Curriculum Vitae

Dr. Ankan Mukherjee

Assistant Professor

Department of Physics,
Bangabasi College,
Kolkata 700009.

Personal Details:

Date of Birth: 07/07/1989
Nationality : Indian

Permanent Residencial Address
Banagram,
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West Bengal,
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Academic Qualification:

- Bachelor of Science (2007-2010) in Physics from Jadavpur University, Kolkata,

- Master of Science (2010-2012) as part of Integrated MS-PhD dual degree programme in Physical Sciences from IISER Kolkata.

- PhD Research Fellow (2012-2017) at Department of Physical Sciences, IISER Kolkata.
  Degree awarded on August 22, 2017.
  PhD Thesis Title : **"On the Reconstruction of Dark Energy Models".**
  Supervisor: Prof. Narayan Banerjee,
  Department of Physical Sciences,
  IISER Kolkata.

Awards and Fellowships :

- **INSPIRE Scholarship** awarded by Department of Science and Technology, Government of India in 2009.
- Lectureship qualified in National Eligibility Test (CSIR-UGC) in 2012.
- **National Post-Doctoral Fellowship (NPDF)** awarded by **Science and Engineering Research Board (SERB),** Department of Science and Technology, Government of India, in 2019.

Post-Doctoral Research Experience:

- Post-Doctoral Fellow at the Department of Physical Sciences, IISER Mohali (from April 19, 2017 to April 15, 2019).
- National Post-Doctoral Fellow (NPDF) at the Centre for Theoretical Physics, Jamia Millia Islamia, New Delhi, (from April 16, 2019 to November 25, 2020.)

Present Position:
Assistant Professor at the Department of Physics, Bangabasi College, Kolkata.

Research Interest:

Gravitation and **Cosmology:**

- Dark Energy:
  - Reconstruction of dark energy models for observational data.
  - Statistical analysis to constraint different cosmological parameters.
  - Reconstruction kinematical quantities of cosmology (like the deceleration parameter, cosmological jerk parameter etc.) from different observational data.
  - Interaction between dark energy and dark matter.
  - Study of cosmological perturbations and formation of large scale structure in the universe.
- f(R) gravity:
  - Modified Gravity (f(R)-gravity) and its application to explain the phenomenon of cosmic acceleration.

Technical Skill:

- Statistical analysis in **Mathematica.**
- Numerical techniques in **Python.**

Publications :

1. *Acceleration of the universe in f(R) gravity models* ,
Ankan Mukherjee and Narayan Banerjee,
Astrophys. Space Sci. **352**, 893 (2014);
DOI: 10.1007/s10509-014-1949-0
arXiv:1405.6788

2. *A reconstruction of quintessence dark energy,*
Ankan Mukherjee and Narayan Banerjee,
Eur. Phys. J. Plus **130**, 201 (2015);
DOI: 10.1140/epjp/i2015-15201-7
arXiv:1311.4024

3. *Parametric reconstruction of the cosmological jerk from diverse observational data sets* ,
Ankan Mukherjee and Narayan Banerjee,
Phys. Rev. D **93**, 043002 (2016);
DOI: 10.1103/PhysRevD.93.043002
arXiv:1601.05172

4. *Acceleration of the universe: a reconstruction of the effective equation of state,*
Ankan Mukherjee,
MNRAS **460**, 273 (2016);
DOI: 10.1093/mnras/stw964
arXiv:1605.08184

5. Reconstruction of interaction rate in Holographic dark energy,
Ankan Mukherjee,
JCAP 11(2016)055;
DOI: 10.1088/1475-7516/2016/11/055
arXiv:1608.00400

6. In search of the dark matter dark energy interaction: a kinematic approach,
Ankan Mukherjee and Narayan Banerjee,
Class. Quantum Grav. **34**, 035016 (2017);
DOI: 10.1088/1361-6382/aa54c8
arXiv:1610.04419

7. Reconstructing the dark energy potential,
Archana Sangwan, **Ankan Mukherjee** and H. K. Jassal,
JCAP 01(2018)018;
DOI: 10.1088/1475-7516/2018/01/018
arXiv:1712.05143.

8. *Astronomical bounds on a cosmological model allowing a general interaction in the dark sector,*
Supriya Pan, **Ankan Mukherjee** and Narayan Banerjee,
MNRAS **477**, 1189–1205 (2018).
arXiv:1710.03725.

9. *Interacting dark energy with time varying equation of state and the H_0 tension*,
Weiqiang Yang, **Ankan Mukherjee**, Eleonora Di Valentino and Supriya Pan,.
Phys. Rev. D **98**, 123527 (2018).
arXiv:1809.06883.

10. Constraining the dark energy statefinder hierarchy in a kinematic approach,
Ankan Mukherjee, Niladri Paul and H. K. Jassal,
JCAP01(2019)005;
DOI:10.1088/1475-7516/2019/01/005
arXiv:1809.08849

11. *Holographic dark energy: constraints on the interaction from diverse observational data sets*,
Purba Mukherjee, **Ankan Mukherjee**, H. K. Jassal, Ananda Dasgupta and Narayan Banerjee;
Eur. Phys. J. Plus (2019) **134**: 147;
DOI: 10.1140/epjp/i2019-12504-7
arXiv:1710.02417.

