

**THE HISTORY-CHANGING DISCOVERIES OF ISAAC NEWTON AND ALBERT EINSTEIN AND THEIR CONTRIBUTIONS TO THE DEVELOPMENT OF SCIENCE**

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**Annotation**

This scientific article analyzes the place of Isaac Newton and Albert Einstein in the history of science, their main discoveries and their contribution to the development of physics. The laws of classical mechanics and the theory of universal gravitation developed by Newton formed the basis of the development of scientific thought in the 17th and 18th centuries. In the 20th century, Einstein, through the theory of relativity, radically changed the ideas about space and time, paving the way for the development of modern physics.

The article provides a comparative analysis of the scientific views of these two great scientists and highlights the impact of their theories on modern technologies, space exploration and energy. Changes in the development of scientific methodology and theoretical physics are also widely considered.

**Key words**

classical mechanics, theory of relativity, law of gravity, space and time, energy and mass, scientific revolution, physics, Newton's laws, Einstein's formula, modern physics, cosmology, scientific methodology

Looking at the history of human development, we see that the development of science has served as a decisive factor in the all-round progress of society. Especially among the natural sciences, physics plays a key role in humanity's understanding of the laws of nature. In the development of physics, the scientific discoveries of some great scientists have made a fundamental shift and changed the direction of the entire scientific thought. Among such great scientists are Isaac Newton and Albert Einstein.

Newton, who lived and worked in the 17th century, occupies an important place in the history of science as the founder of classical physics. The laws of motion and the law of universal gravitation developed by him laid a solid foundation for the development of not only physics, but also astronomy, engineering and technology. Newton's scientific approach is distinguished by the fact that it combines experiment and mathematical analysis, and this approach served as a methodological basis for subsequent scientific research. As a result of his work, it became possible to explain natural phenomena on the basis of precise mathematical laws.

By the beginning of the 20th century, a new revolutionary era began in physics. This period is closely associated with the name of Albert Einstein. The theories of special and general relativity created by Einstein radically changed the classical ideas about space and time. If Newtonian physics worked perfectly mainly in the framework of low speeds and forces,

Einstein's theories were able to explain the laws of nature even in conditions of high speeds and strong gravity. As a result, such complex concepts as the structure of the universe, black holes, and the relativity of time gained a scientific basis. It should be noted that Newton's and Einstein's theories do not contradict each other, but complement each other. While Newtonian mechanics is still important in everyday life and technical calculations, Einstein's theories are of incomparable importance in explaining processes on a cosmic scale. This shows that the development of science is continuous and consistent.

In the history of science, there are some individuals whose discoveries have fundamentally changed the way all of humanity thinks. Among such great scientists are Isaac Newton and Albert Einstein. While Newton created the foundations of classical physics, Einstein made a huge contribution to modern physics - the theory of relativity and quantum theory.

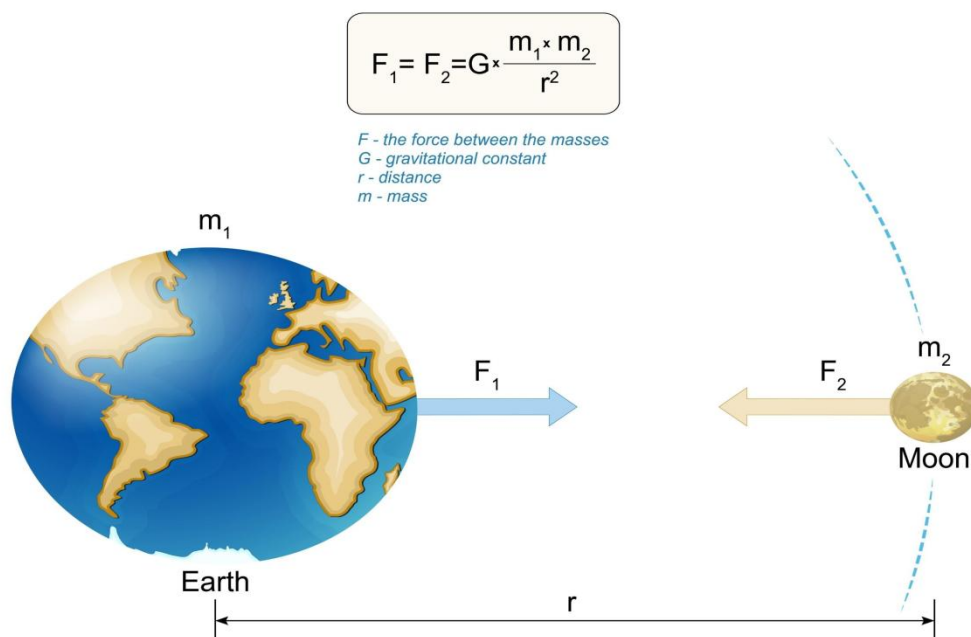
Newton's three laws of motion form the basis of classical mechanics. These laws explain the relationship between the motion of objects and the forces acting on them.

