

Supriya Pan

Curriculum Vitae

Presidency University
86/1 College Street
Kolkata 700073, India

Current Position

Assistant Professor August 08, 2018 – till date: Assistant Professor of Mathematics at [Presidency University](#), Kolkata, India. University profile page: [Link](#)

Previous Positions

Assistant Professor March 23, 2017 – August 07, 2018: Assistant Professor of Mathematics, [Raiganj Surendranath Mahavidyalaya](#), Raiganj, West Bengal 733134, India.

National Post-Doctoral Fellow May 02, 2016 – March 22, 2017: National Post-Doctoral Fellow, at the [Department of Physical Sciences, Indian Institute of Science Education and Research Kolkata](#), India, funded by the Science and Engineering Research Board (SERB) under the Department of Science and Technology, Government of India (File No. PDF/2015/000640).

Advisor: Prof. Narayan Banerjee, Department of Physical Sciences, Indian Institute of Science Education and Research Kolkata, Mohanpur 741246, West Bengal, India.

NBHM Post-Doctoral Fellow February 01, 2016 – April 30, 2016: NBHM Post-Doctoral fellow at the [Department of Physical Sciences, Indian Institute of Science Education and Research Kolkata](#), India, funded by the Department of Atomic Energy, Government of India (File No. 2/40(60)/2015/R&D-II/15420). I left NBHM Post-Doctoral fellowship to avail the National Post-Doctoral fellowship.

Advisor: Prof. Narayan Banerjee, Department of Physical Sciences, Indian Institute of Science Education and Research Kolkata, Mohanpur 741246, West Bengal, India.

Education

Ph. D. Department of Mathematics, [Jadavpur University](#), Kolkata, India. Degree awarded on December 07, 2015.

Thesis title: “An Investigation on the present Accelerating Universe”.

Advisor: Prof. Subenoy Chakraborty, Department of Mathematics, Jadavpur University, Kolkata 700032, West Bengal, India.

M. Sc Department of Mathematics, [Jadavpur University](#), India; Year of passing: 2011; **Marks: 81.6%**. (Special papers: [Quantum Mechanics](#), [Astrophysics](#), [General Theory of Relativity and Cosmology](#)).

B. Sc Mathematics (Major) with Physics and Chemistry as subsidiary courses from the Department of Mathematics, [Jadavpur University](#), India; Year of passing: 2009; **Marks: 82.16%** (First class with distinction).

(10+2) level Rampurhat High School, Birbhum, West Bengal, India; Year of passing: 2006; **Marks: 90.10%**; Board: West Bengal Council of Higher Secondary Education.

10th level Rampurhat High School, Birbhum, West Bengal, India; Year of passing: 2004; **Marks: 85%**; Board: West Bengal Board of Secondary Education.

Awards & Honors

1. **Honorary Research Associate** at Durban University of Technology, Republic of South Africa, from 2022 to 2025.
2. **National Post-Doctoral Fellowship** from the [Science and Engineering Research Board \(SERB\)](#), Department of Science and Technology, Govt. of India.
3. **Post-Doctoral fellowship** from the [National Board for Higher Mathematics \(NBHM\)](#), Department of Atomic Energy, Government of India.
4. **Awarded the Senior Research Fellowship** from the [Council of Scientific and Industrial Research](#), Govt. of India, in the Mathematical Sciences division.
5. **Awarded the Junior Research Fellowship** from the [Council of Scientific and Industrial Research](#), Govt. of India, in the Mathematical Sciences division.
6. Qualified National Eligibility Test (**NET**) [[All India Rank \(JRF\) – 17](#)] conducted by the [Council of Scientific and Industrial Research](#), Govt. of India, in the Mathematical Sciences division and became eligible for PhD fellowship and Lecturship.
7. Qualified Graduate Research and Aptitude Test (**GATE**) conducted by the Indian Institute of Technology Roorkee in the Mathematics division [[All India Rank - 244](#)].

Languages Known

Bengali: **Native**; English: **Fluent**; Hindi: **Average**

Computing Skills

[Mathematica](#), [Maple](#), [Matlab](#), [Cosmic Linear Anisotropy Solving System \(CLASS\)](#)

Research Interests and Research Summary

I am a cosmologist, and my research interests lie in the interface of theory and observations. I am actively engaged in constraining several dark energy and modified gravity theories focusing on the tensions in the cosmological parameters. I have written two 'invited review' articles, one on the "[Hubble tension](#)" (invited by [Classical and Quantum Gravity](#)) and one on the "[cosmological singularities](#)" (invited by [Physics Reports](#)).

