Supriya Pan

Curriculum Vitae

PERSONAL INFORMATION

Date of Birth *On the 1st May of 1989*

Sex Male

Nationality INDIAN

Marital Status Unmarried

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Office Address Department of Mathematics, Presidency University, 86/1 College Street, Kolkata 700073; Room No. M5, 3rd Floor of Bekar Building

CURRENT POSITION

Assistant Professor (From August 2018) From August 08, 2018, I am working as an Assistant Professor of Mathematics at Presidency University, Kolkata, India.

PREVIOUS POSITIONS

Assistant Professor From the 23rd of March, 2017, to August 07, 2018, I worked as an Assistant Professor of Mathematics at Raiganj Surendranath Mahavidyalaya (an undergraduate college under the University of Gour Banga, Maldah), Raiganj, West Bengal 733134, India.

National Post-Doctoral Fellow From 2nd of May, 2016 to 22nd of March 2017, I worked as a 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 (DST), Government of India (File No. PDF/2015/000640).

NBHM Post-Doctoral Fellow From the first day of February 2016 to April 30, 2016, I worked as an NBHM (National Board for Higher Mathematics) 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 National Post-Doctoral fellowship.

EDUCATION

Ph. D. I worked as a CSIR JRF and SRF at the Department of Mathematics, Jadavpur University. My main research area was the classical aspects of gravity. In particular, I worked on the late time accelerated expansion of the universe. I received my Ph.D. degree in December 2015. Thesis Title: **"An Investigation on the present Accelerating Universe".**

M. Sc Department of Mathematics, Jadavpur University, Kolkata 700032, India; Year of passing: 2011; Marks: 81.6%

B. Sc Mathematics (Honours) with Physics and Chemisty as subsidiary courses from the Department of Mathematics, Jadavpur University, Kolkata 700032, India; Year of passing: 2009; Marks: 82.16%

WBCHSE (10+2 level) Rampurhat High School, Birbhum, West Bengal, India; Year of passing: 2006; Marks: 90.10%

WBBSE (10th standard) Rampurhat High School, Birbhum, West Bengal, India; Year of passing: 2004; Marks: 85%

AWARDS & HONORS

1. **National Post-Doctoral Fellowship** from Science and Engineering Research Board (SERB), Department of Science and Technology, Govt. of India.
2. **Post-Doctoral fellowship** from the National Board for Higher Mathematics (NBHM), Department of Atomic Energy, Government of India.

3. Qualified National Eligibility Test **(NET)** [All India Rank (JRF) – 17] conducted by the Council of Scientific and Industrial Research (CSIR), Government of India, in the Mathematical Sciences division.
4. Qualified Graduate Research and Aptitude Test **(GATE)** conducted by the Indian Institute of Technology, in the Mathematics division [All India Rank – 244].

RESEARCH EXPERIENCE

Post-Doctoral Fellow (2016-2017)
On the first day of February, 2016, I joined the Department of Physical Sciences, Indian Institute of Science Education of Research Kolkata as a Post-Doctoral fellow. During that period I mainly focused on the observational constraints on various cosmological models. In particular, I worked on the following areas: the interacting dark energy models, modified gravity theories, gravitational particle creation.

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

Ph.D. Student (2012 - 2015)
In 2012, I joined the Department of Mathematics, Jadavpur University, Kolkata, to work on the classical aspects of Gravity where mainly I worked on the late-time accelerated expansion of the universe.

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

RESEARCH INTERESTS

I am interested in various topics of cosmology. My main attraction is dark energy – this is a hypothetical fluid with negative pressure that we need to add in the Einstein's field equations in order to understand the present accelerating expansion of the Universe. The dark energy occupies nearly 68% of the total energy budget of the Universe and most surprisingly, according to the available astronomical data, we can safely say that we know almost nothing about it. This "unknown" character of dark energy has thrilled the entire scientific community over the years. This is the topic which seems to me extremely fascinating. Apart from dark energy, an alternative route to explain this late acceleration is the modified gravity theories. Over the past several years, I am investigating various cosmological models in light of a number of astronomical datasets. The primary goal of such analyses is to understand the fitness of the models with the observational evidences. With the sensitivity of the experimental data, now we are in a stage to understand the limitations of the underlying cosmological theory, if any. With the growing number of astronomical datasets, current cosmology is facing with a severe problem – the tensions in the cosmological parameters. The well known

cosmological tensions are the H_0 tension and the S_8 tensions. Along with the analysis of dark energy and modified gravity theories, I have been inclined much in the direction of cosmological tensions (I wrote a **review article on the H_0 tension** with my collaborators, see the list of publications for details). In summary, the specific research areas where I often travel are:

