ACTIVITY REPORT (January-April 2021)



COSMICZOM

As part of a major outreach initiative, ICTS launched a virtual exhibition titled 'Cosmic Zoom.' <u>https://www.cosmic-zoom.in/.</u> Based on the theme '*Scales of the Universe*', this exhibition and the associated online events were attended by more than 30,000 people.

I ICTS ACTIVITIES

Summary of Programming Activities (For details see following pages)

Programs/Discussion Meetings held: 7 Academic visitors to ICTS-TIFR: 1 Seminars and colloquia: *(For details see Annexure – A)* **Summary of Research Activities** *(For details see Annexure - B)* Papers published: 30 arXiv submissions: 14



ICTS academic activities, particularly of programs and discussion meetings, have been affected by the COVID-19 crisis and lockdown. However, a number of programs, classes and seminars are now being held online.

Ia. PROGRAMS

All programs were held online

Non-Hermitian Physics Organizers: Manas Kulkarni, Bhabani Prasad Mandal | Date: 22-26 March 2021

Probabilistic Methods in Negative Curvature Organizers: Riddhipratim Basu, Anish Ghosh, Mahan M. J. | 1-12 March 2021

Dualities in Topology and Algebra

Organizers: **Samik Basu**, **Anita Naolekar**, **Rekha Santhanam** | 1-13 February 2021

Nonperturbative and Numerical Approaches to Quantum Gravity, String Theory and Holography

Organizers: David Berenstein, Simon Catterall, Masanori Hanada, Anosh Joseph, Jun Nishimura, David Schaich, Toby Wiseman 18-22 January 2021

Advances in Applied Probability II

Organizers: Vivek S. Borkar, Sandeep Juneja, Kavita Ramanan, Devavrat Shah, Piyush Srivastava | 4-8 January 2021

Ib. DISCUSSION MEETINGS

All Discussion Meetings were held online

Multi-scale Analysis: Thematic Lectures and Meeting (MATHLEC-2021)

Organizers: Patrizia Donato, Antonio Gaudiello, Editha Jose, A.K. Nandakumaran, Daniel Onofrei | 15-19 February 2021

Thirsting for Theoretical Biology

Organizers: Vaishnavi Ananthanarayanan, Vijaykumar Krishnamurthy, Vidyanand Nanjundiah | 11-22 January 2021



Ic. LECTURE SERIES

TMC DISTINGUISHED LECTURE SERIES

The *Distinguished Lecture Series (DLS)* is an initiative of The (Indian) Mathematics Consortium (TMC) and it aims to host virtual colloquiums by some of the best researchers and expositors in the world. The series is co-hosted by IIT Bombay and ICTS Bengaluru.

Pandemics and Paradox

Speaker: Scott Sheffield (*Massachusetts Institute of Technology*) | Video release: 10 February 2021 | Interactive session: 24 February 2021

Stability, Non-Approximate groups, and High Dimensional Expanders Speaker: **Alex Lubotzky** (*Einstein Institute of Mathematics, Hebrew University*) | Video release: 13 January 2021 | Interactive session: 27 January 2021

Due to the COVID-19 situation, the other lecture series could not be held.

Id. VISITS OF SCIENTISTS

Due to the COVID-19 situation, it wasn't possible to host any visitors at ICTS. However, one researcher joined ICTS as a Simons Visiting Scholar during January– April 2021.

Aswin Balasubramanian (Rutgers University, USA)

Ie. NEWS ON GRANTS, AWARDS AND FELLOWSHIPS



ANIRBAN BASAK received the *2020 NASI-Young Scientist Jubilee Award (for Mathematics)*, for his research in probability theory. He works on random matrices and graphs, statistical physics, large deviations, and interacting particle systems. His current research focuses on understanding spectral properties od sparse non-random matrices and large deviations in sparse random matrices and graphs.



