

PHYSICS COLLOQUIUM

Thursday, April 10 | 11:30-12:30 p.m. | RNS 210

Testing Relativity: The Search for New Physics at the High-Sensitivity Frontier

The principle of relativity states that the results of experiments are independent of their orientation and velocity. In spite of the fact that this idea dates back over 350 years, an explosion of new tests of relativity has occurred over the past several decades. Spurred by a categorization of large classes of ways in which relativity could be violated, the new generation of experiments has constrained some of these possibilities to less than parts in 10^{30} . In doing so, these table-top tests gather information about the highest relevant energies known to physics. Although such astounding sensitivities have been achieved, other possible relativity violations remain nearly untested, leaving room for comparatively large relativity violations in nature. Recently, methods of investigating the unexplored possibilities using gravitational experiments and observations have been developed and are being explored using systems ranging in size from atoms to binary-star orbits. This presentation will provide a general introduction to relativity testing and a summary of recent experimental results

Cookies and apple cider served!



Jay Tasson

Dr. Jay D. Tasson, assistant professor of physics at Carleton College. Dr. Tasson's recent research focus has been on the theoretical aspects of testing Lorentz symmetry, which is the symmetry underlying special relativity. Tests of such fundamental symmetries have the potential to provide experimental information to guide the merge of General Relativity and the Standard Model of particle physics into a single quantum-consistent theory. Though the motivation sounds quite technical, there is a relatively large space of interesting projects that can be, and have been, pursued by undergraduates. The possibilities span a variety of areas of physics and styles of investigation, from paper and pencil theory to computer-aided data analysis.