1. Dark energy
2. Modified gravity theories
3. H_0 and S_8 tensions
4. Matter creation as an alternative to both dark energy and modified gravity theories
5. Dynamics of the early universe
6. Gravitational Waves - a new window for astrophysics and cosmology

LANGUAGES

Bengali	**Native**
English	**Fluent**
Hindi	**Average**

PROJECT ONGOING

1. **Title:** *Structure formation in the cosmological models and their astronomical constraints in the light of latest observations*

   Funding Agency: Science and Engineering Research Board (SERB), DST, Govt. of India
   Scheme: Mathematical Research Impact-Centric Support Scheme (MATRICS)
   File No: MTR/2018/000940
   Duration: 3 years
   Start date: May 27, 2019
   Amount: 6 Lacs

RESEARCH COLLABORATION

I am working with many active researchers in the field of gravitation and cosmology. Currently, we have a strong collaborating group where we are investigating the cosmological models in light of the recently available observational data from various astronomical and astrophysical sources. In the following, I have enlisted my present and past collaborating Universities/Institutes since my doctoral work.

NATIONAL COLLABORATION

1. Department of Mathematics, Jadavpur University, Raja S C Mullick Road, Jadavpur, Kolkata 700032, West Bengal, India.

2. Department of Physical Sciences, Indian Institute of Science Education and Research Kolkata, Mohanpur 741246, West Bengal, India.

3. Physics and Applied Mathematics Unit, Indian Statistical Institute, 203 B.T. Road, Kolkata 700108, India.

4. Department of Physical Sciences, Indian Institute of Science Education and Research Mohali, Sector 81, Mohali, Punjab 140306, India.

INTERNATIONAL COLLABORATION

1. Institute for Particle Physics Phenomenology, Department of Physics, Durham University, Durham DH1 3LE, UK.

2. BIPAC, Department of Physics, University of Oxford, Keble Road, Oxford OX1 3RH, UK.

3. Department of Applied Mathematics and Theoretical Physics, Centre for Mathematical Sciences & Kavli Institute for Cosmology (KICC) and Institute of Astronomy, University of Cambridge, Cambridge CB3 0WA, UK.

4. Jodrell Bank Center for Astrophysics, School of Physics and Astronomy, University of Manchester, Oxford Road, Manchester, M13 9PL, UK.

5. School of Mathematical Sciences, Queen Mary University of London, Mile End Road, London, E1 4NS, UK.

6. Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD 21218, USA.

7. Space Telescope Science Institute, 3700 San Martin Drive, Baltimore, MD 21218, USA.

8. CASPER, Physics Department, Baylor University, Waco, TX 76798-7310, USA.

9. Department of Physics and Astronomy, Lehman College, City University of New York, NY 10468, USA.

10. Institut d'Astrophysique de Paris (UMR7095: CNRS & UPMC- Sorbonne Universities), F-75014, Paris, France.

11. Institute of Theoretical Astrophysics, University of Oslo, 0315 Oslo, Norway.

12. Department of Physics, Liaoning Normal University, Dalian, 116029, P. R. China.

13. Institute of Theoretical Physics, School of Physics, Dalian University of Technology, Dalian, 116024, P. R. China.

14. Institute for Theoretical Physics & Cosmology, Zhejiang University of Technology, Hangzhou, 310023, P. R. China.

15. School of Aeronautics and Astronautics, Shanghai Jiao Tong University, Shanghai 200240, P. R. China.

16. Centre for Gravitation and Cosmology, Yangzhou University, Yangzhou 225009, P. R. China.

17. College of Physics, Hebei Normal University, Shijiazhuang 050024, P. R. China.

18. National Observatory of Athens, Lofos Nymfon, 11852, Athens, Greece.

19. Academy of Athens, Research Center for Astronomy and Applied Mathematics, Soranou Efessiou 4, 115 27 Athens, Greece.

20. Physics Division, National Technical University of Athens, 15780 Zografou Campus, Athens, Greece.

21. Department of Mathematics, National and Kapodistrian University of Athens, Panepistimiopolis 15784, Athens, Greece.

22. Faculty of Physics, Department of Astronomy-Astrophysics-Mechanics, University of Athens, Panepistemiopolis, Athens 157 83, Greece.

