

## Theoretical HEP Group Comments on Planning Process

On January 12, the HEP theory group met to discuss the upcoming departmental plan, particularly the interdisciplinary initiatives and the faculty complement. We came to the following conclusions:

1. Lecturers: We all agree that replacing the retiring lecturers should be a high priority within the plan.
2. Interdisciplinary positions: We strongly support the creation of the “Umbrella Center for Mathematical Sciences”. The purpose of this center is to “foster interdisciplinary communications between mathematics ... and the sciences ... on education and research.” In particular, “the emphasis is on the creation and application of new mathematics driven by and for science.” Such a program would be particularly useful for our graduate program, offering a framework in which we can present advanced graduate courses which both mathematics and physics students can take. There is clearly a demand for such courses: in 2003 Kentaro Hori gave a Mathematics Department graduate course on supersymmetric field theories, which attracted a large number of both math and physics students. In addition, such a center could foster ties between very disparate groups which are mathematically oriented - theoretical atmospheric physics and string theory, for example - which can only be beneficial.

The Umbrella Center does not have any immediate complement implications for our group, although new hires (particularly in string theory) will naturally fit into it.

3. HEP theory positions: Our group saw significant renewal in the last planning cycle, with 2.5 new hires (Hori (joint with math), Peet, Poppitz). The new hires greatly broadened the research scope of our group to include supersymmetric field theory and string theory. In addition, these new hires greatly increased our interdisciplinary outlook - each of the new faculty members interacts with either CITA or mathematics (or both). Note, however, that string theory and particle theory continue to evolve as separate, although related, disciplines, and it is important that we retain strength in both fields. With the retirement of O'Donnell, we will only have one theorist who works on collider-based phenomenology. On the opposite end of the spectrum, we currently have only 1.5 string theorists, which is not enough for the number of graduate students who are interested in this extremely active subject - for each of the past years, a number of aspiring string theory students have been turned away due to lack of supervisory capacity.

Because of the recent hires, we do not feel that it makes sense (either demographically or intellectually) to argue for additional positions early in the planning cycle. The later stages of the plan, however, will coincide with a major shift in the intellectual landscape of our field with the advent of the Large Hadron Collider (LHC) at CERN (turning on in 2007). The LHC will introduce a new era in our field, as a new energy regime opens up experimentally, and we should be prepared to capitalize on the new directions that emerge. In particular, we will severely lack expertise in collider-based physics, which is likely to be an extremely important and exciting field. Hence, we see late in the plan as a sensible time to make a theoretical HEP appointment, probably in LHC phenomenology. Such an appointment would also serve an important role in encouraging and facilitating interactions between the theoretical and experimental HEP groups.

4. Other fields: We strongly support the renewal of the theoretical CMP group. With the upcoming retirements, this group will fall below critical mass, even with the planned hire this year. It seems unheard-of to aspire to be a top-ranked physics department without a healthy condensed matter theory group.

It did not seem appropriate at this stage for us to comment on the relative priorities for other positions in the department as a whole, without the relevant background information.