



Old Dominion University

Department of Physics

Colloquium

Tuesday, February 28, 2017

"A glimpse into the exotic world of quarks and gluons"

Raul Briceno
Jefferson Lab

Abstract: At the core of everyday matter is a complex inner world of subatomic particles. In particular, the nuclei of atoms are made of protons and neutrons, which are themselves made of even smaller particles known as quarks and gluons. Thanks to experiments, like the ones being carried out at Jefferson Lab, we have been able to peer inside and deduce the guiding principles for the behavior of quarks and gluons. This knowledge has been formalized into a fundamental theory of the strong nuclear force, Quantum Chromodynamics (QCD). However, despite having the theory in place for over 40 years, the connection between QCD and experiment has been historically limited by the fact that the strong nuclear force is “strongly interacting”. In this talk, I discuss recent theoretical progress that is finally allowing us to directly extract the same observables from QCD that are measured in experiment. This is particularly exciting, because these tools will allow us to study not just conventional states of matter but also exotic ones. The latter refers to states that are not easily described by models of QCD and thus require the full machinery of the theory. These complicated objects continue to puzzle experimentalists and theorists alike, but with these theoretical breakthroughs as well as the new era of Jefferson Lab experiments, we are on the cusp of a richer and deeper understanding of the fundamental theory of the strong force.

Presentation: **OCNPS 200 @ 3:00 pm**
Refreshments: **OCNPS Atrium @ 2:30 pm**

All interested persons are cordially invited to attend.