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LSU gets $250K grant to probe universe's origins

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(Source: WTOV9.com)

BATON ROUGE, La. — Two LSU researchers have won a $250,000 grant to probe the origins of the universe.

Parampreet Singh, an assistant professor in the LSU Department of Physics & Astronomy, and Peter Diener, assistant research professor in the LSU Center for Computation & Technology and in Singh's department, submitted a proposal hoping to answer questions about the earliest state of the university and won the grant funded by the John Templeton Foundation.

The foundation awarded more than $4 million in research grants to 20 scientists worldwide.

Singh and Diener focused their proposal on the fundamental question regarding the origin of the universe, which has so far eluded scientists.

"The goal is to discover a new theory which avoids the problem of big bang singularity, and also captures all the success of Einstein's theory when gravity is weak," Singh said Thursday.

It is generally thought that Einstein's theory of general relativity, which predicts that the universe began with a big bang — an event where all the matter and energy of the universe was concentrated at one point. Unfortunately, Einstein's theory itself breaks down at that point, called a singularity, and cannot predict the earliest state of the universe.

One such theory is loop quantum gravity, which theorizes that the expanding universe did not start from a big bang, but there existed a contracting branch of our universe to which it bounces. LSU's theoretical gravity group at the Department of Physics & Astronomy is one of the major centers in the world for research on this subject.

Singh and Diener will harness the power of high performance computers at LSU and other centers in the U.S., to develop sophisticated algorithms to fully understand the new physics near the singularities in cosmos and black holes.

Singh is an expert on quantum cosmology and has made several important contributions to the field, including in the development of big bounce paradigm in loop quantum gravity.

Diener is an expert on relativistic astrophysics and one of the key maintainers of the Einstein Toolkit. He is involved in the development of various supercomputing applications to understand various aspects of gravitational force including the dynamics of black holes.

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