Curriculum Vitae

Shi Pi
Professor,
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Chinese Academy of Sciences,
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PARTICULARS

EDUCATION

Astronomy Department, Peking University — Beijing, China
Bachelor in Astronomy — *June 2005*

Physics Department, Peking University — Beijing, China
Ph. D. in Theoretical Physics — *January 2013*

RESEARCH INTERESTS

My research interests are cosmology and gravity, including but not limited to string phenomenology, inflation model building, the generation and evolution of primordial perturbations, reheating, the thermal universe, cosmic microwave background radiation (CMB) anisotropies, dark energy, electroweak vacuum instability problem, as well as the gravitational wave astronomy/cosmology.

ACADEMIC HONORS

- May 4th Scholarship, Peking University, 2009.
- Chen Huxiong Scholarship, Physics Department, Peking University, 2010.
- New Academic Researcher Award for Doctoral Candidates, Ministry of Education of China, 2010.
- Outstanding Presentation Golden Award in the 18th Workshop on General Relativity and Gravitation in Japan (JGRG18), 2018.
- Best Talk Award in the 3rd Huan-Wu Peng Youth Forum of Theoretical Physics and Interdisciplinary Fields, 2018.
- Highlighted Progress of Kavli IPMU, 2018-2019.

RESEARCH FUNDING

- JSPS Grant-in-Aid for Early-Career Scientists JP20K14461 (PI, 2020.4-2025.3)
- National Key Research and Development Program of China Grant No.2020YFC2201502 (2020.12-2025.12)
- National Key Research and Development Program of China Grant No.2021YFC2203004 (PI, 2021.12-2026.12)
- the Key Research Program of the Chinese Academy of Sciences Grant NO. XDPB15 (2021.4-2022.3)
- CAS Project for Young Scientists in Basic Research YSBR-006 (2021.7-2026.6)
- CAS New Leading Talent Initiative One Hundred Talents Program (Type B) (PI) (PI, 2021.11-2026.12)
- National High-Level Talent Special Support Program - Outstanding Young Talents (PI, 2022.9-2025.9)
- JSPS KAKENHI No. JP24K00624 (2024.1-2028.3)
- National Science Foundation of China General Program No. 12475066 (PI, 2025.1-2028.12)

WORK EXPERIENCE

- **Postdoc Researcher**, April 2013 - Sep 2015.
  Asian Pacific Center for Theoretical Physics, Pohang, Korea.
- **Postdoc Researcher**, Sep. 2015 - Sep. 2017.
  Institute for Theoretical Physics, Chinese Academy of Sciences, Beijing, China.
- **Research Asistant Professor**, Sep. 2017 - Mar. 2018.
  Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, Japan.
- **Projector Researcher**, Apr. 2018 - Oct. 2020.
  Kavli Institute for the Physics and Mathematics of the Universe, the University of Tokyo, Chiba, Japan.
- **Associate Professor**, Oct. 2020 - Sep. 2024
  Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China.
- **Professor**, Oct. 2024 - Now.
  Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China.

EDITORIAL BOARD

- **Chinese Physics C**
  Since Nov. 2024
- **Symmetry**
  Since Aug. 2023

RESEARCH EXPERIENCE

- **Ph.D. Candidate,**
  School of Physics, Peking University, Sep 2009 - Jan 2013.
  During my Ph.D. era I started studying cosmology by the top-to-bottom model building from string theory, suggested by my Ph.D. supervisor Prof. Bin Chen. Also, cosmological perturbation theory, which is very useful in comparing the prediction of different inflation models to the CMB anisotropies which is measured to a high accuracy by Planck satellite at that time. In my first paper [1] I realize the cosmological perturbation theory to a newly proposed non-relativistic theory of gravity, the Horzva-Lifshitz gravity, and I found that it can predict scale-invariant scalar perturbations without inflation. Our work is very influential on this field and get more than 100 citations soon. Later on I started to be more interested in inflation phenomenology [2-4], especially to detect the other degrees of freedom other than the scalar field that drives inflation [5]. My Ph.D. thesis is based on the phenomenological study of inflation.

- **Postdoctorial Researcher,**
  Asian Pacific Center for Theoretical Physics, Feb 2013 - Oct 2015.
  I joined the group of Prof. Jinn-Ouk Gong in APCTP, and collaborate with him mainly on the study of cosmological perturbation theory. I studied the non-Gaussianity from the heavy degree of freedom during inflation, which may be typical from the low energy realization of string theory [6]. This interesting topic is later developed by Nima Arkani-Hamed and Juan Maldacena under the term of "cosmological colliders", based on a series of works including ours. Based on the data release of Planck in 2013 and 2015, I focus on the model building from their predictions on CMB anisotropies [7-9].

- **Postdoctorial Researcher,**
  Institute for Theoretical Physics, Chinese Academy of Sciences. Nov 2015 - Aug 2017.
  When I worked in ITP, CAS, I tried to broaden my interest. I propose a Higgs-inflaton coupling model to solve the Higgs instability problem [10]. Also, I found a mechanism to realize the oscillation signal on CMB anisotropies by introducing a heavy scalar field during inflation with arbitrary potential [11]. I also work on a dark energy model which consists of an oscillating scalar field [12].

