KAVLI INSTITUTE FOR THEORETICAL PHYSICS
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KITP Conference: At the Crossroad of Physics and Machine Learning
(Feb 11-15, 2019)
Coordinators: Giuseppe Carleo, Kyle Cranmer, Rose Yu, and Lenka Zdeborová

Monday, Feb 11, 2019

Session Chair: Lenka Zdeborová (CEA Saclay)

8:50am	Lars Bildsten (KITP Director)	Welcome
9:00am	Andrea Montanari (Stanford)	Mean Field Concepts in Machine Learning
10:00am	Florent Krzakala (ENS Paris)	Statistical Physics and Machine Learning
11:00am	**Lunch Break-KITP COURTYARD**	
11:30am	Greg Ver Steeg (UCS)	Exact Information Bottlenecks for Arbitrary Distributions with Echo Noise
12:30pm	**LUNCH BREAk-KITP COURTYARD**	

Session Chair: Kyle Cranmer (NYU)

2:00pm	Chiara Cammarota (King's)	Rough-glassy Landscapes from Inference to Machine Learning
3:00pm	Pratik Chaudhari (UCLA)	A Picture of the Energy Landscape of Deep Neural Networks
4:00pm	**Afternoon Break-KITP COURTYARD**	
4:30pm	Michael Bronstein (Imperial)	Deep Learning on Graphs: from Astrophysics to Fake News Detection
5:30pm	**SHUTTLE TO BWSCI**	

Tuesday, Feb 12, 2019

Session Chair: Giuseppe Carleo (Flatiron)

9:00am	Michele Parrinello (ETH Zurich)	Machine Learning and Enhanced Sampling
10:00am	Kieron Burke (UC Irvine)	Machine Learning in Electronic Structure: Finding Better Density Functionals than Humans do
11:00am	**Morning Break-KITP COURTYARD**	

11:30am Isaac Tamblyn (NRC Canada)   Rubber Ducks and a Sea of Electrons - Designing Neural Networks Physics which Incorporate Physics

12:30pm   **Lunch Break-KITP COURTYARD**

2:00pm Mihai A. Petrovici (U of Bern)   Computers Like Brains

3:00pm Benjamin Wandelt (Flatiron)   Bayesian Likelihood-free Inference in Cosmology and Information Maximizing Neural Networks

4:00pm   **Afternoon Break-KITP COURTYARD**

4:30pm Panel   Open problems

5:30pm   **RECEPTION-KITP COURTYARD**

6:00pm   **SPECIAL EVENTS DINNER-KITP COURTYARD**

8:00pm   **SHUTTLE TO BWSCI**

Wednesday, Feb 13, 2019

9:00am Yashar Hezaveh (Stanford)   Mapping Distant Galaxies with Machine Learning

10:00am Fernanda Psihas (UT Austin)   Successes and Perspectives of Deep Learning Applications to Neutrino Physics

11:00am   **Morning Break-KITP COURTYARD**

11:30am Jaan Altosaar (Princeton)   Hierarchical Variational Approximations for Physics Models

12:30pm   **Lunch Break-KITP COURTYARD**

2:00pm   **FREE AFTERNOON-Shuttle Available to BWSCI**

Thursday, Feb 14, 2019

Session Chair: Giuseppe Carleo (Flatiron)

9:00am Eun-Ah Kim (Cornell)   Machine Learning Quantum Emergence

10:00am Titus Neupert (U of Zurich)   Excitations and Symmetries in Neural Network Variational Wave Functions

11:00am   **Morning Break-KITP COURTYARD**

11:30am Juan Carrasquilla (Vector)   Learning Quantum States with Generative Models

12:30pm   **Lunch Break-KITP COURTYARD**

Session Chair: Lenka Zdeborová (CEA Saclay)

2:00pm	Hartmut Neven (Google)	TBA
3:00pm	Lei Wang (CAS, China)	Tensor Networks for Generative Modeling
4:00pm	**Afternoon Break-KITP COURTYARD**	

4:30pm	Panel	Open problems
5:30pm	**RECEPTION-KITP COURTYARD**	

6:00pm	**SPECIAL EVENTS DINNER-KITP COURTYARD**

8:00pm	**SHUTTLE TO BWSCI**

Friday, Feb 15, 2019

Session Chair: Rose Yu (Northeastern)

9:00am	James Halverson (Northeastern)	Machine Learning Geometry and String Theory
10:00am	Stephan Mandt (UC Irvine)	Physics-inspired Machine Learning: Non-equilibrium, Perturbation Theory, and Goldstone Modes
11:00am	**Morning Break-KITP COURTYARD**	

11:30am	Phiala Shanahan (MIT)	Machine Learning for Lattice Quantum Field Theory Calculations
12:30pm	**Lunch Break-KITP COURTYARD**	

Session Chair: Lenka Zdeborová (CEA Saclay)

2:00pm	Andrey Lokhov (LANL)	Predicting the Behavior of Analog Quantum Annealers with Statistical Learning
3:00pm	Yasaman Bahri (Google AI)	Deep Neural Networks as Gaussian Processes

4:00pm	**CONFERENCE END SHUTTLE TO BWSCI *Also available to SB Airport and SB Airbus, Goleta location (See Registration Desk BEFORE FRIDAY to sign up.)**