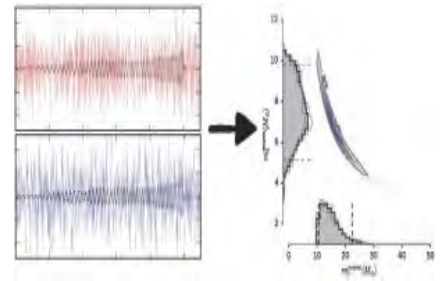


# Source Inference and Parameter Estimation in Gravitational Wave Astronomy

November 15 - 19, 2021



## Scientific Overview

Gravitational-wave (GW) observations offer a unique opportunity to study astrophysical and cosmological sources that are difficult to access through electromagnetic observations. Inferring the sources' properties from their GW signal is one of the key objectives of GW data analysis. The planned improvements in the sensitivity of the ground-based detectors and future space-based observatories, however, bring unique computational and mathematical challenges to the inference problem including long-duration signals, high signal-to-noise ratios, increased parameter dimensionality and overlapping signals. These challenges must be overcome to fully exploit the scientific potential of GW observations. The goal of this workshop is to connect statisticians, computer scientists and GW astrophysicists to discuss the current state-of-the-art approaches to parameter estimation in GW astrophysics, and to identify the open issues to enable fast and reliable inference for different GW sources, including modelled and un-modelled signals, for the current and planned GW observatories.

This workshop will include a poster session; a request for posters will be sent to registered participants in advance of the workshop.

## Long Program Schedule

This workshop is part of the long program on "Mathematical and Computational Challenges in the Era of Gravitational Wave Astronomy."

- Mathematical and Computational Challenges in the Era of Gravitational Wave Astronomy Tutorial : September 14 - 21, 2021
- Workshop I: Computational Challenges in Multi-Messenger Astrophysics : October 4 -8, 2021.
- Workshop II: Mathematical and Numerical Aspects of Gravitation : October 25 - 29, 2021.
- **Workshop III: Source Inference and Parameter Estimation in Gravitational Wave Astronomy : November 15 - 19, 2021.**
- Workshop IV: Big Data in Multi-Messenger Astrophysics : November 29 -December 3, 2021.
- Mathematical and Computational Challenges in the Era of Gravitational Wave Astronomy Culminating Retreat at Lake Arrowhead : December 12 - 17, 2021.

## Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

## Organizers

Lydia Bieri (UMich), Matthew Choptuik (UBC), Mihalis Dafermos (Princeton University), Anne Franzen (Technical University of Lisbon), Antonio Marquina (University of Valencia), Igor Rodnianski (Princeton University), and Gunther Uhlmann (UW).

## Speakers

Asimina Arvanitaki (Perimeter Institute for Theoretical Physics), Sylvia Biscoveanu (MIT), Juan Calderon-Bustillo (CUHK), Katerina Chatziioannou (Caltech), Kyle Cranmer (NYU), Ben Farr (UO), Scott Field (UMass Dartmouth), Maya Fishbach (Northwestern University), Jose Antonio Font (University of Valencia), Dan Foreman-Mackey (Flatiron Institute), Rossella Gamba (Uni Jena), Rachel Gray (University of Glasgow), Stephen Green (Max Planck Institute for Gravitational Physics), Kristen Lackeos (Max Planck Institute for Radio Astronomy), Tyson Littenberg (MSFC), Michela Mapelli (University of Padova), Geraint Pratten (University of Birmingham), Jocelyn Read (CSU Fullerton), Arianna Renzini (Caltech), Patricia Schmidt (University of Birmingham), Josh Speagle (University of Toronto), Lilli Sun (ANU), Colm Talbot (Caltech), Sarah Vigeland (University of Wisconsin-Milwaukee), and Salvatore Vitale (MIT).



For more information, visit the program webpage:  
[www.ipam.ucla.edu/GWAWS3](http://www.ipam.ucla.edu/GWAWS3)