- **Research Summary:** The summary statistics of my research can be found at [INSPIRE-HEP](#) (last updated on March 28, 2024):
 - **Total number of published papers:** 106
 - **Total citations:** 7299
 - **Average citations per published paper:** ~ 68.9 ; h_{HEP} index: 46

Published articles

1. S. Halder, J. de Haro, T. Saha and **S. Pan**, “Phase space analysis of sign-shifting interacting dark energy models,” to appear in **Physical Review D** (2024) [arXiv:2403.01397 [gr-qc]].
2. M. Rezaei, **S. Pan**, W. Yang and D. F. Mota, “Evidence of dynamical dark energy in a non-flat universe: current and future observations,” **Journal of Cosmology and Astroparticle Physics** **01**, 052 (2024) [arXiv:2305.18544 [astro-ph.CO]].
3. J. de Haro, S. Nojiri, S. D. Odintsov, V. K. Oikonomou and **S. Pan**, “Finite-time Cosmological Singularities and the Possible Fate of the Universe,” **Physics Reports** **1034**, 1-114 (2023) [arXiv:2309.07465 [gr-qc]] (*Invited Review Article*).
4. W. Giarè, **S. Pan**, E. Di Valentino, W. Yang, J. de Haro and A. Melchiorri, “Inflationary potential as seen from different angles: model compatibility from multiple CMB missions,” **Journal of Cosmology and Astroparticle Physics** **09**, 019 (2023) [arXiv:2305.15378 [astro-ph.CO]].
5. **S. Pan**, W. Yang, E. Di Valentino, D. F. Mota and J. Silk, “IWDM: The fate of an interacting non-cold dark matter – vacuum scenario,” **Journal of Cosmology and Astroparticle Physics** **07**, 064 (2023) [arXiv:2211.11047 [astro-ph.CO]].
6. S. Kumar, R. C. Nunes, **S. Pan** and P. Yadav, “New late-time constraints on $f(R)$ gravity,” **Phys. Dark Univ.** **42**, 101281 (2023) [arXiv:2301.07897 [astro-ph.CO]].
7. W. Yang, **S. Pan**, E. Di Valentino, C. Escamilla-Rivera and A. Paliathanasis, “Exploring bulk viscous unified scenarios with Gravitational Waves Standard Sirens,” **Monthly Notices of the Royal Astronomical Society** **520**, no.1, 1146-1154 (2023) [arXiv:2301.03969 [astro-ph.CO]].
8. W. Yang, W. Giarè, **S. Pan**, E. Di Valentino, A. Melchiorri and J. Silk, “Revealing the effects of curvature on the cosmological models,” **Phys. Rev. D** **107**, no.6, 063509 (2023) [arXiv:2210.09865 [astro-ph.CO]].
9. W. Yang, S. Pan, O. Mena and E. Di Valentino, “On the dynamics of a dark sector coupling,” **Journal of High Energy Astrophysics** **40**, 19-40 (2023) [arXiv:2209.14816 [astro-ph.CO]].

10. E. N. Saridakis, W. Yang, **S. Pan**, F. K. Anagnostopoulos and S. Basilakos, “[Observational constraints on soft dark energy and soft dark matter: challenging \$\Lambda\$ CDM](#),” **Nuclear Physics B** **986** 116042 (2023) [[arXiv:2112.08330](#) [[astro-ph.CO](#)]].
11. S. Chatzidakis, A. Giacomini, P. G. L. Leach, G. Leon, A. Paliathanasis and **S. Pan**, “[Interacting dark energy in curved FLRW spacetime from Weyl Integrable Spacetime](#),” **Journal of High Energy Astrophysics** **36**, 141-151 (2022) [[arXiv:2206.06639](#) [[gr-qc](#)]].
12. E. Abdalla, G. Franco Abellán, A. Aboubrahim, A. Agnello, O. Akarsu, Y. Akrami, G. Alestas, D. Aloni, L. Amendola and L. A. Anchordoqui, (including **S. Pan** as one of the authors) *et al* (~ 203 authors). “[Cosmology intertwined: A review of the particle physics, astrophysics, and cosmology associated with the cosmological tensions and anomalies](#),” **Journal of High Energy Astrophysics** **34**, 49-211 (2022) [[arXiv:2203.06142](#) [[astro-ph.CO](#)]].
13. E. Di Valentino, S. Gariazzo, C. Giunti, O. Mena, **S. Pan** and W. Yang, “[Minimal dark energy: Key to sterile neutrino and Hubble constant tensions?](#),” **Physical Review D** **105**, no.10, 103511 (2022), [[arXiv:2110.03990](#) [[astro-ph.CO](#)]].
14. A. Bonilla, S. Kumar, R. C. Nunes and **S. Pan**, “[Reconstruction of the dark sectors’ interaction: A model-independent inference and forecast from GW standard sirens](#),” **Monthly Notices of the Royal Astronomical Society** **512**, no. 3, 4231-4238 (2022), [[arXiv:2102.06149](#) [[astro-ph.CO](#)]].
15. Y. L. Bolotin, V. A. Cherkaskiy, M. I. Konchatnyi, **S. Pan** and W. Yang, “[Do current observations support transient acceleration of our universe?](#),” **International Journal of Modern Physics D** **31**, no. 05, 2250036, (2022), [[arXiv:2008.09602](#) [[gr-qc](#)]].
16. H. B. Benaoum, W. Yang, **S. Pan** and E. Di Valentino, “[Modified Emergent Dark Energy and its Astronomical Constraints](#),” **International Journal of Modern Physics D** **31**, 03, 2250015 (2022), [[arXiv:2008.09098](#) [[gr-qc](#)]].
17. W. Liu, L. A. Anchordoqui, E. Di Valentino, **S. Pan**, Y. Wu and W. Yang, “[Constraints from High-Precision Measurements of the Cosmic Microwave Background: The Case of Disintegrating Dark Matter with \$\Lambda\$ or Dynamical Dark Energy](#),” **Journal of Cosmology and Astroparticle Physics** **02**, 012 (2022), [[arXiv:2108.04188](#) [[astro-ph.CO](#)]].
18. E. Di Valentino, O. Mena, **S. Pan**, L. Visinelli, W. Yang, A. Melchiorri, D. F. Mota, A. G. Riess and J. Silk, “[In the Realm of the Hubble tension – a Review of Solutions](#)”, **Classical and Quantum Gravity** **38**, 153001 (2021), [[arXiv:2103.01183](#) [[astro-ph.CO](#)]] ([Invited Review Article](#)).

