CURRICULUM VITAE

Personal Information

Name : Biswajit Pandey

Contact Address : Department of Physics
Institute of Science
Visva-Bharati University
Santiniketan, 731235, India
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Date of Birth : 29th December, 1976
Nationality : Indian
Sex : Male

Current Position

Assistant Professor
Department of Physics
Institute of Science
Visva-Bharati University
Santiniketan, 731235, India

Educational qualification

Ph.D. in Cosmology

Research Interests

1. Large scale structures in the Universe
2. Galaxy formation and evolution
3. Accelerated expansion of the Universe
4. Information theory
5. Astrostatistics

Published papers

Total papers: 56
Single author papers: 14
First author/Corresponding author papers: 44

1. The long road to the Green Valley: Tracing the evolution of the Green Valley galaxies in the EAGLE simulation, Apashanka Das, **Biswajit Pandey**, 2025, **Journal of Cosmology and Astroparticle Physics**, 05, 101
   https://iopscience.iop.org/article/10.1088/1475-7516/2025/05/101

2. Unveiling galaxy pair alignment in cosmic filaments: A 3D exploration using EAGLE simulation, Suman Sarkar, **Biswajit Pandey**, 2025, **Journal of Cosmology and Astroparticle Physics**, 01, 023
   https://iopscience.iop.org/article/10.1088/1475-7516/2025/01/023

3. Clustering and physical properties of AGN and Star-Forming Galaxies at fixed stellar mass: does assembly bias have a role in AGN activity? Amrita Banerjee, **Biswajit Pandey**, Anindita Nandi, 2025, Accepted for publication in **Publication of Astronomical Society of Australia**, in press

4. Impact of cosmic web on galaxy properties and their correlations: Insights from Principal Component Analysis, Anindita Nandi, **Biswajit Pandey**, 2025, Accepted for publication in **Astronomy and Computing**, in press

5. The roles of environment and interactions on the evolution of red and blue galaxies in the EAGLE simulation,
   Apashanka Das, **Biswajit Pandey**, 2024, **Journal of Cosmology and Astroparticle Physics**, 08, 060
   https://iopscience.iop.org/article/10.1088/1475-7516/2024/08/060

6. Probing the spatial and velocity anisotropies in stellar halos from the Aquarius simulations, Amit Mondal, **Biswajit Pandey**, 2024, **Monthly Notices of the Royal Astronomical Society**, 533, 3426
   https://doi.org/10.1093/mnras/stae2027

7. The size and shape dependence of the SDSS galaxy bispectrum,
   Anindita Nandi, Sukhdeep Singh Gill, Debanjan Sarkar, Abinash Kumar Shaw, **Biswajit Pandey**, Somnath Bharadwaj 2024, **New Astronomy**, 113, 102292
   https://doi.org/10.1016/j.newast.2024.102292

8. Tracing the green valley with entropic thresholding,
   Biswajit Pandey, 2024, **Monthly Notices of the Royal Astronomical Society**, 530, 4550
   https://doi.org/10.1093/mnras/stae1147

9. The correlations between galaxy properties in different environments of the cosmic web , Anindita Nandi, **Biswajit Pandey**, Prakash Sarkar , 2024, **Journal of Cosmology and Astroparticle Physics**, 02, 012
https://iopscience.iop.org/article/10.1088/1475-7516/2024/02/012

10. Separating the blue cloud and the red sequence using Otsu's method for image segmentation, **Biswajit Pandey**, 2023, **Astronomy and Computing**, 44, 100725
https://doi.org/10.1016/j.ascom.2023.100725

11. Time evolution of the mutual information between disjoint regions in the Universe, **Biswajit Pandey**, 2023, **Entropy**, 25, 1094
https://doi.org/10.3390/e25071094

12. Do minor interactions trigger star formation in galaxy pairs?, Apashanka Das, **Biswajit Pandey**, Suman Sarkar, 2023, **Research in Astronomy and Astrophysics**, 23, 095026
https://iopscience.iop.org/article/10.1088/1674-4527/aceccb

13. Galaxy interactions in filaments and sheets: insights from EAGLE simulations , Apashanka Das, **Biswajit Pandey**, Suman Sarkar, 2023, **Research in Astronomy and Astrophysics**, 23, 115018
https://iopscience.iop.org/article/10.1088/1674-4527/acf6f5

14. Galaxy interactions in filaments and sheets: effects of the large-scale structures versus the local density, Apashanka Das, **Biswajit Pandey**, Suman Sarkar, 2023, **Research in Astronomy and Astrophysics**, 23, 025016
https://iopscience.iop.org/article/10.1088/1674-4527/acab44

