ACTIVITY REPORT

(May-August 2020)

ICTS-TIFR has introduced a new series on their YouTube channel named ‘Where the Big Questions Are.’ This will feature some of the world’s top scientists in various fields. The speakers will engage with the relatively small audience on some of the ‘Big Questions’ in their subject. In the first episode Nima Arkani-Hamed took everyone on an exciting Cosmic Roadtrip. [WEBLINK]

Several ICTS members continue to be an integral part of a multi-institutional and multi-lingual science communication initiative called **CovidGyan**. This is a collaborative effort between the Tata Institute of Fundamental Research (and its centres including ICTS), the Indian Institute of Science (IISc) and Tata Memorial Centre (TMC) and several other partners. The website https://covid-gyan.in is an outcome of this initiative and serves as a hub to bring together a collection of resources in response to the COVID-19 outbreak.
The website content is now available in 12 Indian languages. There are regular Covid-Gyan Webinars held every month.

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.

I ICTS ACTIVITIES

Summary of Programming Activities *(For details see following pages)* Programs/Discussion Meetings held: 8

Academic visitors to ICTS-TIFR: 2

Seminars and colloquia: *(For details see Annexure – A)*

Summary of Research Activities *(For details see Annexure - B)*

Papers published: 19

arXiv submissions: 24

Ia. PROGRAMS

All programs were held online

Physics of the Early Universe - An Online Precursor
Organizers: **Robert Brandenberger, Jerome Martin, Subodh Patil** and **L. Sriramkumar** | 31 August - 3 September 2020

Knots Through Web
Organizers: **Rama Mishra, Madeti Prabhakar** and **Mahender Singh** | 24 - 28 August 2020

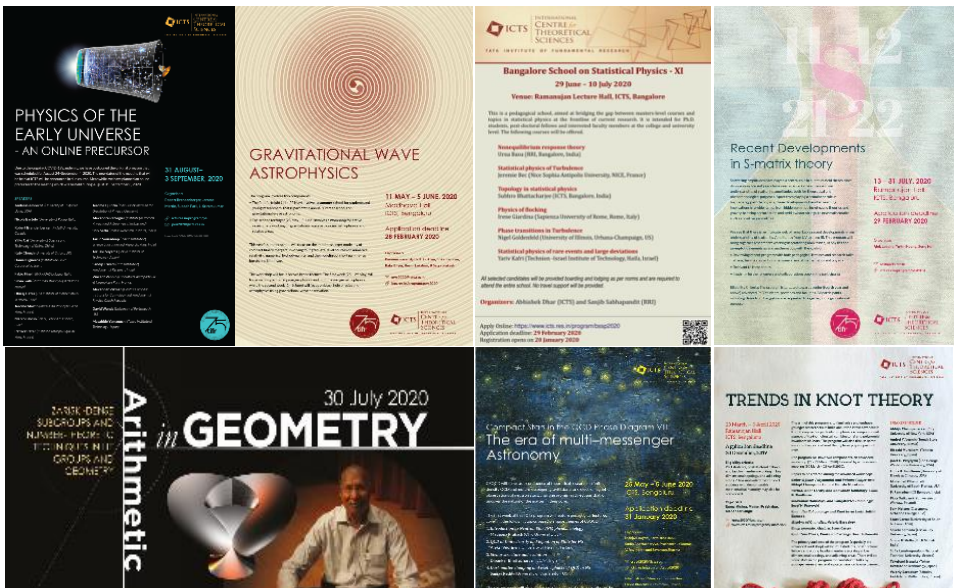
Compact Stars and QCD 2020
Organisers: **Manjari Bagchi, Sarmistha Banik, Sudip Bhattacharyya, Prashanth Jaikumar, V. Ravindran** and **Sayantan Sharma** | 17-21 August 2020

