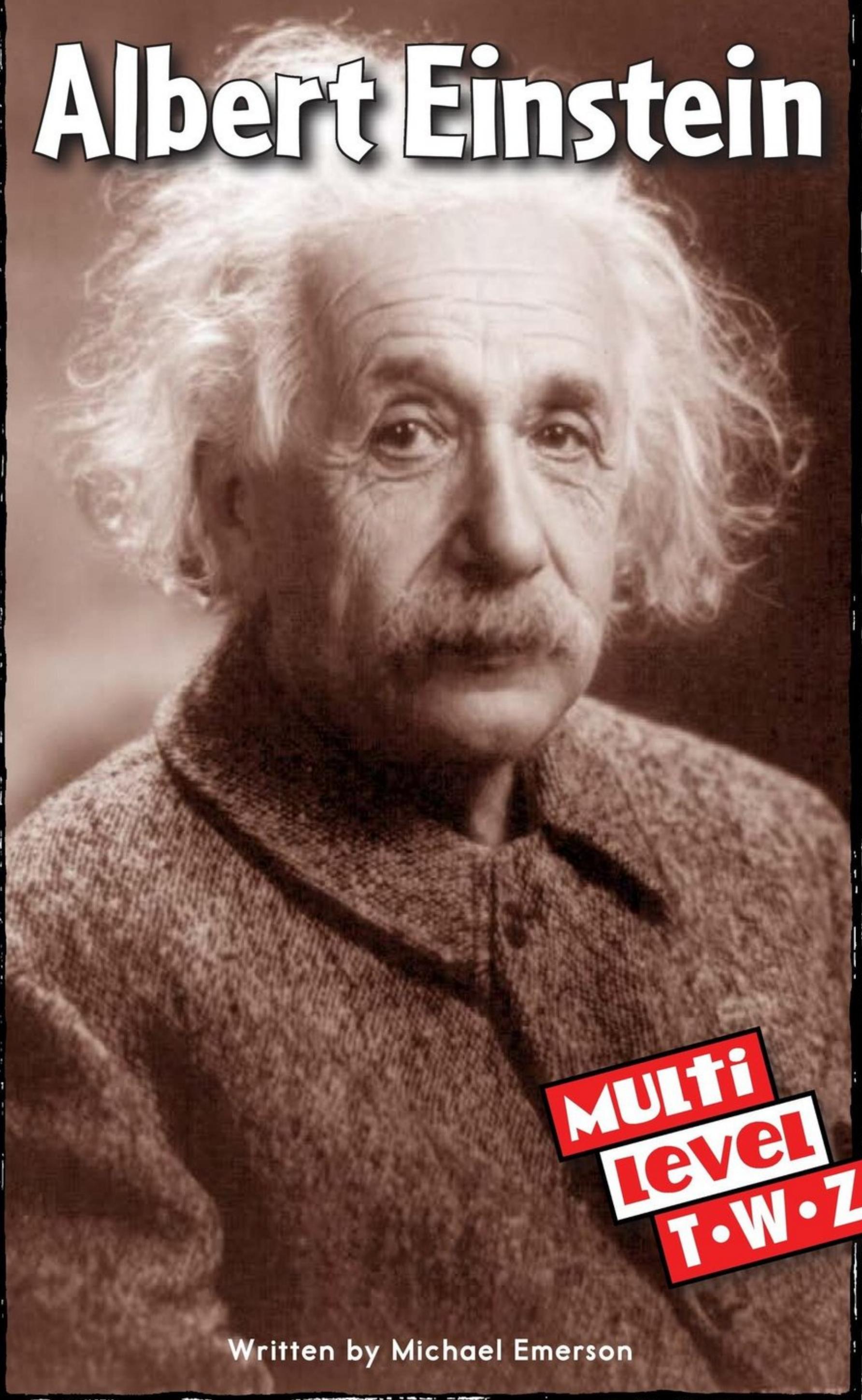


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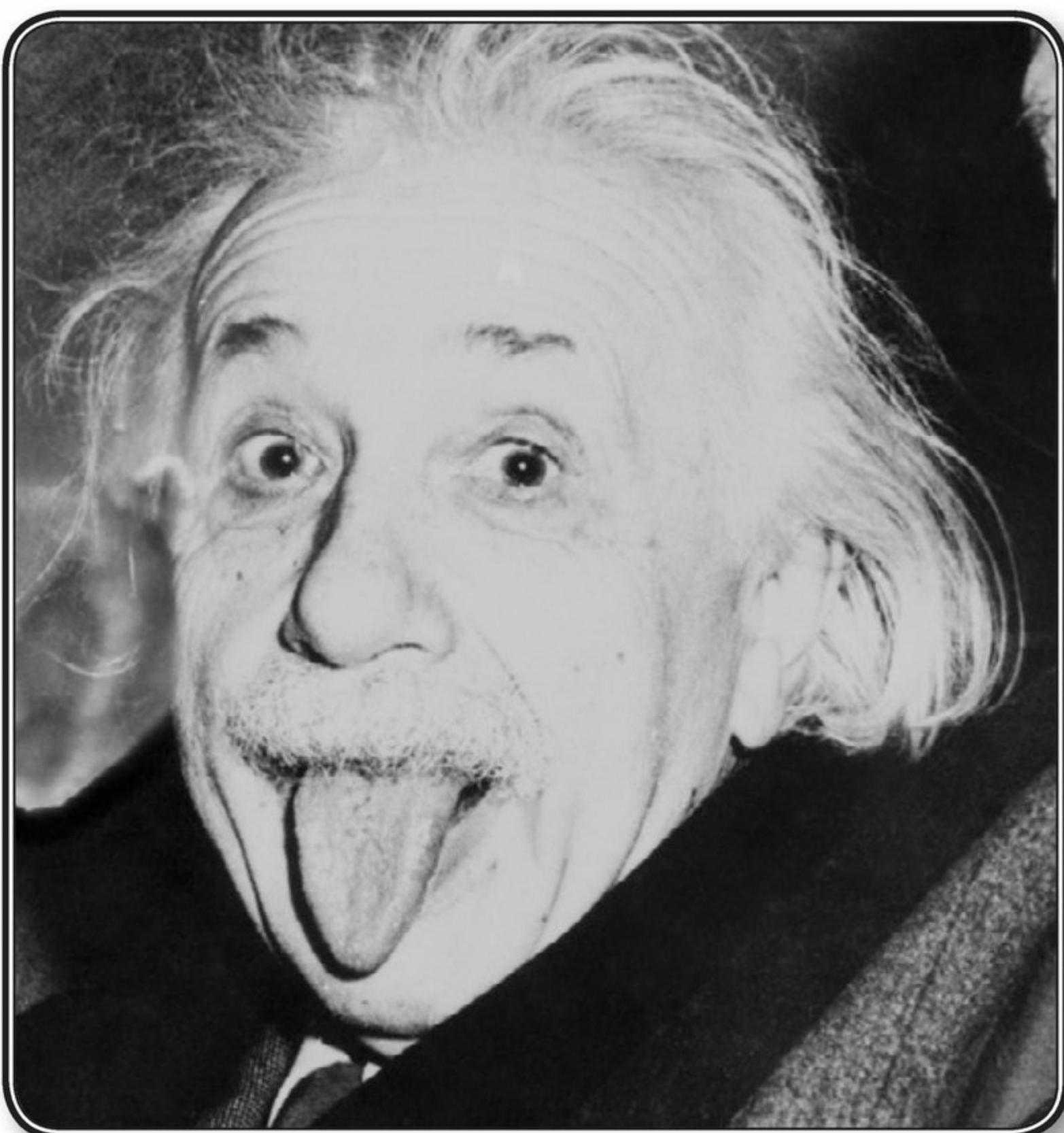
Albert Einstein



