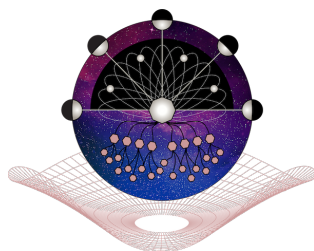


2019 MATH + X Symposium on Inverse Problems and Deep Learning in Space Exploration



Rice University · January 23–25

Agenda

Wednesday, January 23

BRC 280

- 8:00am *breakfast*
- 8:15am opening remarks de Hoop, Rossky
- Chair: de Hoop**
- 8:30am **Keynote:** Artificial Intelligence Opportunities in Exoplanet Discovery and Characterization Seager
- 9:30am Manifold learning and inverse problems Lassas
- 10:15am *coffee break*
- 10:45am Faster Spherical CNNs and a General Theory of Equivariant CNNs on Manifolds Cohen
- 11:30am *spotlights: Seydoux, Nousiainen, Zhao*
- 11:45am How Can Machine-Learning Methods Help to Make Scientific Inferences? Hogg
- 12:30pm *lunch*
- Chair: Uhlmann**
- 1:30pm Computational Thresholds in Simple Models of Neural Networks Zdeborová
- 2:15pm Probing the Properties of Accelerated Electrons in Solar Flares by Spatio-Spectral Inversion of Solar Hard X-ray Data Emslie
- 3:00pm *coffee/tea break*
- 3:30pm Nonlinear Detection of Hermitian Connections in Minkowski Space Paternain
- 4:15pm *spotlights: Barkaoui, Wang, Zou*
- 4:30pm **Keynote:** Generative and Discriminative Models of Images and Video Malik
- 5:30pm *adjourn*
- 6–8pm *reception, BRC 1003*

Thursday, January 24

BRC 280

8:00am	<i>breakfast</i>	
		Chair: van der Hilst
8:30am	Keynote: Partial Differential Equations, Optimization and Deep Neural Nets	Osher
9:30am	Formation and Evolution of Short-period Exoplanets	Schlichting
10:15am	<i>coffee break</i>	
10:45am	SUNLayer: Stable Denoising with Generative Networks	Villar
11:30am	<i>spotlights: Sottile, Caballero, Niraula</i>	
11:45am	Recovery of Material Parameters in Transversely Isotropic Media	Vasy
12:30pm	<i>lunch</i>	
		Chair: Bradshaw
1:30pm	What Gravitational Waves Tell Us About the Universe	Bieri
2:15pm	New Worlds, New Perspectives	de Wit
3:00pm	<i>coffee/tea break</i>	
3:30pm	Exoplanet Discovery and Characterization using Generative Modeling	Fergus
4:15pm	<i>spotlights: Mönkkönen, Ghosh, Lin</i>	
4:30pm	Keynote: Gravitational Wave Astrophysics: Where We Are and Where We Are Going	Vitale
5:30pm	<i>adjourn</i>	

Friday, January 25

BRC 280

8:00am	<i>breakfast</i>	
		Chair: de Hoop
8:30am	Keynote: Inverting the Sky for Planet Nine	Brown
9:30am	Recovering a Riemannian Metric from Area Data	Alexakis
10:15am	<i>coffee break</i>	
10:45am	Challenges for Machine Learning and Inference for the Doppler Characterization of Extrasolar Planets	Ford
11:30am	Keynote: InSight – SEIS	Lognonné
12:30pm	<i>lunch</i>	
		Chair: Bruna
1:30pm	Inverting Simulation: Experiences with Inverse Problems in Particle Physics	Cranmer
2:15pm	<i>spotlights: Bhattacharyya, Golubnichiy, Meyerson</i>	
2:30pm	<i>coffee/tea break</i>	

3:00pm	Towards a Mathematical Theory of Seismology with a Single Seismometer	Ilmavirta
3:45pm	Deep Decoder: Concise Image Representations From Untrained Non-Convolutional Networks	Heckel
4:30pm	<i>adjourn</i>	