Physics Colloquium
Prof. Matthew Sievert
“Dissecting the Guts of the Proton”

Since the discovery of the atom and the proton a century ago, our knowledge of atomic structure and the electromagnetic force has advanced to astronomical precision. But to this day, our knowledge of the internal structure of the proton is sporadic and incomplete, with fundamental questions about the origin of the proton mass and spin still unanswered. These persistent questions and challenges reflect the beautiful, emergent complexity of the nuclear force itself. In this talk I will present an overview of the nuclear force known as quantum chromodynamics and the experimental programs to study it in two distinct regimes: in the plasma state at high temperatures produced in heavy-ion collisions, and "in situ" within the proton using the forthcoming Electron-Ion Collider -- the most powerful electron microscope ever created.

Dr. Matthew Sievert is an Assistant Professor at New Mexico State University. He received undergraduate degrees from Virginia Commonwealth University in Physics and in Spanish in 2006, as well as a master's degree in Physics in 2007. After two years teaching as an Instructor at Virginia Union University, he received his Ph.D. from The Ohio State University in 2014. As a postdoctoral scientist from 2014 - 2020, he performed research in theoretical nuclear physics at Brookhaven National Laboratory, Los Alamos National Laboratory, Rutgers University, and the University of Illinois at Urbana-Champaign. His research encompasses a wide range of topics in high-energy nuclear physics, studying the strong nuclear force under the extreme conditions achieved in modern particle accelerators. His interests include long-standing puzzles about how the proton acquires its mass and spin, the study of the exotic "quark-gluon plasma" formed at temperatures of $10^{12}$ K, and many other topics.

Thursday November 12th at 4:25 via Zoom
If you are outside the Lehigh Physics Department, please email Marina Long (mal516@lehigh.edu) for a link.