- **Research Assistant Professor,**
  Yukawa Institute for Theoretical Physics, Kyoto University. Sep 2017 - Mar 2018.
  I joined Prof. Misao Sasaki's group in YITP. I started to do some work on gravitational wave (GW) astronomy/cosmology, as well as the primordial black holes (PBHs). In [14] I studied the famous R^2-gravity, and found a mechanism to form primordial black holes, which could be either the binary black holes detected by LIGO, or the candidate of dark matter. This work is highly evaluated and cited by many follow-up works, as it is the first work to realize PBH formation in the best-fit inflation model of Planck.

- **Project Researcher,**
  Kavli Institute for Physics and Mathematics of the Universe, the University of Tokyo. Apr 2018 - Oct 2020
  I focus on the study of gravitational wave cosmology. In [16] I studied the gravitational waves induced by non-Gaussian scalar perturbations, and found that such waves must be detectable by LISA if dark matter is fully composed of primordial black holes. This result is very important in predicting new GW signals and revealing the nature of dark matter, which has attracted much attention of the community, and was cited for more than 100 times, including the Astro2020 science white paper on the space-based GW observatory. Later I wrote some follow-up papers, especially in [9] I found that there is an infrared f^3 scaling for all the gravitational wave spectra generated by a transient source that spans a finite range of frequency.

- **Associate Professor,**
  Institute of Theoretical Physics, Chinese Academy of Sciences, Oct. 2020 - Now.
  I became a faculty member in ITP-CAS after spending a long period of time working at home due to the COVID-19. I found an analytical formula for the stochastic GW background induced by the scalar perturbation with a lognormal peak [25], and extend the result to non-standard cosmology [24]. I checked the cosmological implication of the trans-Planckian censorship conjecture, and found that considering multi-stage inflation the upper bound on the tensor-to-scalar ratio can be much relieved [23]. This paper was published in Phys.Rev.D as a rapid communication.

TEACHING EXPERIENCE

- **Teaching Assistant.** General Relativity. Prof. Bin Chen. Spring 2008.
- **Teaching Assistant.** Electrodynamics. Prof. Dahai Lu. Autumn 2008.
- **Teaching Assistant.** General Astronomy. Prof. Xiaojun Jiang. Spring 2009.

PUBLICATIONS

PAPERS

1. *"Structure of D pair in Collective States of Nuclei"*
   Lu Dahai, Zhang Bo, **Pi Shi**, Deng Weizhen, Chen Xiaolin. *Communications in Theoretical Physics*, 2006, 46(6):1047-1051. DOI: `https://doi.org/10.1088/0253-6102/46/6/017`.
2. *"1/R Correction to Gravity in the Early Universe"*
   Shi Pi* and Tower Wang*. arXiv:0905.3470 [astro-ph.CO]. *Physical Review D* **80**, 043503 (2009). DOI: `https://doi.org/10.1103/PhysRevD.80.043503`.
3. *"Scale Invariant Power Spectrum in Horava-Lifshitz Cosmology without Matter"*
   Bin Chen, **Shi Pi** and Jin-Zhang Tang. arXiv:0905.2300 [hep-th]. *Journal of Cosmology and Astroparticle Physics*, **0908**, 007 (2009). DOI: `https://doi.org/10.1088/1475-7516/2009/08/007`.
4. *"Power spectra of scalar and tensor modes in modified Horava-Lifshitz gravity"*
   Bin Chen, **Shi Pi** and Jin-Zhang Tang. arXiv:0910.0338 [hep-th].
5. *"Cosmological perturbations in inflation with multiple sound speeds"*
   Shi Pi and Du Wang*. arXiv:1107.0813 [hep-th]. *Nuclear Physics B* **862**, 409 (2012). DOI: `https://doi.org/10.1016/j.nuclphysb.2012.04.017`.
6. *"Curvature Perturbation Spectrum in Two-field Inflation with a Turning Trajectory"*
   Shi Pi and Misao Sasaki. arXiv:1205.0161 [hep-th]. *Journal of Cosmology and Astroparticle Physics* **10** (2012) 051. DOI: `https://doi.org/10.1088/1475-7516/2012/10/051`.
7. *"Equilateral non-Gaussianity from heavy fields"*
   Jinn-Ouk Gong, **Shi Pi** and Misao Sasaki. arXiv:1306.3691 [hep-th]. *Journal of Cosmology and Astroparticle Physics* **11** (2013) 043. DOI: `https://doi.org/10.1088/1475-7516/2013/11/043`.
8. *"Inflation beyond T-models and primordial B-modes"*
   Yi-Fu Cai, Jinn-Ouk Gong, and **Shi Pi***. arXiv:1404.2560 [hep-th]. *Physics Letters B* **738**, 20 (2014). DOI: `https://doi.org/10.1016/j.physletb.2014.09.009`.
9. *"On the possibility of blue tensor spectrum within single field inflation"*
   Yi-Fu Cai*, Jinn-Ouk Gong, **Shi Pi**, Emmanuel N. Saridakis, and Shang-Yu Wu. arXiv:1412.7241 [hep-th]. *Nuclear Physics B* **900**, 517 (2015). DOI: `https://doi.org/10.1016/j.nuclphysb.2015.09.025`.

