

## Workshop I: Computational Challenges in Multi-Messenger Astrophysics

### Monday October 4, 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 (Missouri S&T)*
- 9:00–9:50 **Pablo Cerdá-Durán** (University of Valencia)  
*Virtual Talk: Understanding gravitational waves from core collapse supernovae*
- 10:00–10:15 *Break*
- 10:15–11:05 **David Radice** (Pennsylvania State University)  
*Binary neutron star mergers*
- 11:15–11:30 *Break*
- 11:30–12:20 **Ryan Quitzow-James** (Missouri University of Science and Technology)  
*Searching for Gravitational Waves from Magnetar Bursts*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:50 **Anthony Mezzacappa** (University of Tennessee)  
*The Computational Challenges associated with Modeling Core Collapse Supernovae and their Gravitational Wave Emission*
- 3:00–3:15 *Break*
- 3:15–4:05 **Kei Kotake** (Fukuoka University)  
*Multi-dimensional modeling of core-collapse supernovae: neutrino and gravitational-wave signatures*
- 4:15–4:30 *Lightning Poster Presentations*
- 4:30–5:45 *Poster Session & Reception (Hosted by IPAM)*

### Tuesday October 5, 2021

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: Mairi Sakellariadou (King's College London)*
- 9:00–9:50 **Luciano Rezzolla** (Johann Wolfgang Goethe-Universität Frankfurt)  
*Virtual Talk: Binary neutron stars: from gravitational to particle physics*
- 10:00–10:15 *Break*

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- 10:15–11:05 **Miguel Ángel Aloy** (University of Valencia)  
*Virtual Talk: Assessing the dependence of magnetic fields and rotation of massive stars in the properties of their compact remnants*
- 11:15–11:30 *Break*
- 11:30–12:20 **Ariadna Murguía-Berthier** (University of California, Santa Cruz)  
*Virtual Talk: Implementing a tabulated EOS and neutrino leakage scheme in HARM3D*
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Susana Serna** (Autonomous University of Barcelona)  
*Capturing complex dynamics in non-convex special relativistic hydrodynamics*
- 3:30–4:00 *Break*
- 4:00–4:50 **Masaru Shibata** (Kyoto University)  
*Virtual Talk: Post-merger mass ejection of binary neutron stars: low total-mass cases*

### Wednesday October 6, 2021

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: Susana Serna (Autonomous Univ. of Barcelona)*
- 9:00–9:50 **Riccardo Ciolfi** (INAF - Astronomical Observatory of Padova)  
*Virtual Talk: Simulating SGRB jets from BNS mergers*
- 10:00–10:15 *Break*
- 10:15–11:05 **Agnieszka Janiuk** (Polish Academy of Sciences (PAN))  
*Virtual Talk: Many faces of black hole accretion in gamma ray bursts*
- 11:15–11:30 *Break*
- 11:30–12:20 **Carlos Lousto** (Rochester Institute of Technology)  
*Virtual Talk: From numerical simulations of binary black hole mergers to insights into astrophysics and gravitational waves*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:50 **Deirdre Shoemaker** (University of Texas at Austin)  
*Virtual Talk: Numerical Relativity and the Next Generation of Gravitational Wave Detections*
- 3:00–3:15 *Break*
- 3:15–4:05 **Jade Powell** (Swinburne University of Technology)  
*Virtual Talk: Detecting gravitational waves from core-collapse supernovae*

## Thursday October 7, 2021

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Morning Session Chair: Helvi Witek (University of Illinois)*
- 9:00–9:50 **Irene Di Palma** (Sapienza University of Rome)  
*Virtual Talk: A Machine Learning Application in Multi-Messenger Astrophysics*
- 10:00–10:15 *Break*
- 10:15–11:05 **Philippe G. LeFloch** (Sorbonne University, Paris)  
*Virtual Talk: Gravitational singularities, massive fields, and asymptotic localization*
- 11:15–11:30 *Break*
- 11:30–12:20 **Manuela Campanelli** (Rochester Institute of Technology)  
*Virtual Talk: Merging black hole binaries: accretion dynamics and outflows*
- 12:30–2:00 *Lunch (on your own)*
- 2:00 *Afternoon Session Chair: David Radice (Penn State)*
- 2:00–2:50 **Jeffrey Winicour** (University of Pittsburgh)  
*Multi-Messenger Aspects of Characteristic Evolution*
- 3:00–3:15 *Break*
- 3:15–4:05 **Helvi Witek** (University of Illinois)  
*The adventures of black holes: the case of quadratic gravity*
- 4:15–4:30 *Break*
- 4:30–5:20 **Maria Hamilton** (Marshall University)  
*Realistic Binary Neutron Stars Collisions Simulations: Challenges and Opportunities*

## Friday October 8, 2021

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: Anthony Mezzacappa (Univ. Tennessee)*
- 9:00–9:50 **Harald Pfeiffer** (Max Planck Institute für Gravitationsphysik, Albert-Einstein-Institut)  
*Virtual Talk: Numerical relativity: Exploring new capabilities with binary black holes*
- 10:00–10:15 *Break*
- 10:15–11:05 **Carlos Palenzuela** (University of the Balearic Islands (Illes Balears))  
*Magnetic field amplification in binary neutron star mergers*
- 11:15–11:30 *Break*

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11:30–12:20 **Luis Lehner** (Perimeter Institute for Theoretical Physics)  
*Virtual Talk: Challenges and options for beyond General Relativity explorations*

12:30–1:00 *Closing Discussion and Wrap Up*