ABHISHODH PRAKASH and MANAS KULKARNI's publication (in collaboration with J.H. Pixley of Rutgers University, USA), titled *Universal Spectral Form Factor for Many-Body Localization*, in the journal Physics Review Research (Letter), has been selected as the Editors' Suggestion.



ANUPAM KUNDU and **PRASHANT SINGH**'s publication titled *Local Time for Run and Tumble Particle* has been selected as the 'Editors' Suggestion' in the journal Physical Review E.



SUBHRO BHATTACHARJEE and former ICTS postdoctoral fellow **ADHIP AGARWALA**'s publication (with **Johannes Knolle** and **Roderich Moessner**) titled *Gapless State of Interacting Majorana Fermions in a Strain-Induced Landau Level* was selected as the 'Editors' Suggestion' in the journal Physical Review B.

II ICTS PEOPLE

Ila FACULTY

 Prayush Kumar joined the ICTS astrophysical relativity group as Reader in January 2021. His interests are in studying the strong-field dynamics of compact-object binaries through non-linear numerical simulations, and their astrophysical formation mechanism through direct gravitational-wave observations.

IIb STUDENTS

GRADUATE PROGRAM

- 1. Graduate courses continued online via Zoom and Moodle for the Spring 2021 semester.
- 2. Apart from the ICTS courses, students registered for the courses from IISc, TIFR Colaba and other centres of TIFR.
- 3. Arrangements were made to bring all the graduate students to the campus. On arrival, they were quarantined for 5 days and then the RT-PCR test was conducted. Once declared COVID negative, they were allowed to move into the hostel.
- 4. The first-year (2020) batch was specifically asked to come on campus to complete formalities so that their fellowships could be started as per the norms.
- 5. PhD registrations are in process for 2018 Int. PhD and 2019 PhD batch.
- 6. Final year students:
 - a. DAE has approved a twelve-month extension with full stipend for all final year students, i.e. 5th-year students in the PhD programmes and 6th-year students in the Integrated PhD programmes.
 - b. Avijit Das (student of Abhishek Dhar) successfully completed his synopsis evaluation seminar on 16th April 2021.
 - c. Pushkal Shrivastava (student of Suvrat Raju) thesis was recommended for acceptance (with minor revisions) by TIFR.
 - d. Rahul Chajwa (student of Rama Govindarajan) successfully defended his thesis.
 - e. Animesh Nanda (student of Subhro Bhattacharjee and Mukesh Singh Raghav (student of Amit Apte), were given a 6-month extension (from Feb -July 2021).
- 7. Graduate Studies Admissions 2021:
 - a. Applications are invited for the CAM-ICTS Joint PhD program from GATE & CSIR UGC NET streams. <u>https://www.icts.res.in/graduate-studies/mathematics</u>.
 - b. 34 candidates have been shortlisted for the interview from the TIFR GS Maths entrance test. The online interviews are scheduled for 30 April and 1 May 2021.

POSTDOCTORAL PROGRAM

 1. 15 candidates were offered the postdoctoral fellowships during Fall 2021. The following 12 accepted and will be joining soon.

Name	Research Group	Current Affiliation	Current Designation
Subhajit Paul	Statistical Physics and Condensed Matter	University of Leipzig, Germany	Postdoctoral Fellow
Dipankar Roy	Statistical Physics and Condensed Matter	IISc, Bengaluru	PhD research scholar
Sharath Jose	Maths	IIT, Madras	Post-doctoral Fellow
Tuhin Chakraborty	Physical Biology	IISc, Bengaluru	Research Associate
Akash Mishra	Astrophysical Relativity	IIT, Gandhinagar	PhD research scholar
Sayak Dutta	Astrophysical Relativity	IUCAA, Pune	PhD research scholar
Shalabh Gautam	Astrophysical Relativity	IUCAA, Pune	PhD research scholar
Tushar Mondal	Astrophysical Relativity	IISc, Bengaluru	Research Fellow
Athira PV	String Theory and Quantum Gravity	CMI, Chennai	PhD research scholar
Amiya Mishra	String Theory and Quantum Gravity	TIFR, Mumbai	PhD research scholar
Anupam A.H	String Theory and Quantum Gravity	IMSc, Chennai	PhD research scholar

