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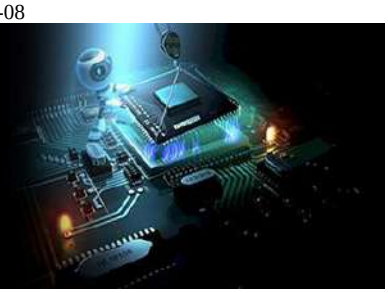

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The role of physics in the study of nature and its role in development with other sciences

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Abstract
Physics is the most basic and fundamental of all the sciences. Studying physics means trying to understand how things work, in every detail and at the deepest level. This includes everything from elementary particles, nuclei, atoms, molecules, macromolecules, living cells, solids, liquids, gases, plasmas, the atmosphere to living organisms, the human brain, complex systems, supercomputers, planets, stars, galaxies and the universe itself. Physics has the reputation of being a difficult subject to master but there are a number of reasons why it is a good idea to do a course in physics. For one thing, most modern technology involves physics. Any technology involving electricity, magnetism, force, pressure, heat, light, energy, sound, optics, etc., comes from physics. Indeed, physics lies in the basis for all types of analytical and measuring systems. Even though the basic knowledge required for products like fertilizers, drugs, plastics, and chemicals comes from chemistry and biology, these items have to Physics offers something that other theoretical subjects cannot - you can see real life applications of it directly. I did not choose physics. Physics chose me! I've wanted to study physics for almost as long as I can remember. I love the feeling of solving a really tough problem.

Keywords: electricity, magnetism, force, pressure, heat, light, energy, sound, optics, thermal physics, nuclear physics, solar engineering physics, physics of insoluble materials

Introduction
To inform students about the origin and development of physics. They also spoke about the contribution of Eastern and Central Asian scientists in the development of physics. To give an idea about physical quantities.
Physics is the study of the simplest and most general laws of natural phenomena, the properties of matter, its structure and the laws of its motion.
The word physics is derived from the Greek word "phusis" - nature, the laws of which are the basis of all natural sciences. That is why it has long been called the philosophy of nature. As a result of the increase in experimental materials, their scientific generalization and improvement of research methods, the philosophy of nature - astronomy, chemistry, biology, geology and other natural sciences, including physics - has emerged. Therefore, the boundaries of physics with other natural sciences are conditional and change over time. The deepening of human knowledge has shown that there is a closer connection between these disciplines. As a result, such disciplines as astrophysics, physical chemistry, biophysics, geophysics are formed.
Matter exists in space (space) and time (time). All the processes in nature take place in a certain sequence and at a certain time. While time shows the sequence and finite duration of natural phenomena, space determines the distance between objects by showing their relative positions.
In turn, the properties of space and time serve as the basis for the laws of conservation, which keep the processes in nature in a certain pattern. All this is a sign of how deeply physics is connected with philosophy.
Physics is an experimental science, the laws of which are based on experimental results. The experiment is conducted to test certain laws and determine new results. The theory, on the other hand, forms the laws of nature based on the results found, explains certain phenomena, and sometimes predicts new phenomena.
Physics depending on the type of objects studied: nuclear physics; elementary particle physics; atomic and molecular physics; solid state physics, plasma physics and so on.
Depending on the studied processes and the form of motion of matter: the mechanics of material points and solids; Integral environment mechanics, thermodynamics and statistical

mechanics are divided into electrodynamics, gravitation theory, quantum mechanics, quantum field theory.

It is a set of all man-made devices and tools based on technology and helping to increase productivity.

Physics is also closely related to technology. The connection between physics and technology is twofold:

Physics emerges as a necessity of human life. In ancient times, the development of mechanics was driven by construction and military needs. Also, the design of a continuous steam engine by the Russian engineer I. Polzunov, the development of a universal steam engine by the British inventor D. Watt, the search for ways to increase the efficiency of steam engines. As a result, thermodynamics developed rapidly.

Physical processes have been in the spotlight since ancient times, even before our era. The doctrine that matter is made up of atoms was advanced by Democritus, Epicurus, and Lucretius. The doctrine of the geocentric system of the universe (Earth is the center of the universe) was developed by Ptolemy. Also in ancient Greece, Archimedes' laws on hydrostatics were developed in ancient Greece about the distribution and return of light in a straight line. Some simple phenomena related to electrical and magnetic phenomena have been observed. All of this was generalized by Aristotle in the fourth century BC and put into a single system. But it should be noted that, in his opinion, the main means of cognition was mental experience, not experience. For a long time after that, there was no significant work that contributed to the development of physics. by the seventeenth century, the famous Italian physicist G. Galilei realized the need to express motion using mathematical equations. He showed that, unlike Aristotle, as a result of the action of an object on an object, it acquires acceleration, not velocity. Galileo (1609) created the laws of inertia, the free fall of bodies (1604 - 1609). He conducted an experiment to measure the speed of light. Nevertheless, the greatest achievement of the seventeenth century was the creation of classical mechanics, invented by the English physicist I. Newton. In his Mathematical Foundations of Natural Philosophy, published in 1687, he described three basic laws of dynamics and the law of universal gravitation.

