



## **Chennai Symposium on Gravitation and Cosmology**

**- An online meeting -**

**February 2-5, 2022**

Centre for Strings, Gravitation and Cosmology, Department of Physics,  
Indian Institute of Technology Madras, Chennai

Chennai Mathematical Institute, Chennai

The Institute of Mathematical Sciences, Chennai

### **Scientific Organizing Committee**

Dhiraj Kumar Hazra, Jerome Martin, B. S. Sathyaprakash,  
L. Sriramkumar, Sumati Surya, Amitabh Virmani

### **Local Organizing Committee**

Divyajyoti, Hari K, Dawood Kothawala, M Laxman, Suvashis Maity, Chandra Kant Mishra,  
Kaushik Paul, H. V. Ragavendra, L. Sriramkumar, Sagarika Tripathy



## Schedule

Note that all dates and times below are in Indian Standard Time (IST). IST is behind Korean Standard Time by 3:30 hours, ahead of Central European Winter Time by 4:30 hours, Greenwich Mean time by 5:30 hours and Eastern Standard Time by 10:30 hours.



## Wednesday, February 2

Time	Speaker	Title
Chair: L. Sriramkumar Co-hosts: Arul Lakshminarayan, Sumati Surya		
09:15-09:30	Introductory remarks by L. Sriramkumar (on behalf of LOC), Arul Lakshminarayan (on behalf of IIT Madras) and Sumati Surya (on behalf of SOC)	
Chair: Sumati Surya Co-hosts: M Laxman, H. V. Ragavendra		
09:30-10:15	K. G. Arun	Testing general relativity using compact binaries
10:15-11:00	Dawood Kothawala	Reconstructing spacetime geometry from non-local bi-tensors - from Synge's 'world' function to the quantum spacetime
11:00-11:30	Coffee break	
Chair: Dawood Kothawala Co-hosts: Suvashis Maity, Sagarika Tripathy		
11:30-12:00	Rajeev Jain	Cosmological imprints of dynamical gauge fields during inflation
12:00-12:30	Srijit Bhattacharjee	Black holes with supertranslation memories
12:30-14:00	Lunch break	
Chair: Rajeev Jain Co-hosts: M Laxman, Kaushik Paul		
14:00-14:45	Sebastien Clesse	Primordial black holes in the early universe
14:45-15:15	Shilpa Kastha	Tests of general relativity with the gravitational wave observations
15:15-15:30	Rajes Ghosh	Causality constraints in quadratic gravity

15:30-15:45	Hari K	Tidal versus absolute acceleration effects on Rindler probes
15:45-16:00	Abhishek Mathur	Spacetime entanglement entropy of quantum fields in de Sitter spacetime
16:00-18:00	Long break	
Chair: Manjari Bagchi Co-hosts: Sagarika Tripathy, Divyajyoti		
18:00-18:15	Vaishak Prasad	Tidal deformations of dynamical horizons in binary black hole mergers
18:15-18:45	Vishal Baibhav	Parents of LIGO's black holes and their hometown
18:45-19:30	Eugenio Bianchi	Quantum gravity and quantum information

### Thursday, February 3

Time	Speaker	Title
Chair: Sumanta Chakraborty Co-hosts: Suvashis Maity, Hari K		
09:30-10:15	Arman Shafieloo	Beyond the standard model of cosmology
10:15-11:00	Alok Laddha	Soft theorems in classical and quantum gravity
11:00-11:30	Coffee break	
Chair: K. G. Arun Co-hosts: M Laxman, Kaushik Paul, L. Sriramkumar		
11:30-11:45	Divyajyoti	Observing higher modes of gravitational radiation in future detectors

11:45-12:00	Parthapratim Mahapatra	Clues on hierarchical binary black hole mergers from kick velocity inferences
12:00-12:15	Koustav Chandra	Hunting for intermediate-mass black hole with international gravitational-wave observatory network
12:15-12:30	Pankaj Saini	Systematic biases on parameterized tests of general relativity due to neglect of orbital eccentricity
12:30-14:00	Lunch break	
Chair: V. Sreenath Co-hosts: Suvashis Maity, Sagarika Tripathy		
14:00-14:45	Mairi Sakellariadou	Gravitational waves: The theorist's swiss knife
14:45-15:00	Akhil Antony	Signature from early universe solves major anomalies and tensions in cosmology
15:00-15:15	H. V. Ragavendra	Modifications to secondary gravitational waves due to scalar non-Gaussianity
15:15-15:30	Amaury Micheli	Quantum discord and decoherence of inflationary perturbations
15:30-16:00	Coffee break	
Chair: L. Sriramkumar Co-hosts: Sagarika Tripathy, H. V. Ragavendra		
16:00-17:00	Kandaswamy Subramanian	Chandrasekhar lecture: Magnetizing the universe
17:00-18:00	Long break	
Chair: Chandra Kant Mishra Co-hosts: Suvashis Maity, Divyajyoti		
18:00-18:30	Guillem Domenech	Gravitational waves from primordial fluctuations
18:30-19:15	Anuradha Gupta	Observation and astrophysics of gravitational waves: Current status and future prospects

