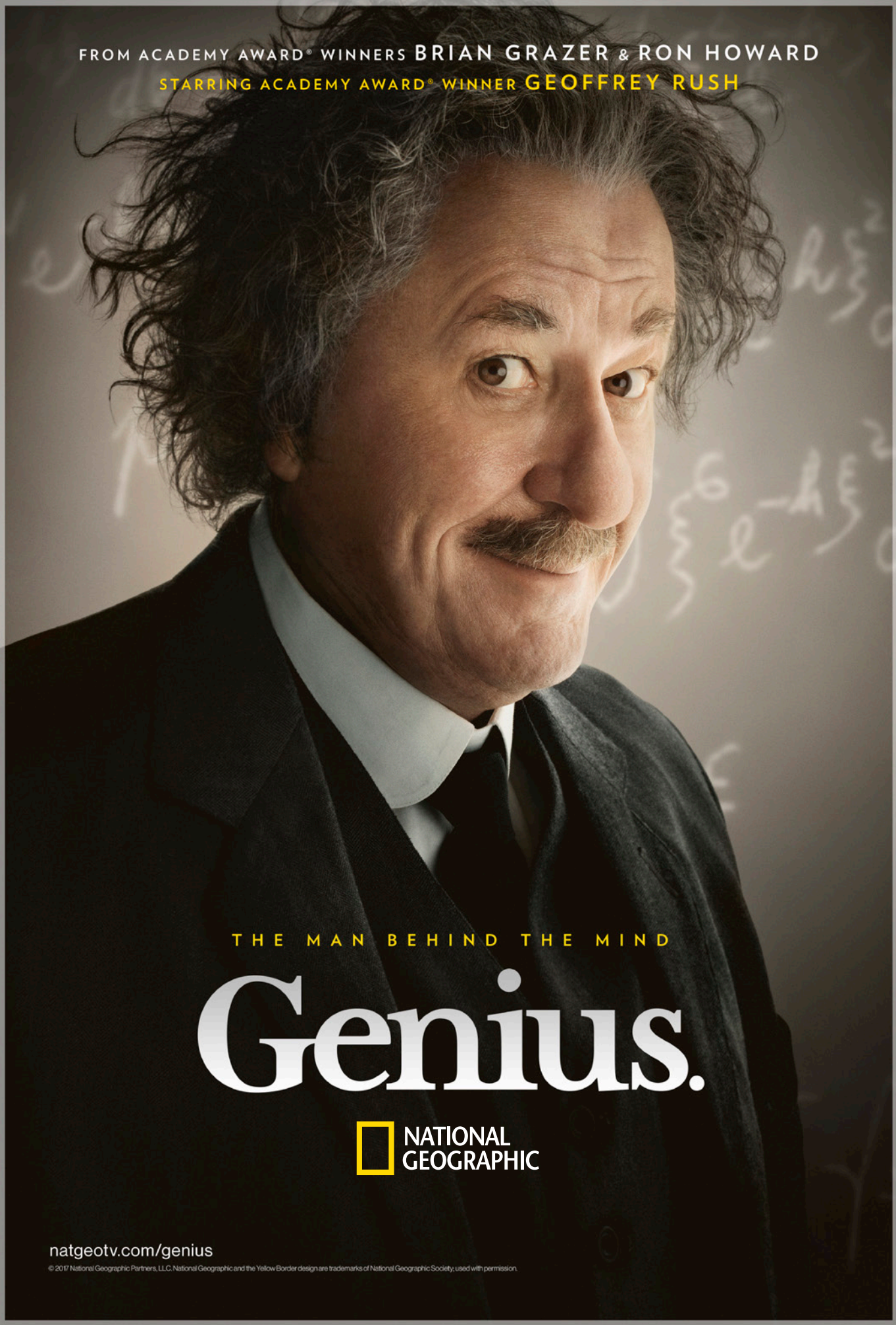
Discussion Guide



JOURNEYS IN FILM
educating for global understanding

JOURNEYS IN FILM™
educating for global understanding

Table of Contents

Click the Chapter heading to be taken to that page

A Letter From Ron Howard and Brian Grazer

Brian Grazer (left) and Ron Howard.

What does the word "genius" mean to you? To us, it represents people who push themselves to their maximum level and pioneer any kind of breakthrough based on that commitment. People who can see things in the world that others do not — and then have the fortitude to make that insight and share it with the world.

We are living in a culture where "genius" is a word that is commonly used and thought about a lot, because the world has exploded with technology and science. People are intrigued with what genius is — and that is why we decided to do a show about one of the most well-known geniuses in history. What makes a genius? Genius involves breakthroughs, discoveries, adventure and curiosity, and all of these are embodied in the character of Albert Einstein.