The next stage in the development of physics was the development of the theory of the electromagnetic field by J. Maxwell (ninth century). In 1888, G. Gers proved experimentally the existence of electromagnetic waves.

The next important events were the discovery of the rays bearing his name by W. Roentgen in 1895, and natural radioactivity by A. Becke-rel in 1896. In 1905, A. Einstein published a special theory of relativity. That same year, he wrote his own formula for the photo effect. In 1911E. Rutherford and in 1913 N. Bor created a planetary model of the atom.

The above is the basis of quantum physics. The physics of the atomic nucleus and elementary particles came into being.

Uzbekistan is one of the most developed countries in science and culture. Especially astronomy, mathematics, medicine, chemistry, textiles, architecture, mining, ceramics, philosophy, music, linguistics, literature are well developed.

Archaeological excavations and researches in Central Asia, especially in Uzbekistan, prove this.

The great scholars of the East, Musa al-Khwarizmi and Muhammad al-Farghani, conducted their research at the Baghdad Academy's Bayt ul-Hikmat (House of Wisdom). Abu Abdullah Muhammad ibn Musa al-Khwarizmi (born in Khiva in 780 and died in Baghdad in 850) created works in the fields of mathematics, astronomy and geography. He founded the science of algebra and the concept of algorithm. His works "Hisab al-Hind" and "Astronomical Tables" were translated into Latin as early as the twelfth century, which led to the spread of the concept of decimal systems and algorithms, which was widespread in Europe.

Abdul Abbas Ahmad ibn Muhammad ibn Kashr al-Farghani, who studied astronomy, geography and mathematics, also predicted the solar eclipse. He scientifically proved that the earth was a giant, calculated the length of the meridian, developed a device to measure the flow of the Nile, and wrote pamphlets on it. His encyclopedia, A Collection of Astronomical Sciences and Celestial Movements, has been translated into many languages.

Another of the great scholars of the East who lived at that time was Abu Nasr Muhammad Uzlug Tarhan al-Farabi. He has written more than 160 works in various fields.

In the eleventh century in Urgench, the capital of Khorezm, the "House of the Knowledge" - "Ma'mun Academy" was established, where philosophy, mathematics and medicine were discussed. Great thinkers: Abu Ali ibn Sino, Abu Rayhan Beruni, Abu Sahl Christian and others were members of this academy.

The encyclopedic scholar and thinker Abu Rayhan Muhammad ibn Ahmad al-Beami (born in 973 in Khorezm and died in Ghazna in 1048) wrote more than 150 books and pamphlets that made the first globe. He made significant contributions to the development of science with his ideas about the heliocentric system.

Abu Ali ibn Sina - encyclopedic scholar, poet (born in 980 and died in 1037 in Isfahan). The number of his works is more than 280. More than 40 of them are in medicine, more than 30 in natural sciences and music, ethics, theology, socio-politics.

In the fifteenth century, Mirzo Ulugbek established an academy in Samarkand. It had a well-equipped observatory, a rich library, and a madrassa.

Muhammad Taragay Ulugbek (born 1394 in Sultaniye, killed 1449) founded the world's largest astronomical school. He left a great scientific and cultural heritage. One of them is "Ulugbek Ziji" ("Ziji Koragoniy"). He made a list of more than a thousand stars with his students.

The famous astronomer and mathematician Nasriddin Tusi (Abu Ja'far Muhammad ibn Muhammad Ibn Hasan made a great contribution to the development of astronomy and mathematics. His "Ethics of Nasri" and "Tajrid", as well as mineralogy, medicine, physics, logic, has many works in philosophy and other fields.

The mathematician and astronomer Qazizada Rumi (Salahiddin Musa ibn Muhammad 1360 - 1437) was the mentor of Mirzo Ulugbek. Rumi called it "Plato's time" (Plato of his time).

Renowned mathematician and astronomer Cauchy, Operation 1430s. died in) introduced first-order science into decimal fractions and theoretically substantiated, calculating sin 1 ° and π with an accuracy of up to 17 chambers in the decimal system.

The famous astronomer Ali Qoshchi (Mawlana Alouddin Ali ibn Muhammad Qoshchi, 1403-1474) wrote treatises on mathematics and astronomy. He scientifically and correctly

