Faculty Profile

1. Name: Biswajit Pandey
2. Designation: Associate Profssor
3. Email(s): biswap@visva-bharati.ac.in
4. Date of Birth: 29.12.1976
5. Contact number(s): 7602198961
6. Address: Department of Physics, Siksha-Bhavana,
7. Visva-Bharati, Santiniketan 731235, West Bengal, India
8. Research ID (Google Scholar, ORCID ID, Scopus ID, WOS ID, Vidwan ID, Research Gate):
   Google Scholar: https://scholar.google.com/citations?user=yCAoqVwAAAAJ&hl=en
   ORCID ID: https://orcid.org/0000-0001-7876-595X
   Researchgate https://www.researchgate.net/profile/Biswajit-Pandey
   Scopus ID: https://www.scopus.com/authid/detail.uri?authorId=9747384100
   Vidwan ID: https://visvabharati.irins.org/profile/151672
9. Membership of Learned Societies:

(i) International Astronomical Union (IAU)
(ii) International Astrostatistics Association (IAA)

10. Homepage (If any): https://sites.google.com/visva-bharati.ac.in/vbcomputationalcosmologylab/home

11. Publication Summary:

   (a) No. of Research papers in international peer reviewed journals - 65
   (b) No. of Book Chapters - 0
   (c) No. of Conference papers - 1
   (d) h-index - 20
   (e) i-10 index - 37

12. Date of Joining Visva-Bharati Service: 25.07.2009
13. Education:

Degree	Year	University/Institution
Ph. D.	2007	Indian Institute of Technology, Kharagpur
M. Sc. / M. Tech.	2000	Vidyasagar University
B. Sc.	1998	Midnapore College, Vidyasagar University

14. Academic Positions held (in reverse chronological order)

Sl. No.	Positions held	Institution	Period
1.	Associate Professor	Visva-Bharati, Santiniketan	25.07.2021 - present

2.	Assistant Professor - III	Visva-Bharati, Santiniketan	25.07.2018 – 24.07.2021
3.	Assistant Professor - II	Visva-Bharati, Santiniketan	25.07.2013 - 24.07.2018
4.	Alexander von Humboldt Fellow	Max Planck Institute for Astrophysics, Garching, Germany	01.02.2011 - 31.01.2013 (On extraordinary leave)
5.	Assistant Professor - I	Visva-Bharati, Santiniketan	25.07.2009 - 24.07.2013
6.	Postdoctoral Fellow	Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune	October, 2006 – June, 2009

15. Areas of Research: Large-scale structures in the Universe, Galaxy formation and evolution, Dark matter and Dark energy
16. Subject Specialization: Cosmology
17. Courses Teach / Taught:

Undergraduate Courses	Mathematical Physics (Major, Theory), Computer Applications in Physics (Major, Laboratory), Waves and oscillations Laboratory (Major), Waves and oscillations Laboratory (Minor), General Laboratory (Allied), Electronics Laboratory (Minor), Mechanics Laboratory (Minor), Laboratory-II (Thermal Physics and Optics Laboratory, Core course, NEP), Basic Computer Programming (Skill Enhancement Course, NEP), Introduction to Astronomy and Astrophysics (Multidisciplinary Course, Theory, NEP), Statistical Methods in Physics (Elective ,Theory, NEP), Basics of Machine Learning (Elective, Laboratory, NEP)
Postgraduate Courses	Classical Electrodynamics & Plasma Physics – I (Theory), Classical Electrodynamics & Plasma Physics – II (Theory), Classical Electrodynamics (Theory, New syllabus), Cosmology (Theory), Astrophysics and Cosmology Experiments (Laboratory), Computational and Numerical Methods in Physics (Laboratory)
Ph.D. Course-work	Cosmology, Classical Electrodynamics

18. Research Guidance:
    (a) No. of Postdoctoral students (Completed / Ongoing): 0
    (b) No. of Doctoral students (Completed / Ongoing): Completed: 4, Ongoing: 3

(c) No. of M.Sc. Dissertations: 30

19. Research Collaboration (National / International):

National	International
(i) Indian Institute of Technology, Kharagpur, (ii) Tata Institute of Fundamental Research, Mumbai, (iii) Osmania University, Hyderabad, (iv) Harish-Chandra Research Institute, Allahabad (v) Kashi Sahu College, Jharkhand, (vi) Indian Institute of Science Education and Research Tirupati	(i) Max Planck Institute for Astrophysics, Garching, Germany, (ii) Max Planck Institute for Astronomy, Heidelberg, Germany, (iii) Centre for Astrophysics and Supercomputing, Swinburne University of Technology, Australia

