

## Workshop IV: Big Data in Multi-Messenger Astrophysics

### Monday November 29, 2021

- 8:00–8:55 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:55–9:00 *Welcome & Opening Remarks: Dean Miguel García-Garibay (Dean of Physical Sciences, UCLA) and Dima Shlyakhtenko (Director, IPAM)*
- 9:00 *Session Chair: Marco Cavaglia*
- 9:00–9:45 **Deep Chatterjee** (University of Illinois at Urbana-Champaign)  
*Applications of machine learning in low-latency electromagnetic counterpart inference from gravitational waves*
- 9:55–10:15 *Break*
- 10:15–10:55 **Joseph Bayley** (University of Glasgow)  
*Virtual Talk: Rapidly searching for continuous gravitational waves*
- 11:05–11:30 *Break*
- 11:30–12:15 **Ik Siong Heng** (University of Glasgow)  
*Gaussian Mixture Models for transient gravitational wave detection*
- 12:25–2:00 *Lunch (on your own)*
- 2:00–2:45 **Gabriela González** (Louisiana State University)  
*Virtual Talk: Non-astrophysical transients in LIGO detectors: help with machine learning techniques*
- 2:55–3:15 *Break*
- 3:15–4:00 **Alejandro Torres-Forné** (University of Valencia)  
*Variational models and algorithms for GW denoising and reconstruction: applications*
- 4:15–6:00 *Reception (Location: IPAM Lobby)*

### Tuesday November 30, 2021

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Antonio Marquina*
- 9:00–9:45 **Michael Coughlin** (University of Minnesota, Twin Cities)  
*Machine Learning in the Multi-Messenger Era: Inference as a service and optimal light curve augmentation*
- 9:55–10:15 *Break*

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- 10:15–10:45 **Agata Trovato** (Università di Trieste)  
*Virtual Talk: Neural networks for gravitational-wave trigger selection in single-detector periods*
- 10:55–11:15 *Break*
- 11:15–12:00 **Joshua Willis** (California Institute of Technology)  
*Meeting the Computational Challenges of Third-Generation Gravitational-Wave Detectors*
- 12:10–2:00 *Lunch (on your own)*
- 2:00–2:45 **Marco Cavaglia** (Missouri University of Science and Technology)  
*Think out of the (counting) box*

### **Wednesday December 1, 2021**

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Mairi Sakellariadou*
- 9:00–9:40 **Irene Di Palma** (Sapienza University of Rome)  
*Virtual Talk: Deep learning algorithm for core-collapse supernova detection*
- 9:50–10:15 *Break*
- 10:15–10:55 **Leïla Haegel** (Université de Paris VII (Denis Diderot))  
*Virtual Talk: Machine learning for accurate gravitational waves modelling*
- 11:05–11:30 *Break*
- 11:30–12:10 **Guillermo Valdes** (Texas A&M University - College Station)  
*Virtual Talk: Acoustic noise in gravitational-wave detectors*
- 12:20–2:00 *Lunch (on your own)*
- 2:00–2:45 **Jenne Driggers** (California Institute of Technology)  
*Improving the sensitivity of gravitational wave interferometers*
- 2:55–3:15 *Break*
- 3:15–3:55 **Nathan Whitehorn** (Michigan State University)  
*Virtual Talk: Finding a neutrino in a haystack: computational challenges for the IceCube Neutrino Observatory*

## Thursday December 2, 2021

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Jenne Driggers*
- 9:00–9:40 **John Veitch** (University of Glasgow)  
*Virtual Talk: Computational Challenges in Gravitational Wave Parameter Estimation*
- 9:50–10:15 *Break*
- 10:15–10:55 **Jess McIver** (University of British Columbia)  
*Virtual Talk: Rapid glitch mitigation for near-future gravitational-wave detectors*
- 11:05–11:30 *Break*
- 11:30–12:15 **Gabriele Vajente** (California Institute of Technology)  
*Virtual Talk: Machine Learning and Gravitational Wave Detectors*
- 12:25–2:00 *Lunch (on your own)*
- 2:00–2:40 **Kelly Holley-Bockelmann** (Vanderbilt University)  
*Virtual Talk: Maximizing Multi-messenger Astronomy with LISA*
- 2:50–3:15 *Break*
- 3:15–3:50 *Discussion*

## Friday December 3, 2021

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Jose Antonio Font*
- 9:00–9:45 **Patrick Godwin** (California Institute of Technology)  
*Low-latency Noise Mitigation Techniques in Gravitational-wave Detector Data Using Auxiliary Sensor Information*
- 9:55–10:15 *Break*
- 10:15–10:55 **Jonathan Gair** (Max Planck Institute for Gravitational Physics, Albert Einstein Institute)  
*Virtual Talk: Rapid and robust parameter estimation for gravitational wave observations*
- 11:05–11:30 *Break*
- 11:30–12:15 **Frank Wuerthwein** (University of California, San Diego (UCSD))  
*Global Cyberinfrastructure for LIGO, Virgo, Kagra, IceCube, and others*