23. IFIC, Universidad de Valencia-CSIC, 46071, Valencia, Spain.

24. Departament de Matemàtica Aplicada I, Universitat Politècnica de Catalunya, Diagonal 647, 08028 Barcelona, Spain.

25. Divisão de Astrofísica, Instituto Nacional de Pesquisas Espaciais, Avenida dos Astronautas 1758, São José dos Campos, 12227-010, SP, Brazil.

26. Departamento de Física, Universidade Federal de Juiz de Fora, 36036-330, Juiz de Fora, MG, Brazil.

27. Grupo de Física Teórica e Matemática Física, Universidade Federal Rural do Rio de Janeiro, 23890-971, Seropédica, RJ, Brazil.

28. Institute of Systems Science, Durban University of Technology, PO Box 1334, Durban 4000, Republic of South Africa.

29. Istituto Nazionale di Fisica Nucleare (INFN), Laboratori Nazionali di Frascati, C.P. 13, I-100044 Frascati, Italy.

30. Dipartimento di Fisica, Università di Napoli Federico II, Complesso Universitario di Monte Sant'Angelo, Via Cinthia, 21, I-80126 Napoli, Italy.

31. Istituto Nazionale di Fisica Nucleare (INFN), Sezione di Napoli, Complesso Universitario di Monte Sant'Angelo, Via Cinthia, 21, I-80126 Napoli, Italy.

32. Physics Department and INFN, Università di Roma "La Sapienza", Ple Aldo Moro 2, 00185, Rome, Italy.

33. Gran Sasso Science Institute (GSSI), Viale Francesco Crispi 7, I-67100 L'Aquila, Italy.

34. Instituto de Física, Pontificia Universidad Católica de Valparaíso, Casilla 4059, Valparaíso, Chile.

35. Instituto de Ciencias Físicas y Matemáticas, Universidad Austral de Chile, Valdivia, Chile.

36. Departamento de Matemàticas, Universidad Católica del Norte, Avda. Angamos 0610, Casilla 1280 Antofagasta, Chile.

37. Department of Mathematics, Tver State University, 170002, Sadovyj per. 35, Tver, Russia.

38. Tomsk State Pedagogical University, 634061 Tomsk, Russia.

39. Laboratory for Theoretical Cosmology, Tomsk State University of Control Systems and Radioelectronics (TUSUR), 634050 Tomsk, Russia.

40. Korea Astronomy and Space Science Institute, Daejeon 34055, Korea.

41. University of Science and Technology, Yuseong-gu 217 Gajeong-ro, Daejeon 34113, Korea.

42. The Oskar Klein Centre for Cosmoparticle Physics, Stockholm University, Roslagstullbacken 21A SE-106 91 Stockholm, Sweden.

43. The Nordic Institute for Theoretical Physics, Roslagstullbacken 23, SE-106 91 Stockholm,

Sweden.

44. TUM Physik-Department, Technische Universität München, James-Franck-Str.1, 85748 Garching, Germany.

45. Astronomisch Fysisch Onderzoek Nederland (ASFYON), The Netherlands.

46. Department of Mathematics, Simon Fraser University, Burnaby, British Columbia, V5A 1S6, Canada.

47. Facultad Tecnolgica, Universidad Distrital Francisco José de Caldas, Carrera 7 No. 40B - 53, Bogotá, Colombia.

48. Kharkiv Institute of Physics and Technology, Akademicheskaya Str. 1, Kharkiv, 61108, Ukraine.

RESEARCH SUMMARY

The following summary statistics of my published research articles (accepted articles have not been taken into account for the summary statistics) is based on the information available in the iNSPIRE-HEP [Last updated on May 13, 2021]:

Total no. of published papers: 80
Total citations: 2534
Average citations per paper: 31.7; h_{HEP} **index**: 32

RESEARCH PUBLICATIONS

1. Eleonora Di Valentino, Olga Mena, **Supriya Pan**, Luca Visinelli, Weiqiang Yang, Alessandro Melchiorri, David F. Mota, Adam G. Riess and Joseph Silk, **"In the Realm of the Hubble tension – a Review of Solutions"**, (Invited Review), `arXiv:2103.01183 [astro-ph.CO]`.