* [A. G. Riess](#) is one of the Nobel Laureates in Physics (Cosmology) in the year 2011 along with Saul Perlmutter and Brian P. Schmidt for the [discovery of the accelerating expansion of the](#)

Universe.

** Silk damping is a widely known terminology in Cosmology after [Joseph Silk](#).

19. L. A. Anchordoqui, E. Di Valentino, **S. Pan** and W. Yang, “Dissecting the H_0 and S_8 tensions with Planck + BAO + supernova type Ia in multi-parameter cosmologies”, **Journal of High Energy Astrophysics** **32**, 28-64 (2021) [arXiv:2107.13932 [astro-ph.CO]].
20. A. Paliathanasis, G. Leon, W. Khyllep, J. Dutta and **S. Pan**, “Interacting quintessence in light of Generalized Uncertainty Principle: Cosmological perturbations and dynamics”, **The European Physical Journal C** **81**, no. 7, 607 (2021) [arXiv:2104.06097 [gr-qc]].
21. W. Yang, **S. Pan**, L. Aresté Saló and J. de Haro, “Theoretical and observational bounds on some interacting vacuum energy scenarios”, **Physical Review D** **103** no. 8, 083520 (2021) [arXiv:2104.04505 [astro-ph.CO]].
22. W. Yang, E. Di Valentino, **S. Pan**, A. Shafieloo and X. Li, “Generalized Emergent Dark Energy Model and the Hubble Constant Tension”, **Physical Review D** **104**, no. 06, 063521 (2021) [arXiv:2103.03815 [astro-ph.CO]].
23. E. Di Valentino, **S. Pan**, W. Yang and L. A. Anchordoqui, “Touch of Neutrinos on the Vacuum Metamorphosis: is the H_0 Solution Back?”, **Physical Review D** **103**, no. 12, 123527 (2021) [arXiv:2102.05641 [astro-ph.CO]].
24. W. Yang, **S. Pan**, E. Di Valentino, O. Mena and A. Melchiorri, “2021- H_0 Odyssey: Closed, Phantom and Interacting Dark Energy Cosmologies”, **Journal of Cosmology and Astroparticle Physics** **10**, 008 (2021) [arXiv:2101.03129 [astro-ph.CO]].
25. W. Yang, E. Di Valentino, **S. Pan**, Y. Wu and J. Lu, “Dynamical dark energy after Planck CMB final release and H_0 tension”, **Monthly Notices of the Royal Astronomical Society** **501**, no. 4, 5845-5858 (2021) [arXiv:2101.02168 [astro-ph.CO]].
26. E. Di Valentino, A. Melchiorri, O. Mena, **S. Pan** and W. Yang, “Interacting Dark Energy in a closed universe”, **Monthly Notices of the Royal Astronomical Society Letters** **502**, No. 01, L23-L28 (2021) [arXiv:2011.00283 [astro-ph.CO]].
27. E. Di Valentino *et al.* (including **S. Pan** as an author), “Cosmology Intertwined IV: The Age of the Universe and its Curvature”, **Astroparticle Physics**, **131** 102607 (2021) [arXiv:2008.11286 [astro-ph.CO]] (Special Issue on Particle Physics Community Planning Exercise (“Snowmass”)).
28. E. Di Valentino *et al.* (including **S. Pan** as an author), “Cosmology Intertwined III: $f\sigma_8$ and S_8 ”, **Astroparticle Physics** **131**, 102604 (2021) [arXiv:2008.11285 [astro-ph.CO]] (Special Issue on Particle Physics Community Planning Exercise (“Snowmass”)).