Most people are familiar with the icon Albert Einstein, but it goes so much deeper than what we think we know. His discoveries capture our imagination. We know just enough to have respect and awe but no deep knowledge of the details. As we researched, we found that Einstein's life was fraught with challenges. It is fascinating to understand how close an individual came to not getting his or her ideas out there — how many barriers there were that society offers up. We are all coping and trying to survive, we are failing often, and the film shows us that Einstein did as well. We had no idea how many struggles he faced and how close he came to being crushed. We did not imagine that at any part of his life he felt intellectual humiliation. Underscoring these obstacles and sharing his aspiration were important to us as storytellers. Kids today aspire to things beyond their reach, and this interconnects to that story.

Our goal with this series was to do Einstein's life justice. He was a complicated and dramatic man. He was a bohemian, a maverick, a poetic-like guy when he was young. He was an artist, musician and philosopher. He was eccentric and an absolute individualist. He loved life and loved love. He had drive and focus. He wanted acknowledgment, but wanted insight more. What fueled him was curiosity. It was all about wonder and the possibility of answering the complex questions of the universe. As filmmakers, demystifying him was interesting. As viewers, you'll be surprised and entertained throughout the series as you get to know him.

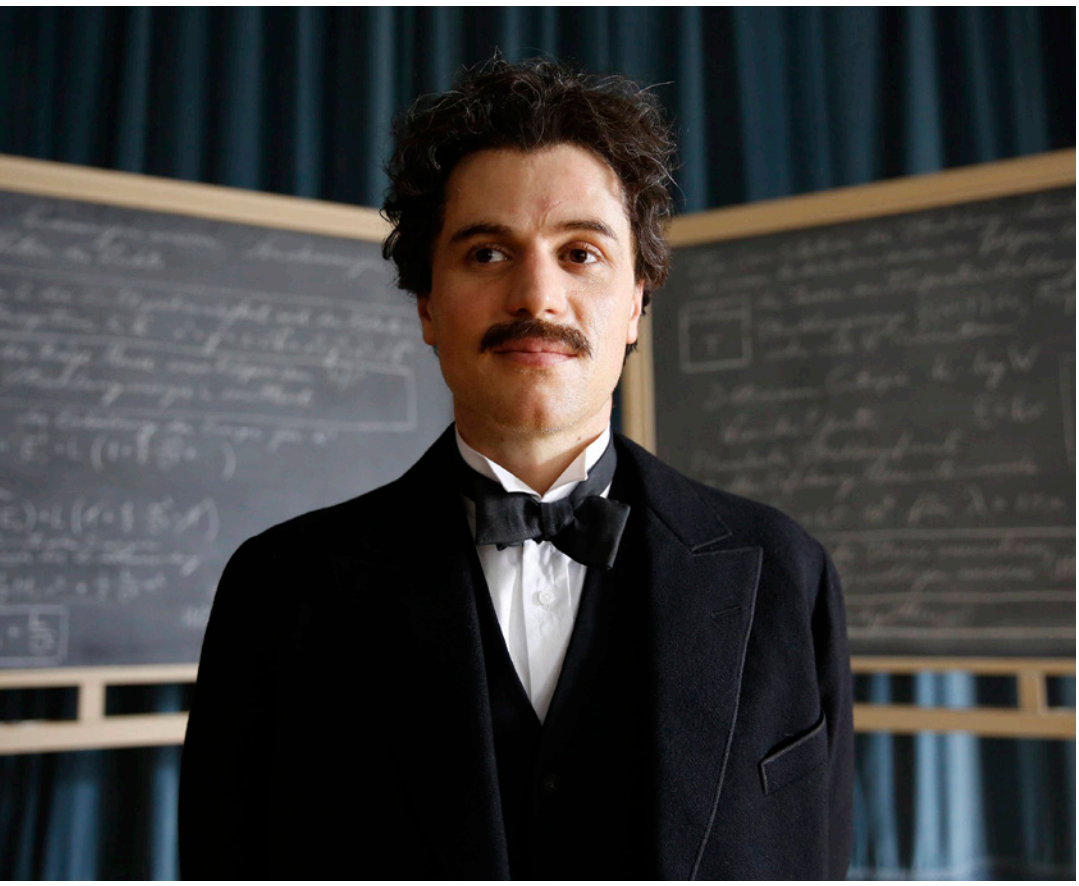
On his deathbed, Einstein was still trying to work on the theory of everything — that curiosity was with him his entire life. It is our hope that GENIUS will spark your ambitions, encourage you to persevere and ignite in you a lifetime of curiosity.