VISITING STUDENTS PROGRAM

- 1. Applications for the *ICTS Long Term Visiting Students Program 2021* are invited. <u>https://www.icts.res.in/academic/long-term-visiting-student-program</u>
- 2. Due to the Covid-19 pandemic, the *ICTS S. N. Bhatt Memorial Excellence Fellowship 2021* program has been cancelled. <u>https://www.icts.res.in/academic/summer-research-program</u>

III OUTREACH

KAAPI WITH KURIOSITY

The lecture series has been temporarily renamed KURIOSITY DURING KUARANTINE. All the lectures are being live streamed on the ICTS YouTube channel.

Scientific Approaches to Understanding the Past

Speaker: **Parth R. Chauhan** (Indian Institutes of Science Education and Research, Mohali) 25 April 2021

What's in a Diet?

Speaker: Anura Kurpad (St John's Medical College, Bengaluru) | 28 March 2021

Why is Climate Change a Wicked Problem?

Speaker: **Raghu Murtugudde** (University of Maryland, USA and IIT, Bombay) 21 February 2021

Symmetries of Nature and Nature of Symmetries

Speaker: Rohini M. Godbole (IISC, Bengaluru) | 24 January 2021



VIGYAN ADDA

Hundred Years of Gravitational Lensing

Speaker: Parameswaran Ajith (ICTS-TIFR, Bengaluru) 28 February 2021

The following talk had to be cancelled Heading Towards Turbulence Speaker: Rama Govindarajan (ICTS-TIFR, Bengaluru) | 29 April 2021



COSMICZ

As part of a major outreach initiative, ICTS launched a virtual exhibition titled 'COSMIC ZOOM.' <u>https://www.cosmic-zoom.in/</u>

Targeted at a wide audience, from school children to university students, the exhibition along with its associated online events were attended by more than 30,000 people. It takes the visitor on a Cosmic journey, through the smallest to the largest scales in the Universe. The exhibition also hosted <u>lectures</u>, interactive sessions with labs and observatories, book readings, workshops for children, film screenings and conversations with researchers as well as virtual guided tours. The topics covered by these events include astronomy, particle physics, quantum information, cell biology, search for extra-terrestrial life, toys and several others.

This outreach effort has been made successful by the efforts of a team of scientists, science communicators and designers from ICTS, with help from scientists across the country.

Cosmic Zoom was planned as a curtain-raiser for a proposed *'Bengaluru Science Habba'-* a science festival conceived by a consortium of academic research institutions in Bengaluru.

GLOBAL VIRTUAL SUMMIT

ICTS-TIFR was part of the organization of the Global Virtual Summit held on 23 April 2021. The other organisers were Stanford Angels and Entrepreneurs, Stanford Business School CSI, Stanford Human Rights and International Justice Center, WINGS, Sustainable Development Goals Philanthropy Platform, ETH Zurich Innovation & Entrepreneurship Lab, Environmental Clinic at University of São Paulo, UN University Lab at Macau.

The summit brought together students, business professionals, academics, and government officials from a wide range of backgrounds and from across the world to discuss important issues relating to sustainability. Rajesh Gopakumar, Director ICTS-TIFR, was one of the speakers.

ANNEXURE - A

The following are the details of seminars and colloquia during the period January-April 2021. All seminars and colloquia were held online.

