

Open Letter to Aurélien Barrau

Copy sent to the editorial team of Philosophie Magazine

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Subject: A conceptual note on the relativity of simultaneity and the invariance of the one-way speed of light

Dear Professor Barrau,

I am sending you my two most recent books: *Paradox of the Invariance of the Speed of Light* and *Conceptual Foundations of a Theory of the Universe*. Your perspective as both a physicist and a philosopher has encouraged me to submit this work to you, as it lies precisely at the intersection of epistemology and the foundations of physics.

As an independent researcher, my intention is not to challenge the mathematical or predictive effectiveness of relativity. My inquiry concerns the ontological interpretation of the relativity of simultaneity, particularly when the invariance of the one-way speed of light is assigned genuine physical significance rather than a purely conventional meaning.

To illustrate this conceptual difficulty, I propose a thought experiment involving a continuously accelerating shuttle and a distant missile located behind it. Through the mere tilting of the shuttle's planes of simultaneity as a result of its acceleration, the missile's launch event shifts, for the shuttle, from the status of "already exists" to that of "does not yet exist", without any local physical change having affected the missile. Although the classification of the relevant intervals as spacelike prevents any operational paradox, this shift raises a question of internal consistency concerning the status of the physical existence of distant objects in an accelerated reference frame.

My question is therefore the following: in your view, at what point does this reasoning break down? Does the answer consist in recalling the strictly conventional nature of coordinates—which would deprive the plane of simultaneity of its physical substance, but would, in my view, call into question the invariance of the one-way speed of light? Or do you adopt the block-universe framework—in which case, from my perspective, the trajectory of the missile behind the accelerating shuttle becomes problematic? Do you see an error in this reasoning?

As an initial introduction, I suggest reading the preamble and the first three chapters of *Conceptual Foundations of a Theory of the Universe*, or the page devoted to this thought experiment on my website.

Your critical assessment, or even a brief opinion, would be extremely valuable in identifying precisely the flaw in this analysis or, failing that, in confirming the legitimacy of this epistemological inquiry.

Thank you very much for the time and attention you devote to reading this work.

Respectfully yours,

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