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Written by Michael Emerson

Albert Einstein

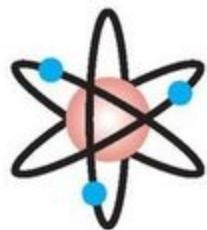


Written by Michael Emerson

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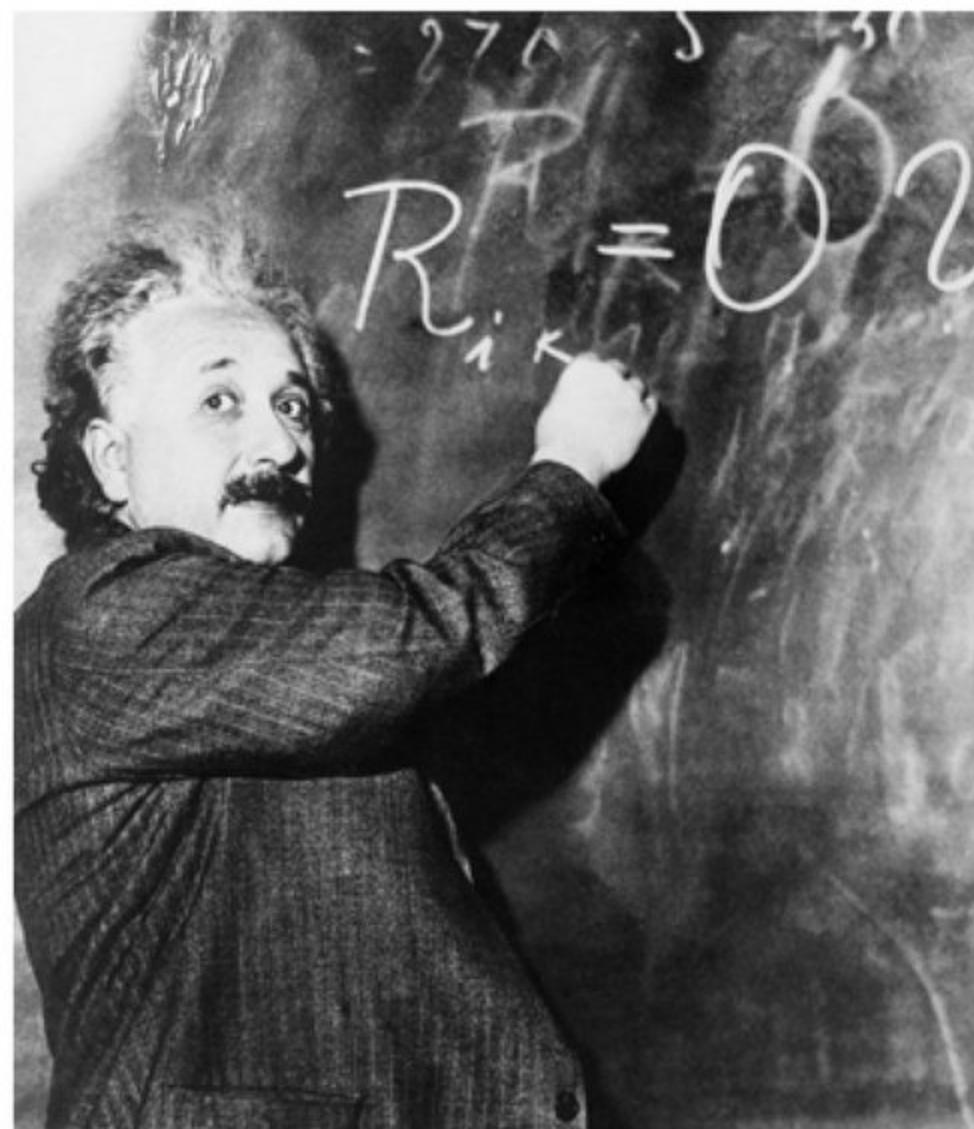
Deeply Hidden Things



“Knowledge of what is does not open the door directly to what should be.”

When Albert Einstein was five years old, his father showed him a magnetic **compass**. Einstein was curious. Why did the compass's needle stay still while his father turned its casing around and around?

Einstein was too young to know the answer back then. Later on, he wrote that the compass had taught him an important lesson—that “something deeply hidden” was “behind things.” That curious little boy grew up to become a curious scientist. He spent his life trying to identify that “something.” In doing so, Albert Einstein forever changed the way people think about the **universe**.



Einstein's curiosity about complex problems led to great discoveries.



Einstein played the violin from childhood through adulthood.

A Talented, Curious Boy



“A table, a chair, a bowl of fruit, and a violin; what else does a man need to be happy?”

Albert Einstein was born on March 14, 1879, in the small town of Ulm, Germany. Einstein's family had a strong influence on his life. His younger sister, Maja, was his closest childhood friend. His mother, Pauline, encouraged Albert to take up the violin when he was six. His violin would be a constant companion for the rest of his life.

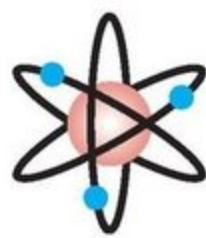


Albert Einstein with his sister, Maja

Do You Know?

As a child, Einstein had a curious speech habit. Whatever he said out loud, he would then say again to himself in a very quiet voice. He eventually outgrew this habit and became an accomplished public speaker.

Einstein's father and two of his uncles introduced Einstein to math and science when he was young. One of his uncles taught him **algebra** by making it into a game. A family friend brought him several books about science and mathematics. Einstein would read the books for hours at a time. He especially liked a book about **geometry**.



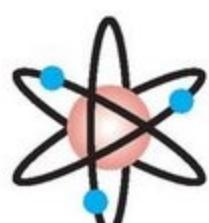
“Teaching should be such that what is offered is perceived as a valuable gift and not as a hard duty.”

