

Science Journal Analysis

1. What year was this paper/journal published?

June 30th, 1905

2. Where was the journal originally published?

The journal was originally published in the physics journal, "*Annalen der Physik*".

3. What was the original title (i.e. the specific language) the paper was published under?

The original title of the paper was *Zur Elektrodynamik bewegter Korper*, translated from German.

4. How many times has this paper been cited since it was published? (This is something you'll have to research)

According to Google Scholar, the paper has been cited 2266 times.

5. Einstein published many papers in a single year ("the miracle year" some called it). What were the papers that Einstein got published in 1905 and where in the order did this one fit?

1. [*On a Heuristic Point of View about the Creation and Conversion of Light*] completed March 17, 1905.
2. [*On the Motion of Small Particles Suspended in Liquids at Rest Required by the Molecular-Kinetic Theory of Heat*] completed in May 1905.
3. [***On the Electrodynamics of Moving Bodies***] completed in June 1905.
4. [*Does the Inertia of a Body Depend Upon Its Energy Content?*] completed in September 1905.

Source: <https://faculty.etsu.edu/gardnerr/einstein/year.htm>

6. There was no experiment done for this paper. However, Einstein does provide us with examples to demonstrate his reasoning. Describe an example he gives in section 2, *On the Relativity of Lengths and Times*.

In the example given to us, Einstein deduced that when two clocks were brought together and synchronized, and then one was moved away and brought back, the clock which had undergone the traveling would be found to be lagging behind the clock which had stayed put.

7. To your best estimation and a short description, what level of physics knowledge does one need to understand the material in this paper?

To my best estimation, I would say that at least a year of physics is required to fully understand the concepts presented in this paper. As someone who has never taken physics, with only limited knowledge on the topic, it is extremely difficult to follow along. It's only due to my exposure to physics in engineering that I can loosely understand the materials Einstein presents.

8. Describe in 3-4 sentences why the journal is significant to our understanding of nature.

The journal is significant to our understanding of nature because it gives us a deeper insight to how time and space correlate in reality. Understanding that space and time both affect each other (instead of one being dependent on the other entirely) allows us to have a better perspective than we did prior. "Matter tells spacetime how to curve, and curved spacetime tells matter how to move." The journal shows us above all that there will

almost always be things in our universe still to discover, just when we think we know it all.

9. One of the things that this paper inspired was the Twin Paradox. If you were to travel 12 lightyears to Tau Ceti (like Ryland Grace does in *Project Hail Mary*), and were able to return to Earth, would everyone you know be older than you, or the same age as you? For this hypothetical, you are assuming that you were able to travel at relativistic speeds to Tau Ceti and make it back within the lifespan of a human. (2-3 sentences please)

Because of how spacial relativity functions, you would be younger than those that you knew after returning because of time dilation. Because of the fact that you're moving at high speeds for multiple years, you experience less time. While everybody else would experience time at a normal rate of 12 years, you'd only experience 4 because of the fact that you're moving at a high speed. This is exactly what happens to Ryland Grace in *Project Hail Mary*, and it's explicitly explained in one of the chapters that this is what occurs. When completing the round trip, you'd have traveled a total of 24 light years, only experiencing 8 in total (assuming you were going at the same speed as the trip there), while everybody else would have experienced the full 24.

10. Add the correctly formatted APA reference.

Einstein, A. (1905). On the electrodynamics of moving bodies. *Annalen der physik*, 17(10), 891-921.