

# Poincare versus Einstein

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\* Poincare was working on the same ideas as Einstein.

\*There are similarities and differences between Einstein's SR (Special Relativity) theory with Poincare's theory.

\* Poincare's theory came before Einstein's theory.

\* Poincare's theory is a more general theory than Einstein's theory.

\* Poincare's theory is just Newtonian physics.

Using information source: Jacques Fric in his article "Henri Poincaré: A decisive contribution to Special Relativity:" [1]

Before Einstein's theory there was Poincare's theory.

Fric: "[Poincare] set up all the basic concepts of Special Relativity, several years before Einstein did in his the famous paper (1905: Annalen der Physik vol XVII 1905 p 891-921: ref 6)."

As is well known Einstein did not cite references in his famous paper.

Fric: "Einstein did not cite Poincare, but "at least the Relativity principle as well as the method for synchronizing clocks are borrowed from Poincaré published papers (1898-1902). This should explain why Einstein was not awarded the Nobel Prize for the Relativity, but for the photo-electric effect!"

i.e. there was dispute over whose theory it was!

Fric: “In his book “La science et l’hypothèse” (1902), Poincaré devoted a full chapter to the relativity principle: “There is no absolute uniform motion, no physical experience can therefore detect any inertial motion (no force felt), there is no absolute time, saying that two events have the same duration is conventional, as well as saying they are simultaneous is purely conventional as they occur in different places.” One can still keep in mind the concept of ether, if it helps for thinking, but it is a unphysical concept, it is a metaphysical concept..”

“He defines the way to synchronise all the clocks of an inertial frame, by using light signals (1900: La théorie de Lorentz et le principe de réaction, published J.Bosscha].”

“In 1904 at the St Louis conference, he proposes to add the Relativity principle to the five classical “universal” principles of the physics.”

“He emphasised that the Lorentz contraction was an “ad hoc” hypothesis, just made for adjusting the theory to the experience.”

“Poincaré has objected to the existing theory of electric and optical phenomena in moving bodies that, in order to explain Michelson’s negative result, the introduction of a new hypothesis has been required, and that the same necessity may occur each time new facts will be brought to light. Surely this course of inventing special hypotheses for each new experimental result is somewhat artificial. It would be more satisfactory if it were possible to show by means of certain assumptions and without neglecting terms of one order of magnitude or another, that many electromagnetic actions are entirely independent of the motion of the system.....”

“He points out that the “form” of the Lorentz formulae can be **demonstrated** from the **Relativity principle alone**, ( see annex 1) and therefore are implied by this principle alone (with a parameter to specify, related to “c” for the Special relativity), only one hypothesis is required, instead of the local time and the associated three new hypothesis of the article of Lorentz ( 1904).”

I would like to draw attention to the fact that the Principle of Relativity is part of Newtonian physics. It is only the addition of the idea of constancy of lightspeed that has caused the problems with thinking there is another theory SR different to Newtonian physics.

So working just from the Principle of Relativity without the lightspeed constancy, he is working within the context of Newtonian physics.

i.e. Poincare’s theory is Newtonian physics.

And further Poincare working within the context of Newtonian physics obtains the Lorentz formulae. But of course not the same Lorentz formulae that Einstein derives.

Poincare derives the more general form of the Lorentz formulae.

An issue I will come back to anon.

But now Fric wants to point out that Poincare derives  $E= m c^2$

Fric: “At last but not at least, In 1900, he noticed that the recoil of a radiation, of energy  $E$ , is  $m = E/c^2$  [ ref oeuvres de Poincaré ,op.cit.t IX p 471] which is nothing else than the famous  $E = mc^2$ .”

Fric: “We can see that in 1905 Poincaré, in different articles, had set up all the basic concepts of the special Relativity even though he did not summarize all of them in the framework of a formal theory as Einstein did.”

OK, Poincare had the same sort of theory as Einstein. But the big difference was Poincare was far better at math than Einstein and did not make all the numerous math mistakes of Einstein.

Fric: “ On one hand, Poincaré as a mathematician had a clear formal approach of the Relativity principle. Whether we have a look at his demonstration (annex 1), we see that he states first that inertial frames are homogenous allowing to express each coordinate  $(x,t)$  of one frame as a linear function of the coordinates of the other frame “Poincaré has objected to the existing theory of electric and optical phenomena in moving bodies that, in order to explain Michelson’s negative result, the introduction of a new hypothesis has been required, and that the same necessity may occur each time new facts will be brought to light. Surely this course of inventing special hypotheses for each new experimental result is somewhat artificial. It would be more satisfactory if it were possible to show by means of certain assumptions and without neglecting terms of one order of magnitude or another, that many electromagnetic actions are entirely independent of the motion of the system.....”