In school, Einstein's talent for math and science was clear. However, he questioned the way the school taught him. To young Einstein, the teachers just drilled their students to memorize useless information. Einstein liked to think creatively, not just memorize.

When he was only 17 years old, Einstein was accepted at one of the best scientific universities in Europe. Once again, Einstein's curiosity about how and why things worked led him to do things his own way. He often skipped classes to spend more time on his own ideas. His professors thought that Einstein might have a bright future—if he would do as he was told.



Einstein's creative thinking was honored with a U.S. stamp.



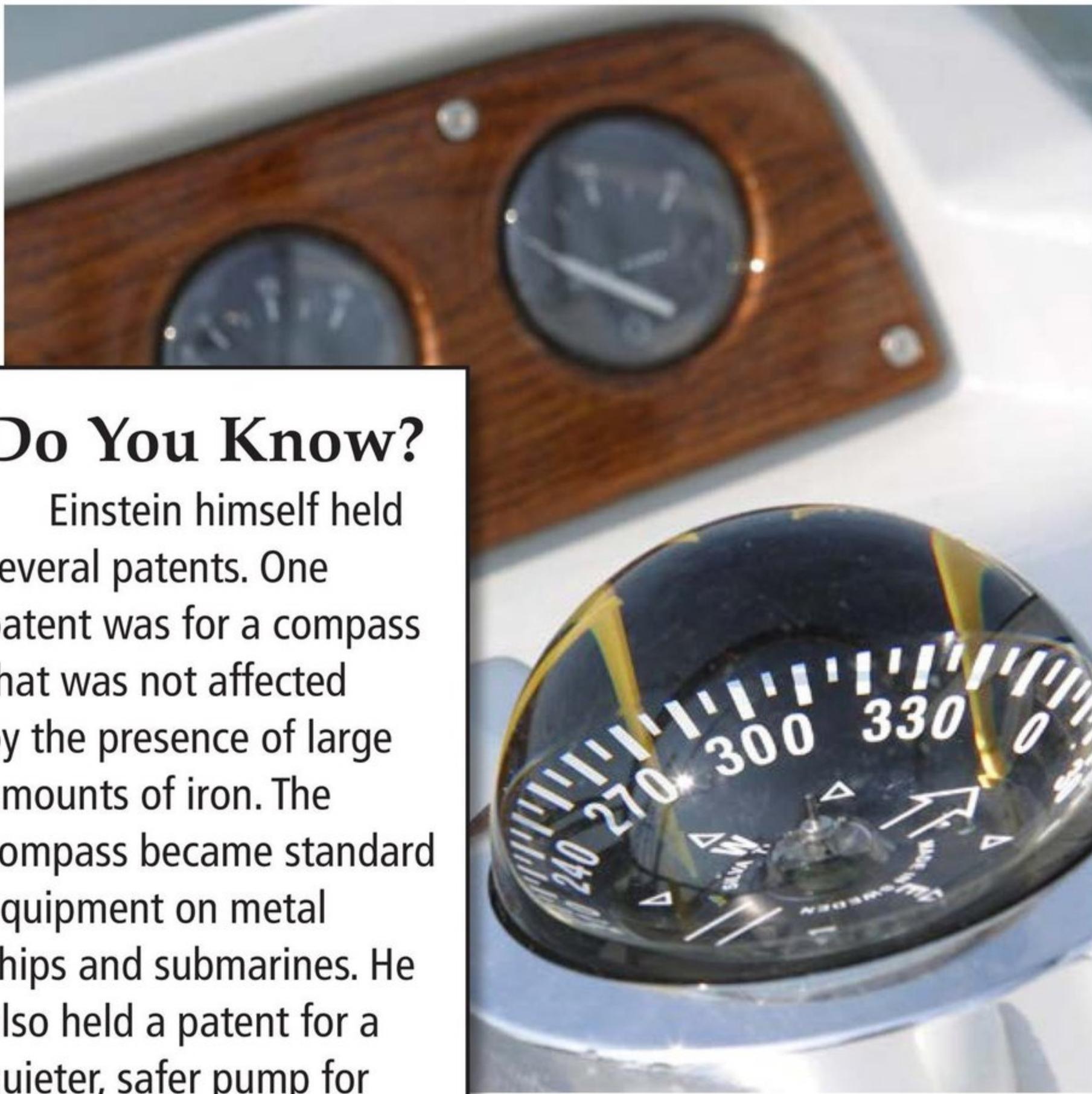
“Imagination is more important than knowledge.”

The Patent Office

Einstein had trouble finding a job after finishing school in 1900. His independence and curiosity made him unpopular with the teachers who could help him find work. In 1902, he took a job in a **patent** office in Bern, Switzerland. His job was to make sure that devices submitted for patents worked the way their inventors said they did. The job in the patent office allowed Einstein to do what he did best—pursue his curiosity and question the ideas of others. On his first day at work, Einstein’s boss told him, “When you pick up an application, think that anything the inventor says is wrong.”



Einstein worked at the patent office in Bern, Switzerland.



Do You Know?