19:15-19:45	Aaron Held	Black holes beyond general relativity: shadows, stability, and nonlinear evolution
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## Friday, February 4

Time	Speaker	Title
Chair: Dhiraj Kumar Hazra Co-hosts: M Laxman, Kaushik Paul		
09:30-10:15	Prayush Kumar	Numerical relativity for gravitational-wave astronomy: the past, present and future!
10:15-11:00	Tirthankar Roy Choudhury	Studying the first stars using neutral hydrogen
11:00-11:30	Coffee break	
Chair: Srijit Bhattacharjee Co-hosts: Kaushik Paul, Hari K		
11:30-11:45	Srashti Goyal	Search for signatures of gravitational wave lensing
11:45-12:00	Aditya Vijayakumar	Constraints on the time variation of the gravitational constant using binary neutron star observations
12:00-12:30	Sk. Jahanur Hoque	Surprising consequences of a tiny positive cosmological constant in Bondi-Sachs formalism
12:30-14:00	Lunch break	
Chair: Nishikanta Khandai Co-hosts: Suvashis Maity, Divyajyoti		
14:00-14:45	Beatrice Bonga	Gravitational waves in cosmology
14:45-15:00	Nilanjandev Bhaumik	Primordial black holes and induced gravitational wave background from inflation
15:00-15:15	Sagarika Tripathy	Deviations from slow roll inflation and implications for magnetogenesis

15:15-15:30	Debabrata Adak	Foreground challenge to detect primordial B-modes using ECHO -- A fourth generation CMB space mission
15:30-17:30	Long break	
Chair: B. S. Sathyaprakash Co-hosts: Hari K, Kaushik Paul		
17:30-17:45	Pratik Tarafdar	The role of Indian pulsar timing array in the global hunt for nanoHz gravitational waves
17:45-18:15	Suvodip Mukherjee	Panorama of the Universe with multi-messenger observations
18:15-18:45	Rahul Kashyap	Binary neutron star mergers: What can we learn from the prompt collapse events?
18:45-19:30	Surabhi Sachdev	Gravitational-wave observations: what have we learned so far?

## Saturday, February 5

Time	Speaker	Title
Chair: Rajesh Nayak Co-hosts: Suvashis Maity, Hari K		
09:30-10:00	Debaprasad Maity	Gravitational reheating and its observable effects
10:00-10:15	Debodirna Ghosh	Supertranslations at timelike infinity
10:15-10:30	Shanmugapriya Prakasham	Black hole hair removal for $N = 4$ CHL models
10:30-10:45	Srijita Sinha	Perturbations in a dark energy model
10:45-11:00	Ruchika	A growing universe... and tension
11:00-11:30	Coffee break	

Chair: Debaprasad Maity Co-hosts: M Laxman, Hari K		
11:30-12:00	Anuradha Samajdar	Constraints on neutron star equation of state from future gravitational wave observations
12:00-12:30	Eleni-Alexandra Kontou	On semiclassical singularity theorems
12:30-14:00	Lunch break	
Chair: Alok Ladha Co-hosts: Divyajyoti, L. Sriramkumar		
14:00-14:45	Atsushi Higuchi	Hartle-Hawking state in de Sitter spacetime
14:45-15:30	Vincent Vennin	Can we prove that cosmic structures are of quantum mechanical origin?
15:30-15:45	Raghvendra Singh	Covariant formulation of the generalized uncertainty principle
15:45-16:00	Chandramouli Chowdhury	Holography from the Wheeler-DeWitt equation
16:00-16:15	Prerna Rana	Astrophysically relevant geodesics in Kerr spacetime
16:15-16:35	Amitabh Virmani	Summary of the meeting
16:35-16:45	Vote of thanks by Dawood Kothawala (on behalf of LOC)	