

**Organising
institution**

Università degli Studi di Padova
Padova Neuroscience Center
Prof. Samir Suweis

**Visiting
Professor**

Kenneth Harris
UCL -University College London's Global University, Regno Unito

**Course Title
and
Description**

Brain as Complex System

This series of four seminars would introduce brain as complex system to a broad audience formed by specialists (e.g neuroscientists), but also quantitative scientists with low specific background on neurobiology from fields such as physics, engineering, or informatics.

The first seminar will be an introduction to the brain and the promise of neurotechnology. This will cover the basics of brain function, and some of the technologies emerging from recent neuroscience research, such as brain-computer interfaces.

The second seminar will be devoted to experimental technologies. This will cover ways to study the brain, including 2-photon microscopy to record from tens of thousands of cells simultaneously, microfabricated electrodes to record from wide brain regions, and optogenetics to stimulate brain cells at will. Also data analysis technique recently developed to exploit and analyse the large amount of data produced by the above experimental methods

The third seminar will be titled "Cells of the brain" and will present some of my recent research on this topic. This will also cover methods from transcriptomics, which can classify all the cells the brain (or any other organ) is made of.

The last seminar will cover the topic of Information coding. This will show how methods of advanced mathematics can help understand how neurons encode information, with implications to machine learning.

Period

09/11/2021 – 19/11/2021

Course Level

PhD in Neuroscienze
Corso di laurea magistrale in Physics of Data,
Corso di laurea magistrale in Physics
Scuola Galileiana (classe di Scienze)