   * Adam 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.

2. E. Di Valentino *et al.* (including **Supriya Pan** as an author), *Cosmology Intertwined IV: The Age of the Universe and its Curvature,* to appear in the **Astroparticle Physics,** [arXiv:2008.11286 [astro-ph.CO]] (Special Issue on Particle Physics Community Planning

Exercise **("Snowmass")**).

3. E. Di Valentino *et al.* (including **Supriya Pan** as an author), *Cosmology Intertwined III: $f\sigma_8$ and S_8,* to appear in the **Astroparticle Physics,** [arXiv:2008.11285 [astro-ph.CO]] (Special Issue on Particle Physics Community Planning Exercise **("Snowmass")**).

4. E. Di Valentino *et al.* (including **Supriya Pan** as an author), *Cosmology Intertwined II: The Hubble Constant Tension,* to appear in the **Astroparticle Physics,** [arXiv:2008.11284 [astro-ph.CO]] (Special Issue on Particle Physics Community Planning Exercise **("Snowmass")**).

5. E. Di Valentino *et al.* (including **Supriya Pan** as an author), *Cosmology Intertwined I: Perspectives for the Next Decade,* to appear in the **Astroparticle Physics,** [arXiv:2008.11283 [astro-ph.CO]] (Special Issue on Particle Physics Community Planning Exercise **("Snowmass")**).

6. Weiqiang Yang, **Supriya Pan**, L. Aresté Saló and Jaume 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].

7. Weiqiang Yang, Eleonora Di Valentino, **Supriya Pan**, Yabo Wu and Jianbo 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]].

8. Eleonora Di Valentino, Alessandro Melchiorri, Olga Mena, **Supriya Pan** and Weiqiang 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]].

9. Weiqiang Yang, Eleonora Di Valentino, **Supriya Pan** and Olga Mena, *"Emergent Dark Energy, neutrinos and cosmological tensions"*, **Physics of the Dark Universe, 31**, 100762 (2021), [arXiv:2007.02927 [astro-ph.CO]].

10. Alex Giacomini, Genly Leon, Andronikos Paliathanasis and **Supriya Pan**, *"Dynamics of Quintessence in Generalized Uncertainty Principle"*, **The European Physical Journal C 80**, no. 10, 931 (2020), [arXiv:2008.01395 [gr-qc]].

11. Giannis Papagiannopoulos, Spyros Basilakos, Andronikos Paliathanasis, **Supriya Pan** and Panayiotis Stavrinos, *"Dynamics in Varying vacuum Finsler-Randers Cosmology"*, **The European Physical Journal C 80**, no. 9, 816 (2020), [arXiv:2005.06231 [gr-qc]].

12. Weiqiang Yang, Eleonora Di Valentino, **Supriya Pan**, Spyros Basilakos and Andronikos

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]].

13. Weiqiang Yang, Eleonora Di Valentino, Olga Mena and **Supriya Pan**, *"Dynamical Dark sectors and Neutrino masses and abundances"*, **Physical Review D 102**, no. 2, 023535 (2020), [arXiv:2003.12552 [astro-ph.CO]].

14. **Supriya Pan**, Jaume de Haro, Weiqiang Yang and Jaume 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]].

15. **Supriya Pan**, German S. Sharov and Weiqiang 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]].

16. Weiqiang Yang, **Supriya Pan**, David F. Mota and Minghui 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]].

17. Weiqiang Yang, Eleonora Di Valentino, Olga Mena, **Supriya Pan** and Rafael C. Nunes, *"All-inclusive interacting dark sector cosmologies"*, **Physical Review D 101**, no. 8, 083509 (2020), [arXiv:2001.10852 [astro-ph.CO]].

18. Weiqiang Yang, **Supriya Pan**, Rafael C. Nunes and David 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]].

19. Jaume de Haro, Jaume Amorós and **Supriya Pan**, *"Scaling solutions in quintessential inflation"*, **The European Physical Journal C 80** no. 5, 404 (2020), [arXiv:1908.01516 [gr-qc]].

