

KITP Conference: Galaxy Formation and Evolution in the Data Science Era

(Mar 21-24, 2023)

Coordinators: Peter Behroozi, Francisco Villaescusa-Navarro, Shirley Ho, and Blakesley Burkhart

Tuesday, Mar 21, 2023

8:50am Lars Bildsten (KITP)	Welcome[Video]
9:00am John Wu (STSCI)	Distilling physics from astronomical imaging[Slides][Video]
9:30am Elise Darragh Ford (Stanford)	Optimizing Target Selection for Low-Redshift Galaxy Surveys[Video]
10:00am Christian Aganze (UCSD)	Prospects for Detecting Gaps in GC Streams with Roman[Video]
10:30am	Morning Break
11:00am Blakesley Burkhart (Rutgers)	How Supermassive Black Holes Ignite the Intergalactic Medium: Tales from the Low Redshift Lyman-alpha Forest[Slides][Video]
11:30am Megan Tillman (Rutgers)	Too Hot to Handle: The Role of Supermassive Black Holes in Heating the Low Redshift Intergalactic Medium[Slides][Video]
12:00pm Sabrina Appel (Rutgers)	How the Gas Dynamics Set the Star Formation Rate of Molecular Clouds[Slides][Video]
12:30pm	Lunch Break
2:00pm Diane Salim (Rutgers)	A physics-informed super-resolution model for model for (astrophysical) turbulence[Video][CC]
2:30pm Haowen Zhang (U. Arizona)	TRINITY: self-consistently modelling the dark matter halo-galaxy-supermassive black hole connection from $z = 0-10$[Slides][Video][CC]
3:00pm GALEVO Conference Participants	Lightning Talks[Video][CC]
3:30pm	Afternoon Break
4:00pm Festa Bucinca (Graduate Center CUNY)	Can we discover a physical model for galaxy sizes using a data-driven approach?[Video][CC]
4:30pm Natali Soler Matubaro De Santi (Flatiron)	Constraining Ω_m with phase-space information of galaxies[Slides][Video][CC]
5:00pm Tri Nguyen (MIT)	FLORAH: Planting Better Merger Trees with Deep Generative Models[Video][CC]
5:30pm	SHUTTLE TO BWSCI

Wednesday, Mar 22, 2023

9:00am Dalya Baron (Tel Aviv U)	Finding simple structures in complex datasets[Video][CC]
9:30am Suchetha Cooray (Nagoya U)	Learning representations of galaxies from simulations and observations[Video][CC]
10:00am Sultan Hassan (New York U)	Generating high-fidelity HI maps using score-based diffusion models[Slides][Video][CC]
10:30am	Morning Break
11:00am Peter Behroozi (Arizona)	MCMCs for neural networks: efficient sampling in millions of dimensions[Slides][Video][CC]
11:30am Josh Peek (STSCI)	Towards Astronomical Search By Image: The Hubble Image Similarity Project[Video][CC]
12:00pm Martin P. Rey (Oxford)	Interpreting the diversity of diffuse stellar halos in the era of large imaging surveys[Video][CC]
12:30pm	Lunch Break
2:00pm Tjitske Starkenburg (Northwestern)	Galaxy formation histories and their stellar halos[Slides][Video][CC]
2:30pm Jo Ciuca (ANU)	Unsupervised learning for stellar spectra with deep normalizing flows[Video][CC]

3:00pm Christian Kragh Jespersen (Princeton) [Learning Galaxy Properties from Merger Trees\[Video\]\[CC\]](#)
3:30pm **Afternoon Break**

4:00pm Paco Villaescusa Navarro (Flatiron) [The CAMELS project\[Video\]\[CC\]](#)
4:30pm Toby Brown (NRC-CNRC) [Regulators of molecular gas content and star formation efficiency in cluster and field galaxies\[Video\]\[CC\]](#)

5:00pm Marc Huertas Company (U ParisÂ Diderot) [Learning from simulations\[Video\]\[CC\]](#)
5:30pm **RECEPTION**

6:00pm **SPECIAL EVENTS DINNER**

8:00pm **SHUTTLE TO BWSCI**

Thursday, Mar 23, 2023

9:00am Risa Wechsler (Stanford) [Tiny galaxies and detectable dark halos: Physics at and below the threshold of galaxy formation\[Video\]\[CC\]](#)

9:30am Richie Wang (Stanford) [Modeling dwarf galaxy formation with UniverseMachine\[Video\]\[CC\]](#)

10:00am Elaheh Hayati (Steward Obs.) [Estimating Andromeda's dark matter halo mass\[Video\]\[CC\]](#)

10:30am **Morning Break**

11:00am Lina Necib (MIT) [Tracing Dark Matter with Stars\[Video\]\[CC\]](#)

11:30am Dovi Poznanski (Tel Aviv U) [Outliers: how I learned to love them, and why you should too\[Video\]\[CC\]](#)

12:00pm Aleksandra Cipurjanovic (Fermilab) [Towards flexible domain adaptation methods for cross-datasets studies of galaxies\[Slides\]\[Video\]\[CC\]](#)

12:30pm **Lunch Break**

2:00pm Eric Gawiser (Rutgers) [Star Formation Histories of Galaxies Near and Far\[Slides\]\[Video\]\[CC\]](#)

2:30pm Louise Edwards (Cal Poly) [The Brightest Cluster Galaxy and Intracluster Light\[Video\]\[CC\]](#)

3:00pm Elena Giusarma (Michigan Tech) [Learning to Simulate the Universe with Deep Learning\[Video\]\[CC\]](#)

3:30pm **Afternoon Break**

4:00pm Christopher Lovell (Portsmouth) [Predicting Galaxy Populations Conditioned on Cosmological and Astrophysical Parameters using Normalizing Flows and the CAMEL Simulations\[Video\]](#)

4:30pm Haley Bowden (Steward Obs.) [Finding environmental measures sensitive to halo properties using neural networks\[Slides\]\[Video\]](#)

5:00pm Yuan Sen Ting (ANU) [Galaxy Merger Reconstruction with Generative Graph Neural Networks\[Video\]](#)

5:30pm **RECEPTION**

6:00pm **SPECIAL EVENTS DINNER**

8:00pm **SHUTTLE TO BWSCI**

Friday, Mar 24, 2023

9:30am Sotiria Fotopoulou (Bristol) [Classification from real, messy data\[Video\]\[CC\]](#)

10:00am Mike Walmsley (U. Manchester) [Galaxy Zoo in the Deep Learning Era\[Video\]\[CC\]](#)

10:30am **Morning Break**

11:00am John Forbes (Flatiron) [Dust Properties of Galaxies from a Data-Driven Hierarchical Model\[Video\]\[CC\]](#)

11:30am Kartheik Iyer (Columbia)

[The information content of galaxy star formation histories\[Video\]\[CC\]](#)

12:00pm Andreas Berlind (NSF)

[Computational & AI Funding Opportunities\[Video\]\[CC\]](#)

12:30pm

Lunch Break

2:00pm **CONFERENCE END-SHUTTLE TO BWSCI *Also available to SB Airport and SB Airbus, Goleta location (See Registration Desk BEFORE Friday to sign up.)**