Macroscopic Description of Confined Particles with Repulsive Interaction in Equilibrium | Anupam Kundu (ICTS-TIFR, Bengaluru) | 28 April 2021

The Tensionless Limit of Chiral Superstring Integrands | Nikhil Kalyanapuram (Pennsylvania State University, USA) | 28 April 2021

Hysteretic Quantum Phase Transitions in a Strongly-Correlated Resonantly Driven Optical Lattice | Shovan Dutta (University of Cambridge, UK) | 27 April 2021

Models for the Yielding Behaviour of Amorphous Solids | Srikanth Sastry (Jawaharlal Nehru Centre For Advanced Scientific Research, Bengaluru) | 22 April 2021

Crossing symmetric dispersion relations in QFTs and CFTs | Aninda Sinha (IISc, Bengaluru) | 21 April 2021

Transport and Correlations in One-Dimensional Interacting Particle Systems | Avijit Das (ICTS-TIFR, Bengaluru) | 16 April 2021

AdS Euclidean Wormholes | Jorge Santos (University of Cambridge) | 14 April 2021

Survival Probability and Record Statistics for Random Walks | Bertrand Lacroix-A-Chez-Toine (Weizmann Institute, Israel) | 8 April 2021

Dynamics of Active Matter: From Cell Monolayer to Chemically Active Polymer | Debarati Sarkar (Forschungszentrum Jülich, Germany) | 7 April 2021

Integrated Four-Point Correlators in N=4 SYM | Congkao Wen (Queen Mary University, London) | 7 April 2021

Settling Dynamics and Flow Instabilities in Dense Shear-thinning Fluids | Ranjini Bandyopadhayay (Raman Research Institute, Bengaluru) | 1 April 2021

A Multi-Messenger View into Cosmic Dawn | Hamsa Padmanabhan (University of Geneva, Switzerland) | 31 March 2021

Global Anomalies on the Hilbert Space | Jaume Gomis (University of Cambridge, UK) | 26 March 2021

Onset of Fluidization in Yield Stress Materials: Insights from Microscopic Simulations and Elastoplastic Models | Suman Dutta (ICTS-TIFR, Bengaluru) | 25 March 2021

Probing the Early Universe Using Cosmological 21-cm Signal | Rajesh Mondal (Stockholm University, Sweden) | 24 March 2021

Stark-Heegner Cycles and Arithmetic | **Guhan Venkat** (Morningside Center of Mathematics, Chinese Academy of Sciences) | 23 March 2021

Cosmology with Dark Gravitational Wave Sources | Suvodip Mukherjee (University of Amsterdam, Netherlands) | 18 March 2021

How to give Chiral Fermions a Mass | David Tong (University of Cambridge, UK) | 17 March 2021

Detectability of Gravitational Higher Order Modes in the 3G Era | Divyajyoti (IIT, Madras) | 17 March 2021

Hydrodynamic Stability: Symmetries and Bifurcations | Balachandra Suri (Institute of Science and Technology, Austria) | 11 March 2021

NEGF and Scattering Approach to Transport in Superconducting Wires Junaid Majeed (ICTS-TIFR, Bengaluru) | 11 March 2021

Spacetime as a Quantum Circuit | Michal P. Heller (American Enterprise Institute, USA) | 10 March 2021

The Universe from the Edge of the Dark Matter Halo | Susmita Adhikary (KIPAC, Stanford University) | 9 March 2021

Active Brownian Motion with Directional Reversals | Sanjib Sabhapandit (Raman Research Institute, Bengaluru) | 4 March 2021

Route to Universal Fault-Tolerant Quantum Computation Using Photonics | Krishnakumar Sabapathy (Xanadu Quantum Technologies, Toronto, Canada) | 3 March 2021

The Black Hole Eikonal and the Information Paradox | Nava Gaddam (University of Utrecht, Netherlands) | 3 March 2021

Molecular Basis of Synaptic Plasticity | Shreyas Kaptan (Free University of Berlin, Germany) | 2 March 2021

From Quadratic Hawkes Processes to Super Heston Rough Volatility | Aditi Dandapani (École Polytechnique and University of Zurich) | 1 March 2021

Slow Quench Dynamics in Classical Systems | Kavita Jain (JNCASR, Bengaluru) | 25 February 2021