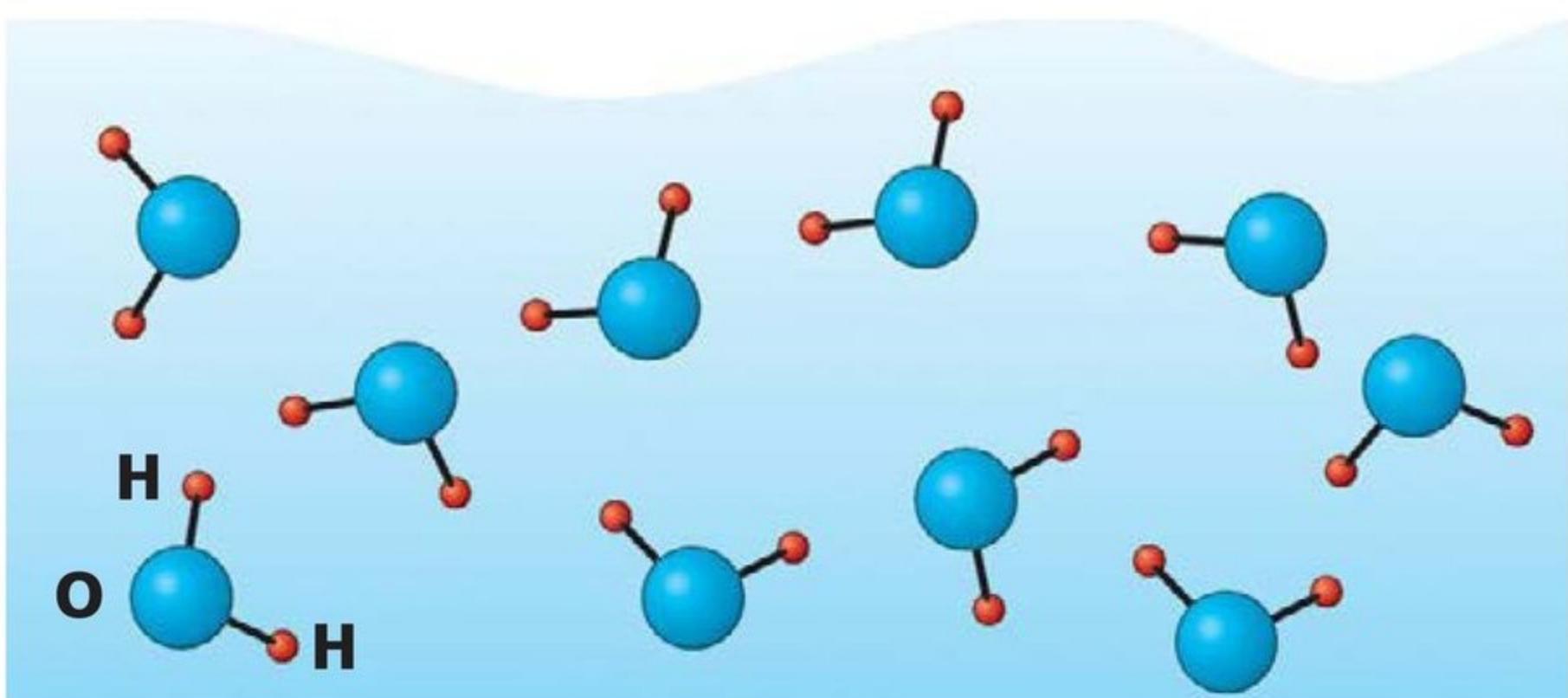
Einstein himself held several patents. One patent was for a compass that was not affected by the presence of large amounts of iron. The compass became standard equipment on metal ships and submarines. He also held a patent for a quieter, safer pump for refrigerators.

The money and work schedule gave Einstein the freedom to pursue his own ideas. In his spare time, he met with a group of friends who shared his curiosity about scientific ideas. They called themselves the Olympia Academy. It was during these years of steady work and strong friendships that Einstein began working on ideas that would change science forever.

The Miracle Year

By 1905, Einstein had worked in the patent office for three years. During that time, he developed new scientific **theories**. He soon felt confident enough in his ideas to share them.

Einstein sent papers explaining his ideas to the leading German scientific journal of the time. The journal published the first of these papers in March 1905. Four more soon followed. Einstein's first paper explained what light is and how it acts. The second and third papers proved the existence of tiny parts of matter, called **molecules** and **atoms**, and described how they moved. The final two papers offered new explanations of the relationships among space, time, and objects in motion.



Water molecules (H_2O)

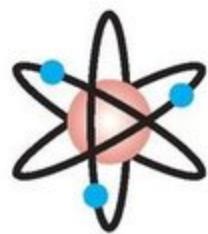
Scientists were **astounded** by what they read. In six months, Einstein changed the way they had thought about the universe for over two hundred years! They were amazed that these ideas came from a curious 26-year-old patent clerk instead of a professor of **physics**.

Einstein's career in science began to take off. He received invitations to explain his new ideas at scientific meetings. The 1905 Nobel Prize winner in physics contacted Einstein to congratulate him. A well-known professor of physics named Max Planck even began to teach Einstein's ideas to his students. In time, 1905 came to be known as Einstein's "miracle year."



Physics professor Max Planck taught Einstein's theories in his university classes.