- Law of inertia
- Law of dynamics ( $F = ma$ )
- Law of action and reaction

These laws laid the foundation for the industrial revolution, engineering, and technology.

1-picture.

## Universal Law of Gravitation



One of Newton's most important discoveries was the law of gravitation, which explains how objects on Earth and in space attract each other. This theory gave a great impetus to the development of astronomy. 1-picture shows the law of mutual attraction of objects.

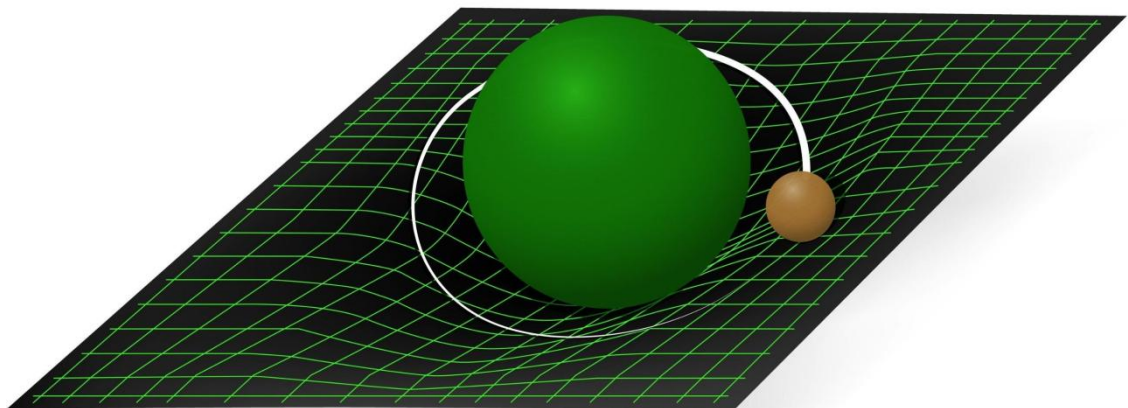
Newton played a key role in the creation of differential and integral calculus. These methods are widely used in modern physics and technology today. Newton created a new method of scientific investigation by combining experiment and mathematics. This method served as the basis for all subsequent scientific work.

Albert Einstein's scientific revolution. Theory of relativity. Developed by Einstein:

- Special theory of relativity (1905)
- General theory of relativity (1915)

These theories showed that space and time are not absolute and explained gravity in a new way

## **GENERAL RELATIVITY (gravity)**



Contribution to quantum theory. Einstein explained the photoelectric effect and revealed the quantum nature of light. For this discovery, he received the Nobel Prize.

Einstein's work constitutes a large part of 20th-century physics and is the basis for many scientific fields.

The work of Newton and Einstein had a profound influence on all fields of science.

In conclusion, Isaac Newton and Albert Einstein are considered to be among the greatest scientists who have made an incomparable contribution to the development of science in the history of mankind. The laws of classical mechanics and the theory of universal gravitation created by Newton formed the theoretical basis of natural sciences for several centuries, creating a solid foundation for the development of technology and engineering. Through his scientific work, the possibilities of mathematical modeling of natural phenomena expanded and the process of scientific knowledge rose to a new level.

In the 20th century, the theory of relativity put forward by Albert Einstein made a fundamental shift in physics, leading to a new interpretation of traditional views on space and time. His scientific ideas have become important not only in theoretical physics, but also in the development of cosmology, astrophysics and modern technologies. In particular, the theory expressing the relationship between energy and mass became the basis for the formation of nuclear energy and other advanced technologies.

It is worth noting that Newton's and Einstein's theories are not contradictory, but represent a consistent continuation of scientific progress. While the laws created by Newton still retain their relevance in everyday life and practical calculations, Einstein's theories provide a deep understanding of complex processes on a cosmic scale. This shows that science is constantly evolving and that each new theory builds on the previous one. As a result, the scientific legacy of these two great scientists has not lost its relevance today and remains one of the main factors in the development of modern science and technology. Their discoveries not only enriched scientific thinking, but also expanded humanity's vision of existence and created a solid foundation for new scientific research.

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