense,of the marvelous structure of existence—as well as the humble attempt to understand even a tiny portion of the Reason that manifests itself in nature.

Quotes

大师名言录：某些是励志的，某些是深邃的，某些是讽刺的，某些是幽默的……

1."The most beautiful experience we can have is the mysterious.It is the fundamental emotion which stands at the cradle of true art and true science.Whoever does not know it and can no longer wonder,no longer marvel,is as good as dead,and his eyes are dimmed."

—"The World As I See It," originally published in FORUM AND CENTURY, 1931.

2."Try to become not a man of success,but try rather to become a man of value."

—*Life* magazine.May 2,1955.

3."Small is the number that see with their own eyes and feel with their own hearts."

"I'm enough of an artist to draw freely on my imagination.Imagination is more important than knowledge.Knowledge is limited; imagination encircles the world."

"The more success the quantum theory has,the sillier it looks."

—from a letter to Zangger,May 20,1912.

4."A man must learn to understand the motives of human beings,their illusions,and their sufferings."

—from an interview in the *New York Times*,September 1952.

"Curiosity is a delicate little plant which,aside from stimulation,stands mainly in need of freedom."

—*Autobiographical Notes*.1949.

5."Whoever undertakes to set himself up as a judge in the field of Truth and Knowledge is shipwrecked(遇难) by the laughter of the gods."

—contribution to a publication commemorating the eightieth birthday of German rabbi and theologian Leo Baeck,1953.

6."A happy man is too satisfied with the present to dwell too much on the future."

—CPAE,Vol 1.,Dec. 22,1896.

7."The important thing is to not stop questioning.Curiosity has its own reason for existing.One cannot help but be in awe（敬畏）when he contemplates the mysteries of eternity; of life; of the marvelous structure of reality..."

—from the *Personal Memoir* of William Miller,1955.

8."The most important endeavor is the striving for morality in our actions.Our inner balance and even our very existence depend on it.Only morality in our actions can give beauty and dignity for life."

—*Einstein, a Portrait*, p.102.

9."The monotony of a quiet life stimulates the creative mind."

—Speech "Civilization and Science," at Royal Albert Hall, London, 1933.

10."Great spirits have always encountered violent opposition from mediocre(普通的) minds.The mediocre mind is incapable of understanding the man who refuses to bow (弯腰) blindly to conventional prejudices and chooses instead to express his opinions courageously and honestly."

—letter to Morris Raphael Cohen, professor emeritus of philosophy at the College of the City of New York, defending the controversial appointment of Bertrand Russell to a teaching position, March 19, 1940.

11."What can the schools do to defend democracy? Should they preach (宣讲) a specific political doctrine? I believe they should not.If they are able to teach young people to have a critical mind and a socially oriented attitude, they will have done all that is necessary."

—message to the New Jersey Education Association, Atlantic City, 1939.

12."Bear in mind that the wonderful things you learn in your schools are the work of many generations, produced by enthusiastic effort and infinite labor in every country of the world.All this is put into your hands as your inheritance in order that you may receive it, honor it, add to it, and one day faithfully hand it to your children.Thus do we mortals achieve immortality in the permanent things which we create in common."

—address to a group of children, 1934.

13."I live in that solitude (孤独) which is painful in youth, but delicious in the years of maturity."

—quote from *Out of My Later Years*, p.13.

14."It is not so very important for a person to learn facts.For that he does not really need a college.He can learn them from books.The value of an education in a liberal arts college is not the learning of many facts but the training of the mind to think something that cannot be learned from textbooks."

—1921, on Thomas Edison's opinion that a college education is useless; quoted in Frank, *Einstein:His Life and Times*, p.185.

15."Science will stagnate(停滞) if it is made to serve practical goals."

—quoted in Nathan and Norden, *Einstein on Peace*, p.402.

16."After a certain high level of technical skill is achieved, science and art tend to coalesce (联合，合并) in esthetics (美学), plasticity (可塑性), and form. The greatest scientists are always artists as well."

—Remark made in 1923; recalled by Archibald Henderson, *Durham Morning Herald*, August 21, 1955; *Einstein Archive* 33-257.

17."The most precious things in life are not those you get for money."

—*Ladies Home Journal*. December 1946.

18."Good acts are like good poems. One may easily get their drift, but they are not rationally understood."

—quote to Maurice Solovine, April 9, 1947.

19."One must shy away from questionable undertakings, even when they bear a high-sounding name."

—quote to Maurice Solovine, spring 1923.

20."It is not so important where one settles down. The best thing is to follow your instincts without too much reflection."

—quote to Max Born, March 3, 1920.

21."I believe that a simple and unassuming life is good for everybody, physically and mentally."

—quote from "The World as I See It" (1930), reprinted in *Ideas and Opinions*, 8.

22."All of science is nothing more than the refinement of everyday thinking."

—quote from "Physics and Reality" (1936), reprinted in *Ideas and Opinions*, 290.

23."When a man sits with a pretty girl for an hour, it seems like a minute. But let him sit on a hot stove (火炉) for a minute—and it's longer than any hour. That's relativity."

—quote from *Journal of Exothermic Science and Technology* (JEST, Vol.1, No.9; 1938).

(这是爱因斯坦对"相对论"的趣解。)

24."I have remained a simple fellow who asks nothing of the world; only my youth is gone—the enchanting(美好的) youth that forever walks on air."

—quote to Anna Meyer-Schmid, May 12, 1909.

25."A scientist is a mimosa (含羞草) when he himself has made a mistake, and a roaring lion when he discovers a mistake of others."

—quote from *Ehlers, Liebes Hertz!*, 45.

26."The true value of a human being is determined primarily by how he has attained liberation from the self."

——quote from *Einstein Archive* 60-492, 1932; published in *Mein Weltbild.*

27."The life of the individual has meaning only insofar (在……范围内) as it aids in making the life of every living thing nobler and more beautiful..."

—quoted in *Ehlers, Liebes Hertz!* , 162.

28. "One should not pursue goals that are easily achieved.One must develop an instinct for what one can just barely achieve through one's greatest efforts."

—quote to Walter Daellenbach, May 31, 1915.

29. "I have little patience with scientists who take a board of wood, look for its thinnest part, and drill a great number of holes where drilling is easy."

—Albert Einstein (quoted by Philipp Frank in "Einstein's Philosophy of Science," Reviews of Modern Physics), Vol 21, No.3 July 1949.

30."Falling in love is not at all the most stupid thing that people do—but gravitation cannot be held responsible for it."

—quote to Fred Wall, 1933.

31."Look deep, deep into nature, and then you will understand everything better."

—To Margot Einstein, after his sister's Maja's death, 1951; quote by Hanna Loewy in *A&E Television Einstein Biography*, VPI International, 1991.

32."and knowledge is one of the finest attributes of man—though often it is most loudly voiced by those who strive for it the least."

—quote from *The Goal of Human Existence*, April 11, 1943.

33."Why is it that nobody understands me, yet everybody likes me."

—quote from *New York Times*, March 12, 1944.

34."It is abhorrent (令人生厌的)to me when a fine intelligence is paired with an unsavory(道德不好的) character."

—quote to Jacob Laub, May 19, 1909.

35."Music does not influence research work, but both are nourished by the same sort of longing, and they complement each other in the release they offer."

—letter to Paul Plaut, October 23, 1928; Einstein Archive 28-065; quoted in Dukas and Hoffmann, Albert Einstein, *the Human Side.*

36."Never regard your study as a duty, but as the enviable (令人羡慕的) opportunity to learn to know the liberating influence of beauty in the realm (领域) of the spirit for your own personal job and to the profit of the community to which your later work