Zariski-Dense Subgroups and Number-Theoretic Techniques in Lie Groups and Geometry
Organisers: **Gopal Prasad, Andrei Rapinchuk, B. Sury** and **Aleksy Tralle** | 30 July 2020

Recent Developments in S-Matrix Theory
Organisers: **Alok Laddha, Song He** and **Yu-tin Huang** | 20-31 July 2020

Bangalore School on Statistical Physics - XI
Organisers: **Abhishek Dhar** and **Sanjib Sabhapandit** | 29 June-10 July 2020

Gravitational Wave Astrophysics
Organisers: **Parameswaran Ajith**, **K. G. Arun**, **Sukanta Bose**, **Bala R. Iyer**, **Resmi Lekshmi** and **B. Sathyaprakash**



The following Programs were cancelled due to the COVID-19 situation:

Canonical Metrics and Connections on Kähler Manifolds and Vector Bundles
Organisers: **Ved V. Datar** and **Vamsi Pritham Pingali** | 3-14 August 2020

First-Passage Percolation and Related Models
Organisers: **Riddhipratim Basu**, **Jack Hanson** and **Arjun Krishnan** | 27 July-14 August 2020

Summer School for Women in Mathematics and Statistics
Organisers: **Siva Athreya** and **Anita Naolekar** | 8-19 June 2020

Ib. DISCUSSION MEETINGS

All Discussion Meetings were held online

Zero Mean Curvature
Organisers: **CS Aravinda** and **Rukmini Dey** | 7-15 July 2020

The following discussion meetings were cancelled due to the Covid-19 situation:

Mathematica Summer School in Theoretical Physics
Organisers: Julius, Nikolay Gromov, Aninda Sinha and Pedro Vieira | 22-27 June 2020

Chevalley Groups and their Representations
Organisers: Shripad M. Garge, Anupam Kumar Singh and Manoj Kumar Yadav | 22-26 June 2020

Ic. LECTURE SERIES

Due to the COVID-19 situation, none of the lecture series could be held.

Id. VISITS OF SCIENTISTS

The following researchers visited the ICTS during May-August 2020.

Hari Kumar Y, Indian Institute of Science
Sidharth Soundaryarajan, Indian Institute of Science

Ie. NEWS ON GRANTS, AWARDS AND FELLOWSHIPS

VISHAL VASAN, ICTS faculty member, has been selected as an associate of the Indian Academy of Sciences, in recognition of his innovational work. Vishal's work is in the field of partial differential equations and their applications. His work balances theoretical and applied aspects of these equations employing a mix of analysis, numerical methods and asymptotics. He has worked on problems arising in water-waves, oceanography, and Bose-Einstein condensates and more recently, he is interested in mathematical tropical meteorology. Vishal's primary mathematical interests are the analysis of partial differential equations, stability theory and inverse problems.

ARCHAK PURAKAYASTHA, a former doctoral student at ICTS has been awarded the prestigious Marie Sklodowska-Curie Actions Individual Fellowship for his research proposal towards developing a thermodynamically consistent microscopic theory which allows numerically exact description of noisy out-of-equilibrium mesoscopic quantum devices. This research is expected to open doors to completely uncharted territories for further developments in quantum technology.

SUBHRO BHATTACHARJEE is part of a successful Quantum Materials grant under the NanoMission special project of the DST. The special project includes researchers from IISc, IACS, TIFR-Mumbai and other research institutions in the country. He will be leading a team at ICTS as part of this project which will involve setting up a new computational cluster at ICTS.

II ICTS PEOPLE

IIa FACULTY

1. Ashoke Sen (HRI, Allahabad) has accepted the offer of the ICTS-Infosys Madhava Chair Professorship.
2. Sumathi Rao (HRI, Allahabad) has accepted the offer of ICTS Endowed Senior Professorship.
3. Prayush Kumar (Cornell University) is expected to join the ICTS Astrophysics faculty in October 2020.
4. Pallavi Bhat (University of Leeds) has been offered a position in the Astrophysics faculty. Her interests overlap with the Fluid Dynamics group as well.