15. A Study of Holographic Dark Energy Models with Configuration Entropy Biswajit Das, **Biswajit Pandey**, 2023, **Research in Astronomy and Astrophysics**, 23, 065003
https://iopscience.iop.org/article/10.1088/1674-4527/accb77

16. Tomography of stellar halos: what does anisotropy in a stellar halo tell us?, **Biswajit Pandey**, 2022, **Journal of Cosmology and Astroparticle Physics**, 10, 058
https://iopscience.iop.org/article/10.1088/1475-7516/2022/10/058

17. The maximum extent of the filaments and sheets in the cosmic web: an analysis of the SDSS DR17, Prakash Sarkar, **Biswajit Pandey**, Suman Sarkar, 2022, **Monthly Notices of the Royal Astronomical Society**, 519, 3227
https://doi.org/10.1093/mnras/stac3722

18. On the origin of red spirals: Does assembly bias play a role?, Suman Sarkar, **Biswajit Pandey**, Apashanka Das , 2022, **Journal of Cosmology and Astroparticle Physics**, 03, 024
https://iopscience.iop.org/article/10.1088/1475-7516/2022/03/024

19. Green valley galaxies in the cosmic web: internal versus environmental quenching
Apashanka Das, **Biswajit Pandey**, Suman Sarkar, 2021, **Journal of Cosmology and Astroparticle Physics**, 06, 045
https://iopscience.iop.org/article/10.1088/1475-7516/2021/06/045

20. Testing homogeneity of the galaxy distribution in the SDSS using Renyi entropy
Biswajit Pandey, Suman Sarkar, 2021, **Journal of Cosmology and Astroparticle Physics**, 07, 019
https://iopscience.iop.org/article/10.1088/1475-7516/2021/07/019

21. Renyi entropy as a measure of cosmic homogeneity,
Biswajit Pandey, 2021, **Journal of Cosmology and Astroparticle Physics**, 02, 023
https://iopscience.iop.org/article/10.1088/1475-7516/2021/02/023

22. Do galactic bars depend on environment?:An information theoretic analysis of Galaxy Zoo 2,
Suman Sarkar, **Biswajit Pandey**, Snehasish Bhattacharjee, 2021, **Monthly Notices of the Royal Astronomical Society**, 501, 994
https://doi.org/10.1093/mnras/staa3665

23. Can we constrain the evolution of HI bias using configuration entropy?,
Biswajit Das, **Biswajit Pandey**, 2021, **Research in Astronomy and Astrophysics**, 21, 35
https://iopscience.iop.org/article/10.1088/1674-4527/21/2/35

24. A method for classification of red, blue and green galaxies using fuzzy set theory,
Biswajit Pandey, 2020, **Monthly Notices of the Royal Astronomical Society Letters**, 499, L31
https://doi.org/10.1093/mnrasl/slaa152

25. Can a conditioning on stellar mass explain the mutual information between morphology and environment?,
Snehasish Bhattacharjee, **Biswajit Pandey**, Suman Sarkar, 2020, **Journal of Cosmology and Astroparticle Physics**, 09, 039
https://iopscience.iop.org/article/10.1088/1475-7516/2020/09/039

26. A study on the statistical significance of mutual information between morphology of a galaxy and its large-scale environment,
Suman Sarkar, **Biswajit Pandey**, 2020, **Monthly Notices of the Royal Astronomical Society**, 497, 4077
https://doi.org/10.1093/mnras/staa2236

27. Exploring galaxy colour in different environments of the cosmic web with SDSS,
Biswajit Pandey, Suman Sarkar, 2020, **Monthly Notices of the Royal Astronomical Society**, 498, 6069
https://doi.org/10.1093/mnras/staa2772

28. Can we constrain the dark energy equation of state parameters using configuration entropy?
Biswajit Das, **Biswajit Pandey**, 2020, **Monthly Notices of the Royal Astronomical Society**, 492, 3928
https://doi.org/10.1093/mnras/stz3538

29. Configuration entropy of the Cosmic Web: Can voids mimic the dark energy?,
Biswajit Pandey, 2019, **Monthly Notices of the Royal Astronomical Society Letters**, 485, L73
https://doi.org/10.1093/mnrasl/slz037

30. A new method to probe the mass density and the cosmological constant using configuration entropy,
Biswajit Pandey, Biswajit Das, 2019, **Monthly Notices of the Royal Astronomical Society Letters**, 485, L43
https://doi.org/10.1093/mnrasl/slz029

