

Physics III

Paper One

Due Monday 30 April, 2007

In this paper I want you to “dig into the weirdness” of quantum mechanics and explore some of the paradoxes, different interpretations, and philosophical implications of what we’ve been learning. The audience to have in mind when writing the paper is other people in the class. (If you want to write to a different audience, that’s fine, but please check with me first.) Your paper should be two to three pages. The topic is wide open—please write about something that’s of interest to you. Some possible topics are below. If you don’t like any of these, feel free to propose some alternative topic, but please clear it with me first.

1. In your own words, describe the EPR paradox. What is it that bothered Einstein so much? There’s no need to go into the details of the Aspect experiment—focus on what was paradoxical to Einstein. In your answer, you might want to quote comments from Einstein’s paper, or Mermin or Styer. This is fine and is probably a good thing to do (be sure to cite your source). However, be sure to also restate any quotes you use—don’t rely entirely on the quotes.
2. *The Ghost in the Atom*, edited by P.C.W. Davies and J.R. Brown, contains interviews of Alain Aspect, John Bell, and a number of other scientists and philosophers. This book is on reserve in the library. Read one of these interviews and comment and/or respond. Assume that your reader has not read the interview, so part of your task is to summarize what you think was important or interesting from the interview. But don’t just summarize—include your own thoughts and analysis.
3. Chose a paragraph or short passage from one of the readings we’ve done and write a detailed response or reflection based on it.
4. Some of the epistemological debates around quantum mechanics are similar to those that have occurred in other fields. Write about a connection you see between quantum mechanics and a particular area of study or question in another area of inquiry. Be as specific as possible and avoid generalities.
5. What interpretation of quantum mechanics are you most comfortable with, and why? What are the issues that quantum mechanics raises for you, and how might you come to terms with those issues? Or, are there issues that you haven’t come to term with?