

## SPECIAL TOPICS IN ELEMENTARY PARTICLE PHYSICS

Physics 481 - Fall Quarter, 2007 - University of Chicago

### FINAL PROJECTS

Thanks for your choices of final project. The course grade will consist of 50% for problem sets, 25% for your in-class presentation, and 25% for a project paper due on Tuesday, Dec. 4. By Tuesday, November 6, please submit a short paragraph describing your proposed project. Try to keep the length of the paper below 10 pages. Papers will be posted on the web for the benefit of the rest of the class, and should be a clear pedagogic exposition for the non-expert. We can schedule short oral presentations of up to three projects on Dec. 4 if we have any volunteers.

Here are the projects that have been chosen. Please ask me if you need help with the appropriate references. I am also listing choices that have *not* been made; if there is strong sentiment, I can cover some of these.

|  |                 |
|--|-----------------|
| Neutrino astronomy: IceCube, RICE, ANITA         | Phil Barbeau    |
| Unparticles (term coined by Howard Georgi)       | B. Bhattacharya |
| Oscillations in supernova neutrinos              | Dennis Erkal    |
| Anyons   | Hao Huan        |
| Tevatron Higgs Searches                          | Michael Schmidt |
| Ultra-high-energy cosmic rays                    | Tom Weisgarber  |
| Experimental program at the LHC                  | Scott Wilbur    |
| Project X at Fermilab                            |                 |
| Dark energy: evidence and alternatives           |                 |
| Light scalar/pseudoscalar (axion-like) particles |                 |
| Higgless / Little Higgs theories                 |                 |
| The LHC- <i>b</i> experiment                     |                 |
| Muon ( $g - 2$ ) experiment and interpretation   |                 |
| Electric dipole moments                          |                 |
| Proton decay theory and experiments              |                 |
| Precision atomic physics                         |                 |
| The International Linear Collider                |                 |
| String theory signatures at or below a few TeV   |                 |