

Physics 205 – Introduction to Research in Physics – Winter Quarter 2012

Syllabus

Physics 205 meets Mondays 4-5:45 pm in ISB 231. All new Physics graduate students must register. Requirements: Attend every class (at most one will be excused) and turn in proposals for two research topics that interest you, each proposal 1 or 2 pages in length, based on Phys 205 lectures and follow-up meetings with the relevant Physics faculty. Grades will be based primarily on the quality of your research proposals, which should also help you to get started on research at UCSC.

Instructor: Joel Primack – ISB 318, 831 459 2580, joel@ucsc.edu
office hours: Wed 2-3 pm or by appointment
lecture slides: Physics 205 website: <http://physics.ucsc.edu/~joel/Phys205/>
the password for any password-protected file is Phys205

Date Lecturers and Topics

- Jan 11 Joel Primack – Physics as a Profession
Sue Carter – Non-Academic Career Opportunities
- Jan 23 Michael Dine – Anticipating LHC Physics
Tom Banks – Holographic Space-Time
Jason Nielsen & Bruce Schumm – LHC and ILC Experiments
- Jan 30 Sasha Sher – Imaging of Neural Function and Structure
Sriram Shastry – Superconductors, Magnets, Thermoelectrics
Gey-Hong Gweon – Spectroscopy on HTSCs and Graphene
- Feb 6 Robert Johnson & Steve Ritz – Fermi Gamma-ray Space Telescope
David Williams – Very High Energy Gamma Ray Astrophysics
David Smith – X-ray Astronomy and Geophysics
Tesla Jeltema – Observational Cosmology and Particle Astrophysics
- Feb 13 Howard Haber – Theory and Phenomenology of the Terascale
Anthony Aguirre - Testing theories of the super-early universe
Stefano Profumo – Fundamental Physics with GeV Gamma Rays
Joel Primack – Galaxy Evolution and Gamma Ray Attenuation
- Feb 27 Joshua Deutsch – Biophysics & Condensed Matter Theory
Peter Young – Frustration and Quantum Computing
- Mar 5 Bud Bridges – Crystal Structure and Microscopic Properties
Art Ramirez – Strongly Correlated Matter
David Belanger – Nanoparticle Magnetism
- Mar 12 Joel Primack – Physics Ethics

Physics 205 Research Proposals

Each short research proposal should have your name and the title at the top, and then explain

- what physics question you want to answer and why this question is interesting,
- what method(s) you propose to use,
- what information and resources (e.g. experimental apparatus, computational capability, and funding) you expect to need,
- how long you expect this project to take, and
- other relevant information such as which faculty member(s) you discussed this project with, why you are especially interested in this project, and what you might want to do if it succeeds.

Your two research project summaries are due at the last meeting of Physics 205, Monday March 12, 2012. However, if you submit drafts to me in advance, I will try to return them to you quickly with comments that may help you improve them. Please submit your research project summaries by email to joel@physics.ucsc.edu (please also cc a copy to relevant faculty members who would advise you on each project).

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