29. E. Di Valentino *et al.* (including **S. Pan** as an author), “[Cosmology Intertwined II: The Hubble Constant Tension](#)”, **Astroparticle Physics**, **131**, 102605 (2021) [arXiv:2008.11284 [astro-ph.CO]] ([Special Issue on Particle Physics Community Planning Exercise \(“Snowmass”\)](#)).
30. E. Di Valentino *et al.* (including **S. Pan** as an author), “[Cosmology Intertwined I: Perspectives for the Next Decade](#)”, **Astroparticle Physics**, **131**, 102606 (2021) [arXiv:2008.11283 [astro-ph.CO]] ([Special Issue on Particle Physics Community Planning Exercise \(“Snowmass”\)](#)).
31. W. Yang, E. Di Valentino, **S. Pan** and O. Mena, “[Emergent Dark Energy, neutrinos and cosmological tensions](#)”, **Physics of the Dark Universe**, **31**, 100762 (2021) [arXiv:2007.02927 [astro-ph.CO]].
32. A. Giacomini, G. Leon, A. Paliathanasis and **S. Pan**, “[Dynamics of Quintessence in Generalized Uncertainty Principle](#)”, **The European Physical Journal C** **80**, no. 10, 931 (2020) [arXiv:2008.01395 [gr-qc]].
33. G. Papagiannopoulos, S. Basilakos, A. Paliathanasis, **S. Pan** and P. Stavrinos, “[Dynamics in Varying vacuum Finsler-Randers Cosmology](#)”, **The European Physical Journal C** **80**, no. 9, 816 (2020) [arXiv:2005.06231 [gr-qc]].
34. W. Yang, E. Di Valentino, **S. Pan**, S. Basilakos and A. Paliathanasis, “[Metastable dark energy models in light of Planck 2018: Alleviating the \$H_0\$ tension](#)”, **Physical Review D** **102**, no. 6, 063503 (2020) [arXiv:2001.04307 [astro-ph.CO]].
35. W. Yang, E. Di Valentino, O. Mena and **S. Pan**, “[Dynamical Dark sectors and Neutrino masses and abundances](#)”, **Physical Review D** **102**, no. 2, 023535 (2020) [arXiv:2003.12552 [astro-ph.CO]].
36. **S. Pan**, J. de Haro, W. Yang and J. Amorós, “[Understanding the phenomenology of interacting dark energy scenarios and their theoretical bounds](#)”, **Physical Review D** **101** no. 12, 123506 (2020) [arXiv:2001.09885 [gr-qc]].
37. **S. Pan**, G. S. Sharov and W. Yang, “[Field theoretic interpretations of interacting dark energy scenarios and recent observations](#)”, **Physical Review D** **101** no. 10, 103533 (2020) [arXiv:2001.03120 [astro-ph.CO]].
38. W. Yang, **S. Pan**, D. F. Mota and M. Du, “[Forecast constraints on Anisotropic Stress in Dark Energy using gravitational-waves](#)”, **Monthly Notices of the Royal Astronomical Society** **497**, 879 (2020) [arXiv:2001.02180 [astro-ph.CO]].

39. W. Yang, E. Di Valentino, O. Mena, **S. Pan** and R. C. Nunes, “[All-inclusive interacting dark sector cosmologies](#)”, **Physical Review D** **101**, no. 8, 083509 (2020) [arXiv:2001.10852 [astro-ph.CO]].
40. W. Yang, **S. Pan**, R. C. Nunes and D. F. Mota, “[Dark calling Dark: Interaction in the dark sector in presence of neutrino properties after Planck CMB final release](#)”, **Journal of Cosmology and Astroparticle Physics** **04**, 008 (2020) [arXiv:1910.08821 [astro-ph.CO]].
41. J. de Haro, J. Amorós and **S. Pan**, “[Scaling solutions in quintessential inflation](#)”, **The European Physical Journal C** **80** no. 5, 404 (2020) [arXiv:1908.01516 [gr-qc]].
42. **S. Pan**, W. Yang, E. Di Valentino, A. Shafieloo and S. Chakraborty, “[Reconciling \$H_0\$ tension in a six parameter space?](#)”, **Journal of Cosmology and Astroparticle Physics** **06**, 062 (2020) [arXiv:1907.12551 [astro-ph.CO]].
43. W. Yang, **S. Pan**, E. Di Valentino, B. Wang and A. Wang, “[Forecasting Interacting Vacuum-Energy Models using Gravitational Waves](#)”, **Journal of Cosmology and Astroparticle Physics** **05**, 050 (2020) [arXiv:1904.11980 [astro-ph.CO]].
44. **S. Pan**, W. Yang and A. Paliathanasis, “[Imprints of an extended Chevallier-Polarski-Linder parametrization on the large scale of our universe](#)”, **The European Physical Journal C** **80**, 274 (2020) [arXiv:1902.07108 [astro-ph.CO]].
45. **S. Pan**, W. Yang and A. Paliathanasis, “[Nonlinear interacting cosmological models after Planck 2018 legacy release and the \$H_0\$ tension](#)”, **Monthly Notices of the Royal Astronomical Society** **493**, 3114 (2020) [arXiv:2002.03408 [astro-ph.CO]].
46. A. Giacomini, G. Leon, A. Paliathanasis and **S. Pan**, “[Cosmological Evolution of Two-Scalar fields Cosmology in the Jordan frame](#)”, **The European Physical Journal C** **80**, 184 (2020) [arXiv:2001.02414 [gr-qc]].
47. **S. Pan**, W. Yang, E. Di Valentino, E. N. Saridakis and S. Chakraborty, “[Interacting scenarios with dynamical dark energy: Observational constraints and alleviation of the \$H_0\$ tension](#)”, **Physical Review D** **100**, no. 10, 103520 (2019) [arXiv:1907.07540 [astro-ph.CO]].
48. W. Yang, **S. Pan**, S. Vagnozzi, E. Di Valentino, D. F. Mota and S. Capozziello, “[Dawn of the dark: unified dark sectors and the EDGES Cosmic Dawn 21-cm signal](#)”, **Journal of Cosmology and Astroparticle Physics** **1911**, 044 (2019) [arXiv:1907.05344 [astro-ph.CO]].
49. W. Yang, O. Mena, **S. Pan** and E. Di Valentino, “[Dark sectors with dynamical coupling](#)”, **Physical Review D** **100**, no. 8, 083509 (2019) [arXiv:1906.11697 [astro-ph.CO]].