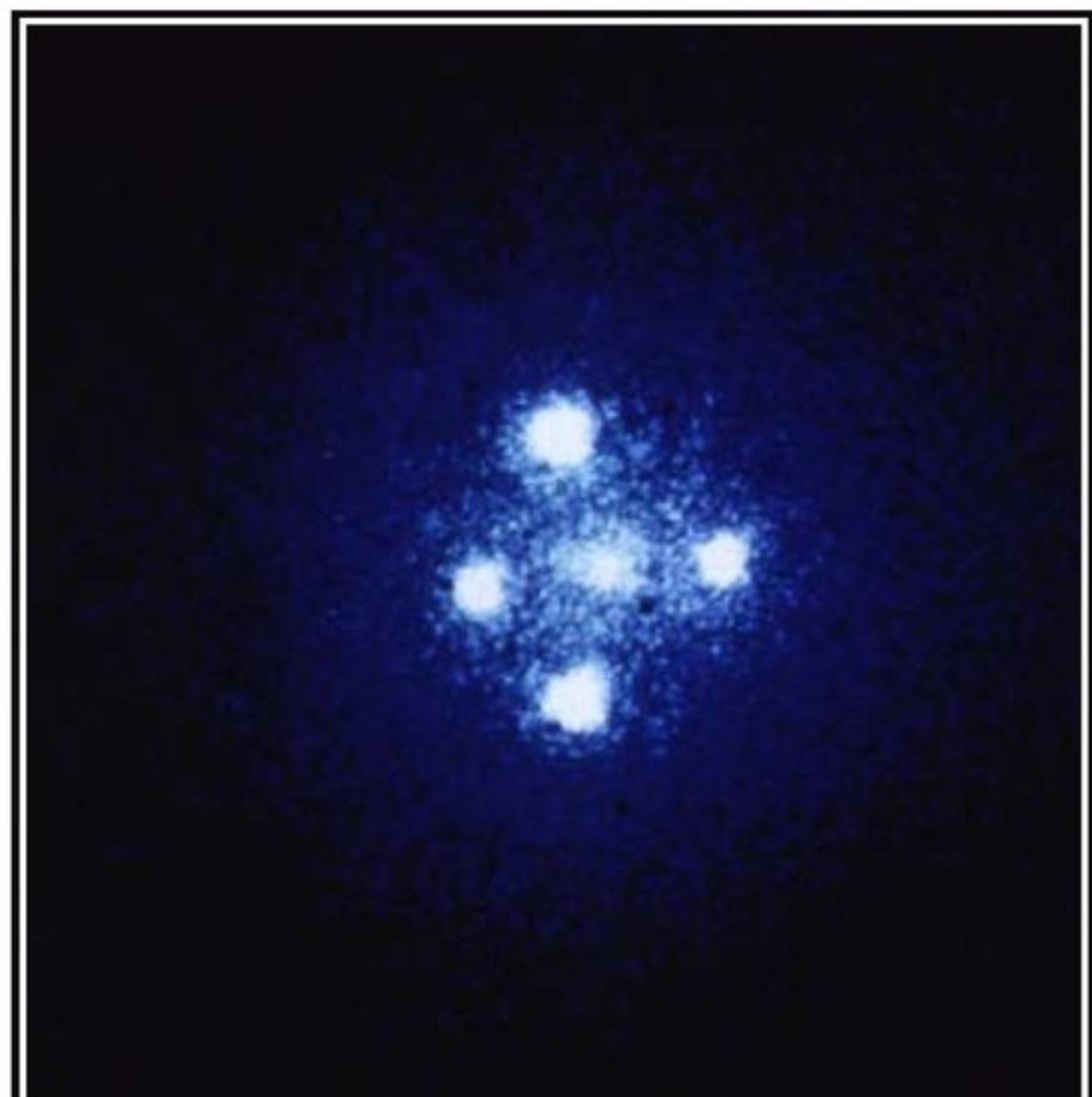
A Rising Star



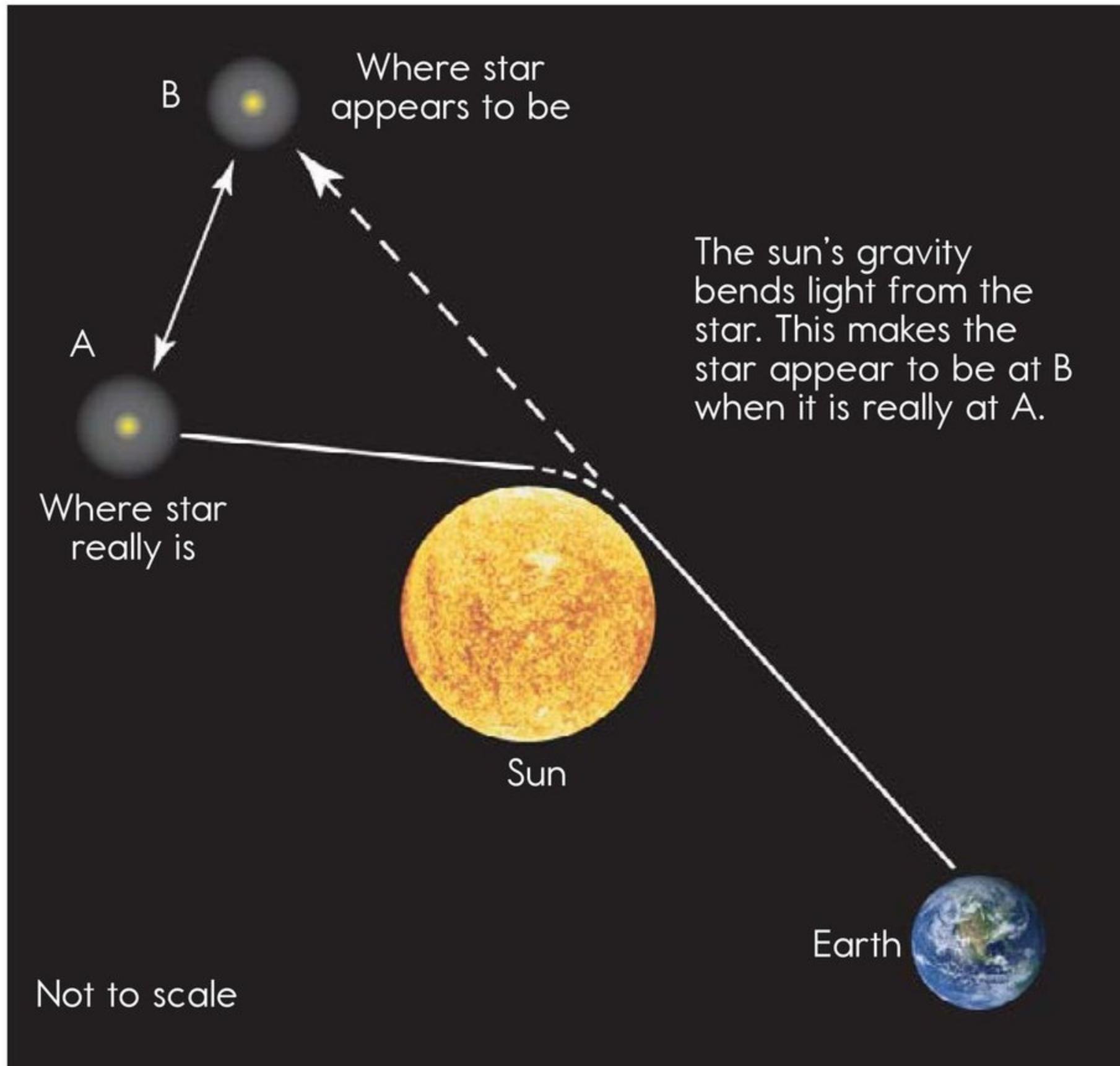
“The most incomprehensible thing about the world is that it is comprehensible.”

In 1909, Einstein finally received an offer to teach at a university. He took the job, but ended up teaching at different schools over the next few years. He was searching for the ideal place for his research.

