

Quotes about Physics by Richard Feynman,  
(Theoretician and Nobel Laureate)

• applies to astronomy and astrophysics

A few hundred years ago, a method was devised to find partial answers to such questions. Observation, reason, and experiment make up what we call the scientific method. We shall have to limit ourselves to a bare description of our basic view of what is sometimes called fundamental physics, or fundamental ideas which have arisen from the application of the scientific method.

The principle of science, the definition, almost, is the following: The test of all knowledge is experiment. Experiment is the sole judge of scientific "truth." But what is the source of knowledge? Where do the laws that are to be tested come from? Experiment, itself, helps to produce these laws, in the sense that it gives us hints. But also needed is imagination to create from these hints the great generalizations—to guess at the wonderful, simple, but very strange patterns beneath them all, and then to experiment to check again whether we have made the right guess. This imagining process is so difficult that there is a division of labor in physics: there are theoretical physicists who imagine, deduce, and guess at new laws, but do not experiment; and then there are experimental physicists who experiment, imagine, deduce, and guess.

Lack of space also prevents our discussing the relation of physics to engineering, industry, society, and war, or even the most remarkable relationship between mathematics and physics. (Mathematics is not a science from our point of view, in the sense that it is not a natural science. The test of its validity is not experiment.) We must, incidentally, make it clear from the beginning that if a thing is not a science, it is not necessarily bad. For example, love is not a science. So, if something is said not to be a science, it does not mean that there is something wrong with it; it just means that it is not a science.

*"There are two kinds of truths; those of reasoning and those of fact. Truths of reasoning are necessary, and their opposite is impossible. And those of fact are contingent, and their opposite is possible."*

Gottfried Wilhelm Von Leibniz

- Monadology (1714)

†  
a creator of  
calculus

Which is science? A truth of reasoning or a truth of fact?