# THE ARCHITECTURE OF FUNDAMENTAL PHYSICAL THEORIES

**Week 1:** From the manifest image to the scientific image. What is a fundamental theory? What is the relationship between the fundamental and fundamental? a) identity, b) supervenience, c) functionalist, d) grounding, e)other?

The history of the idea that everything can be accounted for in terms of the degree of freedom of fundamental entities and fundamental laws expressed mathematically.

Conception of a fundamental theory as space-time arena, ontology, laws and as complete.

**Week 2:** Classical Mechanics (Hamiltonian and Lagrangian). Determinism.

**Week 3:** Fields: Laplace, Faraday, Maxwell. Fields or Particles or both?

**Weeks 4 & 5:** The need for chances to supplement classical mechanics. Statistical mechanics. The thermodynamic arrow. The Mentaculus. Probability vs. typicality (Loewer, Frigg, Lazarovici).

**Week 6:** Recovering the manifest image. The special sciences. The epistemic and causal arrows. (Albert, Loewer, Callender).

**Week 7:** Space and Time: Relationism vs. Substantivalism. How is time different from space. A-theory and B-theory. Is there an intrinsic direction to time? Mach, Williams, Maudlin, Callender.

**Week 8 & 9:** Philosophical analysis of laws and probability. Humeanism vs. Anti-Humeanism (Maudlin). Super-Humeanism (Esfeld). The package deal (Loewer).

**Week 10 & 11:** Quantum Mechanics. Measurement problem with potential solutions. Everett, GRW, Bohm. New and more difficult issues of the relationship between the fundamental and the non-fundamental. Primitive ontology. “How to Teach QM” (Albert, Loewer).

**Week 12:** Equivalent theories (Loewer)

**Week 13:** Recovering the manifest image 2. Grounding and alternatives (Albert, Schaffer, Sider).