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Physicists Create Light From Nothingness

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In quantum physics, the vast emptiness of space isn't actually that empty. In fact, what we think of as a "vacuum" is actually teeming with virtual particles – particles that flit in and out of existence constantly, existing for only tiny periods of time before they go back to nothingness.

This constant cycle of creation and destruction is the consequence of the mathematics of quantum mechanics and the Heisenberg Uncertainty Principle, and creates what is known as vacuum energy – a background energy that exists throughout space, even when there is no matter present. Its existence has been indirectly observed through experimentation, such as those which demonstrate the [Lamb shift](#) – a slight fluctuation of the energy of electrons in a hydrogen atom.



Image via Wikipedia

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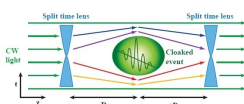
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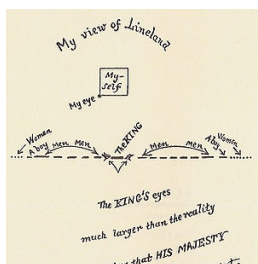
I've been the Social Media Editor at Forbes since October, 2011. Prior to that, I was a freelance writer and contributor here. On this blog, I focus on futurism, cutting edge technology, and breaking research. Follow me on Facebook and Twitter. You can email me at aknapp@forbes.com

Over forty years ago, [physicist Gerald Moore](#) [predicted](#) that if you were able to spin a mirror at speeds close to the speed of light, then the mirror would convert virtual photons into actual photons (the particles that make up light and other electromagnetic radiation). Unfortunately, it's close to physically impossible to spin a mirror at



Physicists Create a Hole In Time to Hide Events

Alex Knapp
Forbes Staff



Does the Universe Add Dimensions As It Expands?

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near-relativistic speeds, and so this effect had not been observed.

Until now, that is. In a [paper published in *Nature*](#), a team of physicists has demonstrated the creation of photons from vacuum fluctuations. To do this, they constructed a superconducting circuit, which they've dubbed the superconducting quantum interference device, or SQUID for short. SQUID is a superconductor that's capable of oscillating at extraordinarily high frequencies – over 11 GHz. The SQUID is designed to effectively act as a mirror in order to replicate the theorized experiment.

Once the SQUID was ready, the team then passed a magnetic field through it, causing it to rotate at a speed of about five percent of the speed of light – fast enough to see the predicted results. And those results were obtained. After rotating the SQUID at those high speeds, the team were able to detect several real photons that were essentially created from nothing. These were the virtual transformed to the real.

The photons that were created weren't actually visible to humans – they were in the microwave range of the EM spectrum. However, there is a possibility that a similar technique could be used to create actual visible light.

That would be a wonder to behold.

(h/t [Nature News Blog](#))

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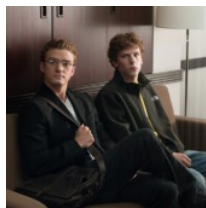
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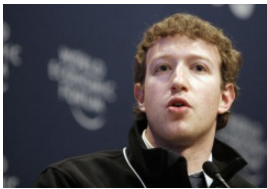
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