Dhruba Dutta Chowdhury

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RESEARCH INTERESTS

Black Holes, Dark Matter, Gas and Stellar Dynamics, Star Clusters

POSITIONS

Center for Astrophysics and Planetary Science,
Racah Institute of Physics, The Hebrew University of Jerusalem, Israel 2022-

- Postdoctoral Fellow (2024 -
- Israel Academy of Sciences and Humanities Postdoctoral Fellow (2022-2024)
- Advisors: Avishai Dekel and Nir Mandelker

Department of Physics, Presidency University, Kolkata, India 2015-2016

- Project Assistant (Junior Research Fellow)
- Project: Modeling the 21 cm Signal from the Dark Ages
- Advisor: Kanan Kumar Datta

EDUCATION

Yale University, New Haven, USA 2016-2022

- Ph.D., M.S., M.Phil. in Astrophysics
- Thesis: Constraining Dark Matter through Gravitational Heating and Cooling Processes
- Advisors: Frank van den Bosch and Pieter van Dokkum

Presidency University, Kolkata, India 2013-2015

- M.Sc. in Physics
- Thesis: The Sunyaev-Zel'dovich Signal from Quasar Host Halos
- Advisor: Suchetana Chatterjee

Presidency College, University of Calcutta, Kolkata, India 2010-2013

- B.Sc. (Honors) in Physics
- Minors and Mathematics and Chemistry

AWARDS

- Arnold Rosenblum Prize for Excellence in Research in Astrophysics, Hebrew University 2023
- Israel Academy of Sciences and Humanities Postdoctoral Fellowship 2022-2024
- Sheldon Wise Pre-Doctoral Fellowship, Yale University 2017-2018
- Junior Research Fellowship, Department of Science & Technology, India 2015-2016
- Lilabati Ray Memorial Prize for Best Student Seminar, Presidency University 2015
- INSPIRE scholarship, Department of Science & Technology, India 2010-2015

PROFESSIONAL ACTIVITIES

- Referee for ApJ 2019-Present
- Astro-ph Meeting Moderator, The Hebrew University of Jerusalem 2022-Present
- Yale Astronomy Graduate Student Talks SOC Member Spring 2019
- Galaxy Lunch Moderator, Yale Astronomy Department 2017-2018

TEACHING EXPERIENCE

- Guest Lecturer, Advanced Astrophysics II: Galaxies and Cosmology, Hebrew University — Spring 2024
- Guest Lecturer, Advanced Astrophysics II: Galaxies and Cosmology, Hebrew University — Spring 2023
- Teaching Fellow, Planets and Stars, Yale University — Spring 2017
- Teaching Fellow, Galaxies and the Universe, Yale University — Fall 2017, 2019

CONFERENCE TALKS

1. Cosmic Dawn Revealed by JWST: First Stars, Galaxies, and Black Holes, KITP, Santa Barbara — Aug 2024
   Dynamical Friction in Disks and Application to FFB Disks
2. Galaxy Formation Workshop, University of California, Santa Cruz — Aug 2024
   Dynamical Friction in Disks
3. Galaxy Formation Workshop, University of California, Santa Cruz — Aug 2024
   Radial Transport in High-Redshift Disks
4. Galaxy Formation Workshop, University of California, Santa Cruz — Aug 2023
   Radial Transport in High-Redshift Disks
5. 68$^{\text{th}}$ Israel Physical Society Meeting, Tel Aviv — April 2023
   Radial Transport in High-Redshift Disks
6. Galaxy Formation Workshop, University of California, Santa Cruz — Aug 2022
   Constraining Dark Matter with Gravitational Heating and Cooling Processes
7. Virtual Workshop on Very Light Dark Matter, Kavli IPMU, Kashiwa — Sept 2021
   On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo
8. Virtual Young Astronomers on Galactic Nuclei Meeting, Niels Bohr Institute, Copenhagen — Sept 2021
   On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo
9. Virtual 16$^{\text{th}}$ Marcel Grossmann Meeting — July 2021
   On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo
10. Virtual 238$^{\text{th}}$ American Astronomical Society Meeting — June 2021
    On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo
11. Epoch of Reionization Workshop, Indian Institute of Technology, Kharagpur — July 2016
    Imprints of the Recombination History of the Universe on the 21-cm Signal from the Dark Ages
12. Topical Conference on Gravity, Cosmology, Astronomy, and Astrophysics, IISER, Kolkata — Sept 2015
    Sunyaev–Zel'dovich Signal from Quasar Hosts: Implications for Quasar Feedback Detection