IIb STUDENTS

GRADUATE PROGRAM

1. The PhD interviews for the Physics stream via JEST/CSIR/GATE entrance exams were held online on 15th July 2020. **4 PhD** and **2 Integrated PhD** offers were made after the interviews.
2. The PhD interviews for the Mathematics stream via TIFR-GS/CSIR/GATE entrance exams were held online on 17th July 2020. **4 PhD** offers were made after the interviews.
3. Because of the current situation the classes for the upcoming semester will be conducted online from 1st week of September onwards.
4. Starting from the upcoming semester, Moodle software will be used to organize the courses. This software will help both the teachers and administrators to efficiently organize courses, to communicate to students, to collect grades, as well as to archive courses for future reference.
5. 10 students completed their registration process and registered for their PhDs.
6. Following students have submitted their PhD thesis and synopsis:
    - Soumyadeep Chaudhuri defended his thesis successfully on 14th May 2020.
    - Anugu Sumith Reddy, Ritabrata Thakur, and Pushkal Shrivastava submitted their thesis on 27th June, 05th Aug, 10th August 2020 respectively.
    - Rahul Chajwa submitted his synopsis on 06th August 2020.

POSTDOCTORAL PROGRAM

1. Applications were invited from 15th August 2020 for the summer hiring cycle of postdoctoral fellows. The applications are obtained through two ways: ICTS web-based application portal and through Academic Jobs Online.
2. From the 10 newly hired postdocs (from the December 2019 fall cycle), a few will join at the beginning of September 2020.

VISITING STUDENTS PROGRAM

1. The following Long Term Visiting Students Program (LTVSP) 2020 batch has started work remotely with their respective faculty mentors:

Name	Affiliation	Mentor
Rithwik S V	IISER, Pune	Rukmini Dey
Nachiket Karve	IISc, Bengaluru	R. Loganayagam
Sridhar Vinayak	IISER, Mohali	Spenta Wadia
Bharathkumar Radhakrishnan	IISER, Mohali	Rajesh Gopakumar
Aditya Pujari	BITS Pilani, Goa	Rama Govindarajan
Vinayak Vinayak	IISc, Bengaluru	Rama Govindarajan
Abhratanu Saha	IISc, Bengaluru	Vijay K
Ruchira Mishra	IISER, Mohali	Suvrat Raju
Sudhi Mathur	California Institute of Technology, USA	P. Ajith
Narola Harsh	IISER, Tirupati	P. Ajith
Surendra Padamata	BITS Pilani, Goa	P. Ajith

SUMMER COURSE

- Rajaram Nityananda (Azim Premji University) gave a summer course titled '*Light and Beyond.*' It was conducted online from 31 May 2020 to 28 June 2020 (every Sunday).

  https://www.icts.res.in/lectures/sc-2020-light.

  Total 63 students attended the online course and there were 10 tutors (8 from ICTS and 2 from APU) to assist the teacher with the course.

- After the successful completion of the course, a small optics study group was started with the students who were interested to study further.

III OUTREACH

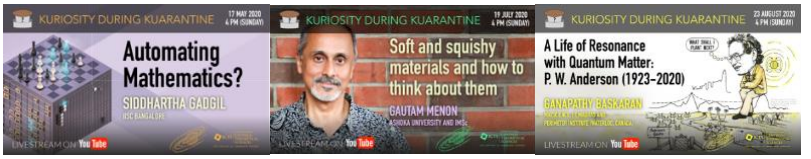
KAAPI WITH KURIOSITY

The lecture series has been temporarily renamed Kuriosity During Kuarantine. All the lectures are being livestreamed on the ICTS YouTube channel.