31. Unravelling the Cosmic Web: An analysis of the SDSS DR14 with the Local Dimension,
Suman Sarkar, **Biswajit Pandey**, 2019, **Monthly Notices of the Royal Astronomical Society**, 485, 4743
https://doi.org/10.1093/mnras/stz499

32. Configuration entropy in the Lambda CDM and the dynamical dark energy models: Can we distinguish one from the other?,
Biswajit Das, **Biswajit Pandey**, 2019, **Monthly Notices of the Royal Astronomical Society**, 482, 3219
https://doi.org/10.1093/mnras/sty2873

33. Testing isotropy in the Universe using photometric and spectroscopic data from the SDSS,
Suman Sarkar, **Biswajit Pandey**, Rishi Khatri, 2019, **Monthly Notices of the Royal Astronomical Society**, 483, 2453
https://doi.org/10.1093/mnras/sty3272

34. Does information entropy play a role in the expansion and acceleration of the Universe?,
Biswajit Pandey, 2017, **Monthly Notices of the Royal Astronomical Society Letters**, 471, L77
https://doi.org/10.1093/mnrasl/slx109

35. Can anisotropy in the galaxy distribution tell the bias?,
Biswajit Pandey 2017, **Monthly Notices of the Royal Astronomical Society**, 469, 1861
https://doi.org/10.1093/mnras/stx912

36. Testing isotropy in the Two Micron All-Sky redshift survey with information entropy,
Biswajit Pandey 2017, **Monthly Notices of the Royal Astronomical Society**, 468, 1953
https://doi.org/10.1093/mnras/stx573

37. How much a galaxy knows about its large-scale environment?: An information theoretic perspective,
Biswajit Pandey, Suman Sarkar, 2017, **Monthly Notices of the Royal Astronomical Society Letters**, 467, L6
https://doi.org/10.1093/mnrasl/slw250

38. An information theory based search for homogeneity on the largest accessible scale,
Suman Sarkar, **Biswajit Pandey**, 2016, **Monthly Notices of the Royal Astronomical Society Letters**, 463, L12
https://doi.org/10.1093/mnrasl/slw145

39. Relating information entropy and mass variance to measure bias and non-Gaussianity,
Biswajit Pandey, 2016, **Monthly Notices of the Royal Astronomical Society**, 463, 4239
https://doi.org/10.1093/mnras/stw2356

40. A new method for testing isotropy with Shannon entropy,
Biswajit Pandey, 2016, **Monthly Notices of the Royal Astronomical Society**, 462, 1630
https://doi.org/10.1093/mnras/stw1788

41. Probing large scale homogeneity and periodicity in the LRG distribution using Shannon entropy,
Biswajit Pandey, Suman Sarkar, 2016, **Monthly Notices of the Royal Astronomical Society**, 460, 1519
https://doi.org/10.1093/mnras/stw1075

42. Testing homogeneity in the Sloan Digital Sky Survey Data Release Twelve with Shannon entropy,
Biswajit Pandey, Suman Sarkar, 2015, **Monthly Notices of the Royal Astronomical Society**, 454, 2647
https://doi.org/10.1093/mnras/stv2166

43. A method for testing cosmic homogeneity with Shannon entropy,
Biswajit Pandey, 2013, **Monthly Notices of the Royal Astronomical Society**, 430, 3376
https://doi.org/10.1093/mnras/stt134

44. Exploring the non-linear density field in the Millennium simulations with tessellations - I. The probability distribution function,
Biswajit Pandey, Simon White, Volker Springel, Raul Angulo, 2013, **Monthly Notices of the Royal Astronomical Society**, 435, 2968
https://doi.org/10.1093/mnras/stt1490

45. Exploring the cosmic web in the Sloan Digital Sky Survey Data Release Seven using the Local dimension,
Prakash Sarkar, **Biswajit Pandey**, Somnath Bharadwaj, 2012, **Monthly Notices of the Royal Astronomical Society**, 423, 955
https://doi.org/10.1111/j.1365-2966.2012.20932.x

46. The size of the longest filament in the Luminous Red Galaxy distribution,
Biswajit Pandey, Gauri Kulkarni, Somnath Bharadwaj, Tarun Souradeep, 2010, **Monthly Notices of the Royal Astronomical Society**, 411, 332
https://doi.org/10.1111/j.1365-2966.2010.17686.x

47. Statistically significant length scale of filaments as a robust measure of galaxy distribution,
Biswajit Pandey, 2010, **Monthly Notices of the Royal Astronomical Society**, 401, 2687
https://doi.org/10.1111/j.1365-2966.2009.15852.x

