Mathematical Methods for the General Relativistic Two-body Problem

(11 Aug 2025–15 Aug 2025)

Organizing Committee

Alvin Chua
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Soichiro Isoyama
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National University of Singapore

Scientific Committee

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Jonathan Gair
Max Planck Institute for Gravitational Physics

Scott Hughes
Massachusetts Institute of Technology

Takahiro Tanaka
Kyoto University, Japan

Venue

IMS Executive Seminar Room
Bock S17, Level 3
10 Lower Kent Ridge Rd Singapore 119076

For more information: https://ims.nus.edu.sg/events/generalrelativistictwobodyproblem

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Monday, 11 August 2025		
Time	**Title**	**Speaker**
0920–0950	Registration	
0950–1000	Welcome Opening	Program Organizers
1000–1100	The Prospects and Challenges of Science with LISA EMRI Observations	Jonathan Gair *Albert Einstein Institute, Germany*
1100–1130	Coffee Break	
1130–1230	*Discussion Session* Scope & Aims	Soichiro Isoyama Josh Mathews *National University of Singapore, Singapore*
1230–1400	Lunch Break	
1400–1500	Memory and Hybridization for Connecting the Numerical and Analytical Two-body Problem	Leo Stein *The University of Mississippi, USA*
1500–1530	Tea Break	
1530–1630	Second-order Self-force: State of Play	Adam Pound *University of Southampton, UK*
1630–1730	Free Discussion	IMS Collaboration Space

Tuesday, 12 August 2025		
Time	**Title**	**Speaker**
0850–0900	Registration	
0900–1000	Analytical Modeling of Gravitational Waves : A Recent View on the post-Newtonian Framework	Laura Bernard *Observatoire de Paris-PSL, France*
1000–1100	Hybrid Post-Newtonian/Self-force inspiral and Transition-to-plunge Waveforms	Geoffrey Compere *Université Libre de Bruxelles, Belgium*
1100–1130	Coffee Break	
1130–1230	Discussion Session on Hybrid Model	Loic Honet *Université Libre de Bruxelles, Belgium* Benjamin Leather *Albert Einstein Institute, Germany*
1230–1400	Lunch Break	

Tuesday, 12 August 2025		
Time	**Title**	**Speaker**
1400–1500	Integrability of the Relativistic Two-body Problem	Vojtech Witzany *Charles University in Prague, Czech Republic*
1500–1530	Tea Break	
1530–1630	Fix the Frame, Resolve the Memory: The Bondi--Sachs Gauge in Black Hole Perturbation Theory	Andrew Spiers *University of Nottingham, UK*
1630–1730	Discussion Session on Extended Body	Paul Ramond *IMCCE, France*

Wednesday, 13 August 2025		
Time	**Title**	**Speaker**
0850–0900	Registration	
0900–1000	Computational Advances in Self-force: Building a Bridge between Theory and Waveform Modeling	Zachary Nasipak *University of Southampton, UK*
1000–1100	The Hyperboloidal Framework in Black Hole Perturbation Theory	Rodrigo Panosso Macedo *Niels Bohr Institute, Denmark*
1100–1130	Group Photo and Coffee Break	
1130–1230	Free Discussion	IMS Collaboration Space
1230–1400	***Lunch Reception at IMS***	
1400–1430	LISA and the LISA Science Team	Anna Heffernan *University of Balearic Islands, Spain*
1430–1500	The DDPC and EMRI Waveform Modelling: Structure, Roles, and Roadmap	Phillip Lynch *Albert Einstein Institute, USA*
1500–1530	Tea Break	
1530–1730	Free Discussion	IMS Collaboration Space

Thursday, 14 August 2025		
Time	**Title**	**Speaker**
0850–0900	Registration	
0900–1000	Dynamical Tidal Resonances in EMRIs	Béatrice Bonga *Radboud University, Netherlands*
1000–1100	Probing Formation Channels of Extreme Mass-ratio Inspirals	Huan Yang *Tsinghua University, China*
1100–1130	Coffee Break	

Thursday, 14 August 2025		
Time	**Title**	**Speaker**
1130–1230	Why Matter Matters: Astrophysical Environments of EMRIs	Lisa Drummond *California Institute of Technology, USA*
1230–1400	Lunch Break	
1400–1500	Discussion Session on Astro	Zhen Pan *Shanghai Jiao Tong University, China*
1500–1530	Tea Break	
1530–1630	Putting the Hype in Hyperbolic Black Hole Scattering	Oliver Long *Albert Einstein Institute, Germany*
1630–1730	Metric Reconstruction on Kerr Spacetime in Lorenz Gauge	Sam Dolan *The University of Sheffield, UK*

Friday, 15 August 2025		
Time	**Title**	**Speaker**
0850–0900	Registration	
0900–1000	Fast EMRI Waveforms: Fast Waveform Generation for Asymmetric-mass Binaries	Christian Chapman-Bird *University of Birmingham, UK*
1000–1100	Building an Efficient EMRI Search Algorithm	Curt Cutler *Jet Propulsion Laboratory, USA*
1100–1130	Coffee Break	
1130–1230	Next Steps: Addressing the Potential for Systematic and Probabilistic Biases in EMRI Inference	Alexander Burke *University of Glasgow, UK*
1230–1400	Lunch Break	
1400–1500	Discussion Session on Data Analysis	Jonathan Thompson *University of Southampton, UK*
1500–1530	Tea Break	
1530–1630	Closing Discussion	