

FEATURE 11 July 2018

Is this our first clue to a world beyond quantum theory?

Our best theory of physical reality is exquisite – but inexplicable. A low, unexplained experimental noise could herald a revolution in the making



Andrea Minini

By **Bob Henderson**

NATURE gives rise to weird and wonderful things: dancing plants, sailing stones, flamingos. But no one, except perhaps on a hallucinogenic trip, has seen a flamingo melt into a wave or split itself into multiple copies. And that may be the weirdest thing of all, since our best theory of nature seems to suggest those things could happen.

That theory is quantum mechanics. Despite its spectacular success accounting for the bizarre behaviour of subatomic particles, it's not clear how, or even if, it can explain why much larger bodies don't behave in a similarly strange way. This is one reason why Einstein, among others, never accepted quantum theory as the ultimate description of nature.

Now a new experiment has seen a hint that these quantum critics may be right. The result must still be corroborated by many other tests, some now getting under way, but there's no overstating the significance if it is shown to be correct. "It would be revolutionary," says physicist and Nobel laureate Anthony Leggett at the University of Illinois at Urbana-Champaign. "It would shatter the notion that quantum mechanics is the whole story about the physical world."

The real problem with quantum mechanics is simply stated. "What the hell is it about?" says physicist Sheldon Goldstein of Rutgers University in New Jersey. Quantum mechanics describes subatomic particles using undulating mathematical objects called wave functions, which evolve smoothly over time. A particle described by a wave function is more potentiality than point. It exists in superposition, meaning, roughly, that it is smeared out in space or is in many places ...

To continue reading this premium article, subscribe for unlimited access.

Existing subscribers, please log in with your email address to link your account access.

DIGITAL



- Unlimited web access
- New Scientist app
- FREE book How to Be Human with annual subscriptions

€46
FOR 13 WEEKS
Save 58%

SUBSCRIBE

PRINT + DIGITAL

PRINT

Quarterly by Direct Debit

Inclusive of applicable taxes (VAT)

*Free book How to Be Human is only available with annual subscription purchases where subscription delivery is in the United Kingdom, USA, Canada, Australia, New Zealand or Euro area.

Sign up to our newsletter

Enter your email address to get started

Your email

JOIN

GET THE APP



FOLLOW US

© Copyright New Scientist Ltd.

Back to top 