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## KITP Conference: Machine Learning for Climate

(Nov 1-4, 2021)

**Coordinators: Henk A. Dijkstra, Claire Monteleoni, and Laure Zanna**

### Monday, Nov 01, 2021

8:50am Lars Bildsten (KITP Director)	Welcome
9:00am Steven Brunton (U Washington)	Interpretable and Generalizable Machine Learning for Fluid Dynamics
9:45am Rose Yu (UC San Diego)	Physics-Guided Deep Learning for Fluid Dynamics
10:30am	<b>Morning Break</b>
11:00am Laure Zanna (NYU)	Machine Learning for Ocean Closures: Advances and Lessons
11:45am Pedram Hassanzadeh (Rice)	Data-driven subgrid-scale modeling: Stability, extrapolation, and interpretation
12:30pm	<b>Lunch Break</b>
2:00pm Jaideep Pathak (LBNL)	Data-driven and data-assisted modeling for applications in fluid dynamics and geophysics
2:45pm Navid Constantinou (ANU)	A data-driven approach for developing and calibrating a parameterization of the ocean mesoscale eddy fluxes
3:30pm	<b>Afternoon Break</b>
4:00pm Alistair Adcroft (Princeton)	Towards using machine learning in real climate models
4:45pm Aneesh Subramanian (CU Boulder)	Exploring physical and Machine Learning approaches for stochastic modeling and ensemble prediction of weather and climate
5:30pm	<b>RECEPTION</b>
6:00pm	<b>SPECIAL EVENTS DINNER</b>
8:00pm	<b>SHUTTLE TO BWSCI</b>

### Tuesday, Nov 02, 2021

9:00am Gus Camps-Valls (U de València)	Gaussianizing the Earth
9:45am Christian Lessig (U Magdeburg)	Representation learning and custom loss functions for atmospheric data
10:30am	<b>Morning Break</b>
11:00am Jakob Runge (DLR)	Causal inference for Earth system sciences
11:45am Claire Monteleoni (CU Boulder)	Deep Unsupervised Learning for Climate Informatics
12:30pm	<b>Lunch Break</b>
2:00pm Maike Sonnewald (Princeton)	Revealing the Impact of Global Heating on the Meridional Overturning Circulation with transparent machine learning
2:45pm Bryan Kaiser (LANL)	Objective discovery of dominant dynamical regimes
3:30pm	<b>Afternoon Break</b>
4:00pm Dorit Hammerling (Mines)	Contained Chaos: Ensemble Consistency Testing for the Community Earth System Model
4:45pm Maria Molina (NCAR)	Deep Learning for Subseasonal Global Precipitation Prediction
5:30pm	<b>RECEPTION</b>
6:00pm	<b>SPECIAL EVENTS DINNER</b>
8:00pm	<b>SHUTTLE TO BWSCI</b>

**Wednesday, Nov 03, 2021**

9:00am Elizabeth Barnes (Colorado State)	Benefits of saying I Don't Know when analyzing and modeling the climate system with ML
9:45am Abigail S Bodner (NYU)	Relating coastal sea level to its drivers in the interior
10:30am	<b>Morning Break</b>
11:00am Henk Dijkstra (Utrecht U)	Skillful El Nino prediction beyond predictability barriers
11:45am Duncan Watson-Parris (Oxford)	Earth System Emulation
12:30pm	<b>Lunch Break</b>
2:00pm Tapio Schneider (Caltech)	How to calibrate climate models with diverse data: an example from cloud parameterizations
2:45pm Robert Pincus (LDEO)	Atmospheric radiation: using machine learning for the unknowable and uncomputable
3:30pm	<b>Afternoon Break</b>
4:00pm Mike Pritchard (UCI)	Lessons and outlook for ML parameterization of sub grid atmospheric physics from the vantage of emulating cloud superparameterization
4:45pm Aditi Sheshadri (Stanford)	A deep learning parameterization of gravity wave drag coupled to an atmospheric global climate model
5:30pm	<b>RECEPTION</b>
6:00pm	<b>SPECIAL EVENTS DINNER</b>
8:00pm	<b>SHUTTLE TO BWSCI</b>

**Thursday, Nov 04, 2021**

9:00am Amy Mc Govern (Oklahoma)	Using AI to Facilitate Environmental Justice: The Need for Ethical and Responsible AI for Weather and Climate
9:45am Antoine Blanchard (AIR Worldwide)	Debiasing coarse-scale climate models using statistically consistent neural networks
10:30am	<b>Morning Break</b>
11:00am Jacquelyn Shelton (Hong Kong Polytechnic U)	Combining deep learning and Bayesian inference for fine dead wood segmentation
11:45am Katie Dagon (NCAR)	Machine Learning-Based Feature Detection to Associate Precipitation Extremes with Synoptic Weather Events
12:30pm	<b>Lunch Break</b>
2:00pm Donata Giglio (CU Boulder)	Estimating Oxygen in the Southern Ocean using Argo Temperature and Salinity
2:45pm Annalisa Bracco (Georgia Tech)	Manifold learning as a tool to link AI/ML and climate dynamics
3:30pm	<b>CONFERENCE END SHUTTLE TO BWSCI *Also available to SB Airport and SB Airbus, Goleta location. (See Registration Desk BEFORE THURSDAY to sign up.)</b>