20. **Supriya Pan**, Weiqiang Yang, Eleonora Di Valentino, Arman Shafieloo and Subenoy 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]].

21. Weiqiang Yang, **Supriya Pan**, Eleonora Di Valentino, Bin Wang and Anzhong Wang, *"Forecasting Interacting Vacuum-Energy Models using Gravitational Waves"*, **Journal of Cosmology and Astroparticle Physics 05**, 050 (2020), [arXiv:1904.11980 [astro-ph.CO]].

22. **Supriya Pan**, Weiqiang Yang and Andronikos Paliathanasis, *"Imprints of an extended Chevallier-Polarski-Linder parametrization on the large scale of our universe"*, **The Euro-**

pean Physical Journal C 80, 274 (2020), [arXiv:1902.07108 [astro-ph.CO]].

23. **Supriya Pan**, Weiqiang Yang and Andronikos 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]].

24. Alex Giacomini, Genly Leon, Andronikos Paliathanasis and **Supriya Pan**, *"Cosmological Evolution of Two-Scalar fields Cosmology in the Jordan frame"*, **The Europen Physical Journal C 80**, 184 (2020), [arXiv:2001.02414 [gr-qc]].

25. **Supriya Pan**, Weiqiang Yang, Eleonora Di Valentino, Emmanuel N. Saridakis and Subenoy 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]].

26. Weiqiang Yang, **Supriya Pan**, Sunny Vagnozzi, Eleonora Di Valentino, David F. Mota and Salvatore 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]].

27. Weiqiang Yang, Olga Mena, **Supriya Pan** and Eleonora Di Valentino, *"Dark sectors with dynamical coupling"*, **Physical Review D 100**, no. 8, 083509 (2019), [arXiv:1906.11697 [astro-ph.CO]].

28. **Supriya Pan**, Weiqiang Yang, Chiranjeeb Singha and Emmanuel 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]].

29. Andronikos Paliathanasis, Genly Leon and **Supriya Pan**, *"Exact Solutions in Chiral Cosmology,"* **General Relativity and Gravitation, 51**, no.9, 106 (2019), [arXiv:1811.10038 [gr-qc]].

30. Weiqiang Yang, **Supriya Pan**, Eleonora Di Valentino, Andronikos Paliathanasis and Jianbo Lu, *"Challenging bulk viscous unified scenarios with cosmological observations"*, **Physical Review D 100**, no. 10, 103518 (2019), [arXiv:1906.04162 [astro-ph.CO]].

31. Weiqiang Yang, **Supriya Pan**, Andronikos Paliathanasis, Subir Ghosh and Yabo 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]].

32. Andronikos Paliathanasis, **Supriya Pan** and Weiqiang Yang, *"Dynamics of nonlinear inter-*

acting dark energy models," **International Journal of Modern Physics D 28**, no.12, 1950161 (2019), [arXiv:1903.02370 [gr-qc]].

33. Minghui Du, Weiqiang Yang, Lixin Xu, **Supriya Pan** and David 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]].

34. Weiqiang Yang, Sunny Vagnozzi, Eleonora Di Valentino, Rafael C. Nunes, **Supriya Pan** and David 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]].

35. Jaume de Haro, **Supriya 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]].

36. Jaume de Haro, Jaume Amorós and **Supriya Pan**, *"The Peebles - Vilenkin quintessential inflation model revisited"*, **The European Physical Journal C 79** no.6, 505 (2019), [arXiv:1901.00167 [gr-qc]].

37. Weiqiang Yang, Narayan Banerjee, Andronikos 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]].

38. Weiqiang Yang, **Supriya Pan**, Eleonora Di Valentino and Emmanuel N. Saridakis, *"Observational constraints on dynamical dark energy with pivoting redshift",* **Universe 5**, no. 11, 219 (2019), [arXiv:1811.06932 [astro-ph.CO]].

39. Proloy Das, **Supriya Pan** and Subir 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]].

40. Weiqiang Yang, Md Shahalam, Barun Pal, **Supriya Pan** and Anzhong Wang, *"Constraints on quintessence scalar field models using cosmological observations,"* **Phys. Rev. D 100**, no. 2, 023522 (2019) [arXiv:1810.08586 [gr-qc]].

