“ Low-energy tests of fundamental physics using precision hydrogen spectroscopy and light-by-light scattering ”

Dylan Yost

Colorado State University

Monday, October 20th, 2025 at 4:00pm

Engineering 100

Abstract

Quantum electrodynamics (QED) is the most highly tested theory in science, with predictions made and experimentally confirmed at the parts-per-trillion level. Because of this extremely accurate theory, testing QED predictions with increased precision can provide more accurate determinations of fundamental constants or reveal deviations that indicate new physics. In this talk, I will discuss our lab’s efforts to test QED predictions through two avenues. The first is our ongoing effort in precision hydrogen spectroscopy. The second is a new experimental effort where we will attempt to detect photon-photon interaction using femtosecond lasers coupled to high finesse optical cavities.

Biography

Dylan Yost received his PhD on work with vacuum-ultraviolet frequency combs from the University of Colorado in 2011. In 2012, he was a Humboldt Fellow at the Max Planck Institute for Quantum Optics and worked on precision hydrogen spectroscopy. He came to CSU in 2015 where he is currently an associate professor. He has received an NSF CAREER award and the NIST Precision Measurement Grant for his hydrogen spectroscopy experiments and was recently named an APS fellow.