

Department of Physics and Astronomy Colloquium Series

Tuesday, February 17, 2026, 2:30pm in PSE 317

Speaker: Yonatan Kahn

Institution: University of Toronto

Title: Physics for AI for Physics

Abstract: In just the past decade, neural networks have made stunning progress on tasks long thought to be exclusive to humans, but the "hard problem" of artificial intelligence remains: why does a trained neural network give the output it does? In this talk, I will show that an approach to studying neural networks which borrows techniques and perspectives from physics can make quantitative progress on at least three important facets of this problem: what happens during training, why performance appears to scale predictably and robustly with the amount of training data, and how the structure of data affects both training and performance. I will argue that physics provides a suite of theoretical tools naturally suited for studying neural networks, and how the topology and geometry of collider physics data may be used as a testbed for theories of machine learning relevant for data "in the wild". Armed with this improved understanding beyond the "black box" of AI, we can put AI tools to better use to discover more about the physics of our universe.