Quantum Field Theory II
Physics 8048, Fall 2014

Lam Hui

My coordinates. Pupin 1026. Phone: 854-7241. Email: lhui@astro.columbia.edu. URL: `http://www.astro.columbia.edu/~lhui`.

Teaching assistant. TBD.

Office hours. Monday 11:30 am – 12:20 pm, or by appointment.

Class Meeting Time/Place. MW, 10 - 11:30 am in Pupin 420.

Prerequisites. QFT I i.e. complete treatment of scalar field theory, including loops, RG, EFT, symmetries; fermions up to tree diagrams (Chapters 1-45 of Srednicki). **If you have not taken QFT I, you should talk to me. If you are an undergraduate student, you must obtain explicit permission from me.**

Requirements. Problem sets. The last problem set will serve as a take-home final.

Topics covered. Spinors. Abelian and non-abelian gauge field theories: QED, QCD and the Standard Model. Spontaneous symmetry breaking. Anomalies. Applications to condensed matter. Non-perturbative methods, time permitting.

Texts. The main texts are

- Quantum Field Theory, Mark Srednicki, Cambridge University Press
- Quantum Field Theory in a Nutshell, Anthony Zee, Princeton Universy Press
- Quantum Field Theory and the Standard Model, Matthew Schwartz, Cambridge University Press

Both are available at Book Culture on W. 112th Street. The website is `http://www.bookculture.com`. Other recommended references include:

- Quantum Theory of Fields Vols. 1 and 2 , S. Weinberg, Cambridge University Press.
- An Introduction to Quantum Field Theory, M. E. Peskin and D. V. Schroeder, Westview Press.
- Modern Quantum Field Theory, T. Banks, Cambridge University Press.
- Aspects of Symmetry, S. Coleman, Cambridge University Press.
- Quantum Field Theory, L. Brown, Cambridge University Press.
- Field Theory, a Modern Primer, P. Ramond, Addison-Wesley.