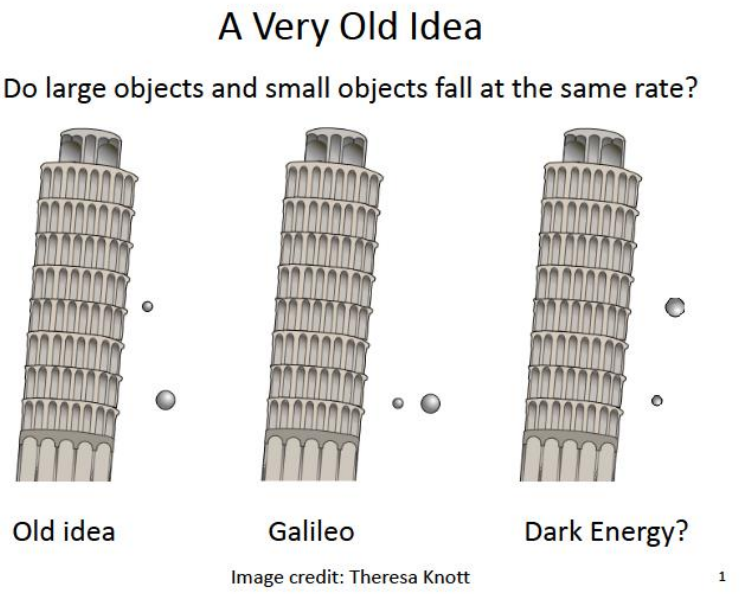
DESY and Universität Hamburg
Quantum Universe VIDEO Colloquium

Testing dark energy model with atom interferometry.

Tuesday, 19 January, 2021 **Webcast 16:00 h**

Clare Burrage (University of Nottingham)

The accelerated expansion of the universe motivates a wide class of scalar field theories that modify gravity on large scales. In regions where the General Relativity has been confirmed by experiment, such theories need a screening mechanism to suppress the new force. I will describe how theories with screening mechanisms can be tested in the laboratory, in particular with atom-interferometry experiments.
I will describe the results of a recent experiment in which we measured the acceleration of an atom toward a macroscopic test mass inside a high vacuum chamber, where the new force is underscreened in some theories. Our measurement shows that the attraction between atoms and the test mass does not differ appreciably from Newtonian gravity. This result places stringent limits on the free parameters in chameleon and symmetron theories of modified gravity.



This is a VIDEO COLLOQUIUM!

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