A Life of Resonance with Quantum Matter: P.W. Anderson (1923-2020)
Speaker: **Ganapathy Baskaran** (Professor Emeritus, The Institute of Mathematical Sciences, Chennai, Distinguished Professor, Indian Institute of Technology, Chennai, and Distinguished Visiting Research Chair, Perimeter Institute for Theoretical Physics, Waterloo, Ontario, Canada) | 23 August 2020

Soft and squishy materials and how to think about them
Speaker: **Gautam Menon** (Ashoka University and IMSc) | 19 July 2020

Automating Mathematics?
Speaker: **Siddhartha Gadgil** (Indian Institute of Science, Bangalore) | 17 May 2020



ICTS-NIAS MATHS CIRCLE

Rukmini Dey gave an online talk titled ***Surfaces from all Around – A Mathematical Point of View***. The talk, held on July 22, 2020, was organised by REVA University, Bangalore.

SPECIAL FILM SCREENING

On May 16, 2020, ICTS organised an online virtual screening of the film ***'Secrets of the Surface: The Mathematical Vision of Maryam Mirzakhani.'*** This was part of *Celebrating Women in Mathematics Day*, held on May 12 to celebrate Maryam Mirzakhani's birthday.

ANNEXURE - A

The following are the details of seminars and colloquia during the period May-August 2020. All seminars and colloquia were held online.

Seminars

Search for Lensed Gravitational Waves from LIGO/Virgo Binary Black Hole Mergers: Intriguing Candidates in O2 | Liang Dai (University of California, Berkeley) | 28 August 2020

A Tutorial on Entanglement Island Computations | Raghu Mahajan (IAS, Princeton) | 26 August 2020

Possibility of Topological Superconductivity and Other Exotic Phases in Experimentally Relevant Bilayer Kagome Systems | Speaker: Aabhaas Vineet Mallik (ICTS-TIFR, Bangalore) | 26 August 2020

Magnus Nernst and Thermal Hall Effect | Speaker: Amit Agarwal | 25 August 2020

Pure Spinor Superstrings: Massive States | Speaker: Subhroneel Chakrabarti (Institute of Mathematical Sciences, Chennai) | 21 August 2020

Holomorphic Anomaly in Vafa-Witten Theory | Speaker: Pavel Putrov | 19 August 2020

The Universal Spectral-Form-Factor for Many Body Localization | Speaker: Abhishodh Prakash | 18 August 2020

Life-as a Matter of Fat | Speaker: Tripta Bhatia (Max Planck Institute of Colloids and Interfaces) | 18 August 2020

Three Avatars of Mock Modularity | Speaker: Atish Dabholkar (International Centre for Theoretical Physics, Trieste) | 12 August 2020

Two Tales of Characterizing Strongly Coupled Quantum Matter In and Out of Equilibrium | Speaker: Abhishodh Prakash (ICTS-TIFR, Bangalore) | Date: 11 August 2020

Transport and Hydrodynamics in Almost the Chiral Limit | Speaker: Derek Teaney (State University of New York) | 5 August 2020

Examining Nonviolent Nonlocality | Speaker: Vijay Kumar (ICTS-TIFR, Bangalore) | 31 July 2020

KMS Relation for Anyons | Speaker: Aswin Parayil Mana (ICTS-TIFR, Bangalore) | 30 July 2020

Testing General Relativity Using Multiband Observations of Binary Black Hole Mergers | Speaker: Sayantani Datta (Chennai Mathematical Institute) | 29 July 2020

Holo-ween | Speaker: Mark Van Raamsdonk (University of British Columbia) | 29 July 2020

Multiscale Simulation of Biomolecules: Understanding the Emergence of Biological Functions from the Interaction of Molecules | Speaker: Sumantra Sarkar (Los Alamos National Laboratory, USA) | 28 July 2020

Black Holes and Holography | Speaker: Pushkal Shrivastava (ICTS-TIFR, Bangalore) | 28 July 2020