41. Weiqiang Yang, **Supriya Pan**, Eleonora Di Valentino, Emmanuel N. Saridakis, Subenoy 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]].

42. **Supriya Pan**, John D. Barrow and Andronikos Paliathanasis, *"Two-fluid solutions of particle-creation cosmologies"*, **The European Physical Journal C 79**, no.2, 115 (2019),

[arXiv:1812.05493 [gr-qc]].

43. Jaume Haro, Weiqiang Yang and **Supriya 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]].

44. Weiqiang Yang, **Supriya Pan** and Andronikos 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]].

45. Weiqiang Yang, **Supriya Pan**, Lixin Xu and David 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]].

46. Jaume de Haro, L. Aresté Saló and **Supriya 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].

47. Weiqiang Yang, Ankan Mukherjee, Eleonora Di Valentino and **Supriya 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]].

48. Rafael C. Nunes, **Supriya Pan** and Emmanuel 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]].

49. Weiqiang Yang, **Supriya Pan**, Ramón Herrera and Subenoy 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]].

50. Weiqiang Yang, **Supriya Pan**, Eleonora Di Valentino, Rafael C. Nunes, Sunny Vagnozzi and David 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]].

51. Praloy Das, **Supriya Pan**, Subir Ghosh and Probir 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].

52. Jaume de Haro and **Supriya Pan**, *Note on bouncing backgrounds*, **Physical Review D 97**, no.10, 103518 (2018), [arXiv:1801.05475 [gr-qc]].

53. **Supriya Pan**, Emmanuel N. Saridakis, Weiqiang Yang, *Observational Constraints on*

Oscillating Dark-Energy Parametrizations, **Physical Review D 98**, no.6, 063510 (2018), [arXiv:1712.05746 [astro-ph.CO]].

54. **Supriya Pan**, Ankan Mukherjee and Narayan 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]].

55. **Supriya 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]].

56. Weiqiang Yang, **Supriya Pan** and Andronikos 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]].

57. Anadijiban Das, Asit Banerjee, Subenoy Chakraborty and **Supriya 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]].

58. Jaume Haro and **Supriya Pan**, *Bulk viscous quintessential inflation*, **International Journal of Modern Physics D 27**, 1850052 (2018), [arXiv:1512.03033 [gr-qc]].

59. Weiqiang Yang, **Supriya Pan** and John 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]].

60. **Supriya Pan**, Barun Kumar Pal and Souvik Pramanik, *Gravitationally influenced particle creation models and late-time cosmic acceleration*, **International Journal of Geometric Methods in Modern Physics 15**, no.03, 1850042 (2018), [arXiv:1606.04097 [gr-qc]].

61. Weiqiang Yang, **Supriya Pan** and David F. Mota, *Novel approach towards the large-scale stable Interacting Dark-Energy models and their Astronomical Bounds*, **Physical Review D 96**, 123508, no.12 (2017), [arXiv:1709.00006 [astro-ph.CO]].

62. Weiqiang Yang, Narayan Banerjee and **Supriya Pan**, *Constraining a dark matter and dark energy interaction scenario with a dynamical equation of state*, **Physical Review D 95**, 123527, no.12 (2017), [arXiv:1705.09278 [astro-ph.CO]].

63. Weiqiang Yang, Rafael C. Nunes, **Supriya Pan** and David F. Mota, *Effects of neutrino mass hierarchies on dynamical dark energy models*, **Physical Review D 95**, 103522, no.10 (2017), [arXiv:1703.02556 [astro-ph.CO]].

64. German S. Sharov, Subhra Bhattacharya, **Supriya Pan**, Rafael C. Nunes and Subenoy Chakraborty, *A new interacting two-fluid model and its consequences*, **Monthly Notices of the Royal Astronomical Society 466**, 3497-3506, no.03 (2017), [arXiv:1701.00780 [gr-qc]].

65. Rafael C. Nunes, **Supriya Pan**, Emmanuel N. Saridakis and Everton M. C. Abreu, *New observational constraints on $f(R)$ gravity from cosmic chronometers*, **Journal of Cosmology and Astroparticle Physics 1701**, no.01, 005 (2017), [arXiv:1610.07518 [astro-ph.CO]].