As Einstein himself said, "The important thing is not to stop questioning. Curiosity has its own reason for existing."

Sincerely,

Brian Grazer and Ron Howard
Executive Producers, National Geographic's GENIUS

What Is Genius?



Most people are familiar with the term IQ, but not everyone knows what it means. The familiar abbreviation stands for "intelligence quotient," the ratio between someone's mental age, as measured by a particular test (like the Stanford-Binet Intelligence Scale), and his or her chronological age. A median IQ score of 100 reflects the fact that two-thirds of the people who take the test score between 85 and 115. Only about 5 percent of test-takers score above 125. Does that make the top 5 percent geniuses? Or the top 2 percent? Or some other arbitrary cutoff?

Or is genius more than the ability to score well on a test that, in general, is dependent on verbal and math ability? Think about how you would define the term "genius."

What are the qualities that mark someone as a genius?

Is genius something that is innate, the result of genetic characteristics, or is it partially a result of upbringing, education, and opportunity?

Think of someone whom you believe is a genius in art. How does this person demonstrate genius?

Can you identify geniuses in music or in film? What traits of genius do they show in their creations?

What qualities do these geniuses you have identified in different fields of endeavor share?

Do some geniuses go unrecognized? Why, or why not?

Can factors like malnutrition or lead in drinking water affect the attainment of genius?

Do you think Einstein might not have been selected for what is today called a "gifted and talented" class? Why, or why not?

The Life of Albert Einstein – A Timeline

The *Genius* series focusing on Albert Einstein has a fundamental chronological order, but it also juxtaposes diverse times and places. Different actors portray Einstein at various points in his life. Here is a timeline to provide a picture of his life as a whole.

March 14, 1879	Born in Ulm, Württemberg, Germany. The family moved to Munich, Germany, soon after.
1894	Family relocated to Italy; Einstein attended school in Aarau, Switzerland.
1896	Einstein began studying in Zurich, Switzerland, in preparation for a career in teaching.
1901	Einstein graduated and attained Swiss citizenship; began work in a patent office.
1903	Married Mileva Maric.
1905	Earned a doctoral degree in physics.
1908	Began working his way up the career ladder, teaching in Bern, Switzerland, and then in Zurich and Prague.
1914	Became a director at the University of Berlin; reestablished German citizenship.
1916	Publication of Einstein's *General Theory of Relativity*.
1919	Divorce from Mileva; marriage to Elsa Lowenthal.
1922	Awarded the Nobel Prize in Physics for 1921.
1933	Renounced German citizenship; moved to the United States and began teaching at Princeton University in New Jersey.
1939	Warned President Franklin Delano Roosevelt of Germany's potential to develop an atomic bomb.
1940	Einstein attained U.S. citizenship.
1945	Retired from university teaching.
April 18, 1955	Died in Princeton, New Jersey.

Young Albert Einstein

Most people, if asked what they know about Albert Einstein, respond simply that he was an extremely intelligent scientist, which is certainly true. He was also more complex than that, a multi-dimensional person who changed with age and experience.

He was born to Hermann and Pauline Einstein in Germany in 1879, and he had one sister. The family were German Jews by ethnicity, but not particularly observant of Jewish religious practices. Like many gifted students, young Albert often found school boring and let his mind wander. His first attempt at the entrance exam for school in Zurich makes it quite clear that he neglected studies that did not particularly interest him and had to fill in the gaps in his knowledge of the humanities.

Einstein's family background was Jewish, but not devout. What did he mean when he said, "You can't change your heritage" (Episode 1)?

A gift of a magnetic compass during his childhood fascinated him and led to his lifelong passion for science. Have you ever received a gift that ignited your interest in a new subject or activity? If so, what was it and how did it influence you?

Why did young Albert often find himself in trouble with school authorities (Episodes 1–3)? Was it his fault, or theirs? What was his German school like? Was he naturally rebellious or was the school too restrictive? How do classrooms today differ from those he experienced? When you were bored in school, how did you handle it?

The Einstein family's move to Italy was motivated by financial pressures. Although his parents decided to leave young Albert in Munich to finish school, he soon resisted this decision. Why did they leave him behind? How and why did he resist their decision?

What tensions developed between him and his parents, both in youth and adulthood? Are such tensions universal or did they result from the personalities of the people involved?

Do you think Professor Weber was justified in writing his letter about Einstein? Why did he feel Einstein was not qualified to teach?