Aspects of Open Quantum Field Theories | Speaker: Chandan Kumar Jana (ICTS-TIFR, Bangalore) | 27 July 2020

Bootstrapping Matrix Quantum Mechanics | Speaker: Sean Hartnoll (Stanford University) | 23 July 2020

Driven Stokesian Suspensions: Particle Anisotropy, Effective Inertia and Transient Growth | Speaker: Rahul Chajwa (ICTS-TIFR, Bangalore) | 23 July 2020

Deformations of JT Gravity and Matrix Models | Speaker: Edward Witten (IAS, Princeton) | 17 July 2020

Holographic Duality for Averaged Free CFTs | Speaker: Tom Hartman (Cornell University) | 15 July 2020

Spacetime, Quantum Mechanics and Clusterhedra at Infinity | Speaker: Nima Arkani-Hamed (IAS, Princeton) | 10 July 2020

Parameter Estimation for Strong Phase Transitions in Supranuclear Matter Using Gravitational-Wave Astronomy | Speaker: Peter Tsun Ho Pang (Nikhef, Amsterdam) | 10 July 2020

On the Density Matrix of the Hawking Radiation | Speaker: Douglas Stanford (Stanford University) | 08 July 2020

Jets, Coherent Structures and Sharp Curvatures in Free Surfaces | Speaker: Sangeeth Krishnan (ICTS-TIFR, Bangalore) | 29 June 2020

A 3D Flat-Space Holography Inspired by AdS3/CFT2 Duality | Speaker: Nabamita Banerjee (Indian Institute of Science Education and Research, Bhopal) | 26 June 2020

Replica Wormholes, Entanglement Wedges and the Black Hole Information Paradox | Speaker: Geoffrey Penington (Stanford University) | 24 June 2020

The BMS Group in (A)dS | Speaker: Geoffrey Compere (Free University of Brussels) | 19 June 2020

Double Soft Theorem in Generalized Bi-Adjoint Scalars | Speaker: Arnab Priya Saha (Harish-Chandra Research Institute, Allahabad) | 17 June 2020

Finite-Cutoff JT Gravity and Self-Avoiding Loops | Speaker: Zhenbin Yang (Stanford University) | 10 June 2020

Page Curves in Asymptotically Flat Spacetime | Speaker: Larus Thorlacius (University of Iceland) | 08 June 2020

Anomalous Dimensions from Thermal AdS Partition Functions | Speaker: Per Kraus (University of California - Los Angeles) | 4 June 2020

Turbulence Suppression and Onset in Stratified Flows | Speaker: Ritabrata Thakur (ICTS-TIFR, Bangalore) | 29 May 2020

Precision Microstate Counting of AdS Black Hole Entropy | Speaker: Leopoldo Zayas (University of Michigan) | 27 May 2020

Magnetic Black Holes | Speaker: Juan Maldacena (IAS, Princeton) | 22 May 2020

Out of Time Ordered Effective Dynamics of a Brownian Particle | Speaker: Soumyadeep Chaudhuri (ICTS-TIFR, Bangalore) | 14 May 2020

Holographic Interpretation of Bulk Entanglement Entropy | Speaker: Gautam Mandal (TIFR, Mumbai) | 13 May 2020

From Hydrodynamics to Viscoelasticity in Holography and beyond … | Speaker: Matteo Baggioli (IFT UAM-CSIC) | 6 May 2020

The Holographic Nature of Null Infinity | Speaker: Suvrat Raju (ICTS-TIFR, Bangalore) | 4 May 2020

Colloquia

Open Questions in Turbulent Stratified Mixing: Do We Even Know What We Do Not Know? | Speaker: C. P. Caulfield (BP Institute & DAMTP, University of Cambridge) | 13 July 2020

Masking it Up: Electrocharged Face Piece Respirator Fabrics Using Common Materials and Simple Methods | Speaker: Mahesh M Bandi (Okinawa Institute of Science and Technology, Japan) | Date: 22 June 2020

