PHILOSOPHY OF PHYSICS CORE LIST

The purpose of this list is to inform a graduate student contemplating taking philosophy of physics as a minor area for his or her comprehensive examinations of some basic reading relevant to the subject. A student may use this information for one or more of three purposes
1. To decide whether to take a comprehensive examination in this area.
2. To get started early on reading central texts in preparation for a comprehensive examination in this area.
3. To provide an initial template in constructing his or her own specific reading list.
N.B. While this list *may* serve as a student's actual reading list for the philosophy of physics minor, a student is encouraged to offer creative alternatives, either to individual items or to an entire topic.
The final list is to be agreed upon by the student and his or her committee.
At least *two* topics should be chosen, including at least *one* of topics 1 and 2.

1. Space and Time

Books

- Sklar, L. Space, Time and Spacetime
- Price, H. Time's Arrow and Archimedes' Point
- Friedman, M. Foundations of Spacetime Theories

Articles

- Stein, Howard (1968) "On Einstein-Minkowski Space-Time" Journal of Philosophy 65: 5-23.
- Stein, Howard (1991) "On Relativity Theory and Openness of the Future", Philosophy of Science 58: 147-167.
- Malament, David (1977) "Causal Theories of Time and the Conventionality of Simultaneity" Nous 11: 293-300.
- Malament (1984) "Time Travel in a Godel Universe" PSA 2: 91-100.
- Maudlin (1993) "Buckets of Water and Waves of Space: Why Spacetime is Probably a Substance" Philosophy of Science 60: 183-203.
- Earman, John and Norton, John D. (1987) "What Price Spacetime Substantivalism," British Journal for the Philosophy of Science, 38, 515-525.
- Maudlin, Tim (1989) "The Essence of Spacetime," pp. 82-91 in A. Fine and J. Leplin (eds.) PSA 1988 Vol. 2.
- Butterfield, Jeremy (1988) "Albert Einstein meets David Lewis," pp. 56-64 in A. Fine and J. Leplin (eds.) PSA 1988 Vol. 2.

2. Quantum Mechanics

Books

- Hughes, R.I.G. The Structure and Interpretation of Quantum Mechanics
- Albert, D. Quantum Mechanics and Experience
- Maudlin, T. Quantum Non-Locality and Relativity

Articles and Selections

- Einstein, Podolsky and Rosen, `Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?', Phys. Rev. 47 (1935): 777--80.
- Niels Bohr, `Can Quantum-Mechanical Description of Physical Reality be Considered Complete?', Phys. Rev. 48 (1935): 696--702.
- Halvorson, Hans and Clifton, Rob (2001) Reconsidering Bohr's reply to EPR, Phil.Sci..
- Bell, J.S. Speakable and Unspeakable in Quantum Mechanics, chs. 1,2,7,16.
- Mermin, D. "Simple unified form for the major no-hidden-variables theorems", Phys. Rev. Lett. 65, 3373–3376 (1990).
- Jeffrey Bub, `Quantum measurement problem', Routledge Encyclopedia of Philosophy, Phil.Sci..

- Sheldon Goldstein, `Bohmian Mechanics', Stanford Encyclopedia of Philosophy (2001).
- David Wallace, `Worlds in the Everett Interpretation', Studies in History and Philosophy of Modern Physics.
- Jeffrey A. Barrett (1998), Everett's Relative-State Formulation of Quantum Mechanics. Stanford Electronic Encyclopedia of Philosophy.
- GianCarlo Ghirardi, `Collapse Theories', Stanford Encyclopedia of Philosophy (2002).
- David Albert, Barry Loewer, `Two No-Collapse Interpretations of Quantum Theory', Noûs 23 (1989): 169--186.

3. Statistical Mechanics

Books

- Albert, D., Time and Chance.
- Sklar, L. Physics and Chance.

Articles

- Callender, C. (2001) "Taking Thermodynamics (Too) Seriously", Studies in History and Philosophy of Modern Physics 32: 539-53.
- Uffink, J. (2001) "Bluff your way in the second law of thermodynamics", Studies in History and Philosophy of Modern Physics 32: *305-394.*
- Lebowitz, J.L. (1999) "Statistical Mechanics: a Selective Review of Two Central Issues", available at http://arxiv.org/abs/math-ph/0010018
- Callender C. "Thermodynamic Asymmetry in Time", available at http://plato.stanford.edu/entries/time-thermo/
- H. Grad, (1961) "The Many Faces of Entropy", Communications on Pure and Applied Mathematics," Vol. XIV, 232-354.
- Callender, C. (1999) "Reducing Thermodynamics to Statistical Mechanics: The Case of Entropy", Journal of Philosophy XCVI: 343-373.
- Earman, J. (2006) "The Past Hypothesis: Not Even False", Studies in History and Philosophy of Modern Physics 37: 399-430.
- Leeds, S. (2003) "Foundations of Statistical Mechanics: Two Approaches", Philosophy of Science 70:126-44.

Examples of Alternative Topics (detailed readings to be chosen in consultation)

4. Determinism in physics and its problems
5. Reduction and emergence in physics
6. Dynamical systems and chaos
7. Quantum field theory
8. Applications of mathematics in physics
9. Philosophy of cosmology
10. Symmetry in physics
11. The role of experiment in physics