

Mathematics of Intelligences

September 9 - December 13, 2024

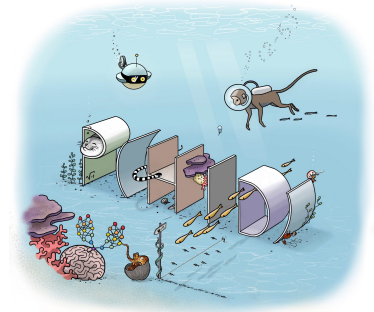
Scientific Overview

The quest to understand intelligence is one of the great scientific endeavors—on par with quests to understand the origins of life or the foundations of the physical world. Several scientific communities have made significant progress in fields like animal cognition, cognitive science, collective intelligence, and artificial intelligence, as well as the social and behavioral sciences. Yet these communities remain largely disconnected. Now is the time to bring them together with mathematicians to develop the mathematical foundations necessary for transformational advances in understanding natural and artificial intelligences.

This long program seeks to develop those foundations. It will build community and collaboration between participants from the domain sciences and participants from relevant mathematical fields, including dynamical systems, statistical physics, theoretical machine learning, probability and (Bayesian) statistics, information theory, high-dimensional geometry, functional analysis, the theory of programming languages, game theory, and category theory.

Long Program Schedule

- Mathematics of Intelligences Opening Day: September 9, 2024
- Mathematics of Intelligences Tutorials: September 10-13, 2024
- Workshop I: Analyzing High-dimensional Traces of Intelligent Behavior: September 23-27, 2024
- Workshop II: Theory and Practice of Deep Learning: October 14-18, 2024
- Workshop III: Naturalistic Approaches to Artificial Intelligence: November 4-8, 2024
- Workshop IV: Modeling Multi-Scale Collective Intelligences: November 18-22, 2024
- Mathematics of Intelligences Culminating Workshop at Lake Arrowhead: December 8-13, 2024



Organizers

Pranab Das (Elon University)
Jessica Flack (Santa Fe Institute)
Jacob Foster (Indiana University)
Tom Griffiths (Princeton University)
Boris Hanin (Princeton University)
Max Kleiman-Weiner (University of Washington)
Orit Peleg (University of Colorado Boulder)
Pat Shafto (Rutgers University)
Josh Tenenbaum (Massachusetts Institute of Technology)

Participation

This long program will involve senior and junior researchers from several communities relevant to this program. You may apply for financial support to participate in the entire fourteen-week program, or a portion of it. We prefer participants who stay for the entire program. Applications will be accepted through April 9, 2024 but offers may be made up to one year before the start date. We urge you to apply early. Mathematicians and scientists at all levels who are interested in this area of research are encouraged to apply for funding. Supporting the careers of women and minority researchers is an important component of IPAM's mission and we welcome their applications. More information and an application is available online.



For more information, visit the program webpage:
www.ipam.ucla.edu/MOI2024