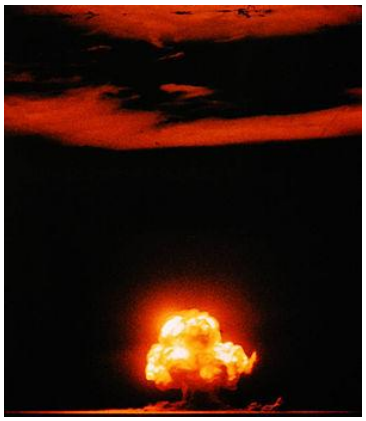
AWESOME stories

Einstein's Letter



Photograph, by Jack W. Aeby, of the first nuclear test explosion on July 16, 1945. The test called "Trinity." Image, from the Life photo archive, online courtesy Wikimedia Commons.

> *Now, I am become Death,*
> *the destroyer of worlds.*
>
> J. Robert Oppenheimer
> "Manhattan Project" Supervising Scientist
> On Witnessing the Atomic-Bomb Test

Albert Einstein, noted by Time Magazine as "Person of the Century," was the first to comprehend that energy and mass (matter) are related. When he wrote his world-changing paper ("Does the Inertia of a Body Depend Upon its Energy Content?"), the 26-year-old patent clerk was so forward-thinking he had no prior sources to cite. His paper, as originally published, was without footnotes.

In a startling departure from prior thinking, Einstein theorized (E=mc2 is his famous formula) that matter (the physical "stuff" in the universe) could become energy (that which matter needs to move) and, conversely, energy could become matter (under the right circumstances). As he himself explained (follow the link to hear him):

> *...very small amounts of mass may be converted*
> *into a very large amount of energy and vice versa.*

These radical ideas were not the only results of Einstein's thinking in 1905 - his "miracle year." In his initial paper, published a few months before his mass-and-energy analysis, Albert examined a question he'd thought about since childhood: What would it be like for a person to travel on a beam of light?

That nagging obsession did not leave him even when he was a less-than-stellar university student. He still pondered the issue after his father helped him to get a job as a patent clerk in Bern. But his preoccupation, with a childish musing, ultimately led the future Nobel laureate to another stunning conclusion: The speed of light is unchanging, but the flow of time is a relative concept.

Applying this analysis to Albert's original question - what would it be like to travel on a beam of light - we conclude that such a thing is not possible. At the speed of light, according to Einstein's theory of special

relativity, length shrinks to zero and time stands still. No one before Einstein had even suggested such a thing. He wrote without footnotes because there was no one to quote.

Once Einstein's revolutionary theory on converting mass to energy was accepted - which did not happen overnight - scientists realized that enormous amounts of power could be produced from splitting tiny particles of matter - like atoms. (For submarines, such a power source would later transform "boats that dived" into true sub-marine vessels which could remain underwater indefinitely.)

But how would such an energy transformation actually occur? How could anyone "open" an atom?

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http://www.awesomestories.com/asset/AcademicAlignment/Einstein-s-Letter

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Media Stream

Albert Einstein - In 1904
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Einstein's Letter

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Einstein Revealed - The Life of Albert Einstein

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Light: How Fast Does it Travel?

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Einstein - A Patent Clerk in Bern

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