Agent-Based Simulators for the Study of COVID-19 Spread | Speaker: Rajesh Sundaresan (Indian Institute of Science, Bangalore) | 8 June 2020

ANNEXURE - B

PAPERS PUBLISHED – 46

In Journals – 19

1. *Prospects for Probing Ultralight Primordial Black Holes Using the Stochastic Gravitational-Wave Background Induced by Primordial Curvature Perturbations*, **S. J. Kapadia, K. L. Pandey**, T. Suyama, **P. Ajith**, Phys. Rev. D 101, 123535 (2020)
2. *Asymptotic Properties of Linear Filter for Noise Free Dynamical System* **Anugu Sumith Reddy, Amit Apte**, Sreekar Vadlamani Systems & Control Letters,v.139, p.104676, (2020)
3. *Thermalization of Local Observables in the α-FPUT Chain*, **Santhosh Ganapa, Amit Apte, Abhishek Dhar**. Journal of Statistical Physics 180, 1, 1010–1030, (2020)
4. *Outliers of Random Perturbations of Toeplitz Matrices with Finite Symbols* **Anirban Basak**, Ofer Zeitouni arXiv:1905.10244 Probability Theory and Related Fields (2020)
5. *Interplay of Magnetism and Topological Superconductivity in Bilayer Kagome Metals*, Santu Baidya, **Aabhaas Vineet Mallik, Subhro Bhattacharjee,** Tanusri Saha-Dasgupta, Phys. Rev. Lett. 125, 026401 (2020)
6. *Understanding Transmission Dynamics of COVID-19-Type Infections by Direct Numerical Simulations of Cough/ Sneeze Flows,* Sourabh Diwan, S Ravichandran, **Rama Govindarajan** and Roddam Narasimha. Transactions of the Indian National Academy of Engineering, Special Issue on Covid, to appear, 2020
7. *Localisation of Optimal Perturbations in Variable Viscosity Channel Flow*. Sharath Jose, Luca Brandt and **Rama Govindarajan**. International Journal of Heat and Fluid Flow, Invited paper, to appear Volume 85, 108588 (2020)
8. *Time Scales of Fickian Diffusion and the Lifetime of Dynamic Heterogeneity*, R. Das, **C. Dasgupta** and S. Karmakar. Front. Phys. 8: 210 (2020). doi: 10.3389/fphy.2020.00210
9. *Dynamical Correlations of Conserved Quantities in the One-Dimensional Equal Mass Hard Particle Gas*, Aritra Kundu, **Abhishek Dhar**, Sanjib Sabhapandit. J. Stat. Mech.: Theory and Experiment 2002, 2, 023205 (2020)
10. *Active Brownian Particles: Mapping to Equilibrium Polymers and Exact Computation of Moments,* Amir Shee, **Abhishek Dhar,** Debasish Chaudhuri. Soft Matter, 16, 4776-4787 (2020)

