# CCSU
## DEPARTMENT OF MATHEMATICAL SCIENCES

# COLLOQUIUM

Friday, April 5
2:00 – 3:00 PM
Maria Sanford, Room 101

## PROPERTIES OF NEGATIVE ENERGY AND PROBABILITY DISTRIBUTIONS FOR VACUUM ENERGY DENSITY FLUCTUATIONS

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**Abstract:** This talk will consist of two parts. Part I will discuss some of the ways in which negative energy arises in quantum field theory, and its implications for various areas of physics. Also discussed are so-called "quantum inequalities", which are restrictions on the expectation value of the quantum energy density operator in arbitrary quantum states. These inequalities severely limit the production of macroscopic effects with negative energy, such as the maintenance of traversable wormholes, and violations of the second law of thermodynamics. Part II focuses on more recent work on the remarkable connection between quantum inequalities and the probability distribution of energy density fluctuations in the vacuum. The talk will consist of a summary of results rather than mathematical derivations.

For further information:
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