

# Dhruba Dutta Chowdhury

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Nationality: Indian

## RESEARCH INTERESTS

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Dark Matter, Dynamics, Galaxies, Star Clusters, Stellar Streams

## POSITIONS

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

- Israel Academy of Sciences and Humanities Postdoctoral Fellow
- Hosts: 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

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**Yale University, New Haven, USA** 2016-2022

- Ph.D. (expected Aug 2022), M.S., M.Phil. in Astronomy
- 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 in Mathematics and Chemistry

## AWARDS

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- 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
- INSPIRE scholarship, Department of Science & Technology, India 2010-2015
- Lilabati Ray Memorial Prize for Best Student Seminar, Presidency University 2015

## PROFESSIONAL ACTIVITIES

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- Referee for ApJ 2019-Present
- Yale Astronomy Graduate Student Talks SOC Member Spring 2019
- Galaxy Lunch Moderator, Yale Astronomy Department 2017-2018

## TEACHING EXPERIENCE

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- Teaching Fellow, Planets and Stars, Yale University Spring 2017
- Teaching Fellow, Galaxies and the Universe, Yale University Fall 2017, 2019

## CONFERENCE TALKS

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1. “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
2. “On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo”, Virtual Young Astronomers on Galactic Nuclei Meeting Sept 2021
3. “On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo”, Virtual 16<sup>th</sup> Marcel Grossmann Meeting July 2021
4. “On the Random Motion of Nuclear Objects in a Fuzzy Dark Matter Halo”, Virtual 238<sup>th</sup> American Astronomical Society Meeting June 2021
5. “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
6. “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

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

## INVITED COLLOQUIA

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1. Academia Sinica Institute for Astronomy and Astrophysics, Taiwan Jan 2022

## CONFERENCE POSTERS

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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

## REFEREED PUBLICATIONS [ADS]

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1. 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  
([provided constructive feedback on the manuscript](#))
2. **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  
([led the study, ran and analyzed simulations, performed analytical calculations, wrote the paper](#))
3. 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  
([provided constructive feedback on the manuscript](#))

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  
(led the study, ran and analyzed simulations, performed analytical calculations, wrote the paper)
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  
(led the study, ran and analyzed simulations, performed semi-analytical calculations, wrote the paper)
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  
(initiated the study, performed a part of the analytical calculations, read the draft and provided constructive feedback)
7. **Dutta Chowdhury, D.** and Chatterjee, S. “Sunyaev-Zel’dovich Signal from Quasar Hosts: Implications for Detection of Quasar Feedback” 2017, ApJ, 839, 34  
(led the study, performed analytical calculations, wrote the paper)

## PAPERS IN PREPARATION

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1. **Dutta Chowdhury, D.**, van den Bosch F.C., van Dokkum, P., Robles, V.H., Schive H. et al. “On the Dynamics of Dwarf Galaxies in a Fuzzy Dark Matter Halo”  
(leading the study, running and analyzing simulations, writing the paper, estimated submission date: June 2022)
2. **Dutta Chowdhury, D.**, van den Bosch F.C., van Dokkum, P., Robles, V.H., Schive H. et al. “Understanding the Heating Effect in Fuzzy Dark Matter: Decomposing the Contributions from Soliton Random Walk, Soliton Oscillations, and Envelope Density Fluctuations”  
(leading the study, performing semi-analytical calculations, writing the paper, estimated submission date: June 2022)

## COMPUTATIONAL SKILLS

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- N-Body simulations with GADGET-2
- Fuzzy Dark Matter simulations with GAMER-2 (AMR Code)
- Programming skills in C, C++, FORTRAN 77, and Python