Einstein was forced to take a job as a patent office clerk because he was unable to find a teaching position, but the time he spent there ultimately facilitated his scientific studies. Thus, a disappointment turned into a stroke of good fortune. How did it affect Einstein's life? Has this ever happened to you?

Love and Family

While preparing for his entrance exams, Einstein went to live with the Winteler family and formed an attachment to the pretty Winteler daughter Marie, who was preparing to be a teacher. Although both families expected them to marry, the romance came to an end when, as a student in Zurich, he met and fell in love with Mileva Maric (Episode 2). They married in 1903, their son Hans Albert was born in 1904, and another son, Eduard, came along in 1910. When Einstein went to Berlin in 1914 to teach at the university, his wife and sons accompanied him but stayed only briefly and then returned to Zurich. The marriage had become strained and ended in divorce in 1919.

What were some of the difficulties that Mileva Maric faced as she struggled to get an education in the sciences? What role did her father play in her life? Was this unusual for the time?

How healthy was Einstein's relationship with Mileva? Did he help or hurt her efforts to have a science career? Why didn't he acknowledge her role in his work when he acknowledged the help of others?

What factors combined to lead Mileva to feel, "I'm suffocating"? (Episode 5) Was there a way she could have maintained her career? Did Einstein treat her fairly? Were her resentments fair to him?

In Episode 5 Marie Curie compares love with a chain reaction. What does she mean? How does the Curies' story shed light on that of Einstein and Mileva Maric?

In Episode 6, Einstein says, "We must be honest with ourselves. Love has abandoned this marriage in equal parts." Is this evaluation true?

Albert had an affair with his cousin Elsa Lowenthal and then married her in 1919 after his divorce from Mileva Maric; this made him stepfather to Margot and Ilse, her daughters from a previous marriage. The new marriage did not result in additional children, but his two sons and her two daughters were strongly affected by radically shifting family situations.

In several episodes, Eduard, who is mentally ill, talks about the fire in their apartment. He thinks his father nearly burned him to death because he was too focused on his work. What was the truth about the fire? How does the incident show ways people can misunderstand a situation? Why didn't Mileva tell her son the truth earlier?

In the concluding episodes, we see the difficulty Hans Albert had accepting his father's decisions. Do you think that his resentment is understandable or unreasonable? Do you think that Mileva Maric played a role in influencing his feelings?

In 1933 Albert and Elsa, confronted with the growing anti-Semitism in Germany, emigrated to the United States; three years later Elsa died. In Episode 7 we hear Einstein say, "It's funny...when Elsa was alive, I never felt any guilt about other women. Now that she is gone...I somehow feel I would be betraying her." How did you react to his relationships with the women we see in the series?

In Episode 7 Elsa says to her daughter Ilse, "When you are older you will realize that there is little for a woman in this world." What light does this perception shed on Marie, Mileva, and Elsa, as well as the others? How did the women in Einstein's life respond to the roles expected of them?

How did Einstein get along with his children? Does he behave in a way that reflects the way his father treated him? Does he change when he has grandchildren?

The April 19 obituary in the New York Times *includes this comment: "'Saintly,' 'noble' and 'lovable' were the words used to describe him by those who knew him even casually. He radiated humor, warmth, and kindliness." To what extent does this description ring true with your observation of his personal life?*

Einstein's Germany

During the 19th century the monarchies of Europe were often linked by marriages contracted for political reasons. Great Britain's Queen Victoria married the German Prince Albert. Their children went on to marry other European nobility. Kaiser Wilhelm II, the last monarch of Germany (1888–1918), was a grandson of Queen Victoria. He was ambitious to expand Germany into a vast and powerful empire like Great Britain and encouraged nationalistic fervor.

Another sentiment being fostered at the time was anti-Semitism—not a new phenomenon, but one that had tended to wax and wane over more than a thousand years of European history. Jews were suspected of all kinds of malevolent activities, including conspiracies toward economic domination. As the 19th century drew to a close, Jewish people in Germany and elsewhere had to be extremely cautious.

This was also a patriarchal society in which women's roles were curtailed in terms of education and career. They were expected to value marriage and motherhood above all else.

When World War I erupted in 1914 with the assassination of an Austrian archduke, Germany's military was more than ready to move into action. The result was war on a scale never before seen and the death and mutilation of untold numbers of people, both military and civilian. Ultimately, Germany was defeated and Kaiser Wilhelm resigned in 1918. The Treaty of Versailles imposed severe and humiliating penalties on Germany.