50. **S. Pan**, W. Yang, C. Singha and E. N. Saridakis, “[Observational constraints on sign-changeable interaction models and alleviation of the \$H_0\$ tension](#)”, **Physical Review D** **100**, no. 8, 083539 (2019) [arXiv:1903.10969 [astro-ph.CO]].
51. A. Paliathanasis, G. Leon and **S. Pan**, “[Exact Solutions in Chiral Cosmology](#)”, **General Relativity and Gravitation**, **51**, no.9, 106 (2019) [arXiv:1811.10038 [gr-qc]].
52. W. Yang, **S. Pan**, E. Di Valentino, A. Paliathanasis and J. Lu, “[Challenging bulk viscous unified scenarios with cosmological observations](#)”, **Physical Review D** **100**, no. 10, 103518 (2019) [arXiv:1906.04162 [astro-ph.CO]].
53. W. Yang, **S. Pan**, A. Paliathanasis, S. Ghosh and Y. Wu, “[Observational constraints of a new unified dark fluid and the \$H_0\$ tension](#)”, **Monthly Notices of the Royal Astronomical Society** **490**, no. 2, 2071 (2019) [arXiv:1904.10436 [gr-qc]].
54. A. Paliathanasis, **S. Pan** and W. Yang, “[Dynamics of nonlinear interacting dark energy models](#)”, **International Journal of Modern Physics D** **28**, no.12, 1950161 (2019) [arXiv:1903.02370 [gr-qc]].
55. M. Du, W. Yang, L. Xu, **S. Pan** and D. F. Mota, “[Future Constraints on Dynamical Dark-Energy using Gravitational-Wave Standard Sirens](#)”, **Physical Review D** **100**, 043535 (2019) [arXiv:1812.01440 [astro-ph.CO]].
56. W. Yang, S. Vagnozzi, E. Di Valentino, R. C. Nunes, **S. Pan** and D. F. Mota, “[Listening to the sound of dark sector interactions with gravitational wave standard sirens](#)”, **Journal of Cosmology and Astroparticle Physics** **1907**, no.07, 037 (2019) [arXiv:1905.08286 [astro-ph.CO]].
57. J. de Haro, **S. Pan** and L. Aresté Saló, “[Understanding gravitational particle production in quintessential inflation](#)”, **Journal of Cosmology and Astroparticle Physics** **1906**, no. 06, 056 (2019) [arXiv:1903.01181 [gr-qc]].
58. J. de Haro, J. Amorós and **S. Pan**, “[The Peebles - Vilenkin quintessential inflation model revisited](#)”, **The European Physical Journal C** **79** no.6, 505 (2019) [arXiv:1901.00167 [gr-qc]].
59. W. Yang, N. Banerjee, A. Paliathanasis and **Supriya Pan**, “[Reconstructing the dark matter and dark energy interaction scenarios from observations](#)”, **Physics of the Dark Universe** **26**, 100383 (2019) [arXiv:1812.06854 [astro-ph.CO]].
60. W. Yang, **S. Pan**, E. Di Valentino and E. N. Saridakis, “[Observational constraints on dynamical dark energy with pivoting redshift](#)”, **Universe** **5**, no. 11, 219 (2019)

[arXiv:1811.06932 [astro-ph.CO]].

