

Alankar Dutta

(he/him)

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Nationality: India

About

- 📌 I am currently an integrated Ph.D. (M.Sc. + Ph.D.) candidate at the Indian Institute of Science, Bangalore, India.
- 📌 I am a Computational Astrophysicist interested in modeling and simulation of the multiphase gas environments around galaxies called the circumgalactic medium.
- 📌 I am a Prime Minister's Research Fellow supported by the Ministry of Education, Government of India (Acceptance rate for fellowship: 3.5% out of 3000 within institute & 0.3% out of 10000 to be selected in IISc Integrated Ph.D. program).

Education




- 2017 – present 📌 **Integrated M.Sc. + Ph.D., Indian Institute of Science, Bangalore, India**
Computational Astrophysics.
- 2014 – 2017 📌 **B.Sc. Physics (Major), Presidency University, Kolkata, India**
Undergraduate majoring in Physics.

Research Publications

Journal Articles

- 1 **A. Dutta**, M. S. Bisht, P. Sharma, R. Ghosh, M. Roy, and B. B. Nath, “Beyond Profiles: Using log-normal distributions to model the multiphase circumgalactic medium,” *submitted to Monthly Notices of the Royal Astronomical Society*, 2023. arXiv: 2310.03717 [astro-ph.GA].
- 2 R. Ghosh, **A. Dutta**, and P. Sharma, “Ram pressure stripping in clusters: Gravity can bind the ISM but not the CGM,” *submitted to Monthly Notices of the Royal Astronomical Society*, 2023.
- 3 **A. Dutta**, P. Sharma, and D. Nelson, “Cooling flows around cold clouds in the circumgalactic medium: steady-state models and comparison with TNG50,” *Monthly Notices of the Royal Astronomical Society*, vol. 510, no. 3, pp. 3561–3574, Mar. 2022. 🌐 DOI: 10.1093/mnras/stab3653. arXiv: 2107.02722 [astro-ph.GA].
- 4 V. Kanjilal, **A. Dutta**, and P. Sharma, “Growth and structure of multiphase gas in the cloud-crushing problem with cooling,” *Monthly Notices of the Royal Astronomical Society*, vol. 501, no. 1, pp. 1143–1159, Feb. 2021. 🌐 DOI: 10.1093/mnras/staa3610. arXiv: 2009.00525 [astro-ph.GA].
- 5 **A. Dutta** and P. Sharma, “On Modeling CC85 Wind in an Expanding Local Box [non-peer reviewed],” *Research Notes of the American Astronomical Society*, vol. 3, no. 10, p. 148, Oct. 2019. 🌐 DOI: 10.3847/2515-5172/ab4bd8. arXiv: 1910.06339 [astro-ph.GA].
- 6 P. Chakraborty, S. Chatterjee, **A. Dutta**, and A. D. Myers, “Mean Occupation Function of High-redshift Quasars from the Planck Cluster Catalog,” *Publications of the Astronomical Society of the Pacific*, vol. 130, no. 988, p. 064 001, Jun. 2018. 🌐 DOI: 10.1088/1538-3873/aaab3e. arXiv: 1801.06522 [astro-ph.GA].
- 7 **A. Dutta**, “X-ray environments of supermassive black holes [non-peer reviewed; undergraduate thesis],” May 2017. 🌐 DOI: 10.13140/RG.2.2.26190.97606.











Skills

- Languages  Proficient in Bengali, English and Hindi. Also knows German (A1).
- Coding  C/C++, Python, \LaTeX . Specialized in computational hydrodynamics. Leading code developer of AstroPlasma, an astrophysical plasma modeling interpolation package. Developed yt visualization frontend and Catalyst In-situ visualization for PLUTO. Developed parallel hdf5 io on IDEFIX.
- Misc.  Academic research, teaching, high-performance computing, GPU programming, data analysis, and 3D data visualization. Tools/Codes used: PLUTO, Arepo, Cloudy, ParaView, ...

Conferences, Workshops and Research visits

- Jun 2023  *Modelling of Multiphase Astrophysical Media*, organized by **Max Planck Institute for Astrophysics** at Kochel am See, Bavaria, Germany
- Mar 2023  *Observe Local Think Global: What Solar Observations can teach us about Multiphase Plasmas across Astrophysical Scales*, organized by **International Space Science Institute** at Bern, Switzerland
- Feb 2023  **University of Turin**, Torino, Italy; *given a seminar talk.*
-  **Nicolaus Copernicus Astronomical Center**, Warsaw, Poland; *given a seminar talk.*
- Jan 2023  **Leibniz Institute for Astrophysics**, Potsdam, Germany; *given a seminar talk (remote).*
- Jan – Feb 2023  **Max Planck Institute for Astrophysics**, Garching, Germany *as a visiting student.*
- Sept 2022  *What matter(s) around galaxies 2022: Connecting the dots between the CGM and the larger-scale environment*, organized by **Università Milano-Bicocca** at Champoluc, Aosta Valley, Italy
- Aug 2022  *6th ICM Theory and Computation Workshop*, **Niels Bohr Institute**, Copenhagen, Denmark
- Mar 2022  Astronomical Society of India Meeting, **ASI 2022, IIT Roorkee**, India
- Jan 2021  *KITP Program: Fundamentals of Gaseous Halos*, **Kavli Institute for Theoretical Physics**, Santa Barbara, California, USA (remote)
- Feb 2020  Astronomical Society of India Meeting, **ASI 2020, IISER Tiupati**, India
- May – Aug 2019  **Max Planck Institute for Astrophysics**, Garching, Germany *as a visiting student.*
- Jan 2019  *Cosmology: The Next Decade*, **International Centre for Theoretical Sciences (ICTS)**, Bangalore, India

References

-  **Prateek Sharma**, Professor, Indian Institute of Science, Bangalore, India
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-  **Dylan Nelson**, Emmy Noether Research Group Leader, Institute for Theoretical Astrophysics, Heidelberg University, Germany
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-  **Biman B. Nath**, Professor, Raman Research Institute, Bangalore, India
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-  **Tiago Costa**, Academic Track Fellow, Newcastle University, Newcastle upon Tyne, UK
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-  **Suchetana Chatterjee**, Assistant Professor, Presidency University, Kolkata, India
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