Spooky Time

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News from the scientific world tell us that there is a “warp” in the universe whereby the speed of light, and the passage of time, are so strangely related that the mere act of measuring them alters their performance.

Einstein spent his life trying to find the “quantum mechanics” of nature whereby moving clocks run slower, and light travels faster, when we watch them. He called the phenomena “spooky action at a distance.”

The great theoretician expressed the relationship in his famous “special theory of relativity” formula: E=MC2 – Energy equals Mass, times the C-speed of light, squared.

Neither he, nor scientists since, have determined the “general theory of relativity” that would explain the relationship between light, time, gravity, electricity and magnetism.

The theory of relativity was proven by a simple experiment. Three atomic clocks fitted with short-wave radio switches were calibrated precisely the same. One was put aboard a jet plane. The other two were placed on the ground along the plane’s flight path. A signal station was located midway between the ground clocks.

All clocks were started by signal when the plane was at full speed. All were turned off three hours later. Upon examination, the airborne clock was found to have marked off less time than the stationary clocks. A Limerick reflects the anomaly:

There once was a lady named Bright
Whose speed was faster than light.
She traveled one day
In a relative way
And returned on the previous night.

Einstein equated time to a ”fourth dimension” -- corollary to the three dimensions of the everyday world of length, width and depth. Some scholars theorize there may be additional dimensions. Comprehending them is daunting.

One scientist comfortable with the new mechanics is Thomas Banchoff, chairman of Brown University mathematics department in 1985. He used his computer to create two-dimension “shadows” of four-dimension objects.

A four-dimension universe may be a twin of ours – perhaps impossible to see and certainly difficult for most of us to comprehend.

Banchoff told the Christian Science Monitor – one of the nation’s leading newspapers

specializing in science information – that he was inspired by an 1884 novel titled "Flatland" by Edwin Abbott.

"The book depicts a world of 2-D creatures who won't accept the idea of another dimension, even though they're visited by a Sphere from a 3-D world.

"A Square, returns the visit to the third dimension and sees what theretofore was unimagined. He suggests to his spherical friend that maybe there is even a fourth dimension. The Sphere scoffs.

"The Square returns to his 2-D world and tells friends of his journey. They jail him for heresy."

Dr. Banchoff describes his computerized 4-D depictions as analogous to casting on a wall the shadow of your hand.

"To a flat 2-D creature on the wall surface, the shadow of your 3-D hand would be mysterious. It would change shape – growing fatter or thinner, as you turn your hand.

"If you move your hand out of the light, it would disappear altogether. In reality, of course, it only appears to do so for 2-D creatures.

"Similarly, a four-dimensional creature invading our world would presumably appear just as odd – contorting, turning inside out, appearing and disappearing."

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The bond between time and light is little understood. Several decades before Einstein, Thomas Young fired a light beam of photons through two slits in a screen. Through the process of "interference" of light rays with each other, this projected a series of light strips.

When Young sent photons to the screen one at a time -- and measured which slit they went through -- the interference stripes became just a bright spot. Having knowledge of what slit each photon went through, apparently altered the mechanics of light.

In a recent experiment, Raymond Ciao and associates of the University of California at Berkeley seemingly got light to travel faster than 186,000 mps.

The Berkeley team fired particles of light toward a detector. Half were sent through the air. The other particles were directed to a glass mirror en route.

All but one percent of the focused particles bounced off the mirror and was lost. However, the surviving one percent tunneled through the mirror and hit the detector 70 percent quicker than the unimpeded particles.

Ciao calls his results an “illusion.” But he can’t explain it. “One implication,” he says, “is that you can affect the past.”

There is something occult, magic, about these phenomena. Simply measuring time and light seems to affect their performance. This raises a profound question: does human consciousness have an impact on the universe?

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In seeking answers to relativity, cosmologists have overturned the long-held belief that light travels at a rate of 186,000 miles per second, and nothing else in the universe exceeds that. Now we know that speed is relative to the observer.

If Einstein’s conclusion that the universe is warped – curved, saddle-shaped, turned back on itself -- then light speed will vary as it traverses peaks and valleys of space.

A curved space suggests that an astronomer looking into the cosmos, with a powerful enough telescope, would be able to see the back of his head. The speed of light is affected by gravitational attraction of stars as it passes near by. Einstein’s supposition -- that light can bend -- has been well proven by observations of our Sun during an eclipse.

A curved universe suggests that a rocket craft could reach point X on a space journey faster by cutting across a circle rather than “directly” around its perimeter. Astronomers have discovered “wormholes,” spaces between heavenly bodies along which light moves more rapidly than elsewhere.

That which goes up, must come down. Or, to state it another way, that which speeds up must slow down. Interstellar space travel may be more feasible than we think.

Other properties of the time-light partnership might be exploited. Dr. Lene Hau, of Harvard, has succeeded in slowing the speed of light through ultra-cold gas – abundant in the universe – to 38 miles per hour. He hopes to slow it to 20 miles per hour for wireless super-computers.

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Scientific American magazine two years ago asked Prof. Gary T. Horowitz, physicist at the University of California at Santa Barbara, if it was possible for a human being within one lifetime to travel into the distant future, or past? His answers were (1) “Definitely yes” and (2) ”Maybe.”

“If we were to depart from Earth in a spaceship that could accelerate continuously at a comfortable one-times-gravity, we would begin to approach the speed of light in about a year. Clocks, and people, aboard the ship would progress at an ever-slower rate relative to the earth.

“Under such circumstances, a round trip to the center of our galaxy and back to Earth – a distance of some 60,000 light-years – could be completed in only a little more that 40 years of ship time.

“Upon arriving back a Earth, astronauts would be only 40 years older, while 60,000 years would have passed on Earth.

“Time travel into the past is much more uncertain. There are many solutions to Einstein’s equation of General Relativity that allow a person to follow a timeline that would result in someone encountering his/her self – or deceased grandparents – at an earlier time.”

Horowitz points out that no experiment or observation has ever indicated that time travel is occurring in our universe. Theoretically, however, one could place a time machine at the mouth of a wormhole and give it a good push. Passage through the wormhole would then would allow travel to the past of the universe – not to our personal lives on Earth.

Now that everyone understands everything about time, all we have to figure out is where God was standing when He/She created heaven and earth.

“Beam me up, Scotty. There is no intelligent life here.”