11. *Gap Statistics of Two Interacting Run and Tumble Particles in One Dimension* **Arghya Das, Abhishek Dhar, Anupam Kundu** Journal of Physics A: Mathematical and Theoretical, vol. 53, 34 issue, 345003 (2020)
12. *Universal Scaling in Active Single-File Dynamics*, **Pritha Dolai, Arghya Das, Anupam Kundu, Chandan Dasgupta, Abhishek Dhar, K. Vijay Kumar.** Accepted for publication in Soft Matter, 2020, Issue 30, 16, 7077-7087 (2020)
13. *Transport, Correlations, and Chaos in a Classical Disordered Anharmonic Chain*, **Manoj Kumar, Anupam Kundu, Manas Kulkarni**, David A. Huse, and **Abhishek Dhar**, Phys. Rev. E 102, 022130 (2020)
14. *Spatio-Temporal Spread of Perturbations in a Driven Dissipative Duffing Chain*: *An OTOC Approach*, A. K. Chatterjee, **A. Kundu, M. Kulkarni**, Accepted in Phy. Rev. E, arXiv:2002.05629 (2020)
15. *Open Quantum Systems and Schwinger-Keldysh Holograms,* **Chandan Jana, R. Loganayagam**, Mukund Rangamani. JHEP 07 242 (2020)
16. *Dynamics of a Long Chain in Turbulent Flows: Impact of Vortices,* J. R. Picardo, R. Singh**, Samriddhi Sankar Ray** and D. Vincenzi*. Philosophical Transactions of the Royal Society A, 378, 20190405 (2020)*
17. *Orientation Dynamics of Sedimenting Particles Anisotropic Particles in Turbulence,* P. Anand, **Samriddhi Sankar Ray** and G. Subramanian*. Physical Review Letters 125, 034501 (2020)*
18. *Elasto-Inertial Chains in a Two-dimensional Turbulent Flow,* **R. Singh**, M. Gupta, J. R. Picardo, D. Vincenzi **and Samriddhi Sankar Ray**. *Physical Review E 105, 053105 (2020)*
19. *Suppressing Thermalization and Constructing Weak Solutions in Truncated Inviscid Equations of Hydrodynamics: Lessons from the Burgers Equation,* S. D. Murugan, U. Frisch, S. Nazarenko, N. Besse, and **Samriddhi Sankar Ray**. *Physical Review Research, 2, 033202 (2020)*

ArXiv -24

1. *Of Harbingers and Higher Modes: Improved Gravitational-Wave Early-Warning of Compact Binary Mergers*, S J. Kapadia, M. K. Singh, M. A. Shaikh, D. Chatterjee, **P. Ajith**. Submitted to ApJ. Lett. arXiv:2005.08830
2. *Probing the Large Scale Structure Using Gravitational-Wave Observations of Binary Black Holes*, A. Vijaykumar, M. V. S. Saketh, S. Kumar, **P. Ajith**, T. Roy Choudhury. Submitted to Phys. Rev. Lett. arXiv:2005.01111
3. *Testing the Nature of Gravitational-Wave Polarizations Using Strongly Lensed Signals*, **S. Goyal**, K. Haris, A. K. Mehta, **P. Ajith**, Submitted to Phys. Rev. D. (2020) arXiv:2008.07060 [gr-qc]
4. *Interlacing and Scaling Exponents for the Geodesic Watermelon in Last Passage Percolation* **Riddhipratim Basu**, Shirshendu Ganguly, Alan Hammond, Milind Hegde arXiv:2006.11448

