# Smarandache Hypothesis that:

# There Is No Speed Barrier in the Universe

Abstract.

In this short paper, as an extension and consequence of Einstein-Podolski-Rosen paradox and Bell's inequality, one promotes the hypothesis that: There is no speed barrier in the universe and one can construct arbitrary speeds, and also one asks if it's possible to have an infinite speed (instantaneous transmission)?

Future research: to study the composition of faster-than-light velocities and what happens with the laws of physics at faster-than-light velocities?

## 1. Introduction:

What's new in science (physics)?

According to researchers from the common group of the University of Innsbruck in Austria and US National Institute of Standards and Technology (starting from December 1997, Rainer Blatt, David Wineland et al.):

- photon is a bit of light, the quantum of electromagnetic radiation (quantum is the smallest amount of energy that a system can gain or lose);

- polarization refers to the direction and
  characteristics of the light wave vibration;

- if one uses the entanglement phenomenon, in order
to transfer the polarization between two photons,
then: whatever happens to one is the opposite of
what happens to the other; hence, their
polarizations are opposite of each other;

-  in quantum mechanics, objects such as subatomic
   particles do not have specific, fixed
   characteristic at any given instant in time until
   they are measured;

-  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 travel between A and B faster
   than the speed of light; hence, one can extend
   the Einstein-Podolsky-Rosen paradox and Bell's
   inequality and assert that the light speed is not
   a speed barrier in the universe;

- such results were also obtained by: Nicolas Gisin
at the University of Geneva, Switzerland, who
successfully teleported quantum bits, or qubits,
between two labs over 2km of coiled cable. But the
actual distance between the two labs was about 55m;

- researchers from the University of Vienna and the
Austrian Academy of Science (Rupert Ursin et al.
have carried out successful teleportation with
particles of light over a distance of 600m across
the River Danube in Austria); researchers from
Australia National University and many others.

## 2. Scientific Hypothesis:

We even promote the hypothesis that: there is no speed barrier in the universe, which would theoretically be proved by increasing, in the previous example, the distance between particles A and B as much as the universe allows it, and then measuring particle A.

## 3. An Open Question now:

If the space is infinite, is the maximum speed infinite?

"This Smarandache hypothesis is controversially interpreted by scientists. Some say that it violates the theory of relativity and the principle of causality, others support the ideas that this hypothesis works for particles with no mass or imaginary mass, in non-locality, through tunneling effect, or in other (extra-)dimension(s)." [Kamla John]

Scott Owens' answer to Hans Gunter in an e-mail from January 22, 2001 (the last one forwarded it to the author): "It appears that the only things the Smarandache hypothesis can be applied to are entities that do not have real mass or energy or information. The best example I can come up with is the difference between the wavefront velocity of a photon and the phase velocity. It is common for the phase velocity to exceed the wavefront velocity, $c$, but that does not mean that any real energy is traveling faster than $c$. So, while it is possible to construct arbitrary speeds from zero in infinite, the superluminal speeds can only apply to purely imaginary entities or components."

Would it be possible to accelerate a photon (or another particle traveling at, say, 0.99c and thus

to get speed greater than $c$ (where $c$ is the speed of light)?

Future possible research.

It would be interesting to study the composition of two velocities $v$ and $w$ in the cases when:

$v < c$ and $w = c$.

$v = c$ and $w = c$.

$v > c$ and $w = c$.

$v > c$ and $w > c$.

$v < c$ and $w = \infty$.

$v = c$ and $w = \infty$.

$v > c$ and $w = \infty$.

$v = \infty$ and $w = \infty$.

What happens with the laws of physics in each of these cases?

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[An early version, based on a 1972 paper, was presented at the Universidad de Blumenau, Brazil, May-June 1993, in a Tour Conference on "Paradoxism in Literature and Science"; and at the University of Kishinev, in a Scientific Conference chaired by Professors Gheorghe Ciocan, Ion Goian, and Vasile Marin, in December 1994.]