61. P. Das, **S. Pan** and S. Ghosh, “[Thermodynamics and phase transition in Shapere-Wilczek \$fgh\$ model: Cosmological time crystal in quadratic gravity](#)”, **Physics Letters B** **791** 66 (2019) [arXiv:1810.06606 [hep-th]].
62. W. Yang, M. Shahalam, B. Pal, **S. Pan** and A. Wang, “[Constraints on quintessence scalar field models using cosmological observations](#),” **Phys. Rev. D** **100**, no. 2, 023522 (2019) [arXiv:1810.08586 [gr-qc]].
63. W. Yang, **S. Pan**, E. Di Valentino, E. N. Saridakis, S. Chakraborty, “[Observational constraints on one-parameter dynamical dark-energy parametrizations and the \$H_0\$ tension](#)”, **Physical Review D** **99** no.4, 043543 (2019) [arXiv:1810.05141 [astro-ph.CO]].
64. **S. Pan**, J. D. Barrow and A. Paliathanasis, “[Two-fluid solutions of particle-creation cosmologies](#)”, **The European Physical Journal C** **79**, no.2, 115 (2019) [arXiv:1812.05493 [gr-qc]].
65. J. Haro, W. Yang and **S. Pan**, “[Reheating in quintessential inflation via gravitational production of heavy massive particles: A detailed analysis](#)”, **Journal of Cosmology and Astroparticle Physics** **1901**, 023 (2019) [arXiv:1811.07371 [gr-qc]].
66. W. Yang, **S. Pan** and A. Paliathanasis, “[Cosmological constraints on an exponential interaction in the dark sector](#)”, **Monthly Notices of the Royal Astronomical Society** **482**, 1007 (2019) [arXiv:1804.08558 [gr-qc]].
67. W. Yang, **S. Pan**, L. Xu and D. F. Mota, “[Effects of Anisotropic Stress in Interacting Dark Matter - Dark Energy Scenarios](#)”, **Monthly Notices of the Royal Astronomical Society** **482**, 1858 (2019) [arXiv:1804.08455 [astro-ph.CO]].
68. J. de Haro, L. Aresté Saló and **S. Pan**, “[Limiting curvature mimetic gravity and its relation to Loop Quantum Cosmology](#)”, **General Relativity and Gravitation** **51** no.4, 49 (2019) [arXiv:1803.09653 [gr-qc]].
69. W. Yang, A. Mukherjee, E. Di Valentino and **S. Pan**, “[Interacting dark energy with time varying equation of state and the \$H_0\$ tension](#)”, **Physical Review D** **98**, 123527 (2018) [arXiv:1809.06883 [astro-ph.CO]].
70. R. C. Nunes, **S. Pan** and E. N. Saridakis, “[New observational constraints on \$f\(T\)\$ gravity through gravitational-wave astronomy](#)”, **Physical Review D** **98** no.10, 104055 (2018) [arXiv:1810.03942 [gr-qc]].
71. W. Yang, **S. Pan**, R. Herrera and S. Chakraborty, “[Large-scale \(in-\) stability analysis of an](#)

- exactly solved coupled dark-energy model”, **Physical Review D** **98**, no. 4, 043517 (2018) [arXiv:1808.01669 [gr-qc]].
72. W. Yang, **S. Pan**, E. Di Valentino, R. C. Nunes, S. Vagnozzi and D. F. Mota, “[Tale of stable interacting dark energy, observational signatures, and the \$H_0\$ tension](#),” **Journal of Cosmology and Astroparticle Physics** **1809**, no.09, 019 (2018) [arXiv:1805.08252 [astro-ph.CO]].
 73. P. Das, **S. Pan**, S. Ghosh and P. Pal, “[Cosmological time crystal: Cyclic universe with a small cosmological constant in a toy model approach](#)”, **Physical Review D** **98**, no.2, 024004 (2018) [arXiv:1801.07970 [hep-th]].
 74. J. de Haro and **S. Pan**, “[Note on bouncing backgrounds](#)”, **Physical Review D** **97**, no.10, 103518 (2018) [arXiv:1801.05475 [gr-qc]].
 75. **S. Pan**, E. N. Saridakis, W. Yang, “[Observational Constraints on Oscillating Dark-Energy Parametrizations](#)”, **Physical Review D** **98**, no.6, 063510 (2018) [arXiv:1712.05746 [astro-ph.CO]].
 76. **S. Pan**, A. Mukherjee and N. Banerjee, “[Astronomical bounds on a cosmological model allowing a general interaction in the dark sector](#)”, **Monthly Notices of the Royal Astronomical Society** **477**, No. 1, 1189-1205 (2018) [arXiv:1710.03725 [astro-ph.CO]].
 77. **S. Pan**, “[Exact solutions, finite time singularities and non-singular universe models from a variety of \$\Lambda\(t\)\$ cosmologies](#)”, **Modern Physics Letters A** **33**, No.1, 1850003 (2018) [arXiv:1712.01215 [gr-qc]].
 78. W. Yang, **S. Pan** and A. Paliathanasis, “[Latest astronomical constraints on some nonlinear parametric dark energy models](#)”, **Monthly Notices of the Royal Astronomical Society** **475**, 2605-2613 (2018) [arXiv:1708.01717 [gr-qc]].
 79. A. Das, A. Banerjee, S. Chakraborty and **S. Pan**, “[Perfect Fluid Cosmological Universes: One equation of state and the most general solution](#)”, **Pramana - Journal of Physics** **90**, 19, no. 02 (2018) [arXiv:1706.08145 [gr-qc]].
 80. J. Haro and **S. Pan**, “[Bulk viscous quintessential inflation](#)”, **International Journal of Modern Physics D** **27**, 1850052 (2018) [arXiv:1512.03033 [gr-qc]].
 81. W. Yang, **S. Pan** and J. D. Barrow, “[Large-scale Stability and Astronomical Constraints for Coupled Dark-Energy Models](#)”, **Physical Review D** **97**, no.4, 043529 (2018) [arXiv:1706.04953 [astro-ph.CO]].
 82. **S. Pan**, B. K. Pal and S. Pramanik, “[Gravitationally influenced particle creation models](#)