20. Research Grants/Projects

Sl. No.	Project Title	PI/Co-PI	Funding Agency	Amount	Completed/ Ongoing
1.	Galaxy evolution in the Cosmic Web: Investigating the impact of large-scale structures on star formation and AGN activity with SDSS and JWST	Biswajit Pandey	ANRF, Government of India	INR 49,56,600	Running
2.	Galaxy formation and evolution in the filamentary Cosmic Web: Exploration and Analysis of the Sloan Digital Sky Survey Final Data Release Twelve (SDSSDRl2)	Biswajit Pandey	SERB, DST, Government of India	INR 24,83,980	Completed
3.	An information theory based study of the large-scale environmental dependence of galaxy properties in the Sloan Digital Sky Survey	Biswajit Pandey	SERB, DST, Government of India	INR 19,71,332	Completed

20. Professional Recognition/ Award/ Prize/Fellowship

Sl. No.	Name of Recognition/ Award/ Prize/Fellowship	Awarding Agency	Year
1.	Research Associateship	Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India	2024-2027, 2021-2024, 2018-2021, 2015-2018
2.	Alexander von Humboldt Fellowship	Alexander von Humboldt Foundation, Germany	2010
3.	Return Fellowship from Alexander von Humboldt Foundation	Alexander von Humboldt Foundation, Germany	2026
4.	Research Associateship	University of California, Irvine, USA	2009
5.	Silver Medal in M.Sc.	Vidyasagar University, Midnapore, West Bengal, India	2000
6.	Membership of the International Astronomical Union (IAU)	International Astronomical Union (IAU)	2018

21. Books / Book Chapters: None

Sl. No.	Title	Name of Author(s)	Publisher	Year of Publication

22. Detail of Patent received (if any): None

Sl. No.	Patent Title	Name of Applicant(s)	Patent No.	Award Date	Agency/Country

23. Talks Delivered at International / National Conferences/Seminars/Symposium: (Last 10 years)

1. Delivered an invited talk titled "Galaxy quenching across the cosmic web: disentangling mass, density, and geometry" in the international conference titled "The Connection between Galaxies and their Dark Matter Halos across Cosmic Time" to be organized by the Max Planck Institute for Astrophysics, Garching during August 17-21, 2026 at Kloster Seeon Culture and Education Center, Seeon, Germany.

2. Delivered an invited talk titled "Galaxy quenching across the cosmic web: disentangling mass, density, and geometry" on March 29, 2026 in the Platinum Jubilee Conference on Contemporary Physics organized by the Department of Physics, Indian Institute of Technology Kharagpur during March 29-31, 2026.

3. Delivered an online seminar in the Majorana-Raychaudhuri Seminar series organized by Italian and Indian Research institutes on March 20, 2026.

4. Delivered an invited talk “Do galaxies know about their large-scale environment?” in an international workshop on “Largest Cosmological Surveys and Big Data Science” organized by International Centre for Theoretical Sciences (ICTS), Bengaluru during 9-12 May, 2023

5. 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.

6. 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.

7. Delivered a colloquium titled “How much does a galaxy know about its large-scale environment?” at TIFR, Mumbai on August 29, 2017.

8. Delivered a plenary talk titled “An information theory based search for homogeneity and isotropy in the Universe” in the 35th Meeting of the Astronomical Society of India held at Jaipur, Rajasthan during March 6-10, 2017.

9. Delivered a seminar titled “Measuring bias and non-Gaussianity with information entropy” on October 20, 2016 at the Centre of Theoretical Studies, IIT, Kharagpur.

10. 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.

11. Delivered a seminar titled “Surfing the cosmic web with tessellations” on January 19, 2016 at the Department of Theoretical Physics, TIFR, Mumbai.

12. Delivered a seminar entitled “Exploring the non-linear cosmic density field with tessellations” on January 18 , 2016 in the Department of Physics, IIT, Mumbai.

13. 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.

