Contest! Isaac Newton versus Albert Einstein! Place your bets!

The Large Hadron Collider in Europe has accelerated **protons** to a Kinetic Energy of — TA DA! — 6.5 TeV ! Is that a HUGE energy? Well, it is 10.4 ergs. Is 10.4 ergs much energy? NO! Hey, drop a shoe six feet, and it lands with 600,000,000 ergs of kinetic energy! But, that shoe *doesn't GO very fast*, does it! That's because it is so heavy (massive). **Protons**? NOT very massive; they *scoot!*

The important question before us is, only, **HOW FAST** are those **protons** going? The answers given by Newton, and by Einstein, are different. VERY different! Let's calculate! **Protons** have a mass of 1.67×10^{-24} grams. If we aim the LHC beam of protons at the Andromeda galaxy, how long will it take those protons to *get there*? Moving, as we shall see, MUCH faster than light, according to Newton.

The Andromeda galaxy is 2,500,000 light years away: if you point your flashlight at Andromeda some nice dark night, those photons will knock the socks off the Andromedans two and a half million years from now!

Einstein claims those **protons** go only a pitiful 3×10^{10} centimeters per second.

Isaac Newton does **not** agree. He considers those protons (at 10.4 ergs) as follows

$$E = \frac{1}{2}\, m\, v^2 \quad \text{and so} \quad v = \sqrt{\frac{2E}{m}} = \sqrt{\frac{2\times 10.4}{1.67\times 10^{-24}}} = 3.5 \times 10^{12} \quad \text{cm per second}$$

Now light goes at 3×10^{10} cm per second, SO Isaac Newton says that if we can aim those protons at the Andromeda galaxy they will TRAVEL THERE at:

$\frac{3.5\times 10^{12}}{3\times 10^{10}}$ =**116.7 times the speed of light**, and so their trip will ONLY TAKE

$$\frac{2{,}500{,}000}{116.7} = 20{,}000 \text{ years}$$

and NOT the two-and-a-half MILLION years that that ass Einstein claims!

But, bottom line: Einstein or Newton, **you are NOT going to Andromeda!**