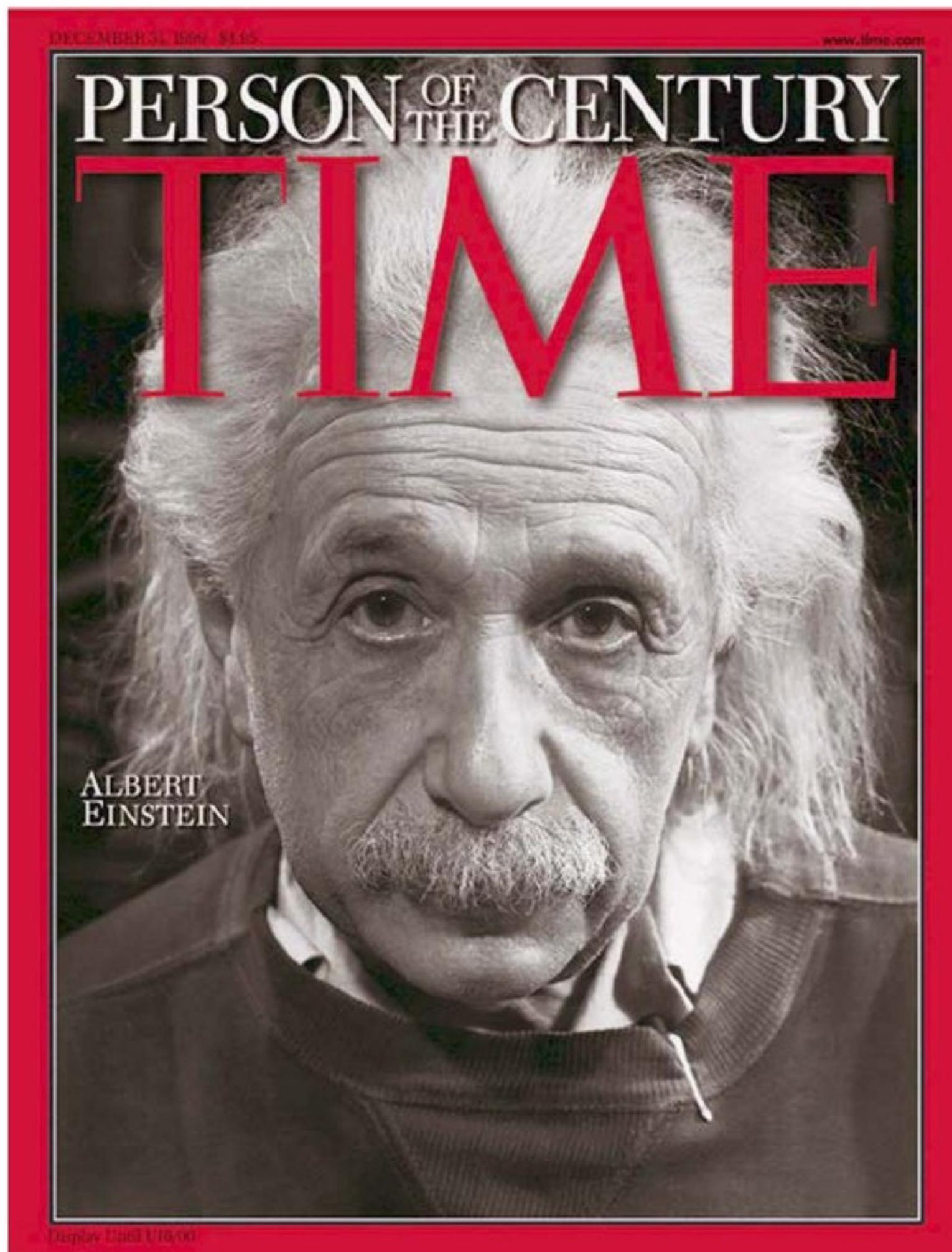
Meanwhile, he continued to develop his earlier ideas in new ways. It was hard work, and Einstein often thought he was on the wrong track. His ideas were so new and unfamiliar that he said they almost drove him crazy. Then, in 1915, he had a breakthrough. He finally figured out how to combine his earlier ideas into one system. He called the system the General Theory of Relativity.



Einstein's ideas revolutionized modern astronomy.



Einstein's ideas once again excited scientists around the world. In 1919, British scientists tested his theory by measuring the position of a star during a **solar eclipse**. If Einstein was correct, the star would appear to be in one position while it was actually in another. The star appeared almost exactly where Einstein said it would be! Newspaper headlines around the world announced the findings. Overnight, Albert Einstein became one of the most famous people in the world.



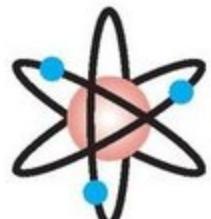
Einstein was named "Person of the Century" by *Time Magazine*.

Not everyone was pleased with Einstein. Many scientists had built their careers on ideas that Einstein tossed aside. Others did not want to believe Einstein's theories because they were difficult to test. Einstein knew that his theories were not perfect. Yet with each new paper, more and more people came to understand the importance of Einstein's work.



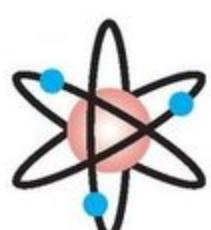
News reporters greet Albert Einstein and Elsa, his wife, arriving in New York in 1921.

The Uses of Fame



*“Try not to become a man of success
but a man of value.”*

As Einstein's fame grew, so did the demand for interviews, photographs, speeches, and writings. Einstein had mixed feelings about all this attention. These demands took up time that he could have spent on other things. He also knew that many people would misunderstand his ideas no matter how carefully he explained them.



*“You cannot simultaneously prevent
and prepare for war.”*

Do You Know?

In the 1930s, Einstein began to publish a series of articles for general audiences titled *The World as I See It*. The collection covered topics from war to liberty to progress and education—not just science.

At the same time, Einstein knew that fame would help him bring his ideas to more people. The more speeches and interviews he gave, the more people would hear and try to understand the world as he saw it.

Einstein also knew that he could use his fame to draw attention to issues he cared about outside of science. One of Einstein's most deeply held beliefs was that war should be avoided. In 1914, he was one of only three scientists who signed a letter against Germany taking part in World War I. More than 100 scientists had signed a letter of support for the war. He also worked with international groups working for peace. He wrote often about his antiwar beliefs. When Germany began preparing for war again in the 1930s, Einstein continued to speak out.

