# Continuum QCD for Strong Interactions in theStandard Model

This series of lectures will address the following themes:

- Euler-Lagrange equations in quantum field theory
- Perspectives on confinement
- Emergence of mass in the Standard Model
- Mesons as a continuum two-body bound-state problem in quantum chromodynamics (QCD)
- Baryons as a continuum three-body bound-state problem problem in QCD

The lectures will explain that comparisons between experiment and theory can expose the impactof running couplings and masses on hadron observables and thereby aid materially in charting themomentum dependence of the interaction that underlies strong-interaction dynamics. The seriesbegins with a primer on continuum QCD, which introduces some of the basic ideas necessary inorder to understand the use of Schwinger functions as a non perturbative tool in hadron physics.It continues with a discussion of confinement and dynamical symmetry breaking (DCSB) in theStandard Model, and the impact of these phenomena on our understanding of condensates, the parton structure of hadrons, and meson electromagnetic form factors. The series ends with the problem ofgrand unification; namely, the contemporary use of Schwinger functions as a symmetry-preservingtool for the unified explanation and prediction of the properties of both mesons and baryons. Itreveals that DCSB drives the formation of diquark clusters in baryons and sketches a picture ofbaryons as bound-states with Borromean character. Planned experiments are capable of validating the perspectives outlined in these lectures.