Bounds on Regge Growth of Flat Space Scattering from Bounds on Chaos Shiraz Minwalla (TIFR, Mumbai) 24 February 2021

Arithmetic Aspects of Algebraic Groups | Srimathy Srinivasan (University of Colorado Boulder, USA) | 23 February 2021

Stratified Stokes Flow Over a Cylinder | **Jim Thomas** (University of North Carolina at Chapel Hill, USA) | 18 February 2021

Information Transfer with a Gravitating Bath | Andreas Karch (University of Texas, Austin) | 17 February 2021

Understanding the Formation of Jet Streams and Storms on Saturn and Jupiter using 3D Convection Simulations | Rakesh K. Yadav (Harvard University, USA) | 12 February 2021 Many Body Chaos is Classical Spin Systems | Subhro Bhattacharjee (ICTS-TIFR, Bengaluru) | 11 February 2021

D-Instanton Amplitudes | Ashoke Sen (HRI, Allahabad) | 10 February 2021

Emergent Behaviors of Complex Chemical Systems | Sumantra Sarkar (Center for Nonlinear Studies at the Los Alamos National Laboratory, USA) | 10 February 2021

Replica Wormholes for an Evaporating Black Hole | Amirhossein Tajdini (University of California, Santa Barbara, USA) | 5 February 2021

Crossover Behaviours Exhibited by Fluctuations and Correlations in a Chain of Active Particles | Prashant Singh (ICTS-TIFR, Bengaluru) | 4 February 2021

The Role of Submesoscale Coherent Structures in Vertical Transport at an Upper-Ocean Front | Vicky Verma (University of California San Diego, USA) | 30 January 2021

Potpourri: Vortex Breakdown, Vortex Rings and Shear Flow Stability | Sharath Jose (IIT, Madras) | 29 January 2021

Relative Velocities of Particles in Turbulence | Akshay Bhatnagar (NORDITA, Sweden) | 29 January 2021

Driven Stokesian Suspensions: Particle Anisotropy, Effective Inertia, and Transient Growth | Rahul Chajwa (ICTS-TIFR, Bengaluru) | 29 January 2021

Well-Posedness, Propagation of Chaos and Numerical Schemes for McKean-Vlasov Stochastic Differential Equations

| Chaman Kumar (Indian Institute of Technology, Roorkee)| 28 January 2021

Periodically Refreshed Baths to Simulate Open Quantum Many-Body Dynamics | Archak Purkayastha (Trinity College Dublin, Ireland) | 28 January 2021

An Intricate Path to Gravity | Sudarshan Ananth (IISER, Pune) | 27 January 2021

Capturing Turbulent Dynamics and Statistics in Experiments using Exact Coherent States | Balachandra Suri (Institute of Science and Technology (IST), Austria) | 21 January 2021

Hydrodynamics Beyond Hydrodynamics | Pavel Kovtun (University of Victoria, Canada) | 20 January 2021

Waves to Weather | Kondapalli Niranjan Kumar (National Centre for Medium Range Weather Forecasting, Ministry of Earth Sciences, India) | 19 January 2021

Study of Flow in a Channel Network | Sunil Bharadwaj (ICTS-TIFR, Bengaluru) | 18 January 2021

Inferring Entropy Production from Short Time Series Data | Supriya Krishnamurthy (Stockholm University, Sweden) | 14 January 2021

Power and Bi-Spectra of Secondary GWs from Ultra Slow Roll Inflation | Ragavendra HV (IIT, Madras) | 13 January 2021 Large-N Expansion and String Theory Out of Equilibrium | Christopher Mogni (University of California, Berkeley, USA) | 13 January 2021

Long-Range Entanglement and Multiple Steady States in a Lossy Qubit Array | Shovan Dutta (University of Cambridge, UK) | 7 January 2021

From Symmetric Product CFTs to AdS_3 | Rajesh Gopakumar (ICTS-TIFR, Bengaluru) | 6 January 2021