14. 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

24. List of Scientific Publications:

S. No.	Author(s)	Title	Name of Journal	Volume	Page	Year
1.	**Biswajit Pandey,** Anindita Nandi,	An information-theoretic framework for quantifying coherence in the cosmic density field	Journal of Cosmology and Astroparticle Physics	In press		2026
2.	Apashanka Das, **Biswajit Pandey**	Triggering and quenching in the shadow of AGN: How does AGN proximity affect star formation in the EAGLE simulation?	Research in Astronomy and Astrophysics	In press		2026
3.	Anindita Nandi, **Biswajit Pandey**	Galaxy quenching across the Cosmic Web: disentangling mass and environment with SDSS DR18	The Astrophysical Journal	1000	251	2026
4.	Suman Sarkar, **Biswajit Pandey,** Apashanka Das	Galaxy evolution in the cosmic web: the relative impact of nodes and filaments in the EAGLE simulation	Journal of Cosmology and Astroparticle Physics	09	025	2026
5.	Amit Mondal, **Biswajit Pandey**	From metallicity distributions to mutual information: A new perspective on stellar halo assembly	Journal of Cosmology and Astroparticle Physics	08	069	2026
6.	Debosi Mondal, **Biswajit Pandey**, Amit Mondal	Probing cosmic isotropy with gamma-ray bursts: A dipole and quadrupole analysis of BATSE and Fermi GBM data	Journal of High Energy Astrophysics	51	100549	2026
7.	Amit Mondal, **Biswajit Pandey**, Anindita Nandi	Spatial and velocity anisotropies of stellar halos across cosmic web environments: Insights from IllustrisTNG simulation	Monthly Notices of the Royal Astronomical Society	545	1	2026
8.	**Biswajit Pandey,** Anindita Nandi	Exploring the evolution of red and blue galaxies in different cosmic web environments using IllustrisTNG simulation	Journal of Cosmology and Astroparticle Physics	09	41	2025
9.	Anindita Nandi, **Biswajit Pandey**	Tracing correlations between galaxy properties across the Cosmic Web: An IllustrisTNG-based study	Astronomy and Computing	55	101023	2025
10.	Apashanka Das, **Biswajit Pandey**	The long road to the Green Valley: Tracing the evolution of the Green Valley galaxies in the EAGLE simulation	Journal of Cosmology and Astroparticle Physics	05	101	2025
11.	Amrita Banerjee, **Biswajit Pandey**, Anindita Nandi	Clustering and physical properties of AGN and Star-Forming Galaxies at fixed stellar mass: does assembly bias have a role in AGN activity?	Publication of the Astronomical Society of Australia	42	78	2025
12.	Anindita Nandi, **Biswajit Pandey**	Impact of cosmic web on galaxy properties and their correlations: Insights from Principal Component Analysis	Astronomy and Computing	53	100972	2025
13.	Suman Sarkar, **Biswajit Pandey**	Unveiling galaxy pair alignment in cosmic filaments: A 3D exploration using EAGLE simulation	Journal of Cosmology and Astroparticle Physics	01	023	2025

14.	Apashanka Das, **Biswajit Pandey**	The roles of environment and interactions on the evolution of red and blue galaxies in the EAGLE simulation	Journal of Cosmology and Astroparticle Physics	08	060	2024
15.	Amit Mondal, **Biswajit Pandey**	Probing the spatial and velocity anisotropies in stellar halos from the Aquarius simulations	Monthly Notices of the Royal Astronomical Society	533	3426	2024
16.	**Biswajit Pandey**	Tracing the green valley with entropic thresholding	Monthly Notices of the Royal Astronomical Society	530	4550	2024
17.	Anindita Nandi, Sukhdeep Singh Gill, Debanjan Sarkar, Abinash Kumar Shaw, **Biswajit Pandey**, Somnath Bharadwaj	The size and shape dependence of the SDSS galaxy bispectrum	New Astronomy	113	102292	2024
18.	Anindita Nandi, **Biswajit Pandey**, Prakash Sarkar	The correlations between galaxy properties in different environments of the cosmic web	Journal of Cosmology and Astroparticle Physics	02	012	2024
19.	**Biswajit Pandey**	Separating the blue cloud and the red sequence using Otsu's method for image segmentation	Astronomy and Computing	44	100725	2023
20.	**Biswajit Pandey**	Time evolution of the mutual information between disjoint regions in the Universe	Entropy	25	1094	2023
21.	Apashanka Das, **Biswajit Pandey**, Suman Sarkar	Do minor interactions trigger star formation in galaxy pairs?	Research in Astronomy and Astrophysics	23	095026	2023
22.	Apashanka Das, **Biswajit Pandey**, Suman Sarkar	Galaxy interactions in filaments and sheets: insights from EAGLE simulations	Research in Astronomy and Astrophysics	23	115018	2023
23.	Apashanka Das, **Biswajit Pandey**, Suman Sarkar	Galaxy interactions in filaments and sheets: effects of the large-scale structures versus the local density	Research in Astronomy and Astrophysics	23	025016	2023
24.	Biswajit Das, **Biswajit Pandey**	A Study of Holographic Dark Energy Models with Configuration Entropy	Research in Astronomy and Astrophysics	23	065003	2023
25.	**Biswajit Pandey**	Tomography of stellar halos: what does anisotropy in a stellar halo tell us?	Journal of Cosmology and Astroparticle Physics	10	058	2022
26.	Prakash Sarkar, **Biswajit Pandey**, Suman Sarkar	The maximum extent of the filaments and sheets in the cosmic web: an analysis of the SDSS DR17	Monthly Notices of the Royal Astronomical Society	519	3227	2022
27.	Suman Sarkar, **Biswajit Pandey**, Apashanka Das	On the origin of red spirals: Does assembly bias play a role?	Journal of Cosmology and Astroparticle Physics	03	024	2022

