Physics Seminar: Jim Halverson, "Neural Networks and Field Theory"

Thursday, October 23 · 2:00 – 3:00pm in room 313

Title: Neural Networks and Field Theory

Abstract: In this lecture I'll dive deeper into connections between neural networks and field theory. I'll begin by reminding you of the simplest neural network, a single layer feedforward neural network, and how it realizes a Gaussian theory in the infinite width limit. I'll then describe generalities of a NN approach to FT and the difference between a NN-QFT and a more general NN-FT. I'll then describe in detail the origin of interactions, simple global symmetries, local interactions, and — time permitting — conformal symmetry and supersymmetry. As in the colloquium, I'll try to clearly divide what is known and what remains to be understood.