66. Andronikos Paliathanasis, John D. Barrow and **Supriya Pan**, *Cosmological solutions with gravitational particle production and non-zero curvature*, **Physical Review D 95**, no.10, 103516 (2017), [arXiv:1610.02893 [gr-qc]].

67. Vasilis K. Oikonomou, **Supriya Pan** and Rafael C. Nunes, *Gravitational Baryogenesis in Running Vacuum models*, **International Journal of Modern Physics A 32**, 1750129 (2017), [arXiv:1610.01453 [gr-qc]].

68. **Supriya Pan** and German S. Sharov, *A model with interaction of dark components and recent observational data*, **Monthly Notices of the Royal Astronomical Society 472**, 4736 (2017) [arXiv:1609.02287 [gr-qc]].

69. Rafael C. Nunes, Alexander Bonilla, **Supriya Pan** and Emmanuel N. Saridakis, *Observational Constraints on $f(T)$ gravity from varying fundamental constants*, **The European Physical Journal C 77**, no. 4, 230 (2017), [arXiv:1608.01960 [gr-qc]].

70. Jaume de Haro, Jaume Amorós and **Supriya Pan**, *Simple inflationary quintessential model II: Power law potentials*, **Physical Review D 94**, no. 06, 064060 (2016), [arXiv:1607.06726 [gr-qc]].

71. Rafael C. Nunes, **Supriya Pan** and Emmanuel N. Saridakis, *New observational constraints on $f(T)$ gravity from cosmic chronometers*, **Journal of Cosmology and Astroparticle Physics 1608**, no. 08, 011 (2016), [arXiv:1606.04359 [gr-qc]].

72. Rafael C. Nunes, **Supriya Pan** and Emmanuel N. Saridakis, *New constraints on interacting dark energy from cosmic chronometers*, **Physical Review D 94**, no. 02, 023508 (2016), [arXiv:1605.01712 [astro-ph.CO]].

73. Rafael C. Nunes and **Supriya Pan**, *Cosmological consequences of an adiabatic matter creation process*, **Monthly Notices of the Royal Astronomical Society 459**, no. 1, 673 (2016), [arXiv:1603.02573 [gr-qc]].

74. Jaume de Haro, Jaume Amorós and **Supriya Pan**, *Simple inflationary quintessential model*, **Physical Review D 93**, no. 8, 084018 (2016), [arXiv:1601.08175 [gr-qc]].

75. **Supriya Pan**, Jaume de Haro, Andronikos Paliathanasis and Reinoud Jan Slagter, *Evolution and Dynamics of a Matter creation model*, **Monthly Notices of the Royal Astronomical Society 460**, no.02, 1445-1456 (2016), [arXiv:1601.03955 [gr-qc]].

76. Jaume de Haro and **Supriya Pan**, *Gravitationally induced adiabatic particle production: From Big Bang to de Sitter*, **Classical and Quantum Gravity 33**, no. 16, 165007 (2016), [arXiv:1512.03100 [gr-qc]].

77. Reinoud Jan Slagter and **Supriya 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]].

78. Andronikos Paliathanasis, **Supriya Pan** and Souvik Pramanik, *Scalar field cosmology modified by the Generalized Uncertainty Principle*, **Classical and Quantum Gravity 32**, no. 24, 245006 (2015), [arXiv:1508.06543 [gr-qc]].

79. **Supriya Pan** and Subenoy Chakraborty, *A Cosmological Study in Massive Gravity theory*, **Annals of Physics 360**, 180 (2015), [arXiv:1505.00743 [gr-qc]].

80. **Supriya Pan**, Subhra Bhattacharya and Subenoy Chakraborty, *An analytic model for interacting dark energy and its observational constraints*, **Monthly Notices of the Royal Astronomical Society 452**, no.03, 3038-3046 (2015), [arXiv:1210.0396 [gr-qc]].

81. **Supriya Pan** and Subenoy Chakraborty, *Will There Be Future Deceleration? A Study of Particle Creation Mechanism in Nonequilibrium Thermodynamics*, **Advances in High Energy Physics 2015**, 654025 (2015), [arXiv:1404.3273 [gr-qc]].