28.	Apashanka Das, **Biswajit Pandey**, Suman Sarkar	Green valley galaxies in the cosmic web: internal versus environmental quenching	Journal of Cosmology and Astroparticle Physics	06	045	2021
29.	**Biswajit Pandey**, Suman Sarkar	Testing homogeneity of the galaxy distribution in the SDSS using Renyi entropy	Journal of Cosmology and Astroparticle Physics	07	019	2021
30.	**Biswajit Pandey**	Renyi entropy as a measure of cosmic homogeneity	Journal of Cosmology and Astroparticle Physics	02	023	2021
31.	Suman Sarkar, **Biswajit Pandey**, Snehasish Bhattacharjee	Do galactic bars depend on environment?:An information theoretic analysis of Galaxy Zoo 2	Monthly Notices of the Royal Astronomical Society	501	994	2021
32.	Biswajit Das, **Biswajit Pandey**	Can we constrain the evolution of HI bias using configuration entropy?	Research in Astronomy and Astrophysics	21	35	2021
33.	**Biswajit Pandey**	A method for classification of red, blue and green galaxies using fuzzy set theory	Monthly Notices of the Royal Astronomical Society Letters	499	L31	2020
34.	Snehasish Bhattacharjee, **Biswajit Pandey**, Suman Sarkar	Can a conditioning on stellar mass explain the mutual information between morphology and environment?	Journal of Cosmology and Astroparticle Physics	09	039	2020
35.	Suman Sarkar, **Biswajit Pandey**	A study on the statistical significance of mutual information between morphology of a galaxy and its large-scale environment	Monthly Notices of the Royal Astronomical Society	497	4077	2020
36.	**Biswajit Pandey**, Suman Sarkar	Exploring galaxy colour in different environments of the cosmic web with SDSS	Monthly Notices of the Royal Astronomical Society	498	6069	2020
37.	Biswajit Das, **Biswajit Pandey**	Can we constrain the dark energy equation of state parameters using configuration entropy?	Monthly Notices of the Royal Astronomical Society	492	3928	2020
38.	**Biswajit Pandey**	Configuration entropy of the Cosmic Web: Can voids mimic the dark energy?	Monthly Notices of the Royal Astronomical Society Letters	485	L73	2019
39.	**Biswajit Pandey**, Biswajit Das	A new method to probe the mass density and the cosmological constant using configuration entropy	Monthly Notices of the Royal Astronomical Society Letters	485,	L43	2019
40.	Suman Sarkar, **Biswajit Pandey**	Unravelling the Cosmic Web: An analysis of the SDSS DR14 with the Local Dimension	Monthly Notices of the Royal Astronomical Society	485	4743	2019
41.	Biswajit Das, **Biswajit Pandey**	Configuration entropy in the Lambda CDM and the dynamical dark energy models: Can we distinguish one from the other?	Monthly Notices of the Royal Astronomical Society	482	3219	2019

