Contribution ID: **75** Type: **talk**

Testing spacetime symmetries with gravitation

Tuesday, 6 July 2021 14:20 (2 minutes)

In recent decades, a growing international group of theorists, experimentalists, and observational astronomers have been working on searches for tiny hypothetical deviations from perfect local Lorentz symmetry in nature. One key motivation for this work is that the discovery of a violation of this principle may uncover aspects of a fundamental unified theory of physics. Tests and analysis searching for Lorentz violation have been performed across many areas in both ground-based experiments, space-based tests and astrophysical observations. Many constraints already exist on many types of local Lorentz violation for different kinds of matter and fields. Despite the null results to date, many areas remain unexplored. We present an overview of the theory and phenomenology of precision tests of local Lorentz symmetry in gravity. The key aspects of a widely-used effective field theory framework for testing local Lorentz symmetry are discussed. Also, we present a summary of the recent precision tests of Lorentz symmetry in gravity including gravitational waves, pulsar tests, lunar laser ranging, ground-based gravimetry, and short-range gravity tests.

Primary author: BAILEY, Quentin (Embry-Riddle Aeronautical University)

Presenter: BAILEY, Quentin (Embry-Riddle Aeronautical University)

Session Classification: Recorded Talks: Fundamental Test and Equivalence Principle