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99. R. Jan Slagter and **S. Pan**, “[A New Fate of a Warped 5D FLRW Model with a \$U\(1\)\$ Scalar Gauge Field](#)”, **Foundations of Physics** **46**, no. 09, 1075 (2016) [arXiv:1501.02843 [gr-qc]].
100. A. Paliathanasis, **S. Pan** and S. Pramanik, “[Scalar field cosmology modified by the Generalized Uncertainty Principle](#)”, **Classical and Quantum Gravity** **32**, no. 24, 245006 (2015) [arXiv:1508.06543 [gr-qc]].
101. **S. Pan** and S. Chakraborty, “[A Cosmological Study in Massive Gravity theory](#)”, **Annals of Physics** **360**, 180 (2015) [arXiv:1505.00743 [gr-qc]].
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107. **S. Pan** and S. Chakraborty, “Will there be again a transition from acceleration to deceleration in course of the dark energy evolution of the universe?”, **The European Physical Journal C 73**, 2575 (2013) [arXiv:1303.5602 [gr-qc]].

Seminars/Conferences/Workshops organized

1. I often take active roles in organizing the outreach programmes on Mathematics for school and college students. The details of the outreach programmes can be found at [“here”](#).
2. Organized an **International Workshop on Emerging Trends in Gravitation and Cosmology** [IWETGC - 2021 (online)] at the Department of Mathematics, Presidency University, Kolkata, India, during December 16-19, 2021. Conference Link: [“here”](#).
 - Convenors: Dr. Supriya Pan and Dr. Subhra Bhattacharya
3. Organized a one day seminar on **“Algebra in Mathematics and Physics”** jointly by the Department of Mathematics and Department of Physics, Raiganj Surendranath Mahavidyalaya (RSM) in collaboration with RSM Research Group, IQAC, on May 11, 2018.
 - Convenors: Dr. Supriya Pan and Dr. Debasmita Bandyopadhaya
4. Organized a one day seminar on **“The Einstein’s theory of Relativity and the Black Holes in the Universe”** jointly by the Department of Mathematics and Department of Physics, Raiganj Surendranath Mahavidyalaya (RSM) in collaboration with RSM Research Group, IQAC, on April 06, 2018.
 - Convenors: Dr. Supriya Pan and Dr. Debasmita Bandyopadhaya

Schools/Conferences/Workshops Attended

1. **“Cosmological Tensions and its implication to Concordance Cosmology”** organized by the Institute for Fundamental Physics of the Universe (IFPU), Trieste, Italy, in collaboration with ICTP and SISSA, Trieste, Italy, during June 13-23, 2023.
2. **“Current Trends in Mathematics and its Applications (NSCTMA-2019)”** organized by the Department of Mathematics, Jadavpur University on 8th March, 2019.
3. **“Gravity at Different Length Scales”** organised by the Gravity Group of the Indian Association for the Cultivation of Science from 25th February to 27th February, 2019.

4. **30th meeting of Indian Association for General Relativity and Gravitation (IAGRG)** organized by the Department of Physics, Birla Institute of Technology and Science Pilani, Hyderabad campus from January 3-5, 2019.
5. **6th Topical Conference on Gravity, Cosmology, Astronomy and Astrophysics (TCGCAA)**, at the Department of Physics, Visva-Bharati, Santiniketan on the 24th of September, 2016.
6. **school and workshop on cosmology (IFSW-2015)** organized by the Institute for Fundamental study, Naresuan University, Phitsanulok, Thailand, during 22nd August- 28th August, 2015.
7. **“Statistical applications to cosmology and astrophysics (STATCOSMO15)”**, organized by the Physics and Applied Mathematics unit, Indian Statistical Institute, Kolkata, during February 10-13, 2015.
8. **“International Conference on Geometry and its Applications”** at the Department of Mathematics, Jadavpur University organized by the Department of Mathematics, Jadavpur University and the Tensor Society during October 16-18, 2014.
9. **32nd meeting of Astronomical Society of India (ASI)** during March 20-22, 2014 at Indian Institute of Science Education and Research (IISER), Mohali.
10. 1st **“Topical Conference on Gravity and Cosmology”** meeting on 13th December, 2013 at Saha Institute of Nuclear Physics, Salt Lake, Kolkata, India.
11. **“Autumn School on Cosmology”** organized by the Department of Physics, Birla Institute of Technology and Science Pilani, Pilani campus, in collaboration with Inter University Centre for Astronomy and Astrophysics (IUCAA), Pune, from November 5-15, 2013.
12. **“Present Observational Constraints on Cosmological Parameters”** organized by IUCAA Resource Centre, University of Delhi from 28th January to 1st February, 2013.