explained the change of seasons, lunar and solar eclipses.
The works and discoveries of the above-mentioned great thinkers in the fields of natural sciences, mathematics, medicine, philosophy, linguistics have made a great contribution to the development of science around the world, the rise of some sciences to new heights, the emergence of new directions. led to The next generations, who have high respect and reverence for the spirit of the great ancestors, continue to be worthy successors of their work. A good example of this is the work being done in Uzbekistan in the field of physical development.
After the independence of Uzbekistan, special attention is paid to the development of science. The current Academy of Sciences of Uzbekistan has eight departments of science. One of them is the Department of Physical and Mathematical Sciences. It includes the following research institutes operating in the field of physics: Institute of Nuclear Physics, Physics-Solar Research and Production Association, Institute of Electronics, Institute of Astronomy, Department of Thermal Physics. Scientific researches are carried out on:
Thermal physics is mainly taught in the scientific school founded by academician P. Habibullayev, which is based on the Department of Thermal Physics of the Academy of Sciences of Uzbekistan. Research: Non-homogeneous environments in the field of thermal physics, the interaction of laser beams with objects, high-temperature superconductivity.
Nuclear physics - work in this area is carried out mainly at the Institute of Nuclear Physics. They started in Uzbekistan in the 1920s. However, regular research was conducted at the Institute of Physics and Technology under the guidance of Academician S. Azimov (1914 - 1988). In 1956, the Institute of Nuclear Physics was established. Currently, research is being conducted in the fields of nuclear spectroscopy and nuclear structure, nuclear reactions, quantum field theory, elementary particle physics, relativistic nuclear physics and others.
Solar engineering physics (heliotechnics) - the main purpose of this direction is to develop the physical basis for the conversion of solar energy into thermal energy and to create high-efficiency solar equipment based on them. He is a correspondent member of the academy in the development of this network. Umarov's (1921-1988) merits are great. At present, solar heaters, fruit dryers, salt water desalination plants, and other solar-powered devices that provide hot water and heat to homes are widely used in the national economy.
Physics of insoluble materials. This research on high-temperature materials science has been carried out on a large scale since 1976 by Azimov S. and others. These studies are based on the method of heat treatment of materials with collected sunlight. For this purpose, in 1987 in Parkent district of Tashkent region was built a large solar panel with a capacity of 1000 kW. Until now, such a device was available only in Odeyo, France. The focal length of the device is 18 m, it measures 54x42 m and consists of 62 heliostats of the same size. In 1993, the Research Institute of Materials Science was established as part of the Physics-Sun Scientific Production Association.
Work in the field of high energy physics began at the Institute of Physics and Technology under the leadership of Academician S. Azimov. Research is being conducted in two main areas: the physics of cosmic rays and the study of the interaction of particles and nuclei with nucleons and nuclei accelerated to very large energies.
Physical electronics. The first research in this area in Uzbekistan began in the thirties of the last century. The further development of this field, the establishment of the Scientific School of Physics and Electronics, is largely associated with the name of Academician U. Arifov (1909 - 1976). In 1967, the Institute of Electronics of the Academy of Sciences was established.
The system of physical quantities consists of basic and derivative quantities. A unit of physical quantity is a quantitative physical quantity used to quantify each physical quantity, conditionally defined as a numerical value equal to one.
The International System of Units of Physical Quantities (SI-Sistema international) was adopted in 1960 at the General Conference on Weights and Measures:

- Meters (m) - the length of the path of light in the space at 1/299792 458 s;
- Kilogram (kg) - a mass equal to the mass of the international symbol of the kilogram (the mass of platinum-iridium alloy stored in the International Bureau of Weights and Measures in Sevres, near Paris);
- Second (s) is the time equal to 9192631770 of the radiation period corresponding to the transition between the two ultra-thin surfaces of the basic state of the cesium-133 atom;
- Kelvin (K) is a unit of temperature equal to a fraction of the thermodynamic temperature of tertiary water up to 273.15;
- Ampere (A) is the interaction force between these thin, infinitely long conductors located parallel to each other at a distance of 1 m in space, between these conductors for each meter of their length $2 \cdot 10^{-7}$ H is the alternating current that generates;
- Mol (mol) - the amount of matter in the system, the components of which are equal to the components present in the ^{12}C nuclide with a mass of 0.012 kg;
- Candela (kd) - directional light with an energy value of 1/683 W / sr of a source emitting monochromatic radiation with a frequency of $540 \cdot 10^{12}$ Hz;
- Radian (rad) - an angle between two radii and the length of the opposite arc is equal to the radius of the circle;
- Steradian (sr) is the spatial angle at the center of a sphere, separating the surface from the surface of a sphere equal to the surface of a square whose side is the radius of a sphere.

Conclusion

Derivative units are found using the laws of physics. Research in semiconductor physics began in the 1930s. This work is being carried out in many research institutes and universities. Uzbek scientists have made great strides in the field of semiconductor physics. In particular, converters for converting solar energy into electricity, high-voltage photoelectric generators, and two-way sensitive photo converters were developed, and on the basis of which modules of photoelectric devices were created. Seconds (s) is the time equal to 9192631770 of the radiation period corresponding to the transition between the two ultra-thin surfaces of the basic state of the cesium-133 atom.
The main method of examination in physics is experiment. Scientific theories are created in order to explain and justify

the results of experiments. All this leads to the study of objective laws that exist in nature and, consequently, to the creation of their physical laws. The laws of physics are represented by certain relations between physical quantities. Physical size is a quantity that is quantitatively specific to each physical object, but qualitatively common to many objects and represents a property of these objects.

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