The ensuing decades saw the rise of Nazism, the emergence of Adolf Hitler as a powerful leader, burgeoning nationalism, and fierce anti-Semitism. During those decades, Germany also advanced in technology and science. Its physicists and chemists were seen as the greatest in the world, and its military developed enormous capabilities.

What is anti-Semitism? What examples of anti-Semitism have you seen in the television series about Albert Einstein? How did it affect Einstein's life and career?

Einstein refused to help other scientists construct weapons for Germany and he was appalled by Professor Fritz Haber's efforts to produce poison gas. Haber was a converted Jew who was trying to prove his loyalty to Germany. He said "During peace time, a scientist belongs to the World, but during war time he belongs to his country." What was Einstein's reaction to this statement?

Why was Einstein's name on the list of people whom the fascists wanted to eliminate? Why were his books burned along with those of Kafka, Rathenau, Minkowski, and Freud?

In the same year that Adolf Hitler was appointed German Chancellor, Einstein renounced his German citizenship, moved to the United States, and began teaching at Princeton. What did Einstein think of Hitler's leadership? Why had Einstein been reluctant to emigrate? What events finally triggered the Einsteins' move to the United States?

Is anti-Semitism visible today in Europe? In your own country? What other groups also experience prejudice and bigotry? Why?

The Nobel Prize in Physics

Alfred Nobel (1833–1896), a wealthy Swedish scientist, left a bequest for annual international awards in physics, chemistry, medicine, and literature, as well as one that he called a Peace Prize. Winners receive medals and diplomas, as well as substantial monetary grants; they also have the opportunity to deliver formal speeches to guests invited to the awards ceremonies in Sweden.

A glance at the history of the Nobel Prize makes clear Germany's role as a powerhouse in scientific development. When Albert Einstein won the 1921 award for physics in 1922,* he became part of a long line of German winners who preceded and followed him.

The Royal Academy gave Einstein the award "for his services in Theoretical Physics, and especially for his discovery of the law of the photoelectric effect." In theoretical physics, the emphasis is not on experimentation, but on mathematics and models. The photoelectric effect involves, light, magnetism, and the release of energy in one form or another.

Einstein's Nobel prize was not for his theory of relativity but for his paper on the photoelectric effect, and it came well after his theory of relativity had been acclaimed by other scientists. Some scholars think the Nobel committee was reluctant to award the prize to him because he was a Jew, a pacifist, and a theoretical rather than experimental physicist.

In Epi*sode 3 we hear Einstein say, "I don't care about awards.... I care about science,...about understanding the world around us. I'm not interested in shiny medals." Why does he then become very interested in winning the Nobel Prize? Did the award of the prize to Einstein really involve scientific squabbling and politics?*

When he finally did receive it, why did he decide not to go to Sweden for the ceremony? (Episode 8)

Why does he need the hard currency that the Nobel Prize would provide? What did he do with it? Was this fair?

*The Academy had decided not to make an award in 1921, and so there were two awards in physics given in 1922. Einstein received the 1921 award and Niels Bohr the 1922 award.

The Theories: Quantum Mechanics

Albert Einstein's area of expertise was physics, which is the study of how matter and energy interact with forces such as electromagnetism and gravity. He played a huge role in the development of the two most important physics theories of the twentieth century: quantum mechanics and relativity.

Quantum mechanics becomes important when considering the behavior of very small things such as atoms or electrons. One of its primary predictions is that familiar things such as light actually come in tiny pieces, or quanta. Einstein's Nobel Prize-winning explanation of the photoelectric effect, in which electrons are emitted from a metal when light shines on it, was one of the first theoretical explanations of natural phenomena that relied on the notion of quanta of light.

In later years, Einstein did not fully accept the principles of quantum mechanics, as quantum mechanics predicts that certain measurements, even if made independently and simultaneously many miles apart, will always return identical results. Einstein called this "spooky action at a distance." He devised with collaborators a way to isolate this behavior, which formed the basis of decades of experimental work testing whether this phenomenon was real. Einstein was incorrect in this case, and this strange behavior of quantum mechanics was proven correct and is now used in highly secure cryptography schemes!

Einstein was right during the early days of quantum mechanics and relativity, but wound up being wrong about other aspects of quantum mechanics. How does science guard against dogma (that if someone famous and intelligent says something it must be true)?

Why were so many scientists of his time reluctant to accept Einstein's theories? Why did some denounce them as not being in the tradition of German science?

