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Machine learning phases of matter JUAN CARRASQUILLA , MILES STOUDENMIRE, Perimeter Inst for Theo Phys, ROGER MELKO, Perimeter Inst for Theo Phys and University of Waterloo — We show how the technology that allows automatic teller machines read hand-written digits in cheques can be used to encode and recognize phases of matter and phase transitions in many-body systems. In particular, we analyze the (quasi-)order-disorder transitions in the classical Ising and XY models. Furthermore, we successfully use machine learning to study classical Z_2 gauge theories that have important technological application in the coming wave of quantum information technologies and whose phase transitions have no conventional order parameter.

Juan Felipe Carrasquilla Alvarez
Perimeter Inst for Theo Phys

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