

Physics X
Q&A on Particle Physics

Instructor: Chu Ming-chung, CUHK
June 7 – July 7, 2011 (10 meetings on T, Th 1:30-3:15pm)
Venue: SC L4

Date	Tentative list of questions
June 7	How was quantum mechanics married to special relativity?
June 9	Why are there anti-particles? Why do electrons have spin?
June 14	Why can we use exchange of virtual particles to represent forces? What are Feynman diagrams?
June 16	Why do we use fields to represent particles? Why/how do we quantize fields?
June 21	What are gauge field theories?
June 23	What is spontaneous symmetry breaking? What is Higgs mechanism?
June 28	Are coupling constants constant? What is asymptotic freedom?
June 30	Why do neutrinos oscillate?
July 5	What are C, P and T symmetries?
July 7	How are particles detected?

A series of questions will be presented, and some answers/partial answers/wrong answers to them will be discussed. The goal is to introduce basic ideas in relativistic quantum mechanics, quantum field theory, and elementary particle physics. The emphasis is on the concepts rather than technical details; however, some mathematical details are needed to illustrate these concepts. This is a non-credit bearing course aimed at students with some background in quantum mechanics (at the level of QMI) and special relativity. **Students will be volunteered to present some of the answers.**