

The second half of the class — from the Spring break to the end of semester — will be about non-abelian gauge theories, especially QCD. To help you understand this material, I need you to be familiar with:

1. Symmetries, especially the continuous symmetries such as isospin, $SO(N)$, or $SU(N)$, since the gauge theories are all about *local* symmetries of this kind.
2. Path integrals in quantum mechanics, since I shall use a similar formalism in QFT to quantize the non-abelian gauge fields.

To make sure you are at least minimally familiar with these subject, I give you two longish reading assignments over the Spring break.

- (1) *Lie Algebras in Particle Physics: from Isospin to Unified Theories* by Howard Georgi, 1999, Westview press, ISBN 9780813346113 ([ebook at UT library](#)). I do not expect you to read the whole book by March 27, just read the first 3 chapters *carefully*, then browse through the chapters about $SU(2)$, $SU(3)$, and color.
- (2) *Quantum Mechanics and Path Integrals* by Feynman & Hibbs ([find at UT library](#), [read online at scribd.com](#)). Read all you can about care and use of the Path Integrals.