

Problem Set 0
What do you want to know?

Assigned reading: Polchinski §1.1, 3.1. Start §1.2-1.4.

Due: Friday, September 7, 2007 at 3 PM in the 8.821 lock box (located on the 3rd floor of Building 8, at the junction with Building 16).

There is still some room for flexibility in the planning of this class. In order to help maximize the general happiness, I need some information from you. Strive for brevity, please.

1. Below is a list of ideas and sub-fields of theoretical physics with some connection to string theory. Please rate your level of intimacy with each of them according to the following rough system:

- 1 'I've never heard of it.'
- 2 'I ran into it once on the street on a rainy weekend evening in 1992.'
- 3 'I tried it a few times, but it made my neck hurt.'
- 4 'I ate it for breakfast this morning.'
- 5 'I wrote a 900-page book about it.'

It will help to keep in mind that the goal here is not to impress, but to convey what it is you need to learn.

- (a) CFT in two dimensions
- (b) quantization of constrained systems, BRST quantization
- (c) Seiberg-Witten theory, 4d $\mathcal{N} = 1$ field theories, duality in field theory
- (d) Calabi-Yau manifolds
- (e) instantons and solitons
- (f) black holes
- (g) Wigner's semicircle law
- (h) 't Hooft's double-line notation
- (i) supersymmetric quantum mechanics and the de Rham complex

[OVER, PLEASE]

2. What are your specific goals for this course?
3. Complete this sentence as many times as is applicable: I would be disappointed if January 2008 arrived and I still didn't know about ...