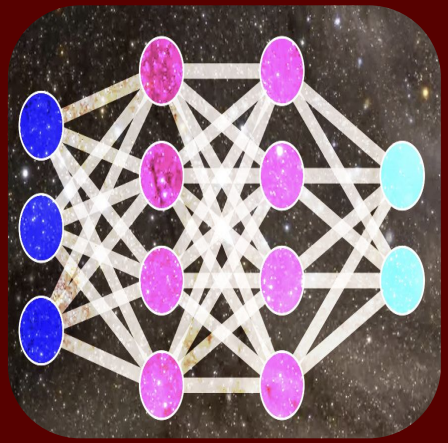
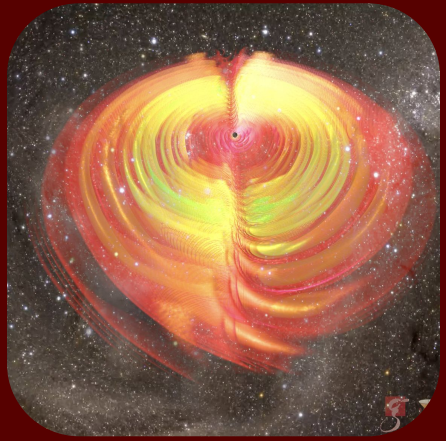
Scientific Machine Learning for Gravitational Wave Astronomy



