

Translation into English: [Chapter 2 - Catalogue of Errors for Both Theories of Relativity](#)

from the German documentation of G.O. Mueller

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G: Minkowski's World / Error No. 7

Minkowski attempts to interpret his fictitious, four-dimensional coordinate system space-time as the material world

In his 1908 lecture (cited in keeping with the 1958 reprint) Minkowski defines, as basic elements and operations in his four-dimensional "world" (instead of our inverted commas, Minkowski sometimes uses italics):

- (p. 55:) the "world point", which is said to be "one point in space at a point in time", determined by the four coordinates;
- the "world line", a "résumé of the substantial points", a "curve in the world", this referring, of course, to his four-dimensional "world";
- the "world", which is intended to stand for the entirety of all world points, in his formulation: "the great diversity of all imaginable systems of value x, y, z, t ";
- in this "world" there is a "null point of space and time";
- (p. 56:) there are "rotations of space around the null point" and
- "arbitrarily many displacements of space null points and time null points".
- (p. 60:) "I decide to make a random world point O to the space-time null point."

Up to here it is perfectly clear that his "world point" with four coordinates is no point in our three-dimensional physical space. His "world line" is also no path in our space, and his "world" is not our outer space or geostationary observational space. Minkowski constructs a geometry, a light cone, etc. that can only exist on the mathematician's millimetre paper and can be constructed there without contradiction.

He first introduces a logical and mathematical contradiction when he tries (p. 55) to define the four "axes" of his world system. with "orthogonality in space" and "complete freedom of the time axis upwards", i.e. the three space axes are still to be perpendicular (!) with respect to each other and the time axis is permitted to somehow grow "upwards" and at will. It remains Minkowski's sweet secret as to how he wants to accommodate the four axes in his "space null point and time null point".

Minkowski attempts to present this mathematical construction, which as compared with our three-dimensional reality is but a fiction - as the peculiarity of his axes already adequately proves - as real by introducing a series of other claims:

- (p. 55:) "So as not to leave a gaping void, we now want to imagine that at all places and at all times something perceptible is present. And so as not to have to say matter or electricity, I will use the word "substance" for this something. We will now focus our attention on the existing substantial point in the world point x, y, z, t and imagine that we are able to recognize this substantial point at any other point in time."
- (p. 63:) on the fourth-last page of his text Minkowski at last speaks clearly, without any disguise or abstraction, of "a substantial point with constant mechanical mass m ", which is said to describe a "world line".

"We want to imagine ...": Minkowski suggests concepts that are familiar to us in our three-dimensional world and he wants to claim them for his four-dimensional "world". Instead he has to prove the feasibility of his concepts. On top of this, he attempts in the process to veil the concrete circumstances with rules of language. Why does he not want to use words like matter and electricity, when he means matter and electricity? Why does he prefer to use the abstract concept "substance" and then speak of a "substantial point" when it actually does have to do with matter and a point of matter? It is not until later that he speaks openly of a "mechanical mass m". He is clearly afraid that the use of a clearer and more direct language will immediately invite the question as to how one can accommodate the material bodies of our world in a four dimensionality of his "world". This question in fact necessarily reveals the fiction of Minkowski's "world" and "world points" and "world lines". If one were to try to place a table, for example, in Minkowski's four-dimensional "world" one would see that the four corners of the table-top and the table legs would have to have different time coordinates. No matter how one arranges the table, it is simply not possible to accommodate a three-dimensional object in a four-dimensionally constructed "world". It is not without reason that in the endless images of Minkowski's world - with light cones, forward-cones and backward-cones - only points appear, never bodies from our world. This is something that the mathematician Minkowski knows, of course, which is the reason for his flight into abstractions. Only ... the physicists and the general public do not realize this, and they find it absolutely tremendous.

Alone with the question as to where in the three-dimensional space of our reality Minkowski would like to place his supposedly arbitrarily selectable "space-time null point", his project comes to grief. Whether at the earth's North Pole, in New York or on the moon, he finds a four-dimensional "world point" of his construction nowhere in our observational space but only points in space right out to the horizon of our cosmos, because a "world point" by definition is no point in space, a "world line" no path and his "world" is no space.

Minkowski begins with the harmless construction of a coordinate system, with which he can jump about at will (e.g. selecting, displacing and rotating a null point). Then he introduces matter in point form (!), disguised by a rule of language, and maintains that his coordinate system is reality, in which a "substantial point with constant mechanical mass m" represents a "world line". If this construction is supposed to be reality, then Minkowski must be able to show what a "null point" in this reality should be and which path in three-dimensional space is occupied by the "substantial point with the mass m". The "world null-points", "world points" and "world lines" can only exist in Minkowski's geometry, but not in reality.

The rules of language and linguistic tricks by means of which they convey their message to the public is characteristic for Albert Einstein, for Minkowski and for the other relativists right up to the present day. "Requirements" become "principles" just like that and then "laws" without further ado. And because the introduction of matter would immediately give rise to physical consequences, the more abstract term "substance" is introduced and only later let out of the bag as the "mechanical mass". And all of these tricks are announced as simple "linguistic measures", although they are in fact introduced disguised as hard physical facts. Readers who protest too late can no longer escape the trap. Albert Einstein and Hermann Minkowski are masters of this technique and can rely on the fact that many readers do not realize what is going on.

Minkowski, Hermann: Raum und Zeit : Lecture, 80. Naturforscher-Vers., Köln 1908, 21st Sept. In: Naturforschende Gesellschaft, Cöln. Verhandlungen. 80. 1909, pp 4-9. Also in: Physikalische Zeitschrift. 20. 1909, pp 104-111. Reprinted in: Das Relativitätsprinzip. Lorentz, Einstein, Minkowski. 6. Edition 1958, pp 54-66.