The Theories: Relativity

While Einstein won the Nobel Prize for his work in quantum mechanics, it is his work in relativity for which he is most famous. Most people after all associate Einstein with the equation $E=mc^2$, which is the mathematical expression of one of the most profound advances of special relativity: that energy and mass can be converted into one another. To understand this equation, we need to understand what each symbol represents. The easiest symbol is the last; *c* is the speed of light, almost 3 million meters per second. The symbol *m* represents the mass of an object. Mass characterizes how much an object resists accelerating when acted upon by a force. A simple example of mass is a grocery cart; push lightly on an empty grocery cart and it will accelerate significantly and roll away. Fill that cart with groceries, though, and the same push will cause the cart to barely begin moving at all. This is because the cart now has more mass. Finally, *E* is energy. All moving objects, light, and heat carry energy, which can be used to heat other objects, make them move, etc.

Before Einstein, people believed that mass and energy were two separate things and that the total amount of each was always a constant. If you crash two grocery carts full of food together, you might get a mess, but your gallon of milk will still weigh the same and hence have the same mass before and after

the crash. Mass was therefore considered a constant. Similarly, energy was considered a separate constant. Einstein showed that this was wrong and that mass and energy can actually be exchanged for one another. Sometimes you can take two particles with mass, push them together, and get just energy in the form of electromagnetic radiation (light) and heat back out. $E=mc^2$ tells you how much energy you get out and, since the speed of light is enormous, you generally get a lot!

Why don't we see this happen all the time? We don't see this because there are other constant quantities in nature, for example total electric charge. If one squeezes two electrons together they won't convert all their mass into light because electrons have an electric charge and light does not. Nature forbids turning a system with a non-zero electric charge into one with zero electric charge. If, however, you squeeze an electron and its antiparticle, the positron (which has opposite electric charge), together, then the total electric charge vanishes and they can *annihilate* into a burst of light (although at a frequency we cannot see). The particles themselves would disappear; their mass was turned completely into light. Hence, we can only convert mass into energy with particular combinations of particles. Additionally, it's simply hard to push electrons or atomic nuclei close to other electrons or nuclei – they tend to strongly repel each other due to electric repulsion. The net effect of these two limitations is that converting mass into energy requires very special conditions that only commonly occur in places such as nuclear power plants or the interior of the sun, and not in the dairy aisle of the grocery store.

Einstein's greatest and deepest physical contribution is his Theory of General Relativity, which extended Special Relativity to include gravity and reshaped how physicists thought about space and time. Up until Einstein, physicists had assumed that time and space were immutable things – the background stage that objects and forces existed in but did not change. Due to Einstein's work, physicists now realize that time and space are also dynamical things that change in response to other objects that are around. Einstein's great insight came in part from his ability to isolate the essential fundamental principles in different physical theories and follow the principles to their logical conclusion without regard for established orthodoxy. In the case of Special Relativity, Einstein was able to isolate a discrepancy between the mathematics that predicted how objects move and the mathematics that predicted how light behaves to reshape how we consider time itself. For his theory of general relativity, he constructed simple thought experiments to prove that physics of gravity and simple acceleration are closely related. Coupled with Special Relativity this led to the realization that matter can shape time and space. This theory was proven correct by examining the behavior of large systems with lots of matter, such as the motion of the planets around the sun.

Einstein's General Theory of Relativity is one of his signature works and marks a major change in the entire science of physics. In Episode 6 we hear Einstein say, "If we know anything, it is that science is fluid, ever-changing." What do you think he meant? What drives change in science and how does this prevent science from becoming "obsolete"?

Quantum mechanics deals with very small things, while relativity deals with the very large. Both regimes are outside of our direct human experience which, roughly speaking, is with things of approximately meter size. Additionally, both theories are considered very non-intuitive by the general public. How do scientists guard against their intuition, which is built off everyday experience, taking them down an incorrect path when dealing with natural laws that govern behavior at very different scales?

Patriotism, Nationalism, and Internationalism

Patriotism is love for and allegiance to one's country, and the word generally has positive connotations. It also suggests a willingness to fight to defend against attacks. Patriotism generally leads to reverence for a national flag and anthem, as emblems of the country's history, laws, and ideals. Patriotism provokes joy at the nation's successes and sorrow at its losses or failures. Sometimes patriotism is a very popular attribute, a visible sign of widespread national pride and unity.

Patriotism is related to but not the same as nationalism, although both can parade in the same guise. Nationalism is patriotism raised to the nth degree and often leads to a belief in "my nation right or wrong." It is concerned less with ideals and loyalty than with power and wealth. Unbridled nationalism leads countries to form empires, to exploit the weak, and to seek economic and military dominance.

Internationalism, a term less often used, is a belief in world citizenship beyond allegiance to one country. It is often seen as a very liberal and idealistic philosophy. Its goal is cooperation (rather than competition) to create a better world for all people in every nation. It is not a safe philosophy in times of discord.