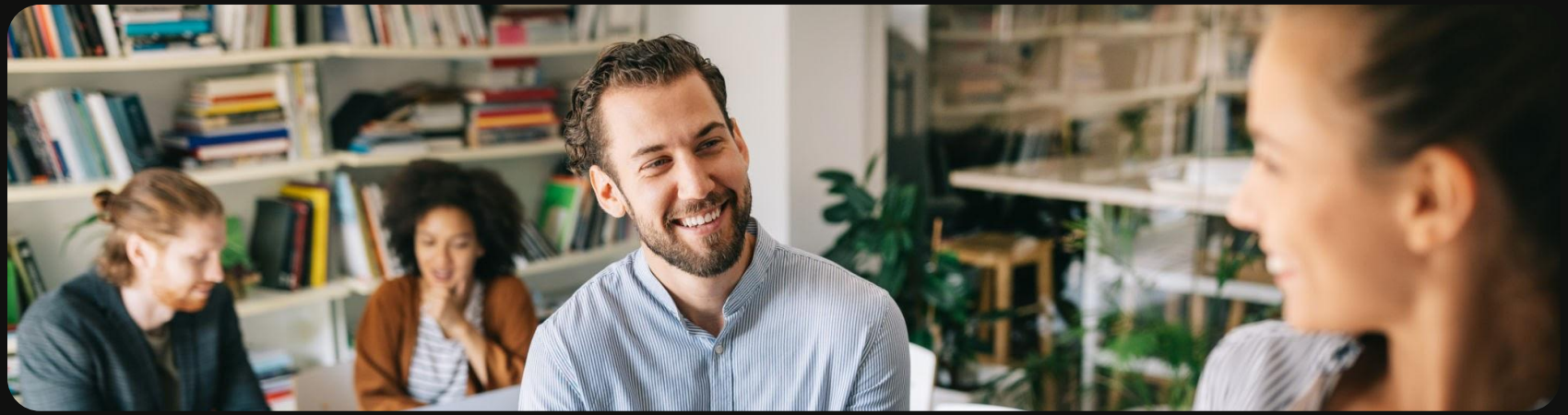


June 2 – 6, 2025
Providence, RI

Welcome to the workshop

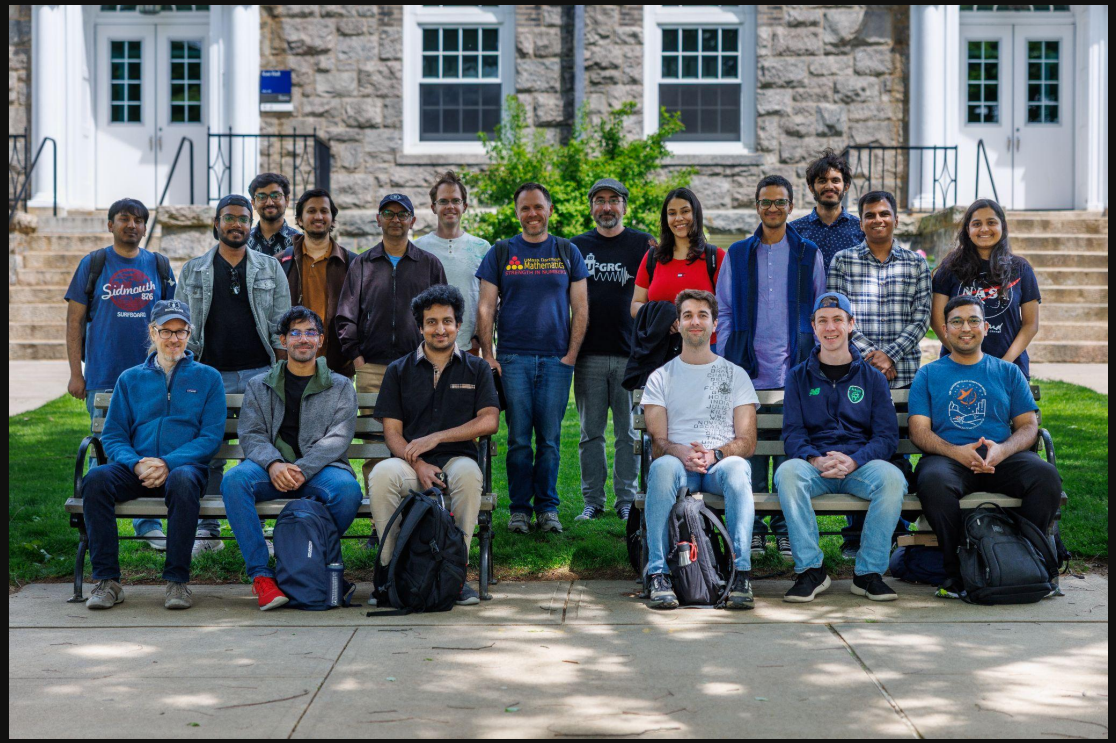
We would like to thank

- Brendan Hassett and the ICERM SAB for selecting our proposal
- ICERM staff for their significant help in organizing this workshop



U2GRC = UMass-URI Gravity Research Consortium

- Come visit us!
- https://web.uri.edu/gravity

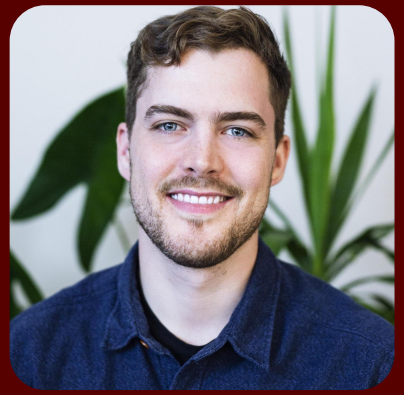


Organizing Committee

Sarah Caudill
University of Massachusetts Dartmouth

Katerina Chatziioannou
Caltech

Maya Fishbach
University of Toronto

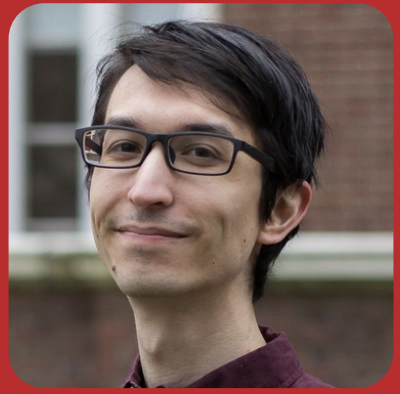


Brendan Keith
Brown University

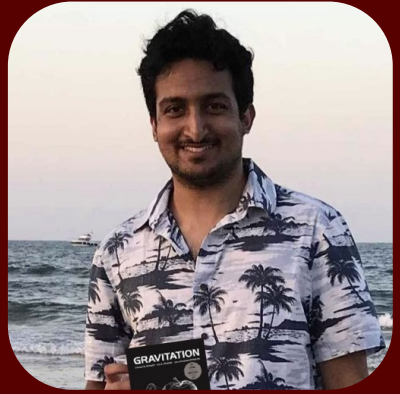
Organizing Committee

Jess McIver
The University of British Columbia

Michael Puerrer
University of Rhode Island



Joshua Speagle
University of Toronto



Vijay Varma
University of Massachusetts Dartmouth

GW Astronomy topics

1. **Searches & Detector characterization**
   Classify whether a GW event is astrophysical rather than an instrumental noise artifact
2. **Waveforms**
   Accurately and efficiently model the GWs emitted from compact binary coalescences
3. **Parameter estimation**
   Bayesian inference for the source parameters of a single GW event
4. **Population inference**
   Hierarchical Bayesian inference for a population of GW events

GW data analysis ⟺ Scientific ML

Structure of this workshop

1. **Talks**
   Morning sessions
2. **Tutorials**
   Morning sessions
3. **Discussion sessions**
   Afternoon idea and working problem sessions
4. **Other activities**
   Poster sessions & networking lunch

Interactive nature of the workshop

- Ask questions during / after talks
- Participate in code tutorials
  - Materials shared on workshop google drive
- Poster sessions (afternoon coffee break) and lightning talks
- Networking lunch on Friday - Main Lecture Hall

Lunch and dinner options

- Near ICERM:
  S Main St (Geoff's sandwiches, Plant city)
- College Hill (Thayer St)
- Fox point
- Downtown
- Jewelry district
- Federal Hill (Italian)