

# **Scientist deduced the existence of particles with faster-than-light speeds recently discovered by CERN**

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## Abstract.

In this paper we present a short survey on Smarandache Hypothesis that there is no speed barrier in the universe and one can construct arbitrary speeds, hypothesis which has been partially confirmed by the recent CERN results of OPERA team led by Dr. Antonio Ereditato that experimentally found that neutrino particles travel faster than  $c$ .

## 1. Introduction.

Physicists at CERN have recently experimentally discovered particles traveling faster than light: the neutrinos!

The OPERA experiment, which sent sprays of neutrinos from CERN laboratory in Geneva, Switzerland, to INFN Gran Sasso Laboratory, Italy, found that neutrinos traveled underground 730 km faster than light could do.

Dr. Antonio Ereditato of University of Bern, leader of the OPERA scientist team, made the results public and invited scientists all over the world to discuss these astonishing results.

There are mediums where the light travels slower than some particles, for example in water and oil, but not in the vacuum.

There also exist superluminal phenomena like wave phase velocity and wave group velocity, but in these cases no information or energy travels faster than the light.

Similarly there are X-waves whose superluminal velocity of the peak is a transitory phenomenon, but their wavefronts move with the speed  $c$  (Maiorino and Rodrigues, 1999).

In the breaking News on September 22, 2011, in the LiveScience.com, it is said that proven true, the laws of physics have to be re-written:

<http://news.yahoo.com/strange-particles-may-travel-faster-light-breaking-laws-192010201.html> .

## 2. A Hypothesis.

Professor Florentin Smarandache from the University of New Mexico, United States, has deduced the existence of particles moving faster-than-light in a published paper called "There Is No Speed Barrier in the Universe" in 1998, as an extension of a 1972 manuscript that he presented at the Universidad de Blumenau, Brazil, in a Tour Conference on "Paradoxism in Literature and Science" in 1993.

His paper is based on the Einstein-Podolsky-Rosen Paradox (1935), a Bohm's paper (1951) and Bell's Inequalities (1964).

For his hypothesis of particles of speeds greater than the speed of light (called "Smarandache hypothesis") and for his introduction of the Neutrosophic Logic, Set, and Probability (which are the most general and powerful logic and respectively set and probability theories today), Dr.

Florentin Smarandache was awarded the Telesio-Galilei Academy Gold Medal in 2010 at the University of Pecs in Hungary.

The Smarandache Hypothesis, that is included and criticized in the *Encyclopedia of Physics*,  
<http://scienceworld.wolfram.com/physics/SmarandacheHypothesis.html>

is enounced as follows:

- suppose a certain physical process produces a pair of entangled particles A and B (having opposite or complementary characteristics), which fly off into space in the opposite direction and, when they are billions of miles apart, one measures particle A; because B is the opposite, the act of measuring A instantaneously tells B what to be; therefore those instructions would somehow have to traveled between A and B faster than the speed of light; hence, one can extend the Einstein-Podolsky-Rosen paradox and Bell's inequalities and assert that the light speed is not a speed barrier in the universe;
- more, one can construct any speed, even greater than the speed of light ( $c$ ), by measuring particle A at various time intervals;
- also, the information from particles A and B is transmitted instantaneously (thus, there is no speed barrier in the universe).

### 3. Conclusion.

Although superluminal phenomena are in contradiction with Einstein's Theory of Special Relativity (1905) that prevents energy, information and (real) mass from traveling faster than light, Smarandache (1972) considered that superluminal phenomena do not violate the causality principle, neither produce time traveling, nor necessitating infinite energy for particles traveling at speeds greater than the speed of light.

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