Coming to America

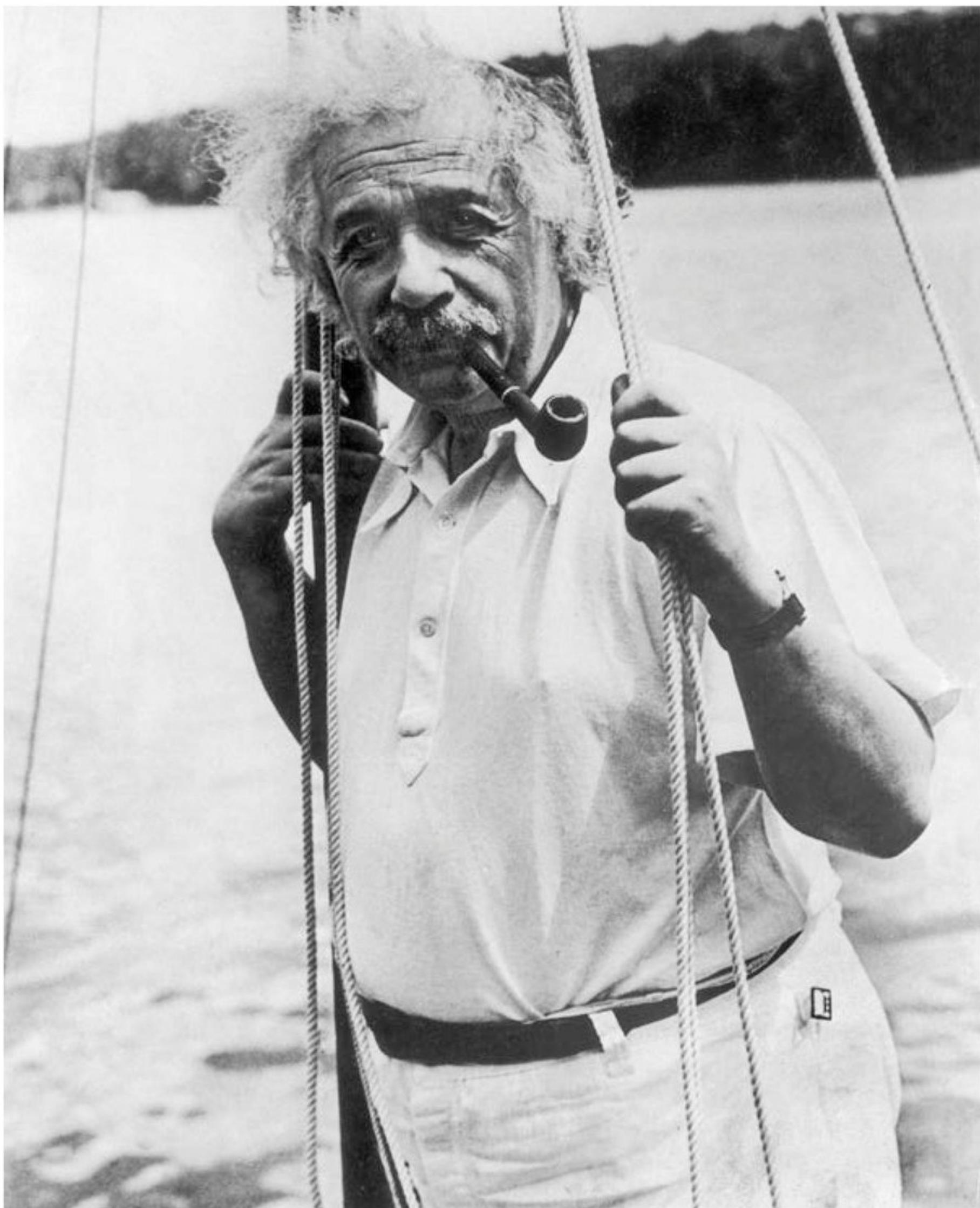


“The most important motive for work in school and in life is pleasure in work, pleasure in its result, and the knowledge of the value of the result to the community.”

Despite the efforts of Einstein and others to promote peace, Germany moved closer to war in the 1930s. Einstein left Germany in 1933. He took a job at Princeton University in the United States.



Einstein meets with Jawaharlal Nehru, prime minister of India, at Einstein's home in Princeton, New Jersey, in 1949.



Einstein enjoyed sailing, and often took his boat out on Princeton's Lake Carnegie.

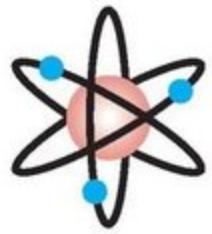
Einstein and his family soon became part of Princeton's close-knit community. When out-of-town visitors wanted to know where he lived, townspeople would ask, "Are you expected?" This question kept strangers from bothering Einstein at home.

For the next 22 years, Einstein continued working to expand his ideas into new areas. He believed that he could develop a new theory that would unify his ideas with the latest theories. He worked as hard as he ever had, yet he never achieved the sort of breakthroughs he'd had during the "miracle year" or with his General Theory of Relativity. Despite the lack of new breakthroughs, he continued to give speeches, write articles, and meet regularly with fellow scientists.



Albert Einstein goes over matters with secretary Helen Dukas, who worked with Einstein from 1928 until his death in 1955.

Einstein's Influence



"Few are those who see with their own eyes and feel with their own hearts."

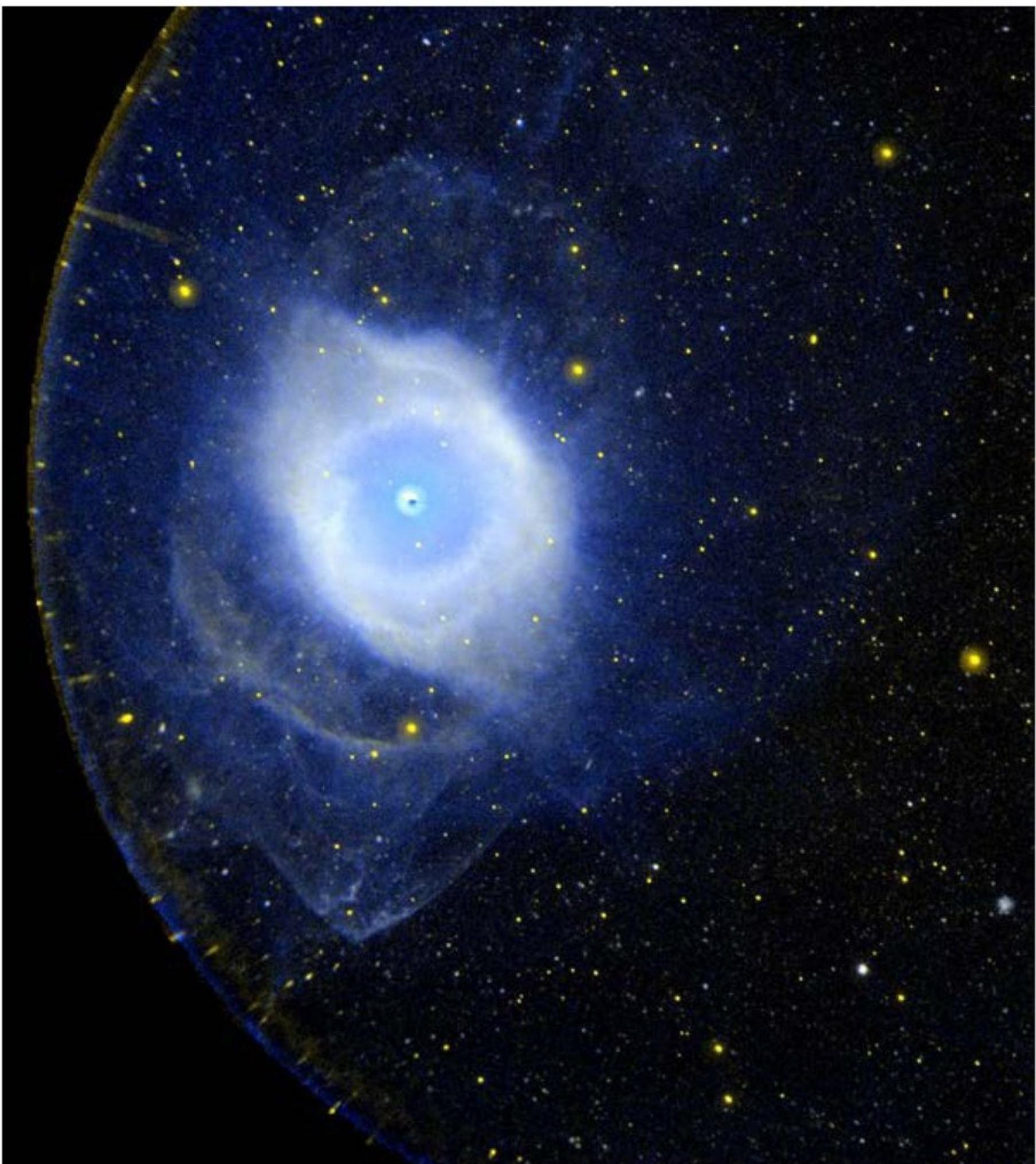
Einstein was not an inventor. Yet his curiosity led to the creation of many useful products. For example, Einstein's ideas about light led scientists to develop new ways to control light.