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Fric: “ On one hand, Poincaré as a mathematician had a clear formal approach of the Relativity principle. Whether we have a look at his demonstration (annex 1), we see that he states first that inertial frames are homogenous allowing to express each coordinate (x,t) of one frame as a linear function of the coordinates of the other frame

(x',t') and vice versa , he had previously rotated one axis by 180 ° in order to have a full symmetrical situation. This results in four relations with eight unknown parameters. The symmetry of the situation reduces them to four and using relations leaves the equations with only one undetermined parameter, function of the relative speed. The form of this last parameter can be computed taking into account that into a group, by definition, operation by two elements is an element of the group. He considered three inertial frames (1), (2), (3) and applied the equations according (1) ->(3) = (1)->(2)->(3): he got:”

$$x'=(x-Vt) (1-V^2/K)^{-1/2} ; y'=y ; z'=z$$

$$t'=[(t-(Vx/K)] (1-V^2/K)^{-1/2} \quad (1)$$

This is Poincare’s version of the Lorentz Formulae.

And Fric wants us to note: “Note that in this demonstration, he never uses the (second) postulate ( constancy of the speed of light). So it is more general.”

i.e. Lorentz formulae in more general form than in Einstein’s SR

Fric: “Where V is the relative velocity of the two frames and K is a parameter having the dimension of a square of a speed which, is the maximum possible value of V (to keep the equation real) . Whether  $K = c^2$ , we recognize the Lorentz equations, whether  $K = \text{infinity}$ , it is Newton.”

So there we have it when adjust the clocks and length we can set  $K = c^2$ , and have the Lorentz Transformations (LT). When we allow  $K = \text{infinity}$  we have Newtonian physics.

Article continues but that is as far as I want to go. I showed how LT is connected to Newtonian physics. Its mainly a question of synchronization. If choose to synchronize

clocks a certain way (and adjust lengths) then have LT. LT is really just part of Newtonian physics! SR has more, but anything extra is just mistakes added to make it look like a different theory.

When we add constancy of light it is a stipulation not postulate. Therefore is still Newtonian Physics. .

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When we add constancy of light it is a stipulation not postulate. (to be explained anon) Therefore is still Newtonian Physics.

**Many people refer to Einstein's lightspeed constancy as a "postulate" but really its a "stipulation".**

A "stipulation" is not a "postulate" - they are two different things.

As Einstein has clearly explained it -- the facts should be altered to fit a theory. [2]

So, as consequence the experiments need to be interpreted by the "stipulation" of lightspeed constancy-i.e the experiments adjusted to fit that belief.

If it were postulated that lightspeed was constant and experiment then showed that, then the postulate would be confirmed. (That is what most people think a "theory" is.)

But that is not what happens; although many are under that delusion.

What happens is that it is stipulated, so that the experiment is altered to fit the stipulation.

The "theory" of Einstein is thus more of a tautology. Einstein's idea of the meaning of "theory" is different to what "theory" was used to mean.

Einstein changed everything from how things were done before him, that's why he is considered genius etc etc

i.e. Einstein thought about things differently to everyone else.

The several experiments supposedly establishing that light speed is independent of its source, are only doing so by a "stipulation" not as a "postulate".

stipulation = specify as a condition for an agreement

postulate = assume to be true for a theory

If propose a postulate then can test it by experiment to see if its true

If propose a stipulation then the experiment is adjusted to fit that stipulation.

In the case of SR the condition to be imposed is that lightspeed be made constant

Lightspeed constancy in SR is a stipulation not postulate; but erroneously called postulate because when Einstein said postulate what he really meant was stipulation

As per most textbooks on SR it makes the mistake of calling lightspeed constancy a "postulate" when really it a "stipulation".

Most science textbooks are full of mistakes.

As pointed out by: "Science Myths" in [K-6 Textbooks and Popular culture](http://www.amasci.com/miscon/miscon.html)  
at: <http://www.amasci.com/miscon/miscon.html>

Where points out such things as - scientists don't follow the scientific method;  
contrary to the myth that they do etc.

Unfortunately the site does not deal with the mistakes made in SR texts, probably  
because Einstein is a sacred cow.

Top scientist Essen dealt with Einstein's mistakes and it cost him a Nobel prize

The experiments supposedly proving Einstein, are treating lightspeed constancy as a  
stipulation not as a postulate.

When I talked to GPS expert Ron Hatch this year at NPA Conference he said that he  
experiments with GPS were being adjusted to fit with SR expectations

That is what is meant by "stipulation" - adjust the experiment to fit with the theory

Instead of the "postulate" approach of looking to see if theory agreed with what is  
observed.

i.e. how Einstein treats "theory" is different to what most textbooks on SR state.

When taught at lower levels of relativity are told its a "postulate"

But when progress up to the higher levels of actually having to deal with experiments  
involving SR are then treating it as "stipulation" not "postulate", but at that stage  
Einstein is a sacred cow

At lower levels are taught theory#1 that of the postulate. At higher level deal with theory#2.

i.e Einstein's SR is misrepresented to students, taught as something it is not.

And when we undo all the mistakes we have Poincare's theory, which is still Newtonian physics.

### **References**

[1] Henri Poincaré : A decisive contribution to Special Relativity: The short story by Jacques. Fric (June 2003)

[2] Dealing with issues dealt with in earlier articles

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