

KINEMATICS

Unit4 &5Dr John P. Cise, Professor of Physics, Austin Com. College, 1212 Rio Grande St., Austin Tx 78701

jpcise@austincc.edu & NYTimes March 16,2012 by Associated Press, Send Dr Cise an e-mail on how you used this physics application. Thanks

Einstein Proved Right in Retest of Neutrinos' Speed

GENEVA (AP) — Einstein may have been right after all.

European researchers said Friday they had measured again the speed of a subatomic particle that a September experiment suggested traveled faster than the speed of light, violating Einstein's special theory of relativity, which underlies much of modern physics.

The research team, led by the **Nobel Prize-winning physicist Carlo Rubbia, found that the particles,(((neutrinos, do not travel faster than light)))).**

Mr. Rubbia's team, called Icarus, measured the speed of neutrinos fired from **CERN**, the European Organization for Nuclear Research, in Switzerland, to a **(((detector 453 miles away in Italy)))).**

"The results are very convincing," Mr. Rubbia said, "and they tell us essentially that there was something not quite right with the results of Opera." Opera was the team that reported in September that its tests appeared to show neutrinos speeding faster than light, prompting widespread disbelief among scientists. Einstein's theory of relativity, a pillar of modern physics, says nothing in the universe can travel faster than the **(((speed of light in a vacuum, approximately 186,282 miles per second)))).** That speed factors into all kinds of calculations, from estimates about the size and age of the universe to the radius of black holes. Doubts about the Opera results were heightened last month when researchers said they had found a flaw in the technical setup that could have distorted the experiment's figures. Antonio Ereditato, a member of the Opera team and the head of the Albert Einstein Center for Fundamental Physics, said he welcomed the latest results. "These results are in line with our recent findings about the possible malfunctioning of some of the components of our experimental setup," he said.

QUESTIONS: (a) Find time it would take a particle traveling at just under the speed of light(speed given above) the distance listed above?

ANSWER: 0.0024317 S