# PHYSICISTS THE ATOMS ALL AROUND THEM

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# WHAT IS A PHYSICST?

(I)A physicist is an expert in the study of physics.

(2)Works to explain how forces, structures, and phenomena affect the natural world.

(3) Explores and identifies the basic principles that govern the structure of behavior.

# Particle accelerators

### How are particle accelerators used?

 According to Oxford languages, A particle accelerator is, "A apparatus for accelerating subatomic particles to high velocities by means of electric or electromagnetic fields. The accelerated particles are generally made to collide with other particles, either as a research technique or for the generation of high-energy x-rays and gamma rays." (4)

### This is what physicists do their research with!

I talked to a physicist, my dad(Geffery Solomon) and he said that his college project was, "measuring at what quantum rate does nuclei spin and what the shape implies."

### A particle accelerator diagram:



### **COLLEGE DISSERTATION PROJECT** (SPIN STATES IN MASS 80 NUCLEI)

My father(Geffery Solomon) is a physicist, when I asked him on what he researched in college, he told me simplified all abput his disseration project. In which he •• researched spin states in mass 80 nuclei. Take the following example:You can think of nucleus as a bag of marbles, you can shape the bag into a coin, football,dumbell, along with many more. You measure the rates at which the object can spin and discrete transition between those spin states.



## HOW LONG DO PHYSICISTS SPEND IN COLLEGE?

According to owlgru.com, physicists spend anywhere from 4-6 years in college.

This is important because physicists will spend those years doing life work.

According to study.com, time in college can be at the maximum of 12 years.

## ALBERT EINSTEIN

Albert Einstein was born March 14, 1879 in Ulm, Germany. In 1909, he became Professor Extraordinary at Zurich. - 1911: Professor of Theoretical Physics at Prague - Returned to Zurich in 1912 to fill a similar post. In 1933, he renounced his citizenship in Germany for political reasons (Nazi uprising within Germany) and emigrated to America to take the position of Professor of Theoretical Physics at Princeton University. He became a United States citizen in 1940 and retired from his post in 1945.

After World War II, Einstein was a leading figure in the World Government Movement. He was offered the Presidency of the State of Israel, which he declined, and he collaborated with Dr. Chaim Weizmann in establishing the Hebrew University of Jerusalem..

In the 1920s, Einstein embarked on the construction of unified field theories, although he continued to work on the probabilistic interpretation of quantum theory, and he persevered with this work in America. He contributed to statistical mechanics by his development of the quantum theory of a monatomic gas. He has also accomplished valuable work in connection with atomic transition probabilities and relativistic cosmology.

Einstein's gifts inevitably resulted in his dwelling much in intellectual solitude and, for relaxation, music played an important part in his life. He married Mileva Maric in 1903 and they had a daughter and two sons; their marriage was dissolved in 1919 and in the same year he married his cousin, Elsa Löwenthal, who died in 1936. He died on April 18, 1955 at Princeton, New Jersey.







## ISSAC NEWTON

• (12) Isaac Newton, in full 'Sir Isaac Newton', was born on January 4, 1643 in England—and died March 31, 1727

- Born in the hamlet of Woolsthorpe, Newton was the only son of a local yeoman, also Isaac Newton, who had died three months before, and of Hannah Ayscough. That same year, at Arcetri near Florence, Galileo Galilei had died; Newton would eventually pick up his idea of a mathematical science of motion and bring his work to full fruition. A tiny and weak baby, Newton was not expected to survive his first day of life, much less 84 years
- At the school he apparently gained a firm command of Latin but probably received no more than a smattering of arithmetic. By June 1661, he was ready to matriculate at Trinity College, Cambridge, somewhat older than the other undergraduates because of his interrupted education.
  - Newton was sent back to the grammar school in Grantham, where he had already studied, to prepare for the university. As with many of the leading scientists of the age, he left behind in Grantham anecdotes about his mechanical ability and his skill in building models of machines, such as clocks and windmills. At the school he apparently gained a firm command of Latin but probably received no more than a smattering of arithmetic. By June 1661, he was ready to matriculate at Trinity College, Cambridge, somewhat older than the other undergraduates because of his interrupted education.

When Newton arrived in Cambridge in 1661, the movement now known as the Scientific Revolution was well advanced, and many of the works basic to modern science had appeared. Astronomers from Copernicus to Kepler had elaborated the heliocentric system of the universe. Galileo had proposed the foundations of a new mechanics built on the principle of inertia. Led by Descartes, philosophers had begun to formulate a new conception of nature as an intricate, impersonal, and inert machine. Yet as far as the universities of Europe, including Cambridge, were concerned, all this might well have never happened. They continued to be the strongholds of outmoded Aristotelianism, which rested on a geocentric view of the universe and dealt with nature in qualitative rather than quantitative terms.

- When Newton received the bachelor's degree in April 1665, the most remarkable undergraduate career in the history of university education had passed unrecognized. On his own, without formal guidance, he had sought out the new philosophy and the new mathematics and made them his own, but he had confined the progress of his studies to his notebooks. Then, in 1665, the plague closed the university, and for most of the following two years he was forced to stay at his home, contemplating at leisure what he had learned. During the plague years Newton laid the foundations of the calculus and extended an earlier insight into an essay, "Of Colours," which contains most of the ideas elaborated in his Opticks. It was during this time that he examined the elements of circular motion and, applying his analysis to the Moon and the planets, derived the inverse square relation that the radially directed force acting on a planet decreases with the square of its distance from the Sun—which was later crucial to the law of universal gravitation.
- Newton was elected to a fellowship in Trinity College in 1667, after the university reopened. Two years later, Isaac Barrow, Lucasian professor of mathematics, who had transmitted Newton's De Analysi to John Collins in London, resigned the chair to devote himself to divinity and recommended Newton to succeed him. The professorship exempted Newton from the necessity of tutoring but imposed the duty of delivering an annual course of lectures. He chose the work he had done in optics as the initial topic; during the following three years (1670–72), his lectures developed the essay "Of Colours" into a form which was later revised to become Book One of his Optics.

# • (11) The Manhattan Project was the code name for the American• (11) The Manhattan Project was the code name for the American• (11) The Manhattan Project was the code name for the American-

- (11) The Manhattan Project was the code name for the Americanled effort to develop a functional atomic weapon during World War II. The controversial creation and eventual use of the atomic bomb engaged some of the world's leading scientific minds, as well as the U.S. military—and most of the work was done in Los Alamos, New Mexico, not the borough of New York City for which it was originally named. The Manhattan Project was started in response to fears that German scientists had been working on a weapon using nuclear technology since the 1930s—and that Adolf Hitler was prepared to use it.(history.com)
- Multiple fuels and sites for gaining fissional material were constructed for the Manhattan project.
- Fun Fact: Godzilla was a response to the fears of nuclear destruction during ww2 and the cold war.
- (10)For updates on the nuclear status of the world visit the doomsday clock at <u>https://thebulletin.org/doomsdayclock/current-time/</u>



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## WHAT DO PHYSICISTS DO FOR US?

- Physicists do many things forcus such as,
- Give us a better understanding of the universe
- Discover new things about the atoms+
- Build spacecraft



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## SCHOOL:

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