

## Workshop II: Mathematical and Numerical Aspects of Gravitation

### Monday October 25, 2021

- 8:00      *SESSION CHAIR: Matthew Choptuik (University of British Columbia)*
- 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)*
- 9:00–9:45      **Jonathan Luk** (Stanford University)  
*A tale of two tails*
- 9:55–10:15      *Break*
- 10:15–10:55      **Anna Sakovich** (Uppsala University)  
*Virtual Talk: Positivity of mass for asymptotically hyperbolic initial data sets*
- 11:05–11:30      *Break*
- 11:30–12:15      **Georgios Moschidis** (Princeton University)  
*The instability of Anti-de Sitter spacetime for the Einstein-scalar field system*
- 12:25–1:45      *Lunch (on your own)*
- 1:45–2:25      **Frans Pretorius** (Princeton University)  
*Virtual Talk: Testing General Relativity with Black Hole Mergers*
- 2:35–3:00      *Break*
- 3:00–3:40      **Pengyu Le** (University of Michigan)  
*Virtual Talk: Null hypersurfaces and the Penrose inequality for a perturbed Schwarzschild black hole*
- 4:30–5:30      **Andrea M. Ghez** (University of California, Los Angeles (UCLA))  
*Green Family Lecture: "From the Possibility to the Certainty of a Supermassive Black Hole"*

### Tuesday October 26, 2021

- 8:00      *SESSION CHAIR: Marco Cavaglia (Missouri University of Science and Technology)*
- 8:00–9:00      *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:40      **Pau Figueras** (Queen Mary, University of London)  
*Virtual Talk: Binary black hole mergers in cubic Horndeski theory*
- 9:50–10:15      *Break*

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- 10:15–11:00 **Gunther Uhlmann** (University of Washington)  
*Seeing Through Space-Time*
- 11:10–11:30 *Break*
- 11:30–12:10 **Martin Taylor** (Imperial College London)  
*Virtual Talk: The nonlinear stability of the Schwarzschild family of black holes*
- 12:20–2:00 *Lunch (on your own)*
- 2:00–2:40 **Yakov Shlapentokh-Rothman** (University of Toronto)  
*Virtual Talk: On Naked Singularities for the Einstein Vacuum Equations*
- 2:50–3:15 *Break*
- 3:15–4:00 **Matthew Choptuik** (University of British Columbia)  
*Multi-oscillating Boson Stars*
- 4:10–5:45 *Reception (Location: IPAM Lobby)*

### Wednesday October 27, 2021

- 8:00 *SESSION CHAIR: Gunther Uhlmann (University of Washington)*
- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:40 **Cécile Huneau** (Ecole Polytechnique)  
*Virtual Talk: Global existence for a system of wave equations on a product space.*
- 9:50–10:15 *Break*
- 10:15–10:55 **Katy Clough** (Queen Mary University of London)  
*Virtual Talk: Simulating fundamental fields in strong gravity environments: opportunities and challenges*
- 11:05–11:30 *Break*
- 11:30–12:10 **Mihalis Dafermos** (Princeton University)  
*Virtual Talk: Strong Cosmic Censorship versus  $\Lambda$*
- 12:20–2:00 *Lunch (on your own)*
- 2:00–2:40 **Robert Wald** (University of Chicago)  
*Virtual Talk: The Memory Effect and Infrared Divergences*
- 2:50–3:15 *Break*
- 3:15–4:00 **Yiran Wang** (Emory University)  
*Some inverse problems in cosmology*
- 4:10–4:30 *Break*

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4:30–5:15 **Zvi Bern** (University of California, Los Angeles (UCLA))  
*A new approach to the binary inspiral problem*

## Thursday October 28, 2021

8:00 *SESSION CHAIR: Dimitra Tseneklidou (Eberhard-Karls-Universität Tübingen)*

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

9:00–9:40 **Anne Franzen** (Instituto Superior Técnico)  
*Virtual Talk: Flat FLRW and Kasner big bang singularities - analyzed on the level of scalar waves*

9:50–10:15 *Break*

10:15–10:55 **David Hilditch** (Instituto Superior Tecnico, University of Lisbon)  
*Virtual Talk: Dual-Frame Generalized Harmonic Gauge on Hyperboloidal Slices*

11:05–11:30 *Break*

11:30–12:10 **Igor Rodnianski** (Princeton University)  
*Virtual Talk: On the characteristic gluing problem*

12:20–2:00 *Lunch (on your own)*

2:00–2:45 **Rita Teixeira da Costa** (Princeton University)  
*The Teukolsky equation on Kerr black hole spacetimes*

2:55–3:15 *Break*

3:15–3:55 **Lydia Bieri** (University of Michigan)  
*Virtual Talk: New Structures in Gravitational Radiation*

## Friday October 29, 2021

8:00 *SESSION CHAIR: Georgios Moschidis (Princeton University)*

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

9:00–9:40 **Matti Lassas** (University of Helsinki)  
*Virtual Talk: Inverse problems for Einstein's equations and other non-linear hyperbolic equations*

9:50–10:15 *Break*

10:15–11:00 **Grigorios Fournodavlos** (Princeton University)  
*Stable Big Bang formation*

11:10–11:30 *Break*

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11:30–12:15 **András Vasy** (Stanford University)  
*The black hole stability problem*

