Professor Daniel Whiteson receives DOE grant to use AI to explore theories about the universe

The funding will help address a fundamental question: Why is our universe the way it is?

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Professor Daniel Whiteson of the UC Irvine Department of Physics & Astronomy.

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Professor Daniel Whiteson of the UCI Department of Physics & Astronomy applied for and recently won a $232,000 grant from the U.S. Department of Energy to design new machine learning software that can explore millions of different hypothetical universes in order to disover examples that might correspond to our own universe. Our universe did not have to form the way that it did, and the software will search a space of theoretical ideas defined by 100 different physical parameters, like knobs on the control panel of the universe, to find which knob configuration corresponds to our cosmos. Each time Whiteson and his graduate student Jason Baretz manipulate a knob it “gives you a different universe,” said Whiteson. “So even just figuring out where in that big space of ideas our universe lives is a hard problem, because you have to turn a hundred different knobs to find the right settings.” Software that can efficiently search such a vast virtual space of the cosmos is a giant leap forward, because, Whiteson explained, scientists have until now relied solely on the intuitions of theorists who would turn the 100 knobs in a particular way and find “some spots in the list of universes that corresponds roughly to ours,” Whiteson said. “But we don’t know if they found all of them. There could be a bunch of different places in that space that are sort of like hidden islands, ways you can tune those knobs to actually get a universe that’s like ours and nobody’s found it so far.”

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