Myths and Physics—a Myth is as good as a Smile!

Albert Einstein discovered Special Relativity in 1905: he hypothesized that there is a limiting velocity, that of light. His theory led to many predictions, every one of which has proven true, when testable.

But in 1908, Hermann Minkowski recast Special Relativity as being nothing more than a simple extension of the Pythagorean theorem to now include time as a fourth dimension, only distinguished from the three space dimensions by a minus sign.

So who is right, Minkowski or Einstein? Einstein, for a year at least, rejected Minkowski’s claim. Had Einstein stuck to his guns, he could not have discovered General Relativity: his greatest discovery.

The Special Relativity mathematics of Minkowski, and the Special Relativity mathematics of Einstein, are identical intrinsically—they are merely different displays of the same mathematics. One could correctly claim that Minkowski discovered nothing at all.

So! is there any objective point in using words at all in describing the universe? Do we actually understand anything better when we find ourselves able to attach attractive words to equations? What does understand mean?

I certainly feel happier with Minkowski than with Einstein. With Minkowski, I feel that I am actually in contact with the basic structure of the universe, and I am thrilled with its simplicity, and its accessibility to us, and to me in particular.

The range of mathematical competence among humans is FAR greater than is the range of linguistic competence. (At least I think so: has this been investigated?) Why is that? Is evolution gradually proceeding to produce, in due course, much more widespread high mathematical competence? Or, will high mathematical competence remain, like red-headedness and left-handedness, a minority trait?

OK, now let me change topic….

The mass of the electron: Which is small, compared with that of a proton: But, NOT compared with any quark, up or down. (Almost all of a proton’s “mass” is merely the kinetic energy of its gluons.) If the electron’s mass were just four times greater than it actually is, all electrons would have combined with protons to make neutrons, and there would be no life in the universe anywhere. Astrophysics would…..who cares? When a sufficiently energetic photon flies past an atomic nucleus (giving it somewhere to dump momentum), it, with some probability vanishes, its place taken by: an electron – positron pair.

The biggest unanswered question in all of physics is … how does the universe know what mass to give to that electron (and of course also to the positron). If I knew that, I would be a happier person. I don’t.