

Special Topics in Physics: Conceptual Problems in Physics

Physics 598 CPP

Fall 2019

<u>Lecture</u>	<u>Date</u>	<u>Topic(s)</u>
1.	Mon. 26 Aug.	General introduction to course
2.	Tues. 27 Aug.	Space time and causality in Newtonian mechanics: Laplace's demon
3.	Tues. 3 Sept.	Classical electromagnetic theory: what's for real?
4.	Mon. 9 Sept.	Special relativity: space, time Lorentz invariance, mass-energy relation
5.	Tues. 10 Sept.	Special relativity: some paradoxes
6.	Mon. 16 Sept.	General relativity: basic notions
7.	Tues. 17 Sept.	General relativity: black holes, wormholes, black hole thermodynamics...
8.	Mon. 23 Sept.	Optional topics in classical mechanics, electromagnetism, special and general relativity
9.	Tues. 24 Sept.	Classical thermodynamics: Caratheodory's principle
10.	Mon. 30 Sept.	The concept of probability in physics
11.	Tues. 1 Oct.	Entropy in thermodynamics and statistical mechanics
12.	Mon. 7 Oct.	Information and entropy: Maxwell's demon
13.	Tues. 8 Oct.	Irreversibility in physics and biology
14.	Mon. 14 Oct.	The "arrow of time"
15.	Tues 15 Oct.	Optional topics in thermodynamics and statistical mechanics.

The second half of the course will be mainly on quantum mechanics and cosmology.