How did each of these ideas have an impact on Albert Einstein's life?

- *Patriotism*
- *Nationalism*
- *Internationalism*

What evidence of the three do you see in our world today? Do they appear to have positive or negative effects?

In Episode 1, Einstein renounces his German citizenship; he holds that "nationalism is an infantile disease. The measles of mankind." What does he mean by this metaphor? Why does he renounce his citizenship?

Einstein returned to Berlin and was there during World War I (1914–1918). Why do you think he returned to the German citizenship he had renounced years previously? How did his actions during the war differ from those of other scientists, such as Fritz Haber?

During World War II, Einstein was in the United States, teaching at Princeton University. As a preeminent German physicist, he was in a position to know the scientific goals of the Nazi regime and informed Franklin D. Roosevelt. When the United States actually developed the atomic bomb, what did Einstein think of it? (Episodes 9 and 10) Why is his name so often linked with it, for example, on the Time magazine cover showing his equation and a mushroom cloud?

What were Einstein's reasons for being a pacifist?

Do you consider yourself a patriot, a nationalist, or an internationalist? Why? How do you respond if someone refuses to stand for the national anthem or acts in some other form of protest?

In the Words of Albert Einstein….

Imagination is more important than knowledge. Knowledge is limited.

To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science.

That deep emotional conviction of the presence of a superior reasoning power, which is revealed in the incomprehensible universe, forms my idea of God.

The difference between stupidity and genius is that genius has its limits.

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

Education is what remains after one has forgotten what one has learned in school.

I believe that a simple and unassuming manner of life is best for everyone, best both for the body and the mind.

When you are courting a nice girl an hour seems like a second. When you sit on a red-hot cinder a second seems like an hour. That's relativity.

Pure mathematics is, in its way, the poetry of logical ideas.

Heroism on command, senseless violence, and all the loathsome nonsense that goes by the name of patriotism - how passionately I hate them!

The release of atomic energy has not created a new problem. It has merely made more urgent the necessity of solving an existing one.

The distinction between the past, present and future is only a stubbornly persistent illusion.

If we knew what it was we were doing, it would not be called research, would it?

The most beautiful thing we can experience is the mysterious. It is the source of all true art and science.

I have no special talent. I am only passionately curious.

Whoever undertakes to set himself up as a judge of Truth and Knowledge is shipwrecked by the laughter of the gods.

I am not only a pacifist but a militant pacifist. I am willing to fight for peace. Nothing will end war unless the people themselves refuse to go to war.

I do not know with what weapons World War 3 will be fought, but World War 4 will be fought with sticks and stones.

Only one who devotes himself to a cause with his whole strength and soul can be a true master. For this reason, mastery demands all of a person.

Strive not to be a success, but rather to be of value.

As a professor, a writer, and a popular lecturer, Einstein, over the years, left many memorable quotations. Choose one or more of the quotations on this and the previous page and discuss:

- *What do you think Einstein meant by this statement?*
- *What does this quote from Einstein say about the man?*
- *How does it reflect themes or incidents that you saw in Genius?*
- *Can you think of an example today where the quote would apply?*
- *If you were going to rewrite the quote for today's students, how would you do it?*

Are Einstein's statements still valid today, more than 60 years after the great scientist's death? Why, or why not?

Can someone be imperfect and still be considered a genius?

Resources for Learning More about Einstein

Internet:

http://channel.nationalgeographic.com/genius/
National Geographic's website to accompany the film series, with trailers, photos, and interviews with actors and directors.

http://www.biography.com/people/albert-einstein-9285408#synopsis
Website includes a biography, a short video, and a full-length video biography.

http://www.nobelprize.org/nobel_prizes/physics/laureates/1921/einstein-bio.html
Information about Einstein's life and work.

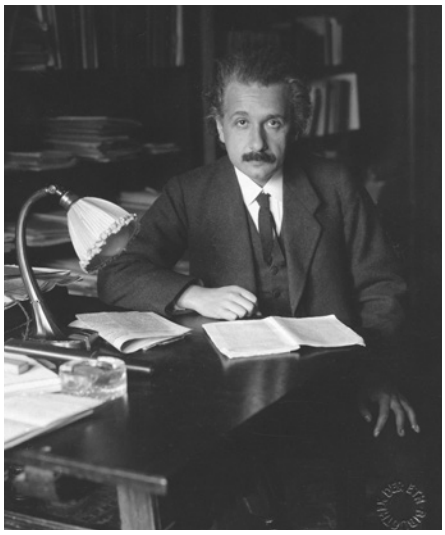
https://www.nytimes.com/topic/person/albert-einstein
Recent and archived articles that comment on Einstein's impact on modern science.

