Mathematical and Computational Challenges in the Era of Gravitational Wave Astronomy Tutorial

Tuesday September 14, 2021

8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*

9:00–10:15 **Marco Cavaglia** (Missouri University of Science and Technology)
The characterization of ground-based gravitational-wave detector data

10:15–10:45 *Break*

10:45–11:45 **Helvi Witek** (University of Illinois)
Virtual Talk: Introduction to Numerical Relativity

11:45–12:15 *IPAM Orientation*

12:15–2:00 *Lunch (on your own)*

2:00–3:00 **Helvi Witek** (University of Illinois)
Virtual Talk: Introduction to Numerical Relativity

3:00–3:30 *Break*

3:30–4:45 **Peter Couvares** (California Institute of Technology)
Computing Challenges in Gravitational-Wave Data Analysis

Wednesday September 15, 2021

8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*

9:00–10:15 **Gunther Uhlmann** (University of Washington)
Seeing Through Space-Time

10:15–10:45 *Break*

10:45–12:00 **Pablo Cerdá-Durán** (University of Valencia)
Virtual Talk: Numerical analysis: Supernovae and burst-like sources

12:00–2:00 *Lunch (on your own)*

2:00–3:15 **Antonio Marquina** (University of Valencia)
Introduction to Machine Learning for Gravitational Wave Astronomy I: General concepts and terminology.

Monday September 20, 2021

8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*

9:00–10:15 **Stefanos Aretakis** (University of Toronto)
Virtual Talk: Topics in mathematical general relativity I

10:15–10:45 *Break*

10:45–12:00 **Sylvia Biscoveanu** (Massachusetts Institute of Technology)
Virtual Talk: Source characterization of individual compact binary coalescences using Bayesian inference

12:00–2:00 *Lunch (on your own)*

2:00–3:15 **Salvatore Vitale** (Massachusetts Institute of Technology)
Virtual Talk: Inferring the properties of populations of gravitational-wave sources

3:15–3:45 *Break*

3:45–5:00 **Helvi Witek** (University of Illinois)
Virtual Talk: Tutorial: 3+1 decomposition with xTensor

Tuesday September 21, 2021

8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*

9:00–10:15 **Jose Antonio Font** (University of Valencia)
Virtual Talk: Numerical analysis: binary neutron stars

10:15–10:45 *Break*

10:45–12:00 **Stefanos Aretakis** (University of Toronto)
Virtual Talk: Topics in mathematical general relativity II

12:00–2:00 *Lunch (on your own)*

2:00–3:15 **Antonio Marquina** (University of Valencia)
Introduction to Machine Learning for Gravitational Wave Astronomy II: Variational models and Dictionary learning

3:15–3:45 *Break*

3:45–5:00 **Patricia Schmidt** (University of Birmingham)
Introduction to modelling gravitational waves from compact binaries

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