82. **Supriya Pan** and Subenoy Chakraborty, *Dynamic wormholes with particle creation mechanism*, **The European Physical Journal C 75**, no. 1, 21 (2015), [arXiv:1412.6094 [gr-qc]].

83. **Supriya Pan** and Subenoy Chakraborty, *A cosmographic analysis of holographic dark energy models*, **International Journal of Modern Physics D 23**, no. 11, 1450092 (2014), [arXiv:1410.8281 [gr-qc]].

84. Subenoy Chakraborty, **Supriya Pan** and Subhajit Saha, *A third alternative to explain recent observations: Future deceleration*, **Physics Letters B 738**, 424 (2014), [arXiv:1411.0941 [gr-qc]].

85. **Supriya Pan** and Subenoy 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]].

COMPUTING SKILLS

Basic	**Fortran, C**
Intermediate	**Latex, Linux, Windows**
Advanced	**Mathematica, Maple, Matlab**
Data analysis	**The Cosmic Linear Anisotropy Solving System (CLASS)**

ACADEMIC MEMBERS

- Life member of Indian Association for General Relativity and Gravitation
- Member of Astronomisch Fysisch Onderzoek Nederland

SCHOOLS/CONFERENCES ATTENDED

1. Attended the national confence on "Current Trends in Mathematics and its Applications (NSCTMA-2019)" organized by the Department of Mathematics, Jadavpur University on 8th March, 2019.

2. Attended the national conference on "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.

3. Attended 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 from January 3-5, 2019.

4. Participated in the 6th Topical Conference on Gravity, Cosmology, Astronomy and Astrophysics (TCGCAA), at the Department of Physics, Visva-Bharati, Santiniketan on the 24th of September, 2016.

5. Participated in the school and workshop on cosmology (IFSW-2015) organized by the Institute for Fundamental study, Naresuan University, Phitsanulok, Thailand, during 22nd August- 28th August, 2015.

6. Participated in the workshop on "Statistical applications to cosmology and astrophysics (STATCOSMO15)", organized by the Physics and Applied Mathematics unit, Indian Statistical Institute, Kolkata, during February 10-13, 2015.

7. Participated in the "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.

8. Participated 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.

9. Participated in the 1st "Topical Conference on Gravity and Cosmology" meeting on 13th December, 2013 at Saha Institute of Nuclear Physics, Salt Lake, Kolkata, India.

10. Attended the "Autumn School on Cosmology" organized by the Department of Physics, Birla Institute of Technology and Science (BITS) Pilani, Pilani campus, in collaboration with Inter University Centre for Astronomy and Astrophysics (IUCAA), Pune, from November 5-15, 2013.

11. Attended the workshop on the "Present Observational Constraints on Cosmological Parameters" organized by IUCAA Resource Centre, University of Delhi from 28th January to 1st February, 2013.

TALKS & POSTERS PRESENTED

1. Delivered a lecture 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.

2. Delivered a webinar (invited) on **"Tension in the dark"** in the 16th IMT-GT International Conference on Mathematics, Statistics and Their Applications (ICMSA 2020) during Novermber 23-24, 2020, Organized by Centre for Mathematical Sciences, Universiti Tunku Abdul Rahman, Malaysia.

3. Delivered a webinar (invited) 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 30^{th} September, 2020 and 1^{st} October, 2020.

4. Delivered a webinar (invited) on **"Tensed H_0"** at the School of Physical Sciences, Indian Association for the Cultivation of Science, Jadavpur, on August 25, 2020.

5. Delivered a webinar (invited) 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.

6. Delivered a webinar (invited) 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.

7. Delivered a lecture 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

8. Delivered a lecture 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.

9. Delivered a lecture 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.

10. Delivered a lecture on **"Analytic solutions for interacting dark energy and its observational constraints"** in IFSW-2015, Naresuan University, Phitsanulok, Thailand, during 22nd August- 28th August, 2015.

11. Delivered a lecture 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.

12. Presented a 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.

13. Delivered a lecture 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.

14. Delivered a lecture 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 enjoy teaching! I have taught (and I am teaching) the following courses to various undergraduate students at Presidency University.

- 2021 (Even Semester) - UG III: Mechanics; UG II (GE): Analytical Geometry (Present courses that I am teaching)
- 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