Colloquia

The Physics of Virus Self-Assembly | Vinothan N. Manoharan (Harvard University, USA) | 5 April 2021

Multi-messenger Cosmology: A New Frontier | Suvodip Mukherjee (University of Amsterdam, Netherlands) | 15 March 2021

Geometry of Chaos in Hydrodynamic Systems | Balachandra Suri (Institute of Science and Technology, Austria) | 9 March 2021

Mechanism of SARS-CoV-2 Main Protease Activation | Shreyas Kaptan (Free University of Berlin, Germany) | 1 March 2021

Geophysical Turbulence at Oceanic Mesoscales | **Jim Thomas** (University of North Carolina at Chapel Hill, USA) | 16 February 2021

ANNEXURE - B

PAPERS PUBLISHED - 50

In Journals – 30

- Testing the nature of gravitational-wave polarizations using strongly lensed signals, S. Goyal, K. Haris, A. K. Mchta, P. Ajith, Phys. Rev. D. 103, 024038 (2021)
- Constraints on the Time Variation of the Gravitational Constant Using Gravitational Wave Observations of Binary Neutron Stars, A. Vijaykumar, S. J. Kapadia, P. Ajith. Phys. Rev. Lett. 126, 141104 (2021)
- Improved early warning of compact binary mergers using higher modes of gravitational radiation: A population study, M. K. Singh, S. J. Kapadia, M. A. Shaikh, D. Chatterjee, P. Ajith, Monthly Notices of the Royal Astronomical Society, 502 (2), 1612–1622, (2021)
- Search for the stochastic gravitational- wave background induced by primordial curvature perturbations in LIGOs second observing run, S. J. Kapadia, K. L. Pandey, T. Suyama, S. Kandhasamy, P. Ajith, Astrophys. J. Lett., 910 (1), L4 (2021)
- Fractal geometry of Airy_2 processes coupled via the Airy sheet, Riddhipratim Basu, Shirshendu Ganguly, Alan Hammond. The Annals of Probability 49 (1), 485-505 (2021)
- 6. Temporal Correlation in Last Passage Percolation with Flat Initial Condition via Brownian Comparison. **Riddhipratim Basu**, Shirshendu Ganguly, Lingfu Zhang, Comm. Math. Phys., to appear (Accepted: 2021). arXiv:1912.04891
- Inverse energy transfer in decaying, three dimensional, nonhelical magnetic turbulence due to magnetic reconnection, Pallavi Bhat, Muni Zhou, Nuno F. Loureiro Monthly Notices of the Royal Astronomical Society, 501 (2), 3074–3087, (2021)
- 8. Gapless state of interacting Majorana fermions in a strain-induced Landau level, Adhip Agarwala, Subhro Bhattacharjee, Johannes Knolle, Roderich Moessner Phys. Rev. B 103, 134427 (2021). Selected as Editors' Suggestion.
- Statistics tuned entanglement of the boundary modes in coupled Su-Schrieffer-Heeger chains, Saikat Santra, Adhip Agarwala, Subhro Bhattacharjee Accepted for publication in Physical Review B, arXiv:2010.07327
- Active Brownian particle in harmonic trap: exact computation of moments, and reentrant transition, Debasish Chaudhuri, Abhishek Dhar Journal of Statistical Mechanics: Theory and Experiment 2021 (1), 013207 (2021)
- 11. Revisiting the Mazur bound and the Suzuki equality, Abhishek Dhar, Aritra Kundu, Keiji Saito, Chaos, Solitons & Fractals 144, 110618 (2021)