48. The scale of homogeneity of the galaxy distribution in SDSS DR6,
Prakash Sarkar, Jaswant Yadav, **Biswajit Pandey** & Somnath Bharadwaj, 2009, **Monthly Notices of the Royal Astronomical Society Letters**, 399, L128
https://doi.org/10.1111/j.1745-3933.2009.00738.x

49. Exploring star formation using the filaments in the SDSS DR5,
Biswajit Pandey and Somnath Bharadwaj, 2008, **Monthly Notices of the Royal Astronomical Society**, 387, 767
https://doi.org/10.1111/j.1365-2966.2008.13262.x

50. The luminosity bias relation from filaments in the SDSS DR4,
Biswajit Pandey and Somnath Bharadwaj, 2007, **Monthly Notices of the Royal Astronomical Society Letters**, 377, L15
https://doi.org/10.1111/j.1745-3933.2007.00294.x

51. The Luminosity, color and morphology dependence of the galaxy filaments in the Sloan Digital Sky Survey Data Release Four,
Biswajit Pandey and Somnath Bharadwaj, 2006, **Monthly Notices of the Royal Astronomical Society**, 372, 827
https://doi.org/10.1111/j.1365-2966.2006.10894.x

52. Testing homogeneity on large scales in the Sloan Digital Sky Survey Data Release One,
Jaswant Yadav, Somnath Bharadwaj, **Biswajit Pandey** and T.R. Shesadri, 2005, **Monthly Notices of the Royal Astronomical Society**, 364, 601
https://doi.org/10.1111/j.1365-2966.2005.09578.x

53. What will anisotropies in the clustering pattern in the redshifted 21 cm maps tell us ?,
Sk. Saiyad Ali, Somnath Bharadwaj and **Biswajit Pandey**, 2005, **Monthly Notices of the Royal Astronomical Society**, 363, 251
https://doi.org/10.1111/j.1365-2966.2005.09444.x

54. Modelling non-linear effects in the redshift-space two-point correlation function and it's implications for the pairwise velocity dispersion,
Biswajit Pandey and Somnath Bharadwaj, 2005, **Monthly Notices of the Royal Astronomical Society**, 358, 939
https://doi.org/10.1111/j.1365-2966.2005.08835.x

55. A two dimensional analysis of percolation and filamentarity in the Sloan Digital Sky Survey Data Release One,
Biswajit Pandey and Somnath Bharadwaj, 2005, **Monthly Notices of the Royal Astronomical Society**, 357, 1068
https://doi.org/10.1111/j.1365-2966.2005.08726.x

56. Using the Filaments in the Las Campanas Redshift Survey to test the Lambda CDM model, Somnath Bharadwaj and **Biswajit Pandey**, 2004, **The Astrophysical Journal**, 615, 1
https://iopscience.iop.org/article/10.1086/424476

Awards and Fellowships

1. Awarded a Research Associateship from IUCAA, Pune for the following periods: 2024-2027, 2021-2024, 2018-2021, 2015-2018.

2. Awarded an Alexander von Humboldt Fellowship for 2 years (2011-2013) to work with Prof. Simon White at the Max-Planck Institute for Astrophysics, Garching, Germany (carried out).

3. Awarded a Research Associateship for 3 years to work with Prof. Asantha Cooray at University of California, Irvine, USA in 2009 (declined).

4. Awarded a Postdoctoral Fellowship at Inter University Center for Astronomy and Astrophysics (IUCAA), Pune for 3 years (2006-2009). (carried out)

5. Awarded a JuniorResearch Fellowship from Council of Scientific and Industrial Research (CSIR), India. Secured a position among top 20% in National Eligibility Test (NET) examination, 2002.

6. Silver medal in M.Sc. for securing 1st class second position in 2000 from Vidyasagar University, West Bengal.

Grants

1. Awarded a SERB DST Core Research Grant (INR 2000000) in 2020, Project code - CRG/2019/001110

2. Awarded a SERB DST Extramural Research Project (INR 2500000) in 2016, Project code - EMR/2015/001037

3. Awarded a DST young scientist project (INR 1200000) under DST Fast Track Scheme in 2008 from Department of Science and Technology, Government of India. Project No. - SR/FTP/PS-19/2008

Member

- International Astronomical Union (IAU)
- International Astrostatistics Association (IAA)

Reviewer in Journals

- Monthly Notices of the Royal Astronomical Society (MNRAS)
- Astrophysical Journal (ApJ)
- Astronomy & Astrophysics (A&A)
- Journal of Cosmology and Astroparticle Physics (JCAP)
- Journal of Astrophysics and Astronomy (JAA)
- Astrophysics & Space Science (Astrophys. Space Sci.)
- Publications of the Astronomical Society of Australia (PASA)
- Universe

