Philosophy of Physics – Study Questions

These questions are for your benefit — to direct your reading and to suggest topics for discussion in precept. They are not to be turned in.

Sklar, "The quantum picture of the world," pp. 171–179.

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1. What is von Neumann's projection postulate, and what sort of puzzle does it raise? (p. 171)
2. What does the idea of "complementarity" say about the dichotomy between *waves* and *particles*? (p. 173)
3. How does Bohr attempt to support complementarity with an analogy to length and time in Special Relativity? (p. 174)
4. How does the Uncertainty Principle show up formally in the algebraic structure of (Heisenberg's) matrix mechanics? (p. 176)
5. Explain the differences between the views of (the early) Heisenberg, Bohr, and Einstein on the interpretation of the uncertainty relations. (p. 178) In what sense can Bohr's interpretation be considered "ontological"?
6. Question for further thought: Is Bohr's Copenhagen interpretation of quantum mechanics consistent with a "realist" view of science (i.e., a view according to which the goal of science is to find the truth about physical reality)? Does Bohr's stance devalue scientific research?