Lectures & Posters Presented

1. **(Invited) lecture “On the Dark Energy Phenomenology – the case for Hubble tension”** in the focus workshop on *“Cosmological Tensions and its implication to Concordance Cosmology”* organized by the Institute for Fundamental Physics of the Universe (IFPU), Trieste, Italy in collaboration with ICTP and SISSA, Trieste, Italy, during June 13-23, 2023.
2. Talk on the **“Crisis in cosmology and the role of dark interaction”** in the 14th International Conference MSAST 2020 held during December 21-23, 2020, organized by the Institute for Mathematics, Bioinformatics, Information Technology and Computer Science (IMBIC), India.
3. **(Invited) lecture on “Tension in the dark”** in the 16th IMT-GT International Conference on

Mathematics, Statistics and Their Applications (ICMSA 2020) during November 23-24, 2020, Organized by Centre for Mathematical Sciences, Universiti Tunku Abdul Rahman, Malaysia.

4. (Invited) lecture on **“Our Mysterious Universe”** in the two day National Webinar on *“Mathematics and its applications”* organized by Department of Mathematics in association with IQAC, Moyna College, on 30th September, 2020 and 1st October, 2020.
5. (Invited) lecture on **“Tensed H_0 ”** at the School of Physical Sciences, Indian Association for the Cultivation of Science, Jadavpur, on August 25, 2020.
6. (Invited) lecture on **“Dark Mathematical Equations of our Universe”** in a National level webinar *Advances in Theoretical and Mathematical Physics* organized by the Balagarh Bijoy Krishna Mahavidyalaya, Balagarh, West Bengal, in collaboration with South Maldah College, Maldah, West bengal, on July 27, 2020.
7. (Invited) lecture on **“Our geometrical Universe and its dynamics”** organized by the Department of Mathematics, Ramkrishna Mission Vidyamandira, Belur in collaboration with the Department of Mathematics, Ramkrishna Mission Residential College, Narendrapur, on July 23, 2020.
8. Talk on the **“Mathematical Equations of the Universe and Dark Energy”** in the Webinar Series – Online Summer School 2020 on Mathematics organized by the Department of Mathematics, Presidency University during June 27, 2020 to July 06, 2020.
9. Talk on **“A possible solution to the H_0 tension via interaction in the dark sector”** in the 30th meeting of Indian Association for General Relativity and Gravitation (IAGRG) organized by the Department of Physics, Birla Institute of Technology and Science Pilani, Hyderabad campus on 3rd January, 2019.
10. Talk on **“New constraints on interacting dark energy from cosmic chronometers”** at Topical Conference on Gravity, Cosmology, Astronomy and Astrophysics (TCGCAA), 6th edition, Visva-Bharati, on 24th September, 2016.
11. Talk on **“Analytic solutions for interacting dark energy and its observational constraints”** in IFSW-2015, Naresuan University, Phitsanulok, Thailand, during 22nd August- 28th August, 2015.
12. Talk on **“The Present Status of our Nonlinear Universe”** in the National Seminar on “Recent Perspectives on Nonlinear Mathematics and its Applications” organized by the Department of Mathematics, Siksha Bhavana, Visva-Bharati during March 25-26, 2014.
13. Poster on **“Will there again be a transition from acceleration to deceleration in course of the dark energy evolution of the universe?”** in the 32nd meeting of Astronomical Society of India (ASI) during March 20-22, 2014 at Indian Institute of Science Education and Research

(IISER) Mohali, Punjab, India.

14. Talk on “**The Future of our Universe: A prediction from present scenario**” in the National Conference on “Emerging Trends in Physics of Fluids and Solids” organized by the Department of Mathematics, Jadavpur University, during March 06-07, 2014.
15. Talk on “**Dark Energy: How really dark it is**” in the National Conference on Non-Linear Dynamics, Analysis and Optimization (NDAO) organized by the Department of Mathematics, Jadavpur University, during January 9-10, 2014.

TEACHING

I have taught (and I am teaching) the following courses to the undergraduate and postgraduate students at Presidency University.

- 2023 (Odd Semester) - UG III: Numerical Methods; PG II: Advanced Numerical Analysis – I
- 2023 (Even Semester) - UG III: Mechanics; UG II (GE04): Analytical Geometry of 2D
- 2022 (Odd Semester) - UG III: Numerical Methods; PG II: Advanced Numerical Analysis – I & Mathematical Methods II
- 2022 (Even Semester) - UG III: Mechanics; UG II (GE04): Analytical Geometry of 2D
- 2021 (Odd Semester) - UG III: Numerical Methods; PG II: Numerical Analysis
- 2021 (Even Semester) - UG III: Mechanics; UG II (GE): Analytical Geometry
- 2020 (Odd Semester) - UG III: Numerical Methods; UG I: Geometry
- 2020 (Even Semester) - UG II: Partial Differential Equations; UG III: Classical Mechanics
- 2019 (Odd Semester) - UG I: Geometry; UG III: Probability Theory
- 2019 (Even Semester) - UG II: Geometry I; UG III: Classical Mechanics
- 2018 (Odd Semester) - UG II (GenEd): Linear Algebra