SEMINARS

1. State of the Universe Seminar, Tata Institute of Fundamental Research, India (**invited**) — Apr 2023
2. Nature of Dark Matter on Small Scales Virtual Seminar (**invited**) — Apr 2022
3. Galaxies and Cosmology Seminar, University of Texas at Austin, USA (**invited**) — Nov 2021
4. Galaxy Coffee Talk, Max Planck Institute for Astronomy, Germany — Nov 2021
5. Astro Lunch Seminar, Carnegie Mellon University, USA (**invited**) — Nov 2021
6. Cosmology Group Meeting Talk, Canadian Institute for Theoretical Astrophysics, Canada — Nov 2021
7. L2G2 Meeting Talk, Center for Computational Astrophysics, USA (**invited**) — Nov 2021
8. Lunch Talk, Leiden Observatory, Netherlands — Nov 2021
9. Lunch Talk, Carnegie Observatories, USA (**invited**) — Nov 2021
10. Center for Astrophysics Seminar, Harvard University, USA (**invited**) — Nov 2021
11. Cosmology Seminar, Max Planck Institute for Astrophysics, Germany — Oct 2021
12. Thunch Talk, Princeton University, USA — Oct 2021
13. CCAPP Seminar, Ohio State University, USA (**invited**) — Oct 2021
14. Flash Talk, University of California, Santa Cruz, USA — Oct 2021
15. Brown Bag Lunch Talk, Massachusetts Institute of Technology, USA — Oct 2021
16. TAPIR Seminar, California Institute of Technology, USA (**invited**) — Oct 2021
17. Cosmo Lunch Talk, The Hebrew University of Jerusalem, Israel (**invited**) — Sep 2021
18. Physics Club Talk, Presidency University, India (**invited**) — Jul 2019

INVITED COLLOQUIA

1. School of Astrophysics, Presidency University, Kolkata, India — Sept 2022
2. Academia Sinica Institute for Astronomy and Astrophysics, Taipei, Taiwan — Jan 2022
3. Department of Physics, Presidency University, Kolkata, India — May 2019

CONFERENCE POSTERS

1. Santa Cruz Galaxy Workshop, University of California, Santa Cruz — Aug 2019
   On the Orbital Decay of Globular Clusters in NGC 1052-DF2
2. Small Galaxies, Cosmic Questions Conference, Durham University, Durham — July 2019
   On the Orbital Decay of Globular Clusters in NGC 1052-DF2

PUBLICATIONS [ADS]

Total: 11, Significant contributions: 8 (6 as lead author), 203 Citations, h-index = 8

Major Contributions

1. Dekel, A., Stone, N., **Dutta Chowdhury, D.** et al. "Growth of Massive Black Holes in FFB Galaxies at Cosmic Dawn", submitted to A&A
   (*ran and analyzed numerical simulations and contributed to writing*)
2. **Dutta Chowdhury, D.**, Dekel, A., Mandelker, N., Ginzburg, O., and Genzel, R. "Radial Transport in High-Redshift Disk Galaxies Dominated by Inflowing Streams", submitted to A&A, arXiv:2409.01589
3. **Dutta Chowdhury, D.**, van den Bosch F.C., van Dokkum, P., Robles, V.H., Schive H. et al. "On the Dynamical Heating of Dwarf Galaxies in a Fuzzy Dark Matter Halo", 2023, ApJ, 949, 68
4. **Dutta Chowdhury, D.**, van den Bosch, F.C., Robles, V.H., van Dokkum, P., Schive, H. et al. "On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo" 2021, ApJ, 916, 27
5. **Dutta Chowdhury, D.**, van den Bosch, F.C., and van Dokkum, P. "On the Evolution of the Globular Cluster System in NGC 1052-DF2: Dynamical Friction, Globular-Globular Interactions, and Galactic Tides" 2020, ApJ, 903, 149
6. **Dutta Chowdhury, D.**, van den Bosch, F.C., and van Dokkum, P. "On the Orbital Decay of Globular Clusters in NGC 1052-DF2: Testing a Baryon Only Mass Model" 2019, ApJ, 877, 133
7. Ansar, S., Datta, K.K. and **Dutta Chowdhury, D.** "Impact of Inhomogeneous CMB Heating of Gas on the HI 21-cm Signal During Dark Ages" 2018, PhysRevD, 98, 103505
   (*initiated the study and did a portion of the analytical calculations*)
8. **Dutta Chowdhury, D.** and Chatterjee, S. "Sunyaev-Zel'dovich Signal from Quasar Hosts: Implications for Detection of Quasar Feedback" 2017, ApJ, 839, 34

Collaboration Papers

9. van Dokkum P. et al. including **Dutta Chowdhury D.** [11 total] "Monochromatic globular clusters as a critical test of formation models for the dark matter deficient galaxies NGC1052-DF2 and NGC1052-DF4" 2022, ApJL, 940, L9
10. van Dokkum P. et al. including **Dutta Chowdhury D.** [11 total] "A trail of dark-matter-free galaxies from a bullet-dwarf collision" 2022, Nature, 605, 435
11. Shen Z. et al. including **Dutta Chowdhury D.** [10 total] "A Tip of the Red Giant Branch Distance of 22.1 $\pm$ 1.2 Mpc to the Dark Matter Deficient Galaxy NGC 1052–DF2 from 40 Orbits of Hubble Space Telescope Imaging" 2021, ApJL, 914, L12

COMPUTATIONAL SKILLS

- N-Body simulations with GADGET-2 and GADGET-4
- Fuzzy Dark Matter simulations with GAMER-2 (AMR Code)
- Programming skills in C, C++, FORTRAN 77, and Python
- Post processing and analysis of Hydro-Cosmological Simulations