Dhruba Dutta Chowdhury

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RESEARCH INTERESTS

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

POSITIONS

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

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

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. "On the Orbital Decay of Globular Clusters in NGC 1052-DF2: Testing a Baryon Only Mass Model", Santa Cruz Galaxy Workshop, University of California, Santa Cruz, USA Aug 2019
2. "On the Orbital Decay of Globular Clusters in NGC 1052-DF2: Testing a Baryon Only Mass Model", Small Galaxies, Cosmic Questions Conference, Durham University, UK July 2019

PUBLICATIONS [ADS]

Total: 10, Major contributions: 7 (6 as lead author), 199 Citations, h-index = 8

Major Contributions

1. **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
2. **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
3. **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
4. **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
5. **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
6. 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
7. **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

8. 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
9. 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
10. Shen Z. et al. including **Dutta Chowdhury D.** [10 total] "A Tip of the Red Giant Branch Distance of 22.1 ± 1.2 Mpc to the Dark Matter Deficient Galaxy NGC 1052–DF2 from 40 Orbits of Hubble Space Telescope Imaging" 2021, ApJL, 914, L12

MANUSCRIPTS IN PREPARATION

1. Dekel, A., Stone, N., **Dutta Chowdhury, D.** et al. "Growth of Massive Black Holes in FFB Galaxies at Cosmic Dawn"

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