UCLA

Mani L. Bhaumik
Institute for Theoretical Physics

California AI Amplitudes
School and Workshop



November 18–21, 2026

Location

The Mani L. Bhaumik Centennial Collaboratory

Young Hall 4222, Chemistry Department, UCLA

Program overview

The Mani L. Bhaumik Institute for Theoretical Physics is hosting a school and workshop on machine learning and artificial intelligence for theoretical physics. Scattering amplitudes in quantum field theory will serve as case studies. In brainstorming sessions, participants will work with ML experts to discuss possible new ways to tackle research problems. The final day will be devoted to research talks from participants.

ML foundations

- Supervised and unsupervised learning, including classification and regression
- Neural networks, loss functions, and gradients
- Generative models (GANs, VAEs, diffusion)
- Transformers and reinforcement learning

Research case studies

- Spinor-helicity amplitude classifier demo
- Transformer example for amplitudes
- Linear identities for Feynman integrals
- Feynman integral differential equations

AI-assisted research

Coding, agentic workflows and validation

School Lecturers

WED–FRI, NOV 18–20

François Charton (Axiom Math)

Kyle Cranmer (Wisconsin)

Federica Devoto (SLAC)

Sven Harder (UCLA)

Zhongbo Kang (UCLA)

Julie Pagès (SLAC)

Sofia Palacios Schweitzer (Rutgers)

Michael Ruf (SLAC)

David Shih (Rutgers)

Matthias Wilhelm (U. Southern Denmark)

Mao Zeng (Edinburgh)

Participant research talks

SAT, NOV 21

Organizers

Zvi Bern (UCLA)

François Charton (Axiom Math)

Lance Dixon (SLAC)

Sven Harder (UCLA)

Callum Jones (University of Arizona)

Zhongbo Kang (UCLA)

Michael Ruf (SLAC)

David Shih (Rutgers)

Matthias Wilhelm (U. Southern Denmark)

Program & event information

indico.global/event/19403/