- Covid-19: Analytic results for a modified SEIR model and comparison of different intervention strategies, Arghya Das, Abhishek Dhar, Srashti Goyal, Anupam Kundu, Saurav Pandey, Chaos, Solitons & Fractals, 144, 110595 (2021)
- Quantum Dynamics under continuous projective measurements: non-Hermitian description and the continuous space space limit, Varun Dubey, Cedric Bernardin, Abhishek Dhar Phys. Rev. A 103 (3), 032221 (2021)
- Spatio-temporal relationships between rainfall and convective clouds during Indian Monsoon through a discrete lens, Arjun Sharma, Adway Mitra, Vishal Vasan, Rama Govindarajan International Journal of Climatology 41 (2), 1351-1368 (2021)
- Free field world-sheet correlators for AdS₃, Andrea Dei, Matthias R. Gaberdiel, Rajesh Gopakumar, Bob Knighton JHEP 02, 2021, 81 (2021)
- From Symmetric Product CFTs to AdS₃, Matthias R. Gaberdiel, Rajesh Gopakumar, Bob Knighton, Pronobesh Maity accepted for publication in JHEP. arXiv:2011.10038
- 17. Stephen Hawking (1942–2018), Rajesh Gopakumar, Spenta R. Wadia, Resonance, 26 (1), 13 - 31 (2021)
- Gravitational-wave physics and astronomy in the 2020s and 2030s, Bailes, M., Berger, B.K., Brady, P.R. Iyer, B.R. et al. Nat Rev Phys (2021). https://doi.org/10.1038/s42254-021-00303-8
- 19. The universal spectral form factor for many-body localization, Abhishodh Prakash, J. H. Pixley, Manas Kulkarni, Phys. Rev. Research 3 (1), 012019 (2021) Selected as 'Editors' Suggestion'.
- Multilayered density profile for noninteracting fermions in a rotating twodimensional trap, Manas Kulkarni, Satya N. Majumdar, Gregory Schehr, Phys. Rev. A 103 (3), 033321 (2021)
- Observation of eccentric binary black hole mergers with second and third generation gravitational wave detector networks, Zhuo Chen, E. A. Huerta, Joseph Adamo, Roland Haas, Eamonn O'Shea, Prayush Kumar, Chris Moore Phys. Rev. D 103 (8), 084018 (2021)
- 22. Local time of an Ornstein-Uhlenbeck particle, G. Kishore, Anupam Kundu J. Stat. Mech. 2021, 033218 (2021)
- 23. Local time for run and tumble particle, **Prashant Singh, Anupam Kundu** Phys. Rev. E 103 (4), 042119, (2021) Apr. 2021. Selected as the 'Editor's Suggestion'.
- 24. Resetting with stochastic return through linear confining potential, Deepak Gupta, Arnab Pal, **Anupam Kundu** Journal of Statistical Mechanics: Theory and Experiment 2021 (4), 043202 (2021)
- 25. Stochastic Resetting with Stochastic Returns Using External Trap, Deepak Gupta, Carlos A Plata, Anupam Kundu, Arnab Pal. Journal of Physics A: Mathematical and Theoretical 54 (2), 025003 (2021)

- The Holographic Nature of Null Infinity, Alok Laddha, Siddharth G. Prabhu, Suvrat Raju, Pushkal Shrivastava. SciPost Phys. 10, 041 (2021)
- 27. Holographic KMS relations for finite density fermions, **R. Loganayagam**, Krishnendu Ray, **Shivam K. Sharma**, **Akhil Sivakumar** Journal of High Energy Physics 2021(03), 233 (2021)
- Polymer scission in turbulent flows, Dario Vincenzi, Takeshi Watanabe, Samriddhi Sankar Ray, Jason R. Picardo Journal of Fluid Mechanics 912, A18 (2021)
- 29. Optimal control in pandemics, Joseph Samuel and Supurna Sinha Phys. Rev. E 103 (1), L010301 (2021)
- Of Light and Shadows: Raychaudhuri's Equation, the Big Bang and Black Holes, Joseph Samuel, Resonance, 26, 47-60 (2021)