These developments eventually led to television cameras, remote controls, and flat-screen computers. Einstein was also the first person to think of laser light. Laser light is now used in CDs, DVDs, and supermarket checkout equipment. His proof of the

existence of atoms and molecules led to the creation or improvement of a wide range of products.

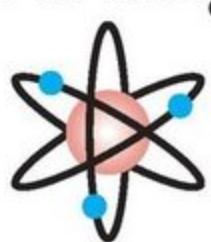
Those products include shaving cream, toothpaste, personal computers, portable phones, and more.



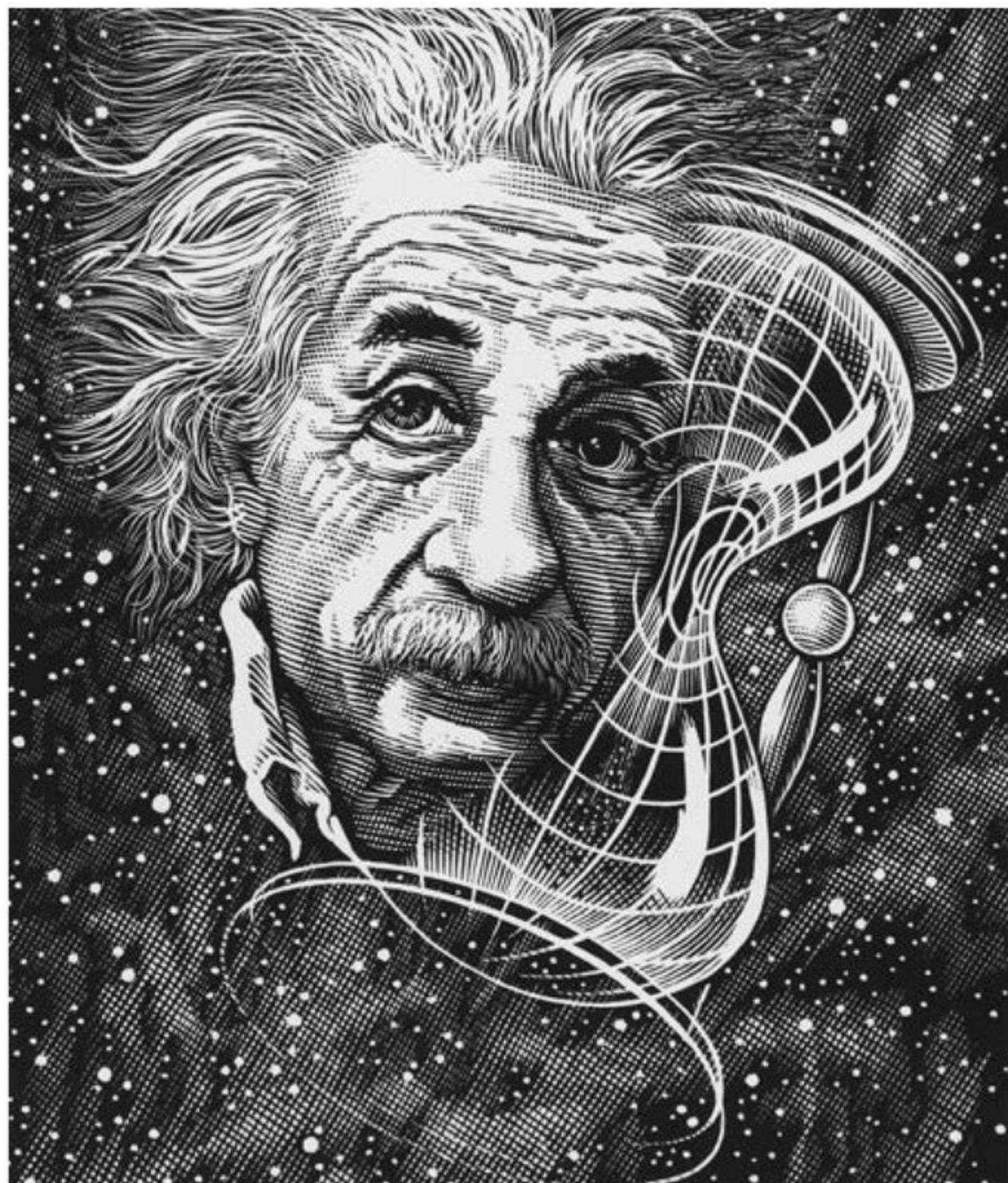


Einstein's theories provide scientists with a framework to study space objects, such as the Helix Nebula.

Einstein's scientific ideas continue to influence new theories. Current ideas about the origins of the universe, the nature of space, and strange objects called black holes all owe a large debt to Einstein.



"The important thing is to never stop questioning."



A Life Well Lived

Einstein once said, “The most beautiful experience we can have is the **mysterious**. . . . It is enough to try to understand a little of this mystery every day.”

Until his death on April 18, 1955, Einstein’s curiosity led him to work to understand nature’s greatest mysteries. In doing so, he changed the way people think about time, space, energy, and matter—the foundations of the universe.

Glossary

algebra (<i>n.</i>)	a type of math that uses symbols such as letters to represent numbers (p. 6)
astounded (<i>v.</i>)	greatly amazed or surprised (p. 11)
atoms (<i>n.</i>)	tiny pieces of matter (p. 10)
geometry (<i>n.</i>)	a type of math that deals with lines, angles, surfaces, and shapes (p. 6)
compass (<i>n.</i>)	a direction-finding tool with a needle that always points north (p. 4)
molecules (<i>n.</i>)	the smallest parts of a substance that are still identifiable as that substance (p. 10)
mysterious (<i>adj.</i>)	not easily understandable (p. 22)
patent (<i>n.</i>)	a document that grants an inventor the right to make money from an invention (p. 8)
physics (<i>n.</i>)	the scientific study of matter and energy (p. 11)
solar eclipse (<i>n.</i>)	a period of time when the Moon blocks our view of the Sun (p. 13)
theories (<i>n.</i>)	possible explanations (p. 10)
universe (<i>n.</i>)	all things that exist in space (p. 4)

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Back cover: Einstein receives a certificate of U.S. citizenship from Judge Phillip Forman in 1940.

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