42.	Suman Sarkar, **Biswajit Pandey**, Rishi Khatri	Testing isotropy in the Universe using photometric and spectroscopic data from the SDSS	Monthly Notices of the Royal Astronomical Society	483	2453	2019
43.	**Biswajit Pandey**	Does information entropy play a role in the expansion and acceleration of the Universe?	Monthly Notices of the Royal Astronomical Society Letters	471	L77	2017
44.	**Biswajit Pandey**	Can anisotropy in the galaxy distribution tell the bias?	Monthly Notices of the Royal Astronomical Society	469	1861	2017
45.	**Biswajit Pandey**	Testing isotropy in the Two Micron All-Sky redshift survey with information entropy	Monthly Notices of the Royal Astronomical Society	468	1953	2017
46.	**Biswajit Pandey**, Suman Sarkar	How much a galaxy knows about its large-scale environment?: An information theoretic perspective	Monthly Notices of the Royal Astronomical Society Letters	467	L6	2017
47.	Suman Sarkar, **Biswajit Pandey**	An information theory based search for homogeneity on the largest accessible scale	Monthly Notices of the Royal Astronomical Society Letters	463	L12	2016
48.	**Biswajit Pandey**	Relating information entropy and mass variance to measure bias and non-Gaussianity	Monthly Notices of the Royal Astronomical Society	463	4239	2016
49.	**Biswajit Pandey**	A new method for testing isotropy with Shannon entropy	Monthly Notices of the Royal Astronomical Society	462	1630	2016
50.	**Biswajit Pandey**, Suman Sarkar	Probing large scale homogeneity and periodicity in the LRG distribution using Shannon entropy	Monthly Notices of the Royal Astronomical Society	460	1519	2016
51.	**Biswajit Pandey**, Suman Sarkar	Testing homogeneity in the Sloan Digital Sky Survey Data Release Twelve with Shannon entropy	Monthly Notices of the Royal Astronomical Society	454	2647	2015
52.	**Biswajit Pandey**	A method for testing cosmic homogeneity with Shannon entropy	Monthly Notices of the Royal Astronomical Society	430	3376	2013
53.	**Biswajit Pandey**, Simon White, Volker Springel, Raul Angulo	Exploring the non-linear density field in the Millennium simulations with tessellations – I. The probability distribution function	Monthly Notices of the Royal Astronomical Society	435	2968	2013
54.	Prakash Sarkar, **Biswajit Pandey**, Somnath Bharadwaj	Exploring the cosmic web in the Sloan Digital Sky Survey Data Release Seven using the Local dimension	Monthly Notices of the Royal Astronomical Society	423	955	2012
55.	**Biswajit Pandey**, Gauri Kulkarni, Somnath Bharadwaj, Tarun Souradeep	The size of the longest filament in the Luminous Red Galaxy distribution	Monthly Notices of the Royal Astronomical Society	411	332	2010

56.	**Biswajit Pandey**	Statistically significant length scale of filaments as a robust measure of galaxy distribution	Monthly Notices of the Royal Astronomical Society	01	2687	2010
57.	Prakash Sarkar, Jaswant Yadav, **Biswajit Pandey**, Somnath Bharadwaj	The scale of homogeneity of the galaxy distribution in SDSS DR6	Monthly Notices of the Royal Astronomical Society Letters	399	L128	2009
58.	**Biswajit Pandey**, Somnath Bharadwaj	Exploring star formation using the filaments in the SDSS DR5	Monthly Notices of the Royal Astronomical Society	387	767	2008
59.	**Biswajit Pandey**, Somnath Bharadwaj	The luminosity bias relation from filaments in the SDSS DR4	Monthly Notices of the Royal Astronomical Society Letters	377	L15	2007
60.	**Biswajit Pandey**, Somnath Bharadwaj	The Luminosity, color and morphology dependence of the galaxy filaments in the Sloan Digital Sky Survey Data Release Four	Monthly Notices of the Royal Astronomical Society	372	827	2006
61.	Jaswant Yadav, Somnath Bharadwaj, **Biswajit Pandey**, T.R. Shesadri	Testing homogeneity on large scales in the Sloan Digital Sky Survey Data Release One	Monthly Notices of the Royal Astronomical Society	364	601	2005
62.	Sk. Saiyad Ali, Somnath Bharadwaj and **Biswajit Pandey**	What will anisotropies in the clustering pattern in the redshifted 21 cm maps tell us ?	Monthly Notices of the Royal Astronomical Society	363	251	2005
63.	**Biswajit Pandey**, Somnath Bharadwaj	Modelling non-linear effects in the redshift-space two-point correlation function and it's implications for the pairwise velocity dispersion	Monthly Notices of the Royal Astronomical Society	358	939	2005
64.	**Biswajit Pandey**, Somnath Bharadwaj	A two dimensional analysis of percolation and filamentarity in the Sloan Digital Sky Survey Data Release One	Monthly Notices of the Royal Astronomical Society	357	1068	2005
65.	Somnath Bharadwaj and **Biswajit Pandey**	Using the Filaments in the Las Campanas Redshift Survey to test the Lambda CDM model	Astrophysical Journal	615	1	2004

Biswajit Pandey

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