Tips for Phys-835 Collider Physics, 2007

I am glad to see the unusually high enrollment in 835 this year. That must have reflected the full recognition for the importance of the subjects. Indeed, collider physics, in particular the physics program at the Large Hadron Collider (LHC), will dominate high energy physics or arguably the fundamental science overall in the next two to three decades. There is no better time than now that any physics student who is interested in particle and nuclear physics, cosmology and astro-particle physics should gain some basic knowledge of collider physics.

On the other hand, given the wide range of topics, from theoretical models to phenomenological calculations to experimental considerations, and given the broad spectrum of the registrants, it will be a challenge for me to teach this course, and no less for any one of you to take this course as well. Therefore, I list a few items that hopefully would help the students at any level to optimize their learning in the due course.

- Throughout this semester, any physics topic will be discussed at a *qualitative* level and a *quantitative* level. For a technically poorly prepared student (no Phys 831 yet), it is of most importance to understand the topics at a qualitative level, namely to learn the basic concepts and the general approaches. It would be viewed as a success if this can even be achieved.

- For a technically well prepared student (with phys. 735, 831, 832), you should go beyond the basic concepts and emphasize collider physics techniques, both analytical and numerical.

- For advanced students who already start research, you may try to make connections between your research, your random thoughts and the course materials.

- The course offers tremendous flexibility and capacity. No one should be discouraged by not learning some topic as well as you wished; and anyone should be encouraged to go as far as you can within your ability (time, power and money).

- Group study is not only strongly encouraged, but also necessary.

- Do ask a lot of questions to me, to yourself and to each other.

Hope this course serves well for your future research.