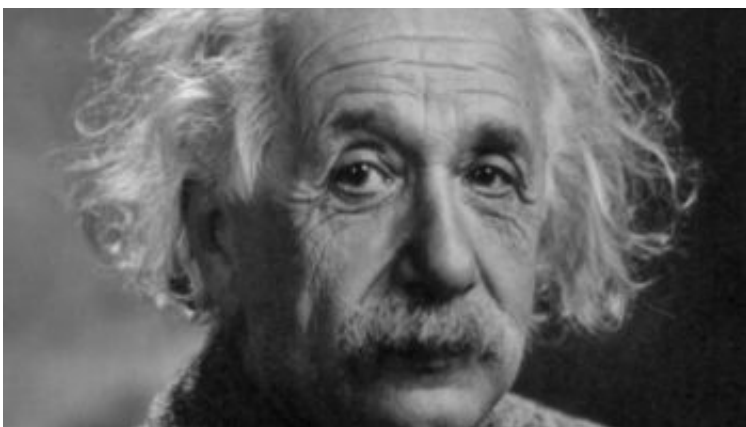


New study furthers Einstein's 'theory of everything'

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Albert Einstein

(Phys.org)—Sussex physicists have taken a small step towards fulfilling Einstein's dream of proving there is only one fundamental force in nature.

Following last year's discovery of the [Higgs boson particle](#) – the so-called "[God particle](#)" that answers how the particles have masses - Dr Xavier Calmet and PhD student Michael Atkins looked at how the Higgs field interacts with gravity.

Besides giving masses to all known particles, it's possible that the Higgs boson played a significant role in the [expansion of the Universe](#) after the Big Bang.

Dr Calmet says: "The discovery at CERN's Large Hadron Collider last year of the Higgs boson particle was very exciting. Although its existence had been predicted, nobody knew for sure. Now we're looking to see if the way it behaves is also as scientists have predicted – and early results look promising."

Through playing with their equations and using data from the Large Hadron Collider, the Sussex scientists have been able to constrain the Higgs boson's interaction with gravity. The results are published this month in the journal *Physical Review Letters*.

Dr Calmet says: "The discovery of the Higgs boson has deep implications for gravitational theories that explain the evolution of our universe."

"Einstein's dream, which we are still trying to fulfil, consists in unifying all interactions of nature – gravitation, electromagnetism, [strong interaction](#) and [weak interaction](#) - into one framework. The idea is that there is actually only one fundamental force in nature and that the forces we see on a daily basis are just different facets of this fundamental force of nature. Understanding the properties of the Higgs boson and in particular its [gravitational interactions](#) will be a key factor on our path to this grand unification."

More information: 'Bounds on the non-minimal coupling of the Higgs boson to gravity' is published in *Physical Review Letters* on 01 February 2013. prl.aps.org/abstract/PRL/v110/i5/e051301

Provided by University of Sussex

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