History Of Physics Essay, Research Paper

History Of Physics

Essay written by: straw\_berry\_4

Early Physics

Physics began when man first started to study his surroundings. Early applications of physics include the invention of the wheel and of primitive weapons. The people who built Stone Henge had a knowledge of physical mechanics in order to move the rocks and place them on top of each other. It was not until during the period of Greek culture that the first systematic treatment of physics started with the use of mechanics.

Thales of Miletus (636BC. – 546BC.)

Thales is often said to have been the first scientist, and the first Greek philosopher. He was an astronomer, merchant and mathematician, and after visiting Egypt he is said to have originated the science of deductive geometry. He also discovered theorems of elementary geometry and is said to have correctly predicted an eclipse of the sun. Many of his studies were in astronomy but he also observed static electricity.

Phythogoras (582BC. – 497BC.)

Phythogoras was a Greek philosopher. He discovered simple numerical ratios relating the musical tones of major consonances, to the length of the strings used in sounding them. The Pythagorean theorem was named after him, although this fundamental statements of deductive geometry was most likely first an idea from Egyptian methods of measurements. With the help of his followers he discovered that the earth was a sphere, but he did not believe it revolved around the su

Democritus (470BC. – 380BC.)

Democritus was the leader of a group called Atomists. Although they were unable to prove that matter was made up of small particles, they were the first to come up with the idea. Democritus believed that atoms differed in size, shape, and movement but were all made of the same substances.

Aristotle (384BC. – 332BC.)

Aristotle was the most important scientific philosopher in Greece. He believed that all matter on earth consisted of four pure substances or elements, which were earth, air, fire, and water. He also believed that the earth was the centre of the universe, and that anything beyond the earth consisted of a fifth pure substance called quintessence.

Archimedes (287-212B.C.)

Archimedes was an inventor and mathematician, who discovered several basic scientific principles and developed a number of measuring techniques.

Ptolemy (100AD.)

Ptolemy was an Egyptian astronomer. He developed a model for predicting the positions of the sun, moon, stars, and planets. Like Aristotle, he believed that the earth was the centre of the universe.

The Middle Ages

Between 400 AD. and 1000 AD. most educated people in western Europe looked to religion rather than scientific investigation to answer their questions about the laws of nature. At the same time Arabic scholars were correcting Ptolemy system of astronomy and performing experiments in optics and mechanics. As trade increased between Arab countries and western countries, their work and Greek scientific documents became available to western culture. During the 1200’s St. Thomas Aquinas reconciled Aristotle’s beliefs with church principles. During this time Roger Bacon an English scholar conducted studies in optics.

The Renaissance

During the Renaissance there were many social, economic and political changes that produced new approaches to science. The famous Italian painter Leonardo da Vinci conducted studies in motion and hydraulics. The polish astronomer Nicolaus Copernicus proposed a system in which the sun was placed at the centre of the universe and the earth was one of the planets orbiting the sun. In the 1600’s Johannes Kepler, a German astronomer constructed a new and accurate model of the solar system. Rene Descartes, a French philosopher and mathematician developed the concept of inertia ( that objects maintain their state of motion unless disturbed ). At this time people began to realise that the physical world was governed by natural laws and that it was possible to discover those laws through careful measurement under controlled conditions. Galileo, an Italian physicist developed a number of telescopes to study the heavens, and performed laboratory experiments on the motion of falling bodies.

1600 – 1800

In the 1600’s there was a great deal of scientific activity. Sir Isaac Newton, an English scientist, published his Mathematical Principle of Natural Philosophy. He developed three laws of motion and a law of universal gravitation based on the work of Galileo and Descartes. He also invented a new form of mathematics called Calculus.

The Industrial Revolution

During the Industrial Revolution scientific instruments were produced which were more accurate and enabled scientists to perform more complicated experiments. People began specializing in specific areas such as: Heat and Energy, Light, and Electricity and Magnetism. Scientists began to learn that heat was able to do work. James Joule, and English physicist, devised a way to calculate how much work a give quantity of heat could do. Later a number of Physicists proposed the Law of Conservation of Energy ( energy can neither be created nor destroyed, only transformed from one form to another ). In the early 1800’s the theory was developed that light existed in the form of waves. Physicists believed that all space was filled with ether and that light energy was the vibration of the ether. There were other development in the study of electricity and magnetism, for example Count Alessandro Volta of Italy invented the electric battery; Andre Marie Ampere and Hans Christian showed that electricity and magnetism were related, and Michael Faraday and Joseph Henry showed how mechanical energy could be converted into electrical energy. At the end of the 1800’s many physicists believed that all the laws concerning the universe had been discovered.

History of Physics in Canada

The first Physicists in Canada taught at universities and did very little research. When Ernest Rutherford studied radioactivity at McGill University, he inspired other Physicists to do more research. In 1930 James Hillier helped to build the first electron microscope while he was a student at the University of Toronto. With financial help from the National Research Council scientists have developed the CANDU nuclear power reactor. Gerhard Herzberg received a Nobel Prize for his studies of the ways atoms and molecules give off and absorb light. The Alouette satellites which were launched in the 1960’s have helped Physicists to study matter high above the earth’s surface.

Modern Physics

At the turn of the twentieth century the understanding of the physical universe changed completely when Antoine Henri Becquerel and Wilhelm Roentgen discovered radioactivity and x-rays. A general, theoretical picture for the generation of x-rays emerged after Niels Bohr developed the first atomic theory. At this time Physicists realized that they had to reexamine the philosophical foundations of their work. In doing so, the public saw them as intellectuals who probed the dark mysteries of the universe. Physical knowledge was reorganized and the theories of quantum mechanics were formulated.

Up until this time most Physicists worked at universities mainly in German-speaking Europe. Then research moved to new countries where it was supported by industry, National Research Council, or private foundations.

Max Planck, a German physicist, published his Quantum Theory of Energy Transfer. Later, Erwin Schrodinger and Werner Heisenberg initiated the development of the field of quantum mechanics. Albert Einstein showed how mass and energy are related in his famous equation E = mc2.

Research in physics has led to important advances in technology, for example: in 1947 American physicists invented the “Transistor” which revolutionized the electronics industry, and in the early 1960’s physicists produced lasers which are light amplifying devices and are valuable tools in areas such as communications, industry, and medicine.

Governments have become interested in promoting scientific investigation. The United States and the Soviet Union have carried out extensive research on thermonuclear weapons and started a space program.

Conclusion

Physics has evolved greatly from when primitive man devised ways to move heavy objects to the complex scientific research that is being done today. Physics has also moved from being a branch of Philosophy in Aristotle’s day to being a very exact science today. Physicists are still seeking knowledge concerning the laws of nature and the universe and are involved in many diverse areas of research, such as, biophysics, astrophysics, solid-state physics, and genetic engineering. Physicist no longer believe, as they once did, that everything is now known concerning the universe and are constantly searching for new truths.

32c