Supervision of Ph.D. thesis

1. Suman Sarkar, Thesis title: An information theory based study of galaxy clustering in redshift surveys, Degree awarded: 2020
2. Biswajit Das, Thesis title: A study of the accelerated expansion of the Universe using configuration entropy, Degree awarded in 2022
3. Apashanka Das, Thesis title: A study of galaxy formation and evolution in the Cosmic Web using galaxy redshift surveys, Degree awarded in 2025
4. Anindita Nandi, Thesis title: Probing the large-scale structures of the Universe with Galaxy Surveys
5. Amit Mondal, Thesis title: Probing the structure and the assembly history of the Galactic stellar halo
6. Tanmoy Ghosh, Thesis title: Exploring the Large-Scale Structure of the Universe using correlation functions

Supervision of Masters thesis

Supervised 22 students for their Masters thesis since 2009.

Organizational activity

- I as the convener organized an International Workshop on 'Galaxy Formation and Evolution Across the Cosmic Time' (GFEACT-2022) at Visva-Bharati during December 13-14, 2022. `https://sites.google.com/view/gfeact-2022/home`
- I jointly as a convenor (with Dr. Swarup Majee) organized 'International Conference on the Emerging Issues in Cosmology and Particle Physics (EICP2)' at Visva-Bharati, during January 12-14, 2020.
  `https://indico.cern.ch/event/849205/`

- I jointly as a co-convenor (with Dr. Sudipta Das) organized an IUCAA sponsored workshop on 'Observational aspects of Astrophysics and Cosmology' during November 3-4, 2014 in Visva-Bharati.

Talks delivered at different institutes since 2015

1. Delivered an invited talk "Do galaxies know about their large-scale environment?" in international workshop on "Largest Cosmological Surveys and Big Data Science" organized by International Centre for Theoretical Sciences (ICTS), Bengaluru during 9-12 May, 2023
2. Delivered an invited online talk titled "Galaxy interactions in filaments and sheets: effects of the large scale structures versus the local density" at the Astronomy Department, Universidad Nacional de Cordoba, Argentina on October 24, 2022.
3. Delivered a seminar titled "How much does a galaxy know about its large-scale environment?" at Centre of Theoretical Studies, IIT, Kharagpur on October 4, 2017.
4. Delivered a colloquium titled "How much does a galaxy know about its large-scale environment?" at TIFR, Mumbai on August 29, 2017.
5. Delivered a plenary talk titled "An information theory based search for homogeneity and isotropy in the Univers" in the 35^{th} Meeting of the Astronomical Society of India held at Jaipur, Rajasthan during March 6-10, 2017.
6. Delivered a seminar titled "Measuring bias and non-Gaussianity with information entropy" on October 20, 2016 at the Centre of Theoretical Studies, IIT, Kharagpur.
7. Delivered a seminar titled "An information theory based search for the scale of cosmic homogeneity" on January 13, 2016 at the Department of Theoretical Physics, TIFR, Mumbai.
8. Delivered a seminar titled "Surfing the cosmic web with tessellations" on January 19, 2016 at the Department of Theoretical Physics, TIFR, Mumbai.
9. Delivered a seminar entitled "Exploring the non-linear cosmic density field with tessellations" on January 18 , 2016 in the Department of Physics, IIT, Mumbai.
10. Delivered a seminar titled "An information theory based search for the scale of cosmic homogeneity" on 4 th November, 2015 in the Centre for Theoretical Studies, IIT, Kharagpur.
11. Delivered an invited lecture titled "Exploring the non-linear cosmic density field with tessellations" on 19 th March, 2016 in the Topical Conference on Gravity, Cosmology, Astronomy and Astrophysics Eastern Region-5 held at the Indian Statistical Institute, Kolkata.

Other roles since 2015

1. Invited as a planary speaker in the XXXV Meeting of the Astronomical Society of India held during 6 - 10 March, 2017 at Jaipur, Rajasthan.
2. Chaired a session on General Relativity and Cosmology in the XXXV Meeting of Astronomical Society of India held during 6-10 March, 2017 at Jaipur, Rajasthan.

3. Invited as an external expert for the evaluation of research proposals submitted for the ERC Consolidator grant 2019 of the European Research Council.
4. Examiner of Ph.D. thesis submitted by Shishir Sankhyayan, IISER, Pune in 2019.
5. Examiner of Ph.D. thesis submitted by Avinanda Chakraborty, Presidency University, Kolkata in 2024.

References

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