

The final exam will take place on **21 March 2013, 11:30am-2:29pm**.

Please bring a bluebook or two and a couple of pens. Do not write your name (or anything else) on the bluebook, as we will swop them around. Please also bring your student ID. You will not be allowed to talk, use any books or notes, or listen to your iPod.

The final exam will consist of three parts, consisting of short identification questions, short-answer questions where I expect a paragraph or so as answer, and of a third part asking you to work through a longer problem and to write an essay or two. You may not have to answer all questions, as I am likely to give you some choices.

A student has asked the very sensible question “what [I] might be able to say about to what degree the quizzes have been representative of the final exam. Particularly, if the final exam will be more conceptual-philosophical than some of the quizzes, particularly the early quizzes (and hence more similar to the later quizzes); or equally dependent on actual applications of quantum mechanics, vector mechanics, and the particular recall of specific discoveries/experiments in the development of quantum theory.”

Let me say the following few things in an attempt to give you some idea of how the final will look like:

- In general, you shouldn't take the quizzes as representative of how the questions will be asked, but perhaps more about what issues I take to be relevant. The quizzes are primarily designed to check whether you understood and memorized the central concepts, positions, arguments, etc. The final is an overall assessment, including a significant part to test the depth of your understanding.
- Before I break down my answer, let me say that I don't think that ultimately, historical, mathematical or technical, and philosophical, interpretational or conceptual aspects of quantum theory are strictly separable. But let me try to still give you some indication of how the final will look like.
- I may ask a question or two on the history of quantum mechanics and of some specific discoveries or experiments, but certainly no more than that. This is not my central concern.
- You should master the technical apparatus of the theory as the answers to some questions will depend on your mastery of it. But although this aspect is much more important than the historical side, it is **not** my utmost or primary concern.
- The primary concern, and hence the bulk of the exam, focuses on the conceptual and philosophical issues that arise from a foundational analysis of quantum theory. You will be asked to answer questions about what sort of implications result from the bare theory and its technical apparatus. You should definitely be able to discuss these.
- You absolutely will have to be able to sharply state the measurement problem and know about the major interpretations, their essential features, and their main difficulties.
- You also have to know the EPR argument, Bell's theorem and the relationship between the two. You should be able to reproduce the main ideas of the proof of the baby Bell's theorem.