College of Arts and Sciences
Department of Physics and Astronomy
University of South Carolina

Colloquium

“Superfluid Universe, the Ground State in Quantum Gravity, and Gravastars”

Speaker:
Dr. Pawel Mazur, Professor
Department of Physics and Astronomy
University of South Carolina

Abstract:
I will talk about superfluid universe, the ground state in quantum gravity, and gravastars. Quantum mechanical considerations applied to the largest physical system in evidence have led to the understanding that there must exist such a thing as vacuum energy, which in its ground state should be homogeneous and isotropic, but in the presence of “impurities” (baryons), it will exhibit inhomogeneities. Superfluid is a condensate. Considering droplets of such a condensate, one arrives at the concept of a gravastar, the maximally supercompact material configuration consistent with the laws of gravitation. It just happens that such objects are abundant in the Universe. There is one in the Center of the Milky Way galaxy known as the Sag A*, which has a mass of approximately 4.4 million Solar masses. The Event Horizon Telescope (EHT), a planet-wide array of radio telescopes, will either refute or confirm predictions following from the gravastar theory of super-compact objects in our Universe in the next few years.

THURSDAY
September 27

4:15 pm
Jones Physical Science Center Room 409
(Rogers Seminar Room)

Hosted By:
Dr. Timir Datta

Refreshments Served
Everyone Invited

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