5. *Emergent Elasticity in Amorphous Solids*, Jishnu N. Nampoothiri, Yinqiao Wang, Kabir Ramola, Jie Zhang, **Subhro Bhattacharjee**, Bulbul Chakraborty Phys. Rev. Lett. (in press). arXiv:2004.02230
6. *Gapless State of Interacting Majorana Fermions in a Strain-Induced Landau Level,* **Adhip Agarwala, Subhro Bhattacharjee**, Johannes Knolle, Roderich Moessner. arXiv:2007.13785
7. *Cooperative Paramagnetic Phase in Diluted Triangular Lattice Magnet magnet Y_2CuTiO_6,* S. Kundu, Akmal Hossain, Pranava Keerthi S, Ranjan Das, Jean-Christophe Orain, M. Baenitz, Peter J. Baker, D. C. Joshi, Roland Mathieu, Sumiran Pujari, **Subhro Bhattacharjee**, A. V. Mahajan and D. D. Sarma. [Accepted for publication in Physical Review Letters (in press)]
8. *Phases and Quantum Phase Transitions in an Anisotropic Ferromagnetic Kitaev-Heisenberg- Magnet* **Animesh Nanda**, Kusum Dhochak, **Subhro Bhattacharjee** arXiv:2006.10081
9. *Covid-19: An Analysis of an Extended SEIR Model and a Comparison of Different Intervention Strategies,* **Arghya Das, Abhishek Dhar, Srashti Goyal, Anupam Kundu**. medRxiv **doi:** https://doi.org/10.1101/2020.06.04.20122580. arXiv:2005.11511
10. *Active Brownian Particle in Harmonic Trap: Exact Computation of Moments, and Re-Entrant Transition,* Debasish Chaudhuri, **Abhishek Dhar.** arXiv:2005.14234
11. *Quantum Brownian Motion: Drude and Ohmic Baths as Continuum Limits of the Rubin Model,* **Avijit Das, Abhishek Dhar**, Ion Santra, Urbashi Satpathi, Supurna Sinha. arXiv:2006.14637
12. *Microscopic Theory of the Fluctuating Hydrodynamics in Nonlinear Lattices,* Keiji Saito, Masaru Hongo, **Abhishek Dhar**, Shin-ichi Sasa. arXiv:2006.15570
13. *Revisiting the Mazur Bound and the Suzuki Equality,* **Abhishek Dhar**, Aritra Kundu, Keiji Saito. arXiv:2007.04562
14. *Transport in Superconducting Wires,* **Junaid Majeed Bhat**, **Abhishek Dhar**. arXiv:2007.09348
15. *How Archimedes Showed That π is Approximately Equal to 22/7*, Damini D. B., **Abhishek Dhar.** arXiv:2008.07995
16. *Early Evolution of Optimal Perturbations in a Viscosity-Stratified Channel,* Ritabrata Thakur, **Arjun Sharma, Rama Govindarajan**. arXiv:2007.03628
17. *Spatio-Temporal Relationships Between Rainfall and Convective Clouds During Indian Monsoon Through a Discrete Lens,* **Arjun Sharma**, Adway Mitra, **Vishal Vasan, Rama Govindarajan**. arXiv:2008.08251
18. *Emergence of Chaos and Controlled Photon Transfer in a Cavity-QED network*, A. Dey, **M. Kulkarni**, arXiv:2005.10202
19. *Non-Analytic Non-Equilibrium Field Theory: Stochastic Reheating of the Ising Model* Camille Aron, **Manas Kulkarni** arXiv:2007.0066
20. *The Universal Spectral Form Factor for Many-Body Localization* **A. Prakash**, J. H. Pixley, **M. Kulkarni**, arXiv:2008.07547

21. *Has the Indian Lockdown Averted Deaths?* **Suvrat Raju.** arXiv:2007.04219
22. *A Physical Protocol for Observers Near the Boundary to Obtain Bulk Information in Quantum Gravity*, **Chandramouli Chowdhury**, Olga Papadoulaki, **Suvrat Raju**. e-Print: 2008.01740
23. *Bridging Inertial and Dissipation Range Statistics in Rotating Turbulence*, S. K. Rathore, M. K. Sharma, **Samriddhi Sankar Ray**, and S. Chakraborty. Physics of Fluids, in press arXiv: 1912.08455
24. *Statistics of the Kinetic Energy of Heavy, Inertial Particles in Weakly Rotating Turbulence,* **P. Maity** and **Samriddhi Sankar Ray.** Perspectives in Nonlinear Dynamics, in press 2020

Consortium-3

1. *GW190814: Gravitational Waves from the Coalescence of a 23 Solar Mass Black Hole with a 2.6 Solar Mass Compact Object*, The Astrophysical Journal Letters, 896:L44 (20pp), 2020
2. *GW190412: Observation of a Binary-Black-Hole Coalescence with Asymmetric Masses*, The LIGO Collaboration, Virgo Collaboration arxiv: 2004.08342
3. *Gravitational-Wave Constraints on the Equatorial Ellipticity of Millisecond Pulsars,* The LIGO Scientific Collaboration, the Virgo Collaboration, R. Abbott et al arXiv:2007.14251