12. *Reconstructing late-time cosmology with kinematical models,*
Ankan Mukherjee,

Eur. Phys. J. Plus **136,** 300 (2021).
doi.org/10.1140/epjp/s13360-021-01269-3
arXiv:2002.12063

13. *Reconstruction of late-time cosmology using Principal Component Analysis*, Ranbir Sharma, **Ankan Mukherjee**, H. K. Jassal,
Eur. Phys. J. Plus 137:219 (2022).
doi.org/10.1140/epjp/s13360-022-02397-0
arXiv:2004.01393

14. *Dark Energy with Phantom Crossing and the H_0 tension*,
Eleonora Di Valentino, **Ankan Mukherjee**, Anjan A. Sen,
Entropy **23**, 404 (2021).
doi.org/10.3390/e23040404
arXiv:2005.12587

15. Assessment of the cosmic distance duality relation using Gaussian process,
Purba Mukherjee, Ankan Mukherjee,
MNRAS 504, 3938–3946 (2021).
doi:10.1093/mnras/stab1054
arXiv:2104.06066

16. Dynamics of tachyon dark energy on large scales and its imprint on the observed galaxy power spectrum,
Ajay Bassi, Ankan Mukherjee, Anjan A. Sen,
PHYS. REV. D 103, 123522 (2021).
DOI: 10.1103/PhysRevD.103.123522
arXiv:2104.05776

Publicatiosn from Cosmology Snowmass2021 colleboration

17. Cosmology Intertwined I: Perspectives for the Next Decade

Astroparticle Physics 131, 102606 (2021).
doi.org/10.1016/j.astropartphys.2021.102606
arXiv:2008.11283

18. Cosmology Intertwined II: The Hubble Constant Tension

Astroparticle Physics. 131, 102605 (2021)

doi.org/10.1016/j.astropartphys.2021.102605

arXiv:2008.11284

19. Cosmology Intertwined III: $f\sigma 8$ and $S8$
Astroparticle Physics 131 (2021) 102604

doi.org/10.1016/j.astropartphys.2021.102604

arXiv:2008.11285

20. Cosmology Intertwined IV: The Age of the Universe and its Curvature

Astroparticle Physics 131 (2021) 102607
doi.org/10.1016/j.astropartphys.2021.102607

arXiv:2008.11286

21. Cosmology Intertwined: A Review of the Particle Physics, Astrophysics, and Cosmology Associated with the Cosmological Tensions and Anomalies

arXiv:2203.06142 (Communicated)

Communicated

1. *Observational Constraints on Axion(s) with a Cosmological Constant,*

Ruchika, Koushik Dutta, **Ankan Mukherjee**, Anjan A. Sen,

arXiv:2005.08813

2. *Spherical collapse in a dark energy model with reconstructed effective equation of state,*
Ankan Mukherjee, **arXiv:2008.03792**

3. *Spherical collapse in DGP braneworld cosmology,*
Ankan Mukherjee, **arXiv:2008.08979**

4. *Clustering of dark matter in interacting tachyon dark energy with ΛCDM background,*
Ankan Mukherjee, **arXiv:2009.00245**

Participations in Conferences and Workshops:

- The 27-th Meeting of the Indian Association for General Relavity and Gravity (7th to 9th Match, 2013); Garhwal Universit, India.

- National Conference on Current Trends in Particle Physics Research (13th to 15th March, 2014); University of Kalyani, India.
  Presented Talk: " Late Time Acceleration of the Universe in f(R) gravity Models."

- Workshop on Observational aspects of Astrophysics and Cosmology, (3th and 4th November, 2014), Viava-Bharati University, Santiniketan, India.

- Workshop in Cosmology with Large Scale Structure, (5th to 9th January, 2015), Centre for Theoretical Physics, Jamia Millia Islamia, New Delhi, India.

- IUCAA-ISI Workshop on Statistical Application to Cosmology and Astrophysics (STATCOSMO15) (10th to 13th February, 2015), Indian Statistical Institute, Kolkata, India.

- International Conference on Gravitation and Cosmology (ICGC 2015) (14th to 18th December, 2015), IISER Mohali, India.
  Presented Poster: " Reconstruction of jerk parameter of different dark energy models from diverse observational data sets".

- School on Good Practices in Astro-Statistics (27th to 30th January, 2016), IUCAA, Pune, India.

- International Conference: Post Planck Cosmology: Enigma, Challenges and Vision (PPC 2017) (9th to 12th October, 2017), IUCAA, Pune, India.
  Presented Poster: " Reconstruction of cosmological jerk parameter".

- Three days conference **"Gravity at Different Length Scales",**
  (February 25-27, 2018) **,** Indian Association for the Cultivation of Science, Kolkata.

- International Conference on Gravitational and Cosmology (ICGC2019),
  (December 10 to 13, 2019) IISER Mohali, Indian.
  Presented Talk: "Constraining dark energy statefinder hierarchy in a kinematic approach".