

What is Time?

The philosopher J.R. Lucas wrote in his **Treatise on Time and Space**: “We listen with respect when we are told that time is a moving image of eternity, a measure of change, an extension of the mind, the order of events, the readings given by clocks, or the fourth dimension...But although we listen with respect, we do not give our wholehearted assent... None of these definitions captures the essence of time. We cannot say what time is because we know already, and our saying could never match up to all that we already know.”

The focus of the course will be on relating our subjective understanding of time and our perceptions of time to what physics and philosophy say about time. We will examine, in six sessions, important approaches to understanding time: Subjective time (psychology and physiology); Classical Physics and Time; Time and Relativity; Time Travel; Time and Quantum Mechanics; and finally the question, “Does time flow?”

This course will be similar to the format of a seminar: presentation of ideas and observations concerning time with questions and comments to and from the participants. A course packet will be given out at the first session with details of the sessions. Below is a selection of reading material. From this list of books, it is suggested that the participants in the course choose one book of particular interest to become familiar with the author’s view and, if so desired, to participate in contributing to the discussions on those topics. Enjoy your summer reading. A background in physics is not necessary.

Suggested readings (one text would be sufficient)

Felt Time – *The Science of How We Experience Time*. Mark Wittmann

Your Brain is a Time Machine – *The Neuroscience and Physics of Time*. Dean Buonomano

Why Time Flies – *A Mostly Scientific Investigation*. Alan Burdick

The Labyrinth of Time – *Introducing the Universe*. Michael Lockwood

The Fabric of the Cosmos – *Space, Time, and the Texture of Reality*. Brian Greene

From Eternity to Here – *The Quest for the Ultimate Theory of Time*. Sean Carroll

Now – *The Physics of Time*. Richard A Muller

The Order of Time. Carlo Rovelli

In Search of Time. *The History, Physics, and Philosophy of Time*. Dan Falk

Time Machines. *Time Travel in Physics, Metaphysics, and Science Fiction*. Paul Nahin

Leader: Stuart Kurtz, whose current interests are in the philosophy of science and time, has had a career in both science and engineering, and as a researcher in industry.

Fridays: 1:30 p.m. to 3:30 p.m., 6 weeks: October 4 through November 15 (no class on 10/25)

Location: PSRC, Maximum 12 seats