

PHY 959 (Sec. 301): Collider Phenomenology

Time & Place:

Fall 2023, 10:00am – 11:50am, Tuesday and Thursday
August 28 - October 15, 2023
Room 3239 in BPS Bldg.

Instructor:

Name & Title: C.-P. Yuan, Professor
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Office Hours: 4:10 pm – 6:00 pm, Friday
(Or you can just drop by my office at any time.)

Textbook:

Recommended (not required):

J. Campbell, J. Huston, and F. Krauss, *The Black Book of Quantum Chromodynamics*

R.K. Ellis, W.J. Stirling, B.R. Webber, *QCD and Collider Physics*

Particle Data Group, *The Review of Particle Physics*
<http://pdg.lbl.gov/>

Topics to be covered:

Standard Model of Elementary Particle Physics
QCD and Parton Distribution Functions (PDFs)
Regularization, Renormalization, and Running Couplings
Leading Order calculations (with CalcHEP and MadEvent, etc.)
Next-to-leading order calculations (with MCFM, etc.)
All order calculations (with PYTHIA, HERWIG, ResBos, etc.)
Experimental Detectors
Event signals and backgrounds
Discovery of W and Z bosons
Discovery of Top quark
Search for Higgs boson

Grading: Reports on team projects (100%)