

Mark Trodden

Center for Particle Cosmology
University of Pennsylvania



Pushing Einstein's Boundaries

Gravitational Approaches to the Challenges of Modern Cosmology

Department of Physics Colloquium

Einstein's general theory of relativity (GR) is one of the most successful and well-tested physical theories ever developed. Nevertheless, modern cosmology poses a range of questions, from the smallest scales to the largest, that remain currently unresolved by GR coupled to the known energy and matter contents of the universe. This raises the logical possibility that GR may require modification on the relevant scales.

I will discuss the status of some modern approaches to alter GR to address cosmological problems. We shall see that these efforts are extremely theoretically constrained, leaving very few currently viable approaches. Meanwhile, observationally, upcoming missions promise to constrain allowed departures from GR in exciting new ways, complementary to traditional tests within the solar system.

