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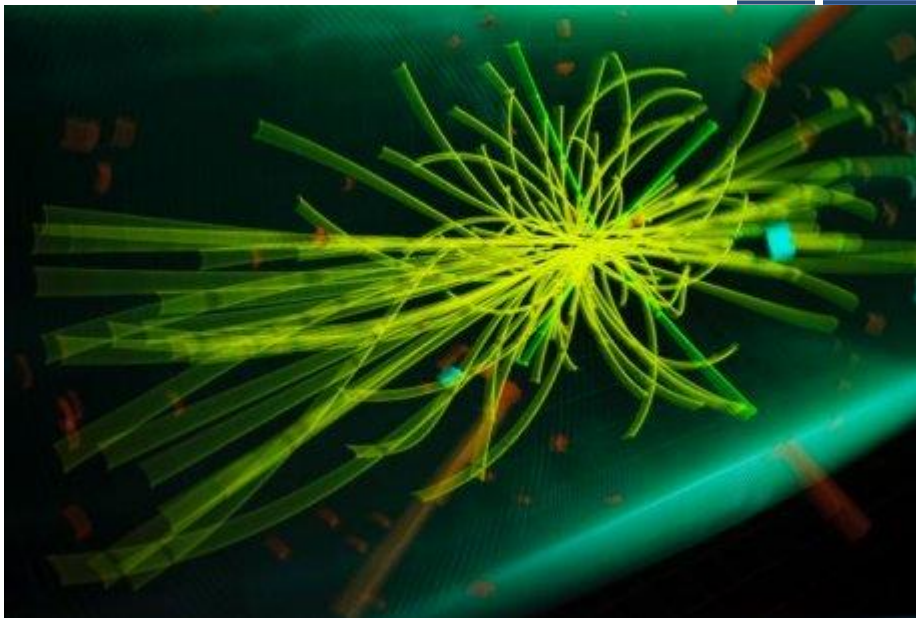
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### Scientists may have discovered nature's fifth force — dark photons

PM BY [LEXI METHERELL](#) YESTERDAY AT 7:45PM

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PHOTO

An anomaly in radioactive decay may point to a fifth force of nature.

AFP: FABRICE COFFRINI

Researchers in Hungary have discovered what they think may be the fifth force of nature, which could be a vital clue to understanding dark matter.

Key points:

- Current models do not explain the way the four known forces interact
- Scientists had been looking for dark photons, but may have discovered a new force
- If proven, would build on work of Albert Einstein in later years

There are currently four identified forces of nature: gravitational, electromagnetic, strong nuclear, and weak nuclear, but they do not interact with each other in ways that can be explained by the current mathematical model of the universe.

So scientists had been looking for evidence of a fifth force, which would go some way to explaining the discrepancy.

Scientists at the Hungarian Academy of Science's Institute for Nuclear Research were looking for evidence of dark photons — a force which they surmised could carry and therefore explain dark matter.

They had been shooting protons at a strip of lithium, and in doing so created an unexpectedly high number of subatomic particles.

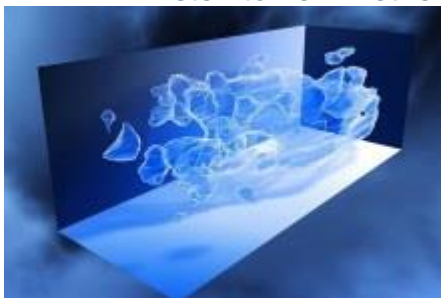
They think this anomaly in radioactive decay could be the result of an entirely new particle, which may suggest the presence of a fifth force.

## New force could account for gaps in current mathematical model of universe

Geraint Lewis, a professor of astrophysics at the University of Sydney, said this could explain discrepancies in the way the four previously known forces interact.

"What we have at the moment is what's known as the standard model of particle physics, and this is a mathematical description of the way the universe works," Professor Lewis said.

AUDIO 4:13 Listen to Lexi Metherell's report



PM

The particle physics model works "really, really well" to describe and explain three of the fundamental forces — electromagnetic, strong nuclear and weak nuclear.

"But what we also know is that those forces don't play well with gravity. Gravity is described by a completely different set of mathematics and people have tried for almost 100 years to make these forces work together," Professor Lewis said.

Professor Lewis said this could build upon the work that occupied Albert Einstein in his last years.

"The story goes that Einstein on his deathbed was still working on uniting gravity and electromagnetism," he said.

"The problem we have is the mathematics worked really well and we don't have many clues pointing to how we should, well even where we should look to unite gravity with these other forces," he said.

## Physicists always looking for 'things that don't fit'

If physicists are able to unite these forces it may lead to a better understanding of dark matter, which they now understand to make up a significant part of the universe.

"So people are looking for anomalies, things that don't fit. Parts of physics that aren't working the way we expect to sort of give us a clue on what areas we should focus upon," Professor Lewis said.

In this latest experiment, he said the researchers were "not quite getting what they're expecting" which could point to the existence of other forces yet to be accounted for.

What this new force might actually do is another black hole of knowledge.

"What it's telling us if it is correct is that there is something going on in the way that one particle talks to another particle that we haven't got inside our mathematics at the moment," Professor Lewis said.

"So it's a force as we now understand forces to be. It's doing something that we currently don't expect the other forces to do."

The physics world is also intrigued by some recent results at the Large Hadron Collider near Geneva.

Scientists there may have found a new particle which could open up a new world of particles and forces.

"There's been some recent results of the Large Hadron Collider where there's been possibly a hint of a detection and people are all over that trying to understand if that also is pointing to a new area of physics we should be investigating," Professor Lewis said.

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**ABC** NEWS



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By [Lexi Metherell](#)

Posted yesterday at 7:45pm

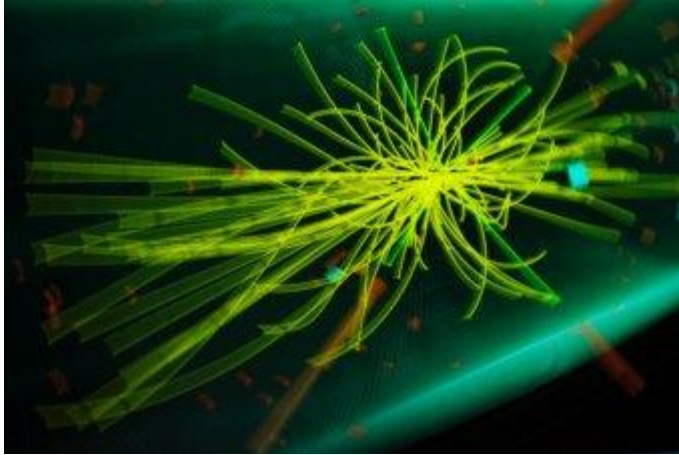


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