

Richard Feynman, Curious Character

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There are two types of genius. Ordinary geniuses do great things, but they leave you room to believe that you could do the same if only you worked hard enough. Then there are magicians, and you can have no idea how they do it. Feynman was a magician. —Hans Bethe (Sykes, 2006)

Richard Feynman is not the first name that comes to mind when someone asks you to think of a physicist. You might name Albert Einstein or Stephen Hawking, or perhaps someone

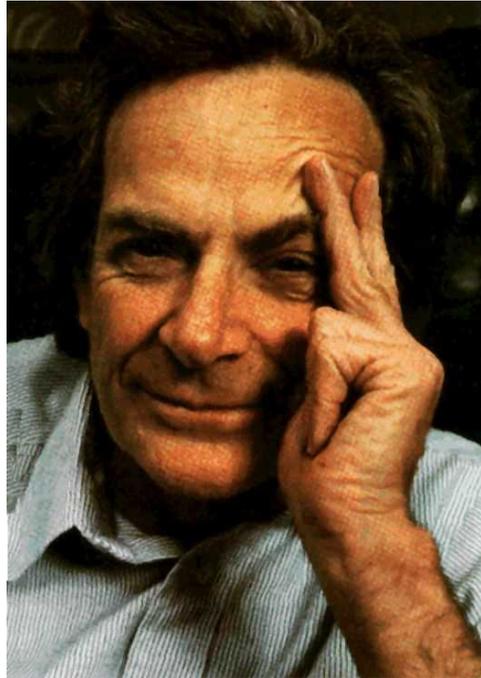


much older such as Isaac Newton. Richard Feynman, however, contributed a great deal to modern physics, and deserves more attention than he is given. As early as his mid-twenties, Richard Feynman made valued contributions to the Manhattan Project, and in 1986, only two years before he died, he exposed the issues that lead to the loss of the space shuttle *Challenger*. With books that were both educational and entertaining, Richard Feynman brought physics to the people.

Richard Phillips Feynman was born on May 11th, 1918 in New York City. Feynman was raised in a Jewish home, but later became an atheist. A good deal of his childhood took place during the Depression, which gave him unique opportunities to do odd jobs as a child for people who could not afford to hire people (Feynman, 1997). He tended to frequently mess with radios and other equipment, often attempting to invent more convenient ways to do simple tasks. In high school, his IQ was measured to be 125, "high, but merely respectable" (Gleick, 1992). Feynman had a very low opinion of IQ as a gauge of intelligence. Feynman studied at Massachusetts Institute of Technology, where he received his

bachelor's degree in 1939, and Princeton University, where he received his Ph.D. in 1942 (*Nobel Lectures*, 1972).

Richard Feynman participated in the Manhattan Project, the U.S. Army project at Los Alamos National Laboratory that developed the atomic bomb. While he was not a major component of the project, he administrated a group of human computers, people assigned to perform mathematical calculations (Feynman, 1997). He claimed to be the only person to see the Trinity bomb test with the naked eye, trading the dark protective glasses for a truck windshield, which he decided would protect him from the ultraviolet radiation.



Feynman is well-noted as one of the greatest physics professors; known as the "Great Explainer" for his ability to make complex topics understandable. He believed that if you could not explain something in a freshman lecture, it was not yet fully understood. Feynman taught at Cornell University from 1945 to 1950, and later chose to teach at the California Institute of Technology, or Caltech (Feynman, 1997). He claimed his decision was made while attaching tire chains to his car in Ithaca, figuring there had to be a part of the world where it was not a necessary process. He turned down several invitations to work at the Institute of Advanced Studies alongside names like Albert Einstein, Wolfgang Pauli, and John von Neumann, because it was too theoretical.

In 1965, Richard Feynman was awarded the Nobel Prize in Physics, alongside Sin-Itiro Tomonaga and Julian Schwinger for their work in quantum electrodynamics (*Nobel Lectures*,

1972). While at Caltech, he contributed several major contributions to physics, including work on the superfluidity of supercooled liquid helium, a model of weak decay, and the Feynman diagrams, a method for conceptualizing interactions between subatomic particles.

After the loss of the space shuttle *Challenger*, Richard Feynman was asked to participate in a committee investigating the causes of the accident. On national television, he demonstrated



how the O-ring component of the solid rocket booster (SRB) would become brittle in cold water. The decision to launch the space shuttle on January 28th, 1986, despite colder weather than expected that day, was the decision that led to the explosion.

During his investigations, Feynman discovered that there were severe communications breakdowns between the NASA engineers and administrators, and that the accident could have easily been prevented. While the engineers believed there was an approximate 1 in 100 chance for failure of the vehicle, the executives believed and publicized that the chance of failure was only 1 in 100,000. Feynman made it clear that real figures had to be kept, whether they looked good or not, in his report, stating that "For a successful technology, reality must take precedence over public relations, for nature cannot be fooled" (Feynman, 1986).

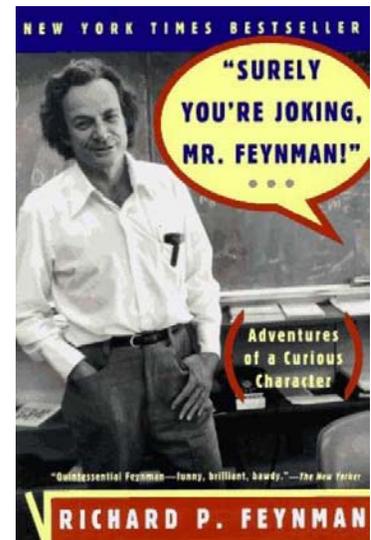
Feynman was known as a bit of an eccentric, from his early pranks with lockpicking and safe-cracking at Los Alamos National Labs, to his bongo drum skills and his visits to a topless bar. When a topless bar that he frequently used as a second office during his years at Caltech

was going to be shut down by county officials, Feynman was the only person who agreed to testify on its behalf, stating that it served a public need, providing a place for craftsmen, technicians, engineers, common workers, "and a physics professor". While the bar lost the case, it was allowed to remain open because a similar case was in appeals. (Feynman, 1997).

Many of his books and lectures were compiled and published by associates or students of his, such as *Surely You're Joking, Mr. Feynman!* and *What Do You Care What Other People Think?*, both books of anecdotes and stories compiled by Ralph Leighton. *The Feynman Lectures on Physics* is one of the most noteworthy publications, being a compilation of lectures he gave at Caltech.

On February 15th, 1988, Richard Feynman passed away from two different rare forms of cancer, in Los Angeles, California. His last noted words were "I'd hate to die twice. It's so boring" (Gleick, 1992).

Richard Feynman was not your every day physicist, he was an individual who focused on education and practice over theory and concept. He strived for not just a deeper understanding of physics for himself, but also for the students he taught, and in that way, he was far more than just the scientist I wrote a paper on, he was a hero. He made physics simple. A champion of the educational system, he emphasized understanding and the search for answers.



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