![IPAM logo] **iPAM** institute for pure & applied mathematics
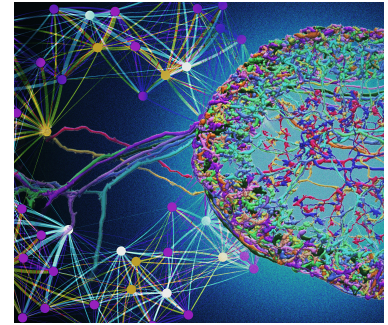
Mathematical Approaches for Connectome Analysis

February 12 - 16, 2024

Scientific Overview

In the past few years, the scale of data sets of the wiring of neural systems ("connectomes") has increased significantly. There are now near-complete connectomes of the central brains of Drosophila larvae and adults, volumes of mouse and human cerebral cortex, and data sets from several other species. With this increasing scale comes a need for quantitative methods to identify structure in large connectivity maps and relate it to the function of nervous systems.

The purpose of this workshop is to bring together neuroscientists who collect and study these data sets with mathematicians and other theorists who develop techniques to model and analyze networks, network dynamics, and dynamical processes on networks. We expect that crossing disciplinary boundaries will greatly facilitate progress, as neuroscientists working in connectomics often lack exposure to recent mathematical developments, while the biological and technical details that underlie connectomic data may not be familiar to mathematicians. This workshop will help define directions of future work in connectomics, with deep links to neuroscience, mathematics, and data science.

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

Organizers

Gwyneth Card (Columbia University)
Moo K. Chung (Uni. of Wisconsin-Madison)
Marta Costa (Uni. of Cambridge)
Vivek Jayaraman (Janelia Research Campus)
Ashok Litwin-Kumar (Columbia University)
Marcella Noorman (Janelia Research Campus)
Mason A. Porter (UCLA))
Sandro Romani (Janelia Research Campus)
Eli Shlizerman (Uni. of Washington)

Speakers

Larry Abbott (Columbia University)
Danielle Bassett (Uni. of Pennsylvania)
Albert Cardona (Uni. of Cambridge)
Carina Curto (Penn State University)
Moritz Helmstaedter (Max Planck Institute for Brain Research)
Kathryn Hess (EPFL (Ecole Polytechnique Fédérale de Lausanne))
Smita Krishaswamy (Yale University)
Wei-Chung Lee (Harvard Medical School)
Cristopher Moore (Santa Fe Institute)
Sarah Muldoon (SUNY Buffalo)
Giovanni Petri (Northeastern Uni. London)
Jonathan Rubin (Uni. of Pittsburgh)
Elad Scheidman (Weizmann Institute of Science)
Philipp Schlegel (Uni. of Cambridge)
Susanne Schreiber (Humboldt-Uni. Berlin)
Sara Solla (Northwestern Uni. Medical School)
Srini Turaga (Janelia Research Campus)
Yusu Wang (UCSD)
Marta Zlatic (Uni. of Cambridge)

![NSF logo] ![UCLA logo] ![QR code]

For more information, visit the program webpage:
www.ipam.ucla.edu/MAC2024