http://www.amnh.org/exhibitions/einstein/
The American Museum of Natural history's online exhibit on Einstein, with a summary of his most important theories and discoveries.

http://www.smithsonianmag.com/science-nature/the-year-of-albert-einstein-75841381/
An article examining in detail Einstein's 1905 papers that revolutionized physics.

http://einsteinpapers.press.princeton.edu/papers
The digitized archive of Einstein's papers, under the auspices of Princeton University.

http://fivebooks.com/interview/albert-einstein/
Recommendations for the five best books on Einstein by an Einstein biographer.


Albert Einstein, c. 1920.

Print:

Walter Isaacson, *Einstein: His Life and Universe*.
(New York: Simon & Schuster, 2008)

National Geographic presents
an Imagine Television and
Fox21 Television Studios production

GENIUS

Executive Producers
BRIAN GRAZER
RON HOWARD
FRANCIE CALFO

Executive Producers
GIGI PRITZKER
RACHEL SHANE

Executive Producers
SAM SOKOLOW
CHRIS COONEY
JEFF COONEY

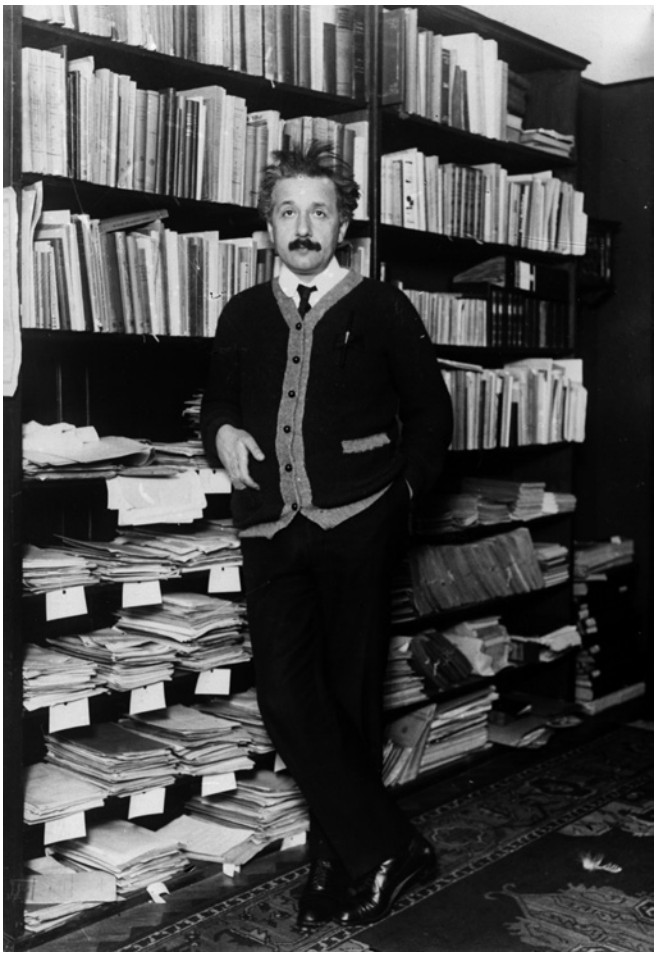
Executive Producers
ALAN SAM POLSKY
GABE POLSKY
JOHN VALENTINE

Executive Producer and Showrunner
KEN BILLER

Main Title Theme by
HANS ZIMMER

Score by
LORNE BALFE

For National Geographic Channel
CEO, COURTENEY MONROE
EVP and Head of Global Scripted Development and Production,
CAROLYN G. BERNSTEIN
EVP of Global Communications and Talent Relations, CHRIS ALBERT
Education Specialist, TRACY SMITH



Albert Einstein, c. 1925.

Image credits:

Pp. 18: By Unknown photographer [Public domain], via Wikimedia Commons at **https://commons.wikimedia.org/wiki/File:Albert_Einstein_photo_1920.jpg**

All other images courtesy of National Geographic.

This discussion guide for the film series *Einstein* was written by Mary Anne Kovacs and Eileen Mattingly for Journeys in Film. For additional free materials to bring the world to your classroom, see **http://journeysinfilm.org**.

National Geographic Channel
1145 17th Street NW
Washington, DC 20036
http://channel.nationalgeographic.com

Journeys in Film
50 Sandia Lane
Placitas, NM 87043
505.867.4666
www.journeysinfilm.org