Course Description

The goal of this course is to analyze a wide range of philosophical issues that are informed by relativistic physics. The primary issue will be the philosophical debates over the ontological status of space and time, starting with the dispute between Newton and Leibniz about whether space is something above and beyond the properties of material bodies, and tracing how this debate evolved as attention shifted to relativistic theories. This debate was a motivating philosophical consideration in Einstein’s development of relativity, so we will examine Einstein’s role in the debate and how logical positivists interpreted relativity as supporting their broader philosophical program. Also, we will examine how relativity bears on our understanding of matter and energy.

There are no formal prerequisites for this course, but mathematics will be used in the course. I will presuppose that you understand differential calculus, vectors, and matrices. We will discuss the necessary elements of differential geometry for understanding the conceptual problems in relativity.

Tasks and Evaluations

Your grade for the course will be determined by these factors:

1. There will be six homework assignments throughout the semester, worth a total of 60% of your final grade. The goal of these assignments will be for you to write expositions of theoretical and philosophical issues that arise in relativity. You will be attempting to write articles of the kind a sophisticated science journalist would write, pitched at an educated adult audience. Two of the assignments will involve solving some simple physics problems.

2. There is a take-home mid-term exam worth 15% of your final grade. It will involve criticism of existing textbook and popular presentations of various aspects of special relativity, as well as analysis about the range of philosophical interpretations of the theory of relativity and spacetime physics more generally.

3. There is a comprehensive final worth 25% of your final grade.