In arXiv - 14

- 1. Small deviation estimates and small ball probabilities for geodesics in last passage percolation, Riddhipratim Basu, Manan Bhatia. arXiv:2101.01717
- 2. Localization of eigenvectors of non-Hermitian banded noisy Toeplitz matrices, Anirban Basak, Martin Vogel, Ofer Zeitouni. arXiv:2103.17148
- 3. Interpolation by maximal surfaces and minimal surfaces, Rukmini Dey, Rahul Kumar Singh. arXiv:2102.03019
- Equivalence of NEGF and scattering approaches to electron transport in the Kitaev chain, Junaid Majeed Bhat, Abhishek Dhar. arXiv:2101.06376
- Blast in the one-dimensional cold gas: From Newton to Euler and Navier-Stokes, Subhadip Chakraborti, Santhosh Ganapa, P. L. Krapivsky, Abhishek Dhar arXiv:2102.08321
- Crossing Symmetric Dispersion Relations for Mellin Amplitudes, Rajesh Gopakumar, Aninda Sinha, Ahmadullah Zahed. arXiv:2101.09017
- The String Dual to Free N=4 Super Yang-Mills, Matthias R. Gaberdiel, Rajesh Gopakumar. arXiv:2104.08263
- Fluid dynamics in clouds: The sum of its parts, S. Ravichandran, Jason R. Picardo, Samriddhi Sankar Ray, Rama Govindarajan. arXiv:2102.10401
- 9. Surface tension as the destabiliser of a vortical interface, Rashmi Ramadugu, Prasad Perlekar, **Rama Govindarajan.** arXiv:2102.10644
- Virus transmission by aerosol transport during short conversations Rohit Singhal, S. Ravichandran, Rama Govindarajan, Sourabh S. Diwan. arXiv:2103.16415
- Shapes of a filament on the surface of a bubble, S Ganga Prasath, Joel Marthelot, Rama Govindarajan, Narayanan Menon. arXiv:2104.09212
- 12. Sedimenting Elastic Filaments in Turbulent Flows, Rahul K. Singh, Jason R. Picardo, Samriddhi Sankar Ray. arXiv:2101.00385

- 13. Soliton-like behaviour in non-integrable systems, Raghavendra Nimiwal, Urbashi Satpathi, Vishal Vasan, Manas Kulkarni. arXiv:2101.01651
- 14. Harnessing confinement and driving to tune active particle dynamics, Aniruddh Murali, **Pritha Dolai**, Ashwini Krishna, **K. Vijay Kumar**, **Shashi Thutupalli**. arXiv:2101.00571

Consortium - 6

- Open data from the first and second observing runs of Advanced LIGO and Advanced Virgo, The LIGO Scientific Collaboration, the Virgo Collaboration, R. Abbott, et al Software X 13 (2021) 100658 arXiv:1912.11716
- 2. Constraints on cosmic strings using data from the third Advanced LIGO-Virgo observing run, The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration, R. Abbott, et. al. arXiv:2101.12248
- 3. Upper Limits on the Isotropic Gravitational-Wave Background from Advanced LIGO's and Advanced Virgo's First Three Observing Runs, The LIGO Scientific Collaboration, the Virgo collaboration, the KAGRA collaboration, Submitted to Phys. Rev. D., arXiv:2101.12130
- 4. Search for anisotropic gravitational-wave backgrounds using data from Advanced LIGO's and Advanced Virgo's first three observing runs, The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration, R. Abbott et. al. Submitted to Phys. Rev. D. arXiv:2103.08520
- All-sky search in early O3 LIGO data for continuous gravitational-wave signals from unknown neutron stars in binary systems, The LIGO Scientific Collaboration, The Virgo collaboration R. Abbott et. al. Phys. Rev. D 103 (6), 064017 (2021)
- 6. A gravitational-wave measurement of the Hubble constant following the second observing run of Advanced LIGO and Virgo, The LIGO Scientific Collaboration, the Virgo Collaboration, Astrophys. J. 909, No. 2 218 (2021)