10. *"Probing reheating with primordial spectrum"*
Jinn-Ouk Gong, **Shi Pi**, and Godfrey Leung. arXiv:1501.03604 [hep-ph]. *Journal of Cosmology and Astroparticle Physics* **1505**, no. 05, 027 (2015) DOI: https://doi.org/10.1088/1475-7516/2015/05/027.

11. *"Trail of the Higgs in the primordial spectrum"*
Jinn-Ouk Gong, Chengcheng Han, and **Shi Pi**. arXiv:1511.07604 [hep-ph].

12. *"Power-law modulation of the scalar power spectrum from a heavy field with a monomial potential"*
Qing-Guo Huang and **Shi Pi**. arXiv:1610.00115 [hep-th]. *Journal of Cosmology and Astroparticle Physics* **04** (2018) 001. DOI: https://doi.org/10.1088/1475-7516/2018/04/001.

13. *"Oscillating scalar fields in extended quintessence"*
Dan Li, **Shi Pi** and Robert J. Scherrer. arXiv:1710.01120 [gr-qc]. *Physical Review D* **97** (2018) 2, 023530. DOI: https://doi.org/10.1103/PhysRevD.97.023530.

14. *"Strongly Coupled Quasi-Single Field Inflation"*
Aditya Varna Iyer, **Shi Pi**, Yi Wang, Ziwei Wang, and Siyi Zhou. arXiv:1710.03054 [hep-th]. *Journal of Cosmology and Astroparticle Physics* **01** (2018) 041. DOI: http://doi.org/10.1088/1475-7516/2018/01/041.

15. *"Scalaron from R^2-gravity as a heavy field"*
Shi Pi, Ying-li Zhang, Qing-Guo Huang, and Misao Sasaki. arXiv:1712.09896 [astro-ph.CO]. *Journal of Cosmology and Astroparticle Physics* **05** (2018) 042. DOI: https://doi.org/10.1088/1475-7516/2018/05/042.

16. *"Quintessence Saves Higgs Instability"*
Chengcheng Han, **Shi Pi***, and Misao Sasaki. arXiv:1809.05507 [hep-ph]. *Physics Letters B* **791**, 314 (2019). DOI: https://doi.org/10.1016/j.physletb.2019.02.037.

17. *"Gravitational Waves Induced by non-Gaussian Scalar Perturbations"*
Rong-Gen Cai, **Shi Pi***, and Misao Sasaki. arXiv:1810.11000 [astro-ph.CO]. *Physical Review Letters* **122** (2019) 20, 201101. DOI: https:doi.org/10.1103/PhysRevLett.122.201101.

18. *"Resonant multiple peaks in the induced gravitational waves"*
Rong-Gen Cai, **Shi Pi**, S. J. Wang and X. Y. Yang. arXiv:1901.10152 [astro-ph.CO]. *Journal of Cosmology and Astroparticle Physics* **1905**, 013 (2019). DOI: http://doi.org/DOI:10.1088/1475-7516/2019/05/013.

19. *"Primordial Tensor Perturbation in Double Inflationary Scenario with a Break"*
Shi Pi, Misao Sasaki and Ying-li Zhang*. arXiv:1904.06304 [gr-qc]. *Journal of Cosmology and Astroparticle Physics* **1906**, 049 (2019). DOI: https://doi.org/10.1088/1475-7516/2019/06/049.

20. *"Hyperbolic field space and swampland conjecture for DBI scalar"*
Shuntaro Mizuno, Shinji Mukohyama, **Shi Pi**, and Yun-Long Zhang. arXiv:1905.10950 [hep-th]. *Journal of Cosmology and Astroparticle Physics* **1909**, 072 (2019). DOI: https://doi.org/10.1088/1475-7516/2019/09/072.

21. *"Pulsar Timing Array Constraints on the Induced Gravitational Waves"*
Rong-Gen Cai, **Shi Pi**, Shao-Jiang Wang, and Xing-Yu Yang. arXiv:1907.06372 [astro-ph.CO]. *Journal of Cosmology and Astroparticle Physics* **10** (2019) 059. DOI: https://doi.org/10.1088/1475-7516/2019/10/059.

22. *"Universal infrared scaling of gravitational wave background spectra"*
Rong-Gen Cai, **Shi Pi**, and Misao Sasaki. arXiv:1909.13728 [astro-ph.CO]. Phys. Rev. D **102**, no.8, 083528 (2020) DOI: https://doi.org/10.1103/PhysRevD.102.083528.

23. *"Universal Upper Bound on the Inflationary Energy Scale from the Trans-Planckian Censorship Conjecture"*
Shuntaro Mizuno, Shiji Mukohyama, **Shi Pi***, and Yun-Long Zhang. arXiv:1910.02979 [astro-ph.CO]. *Physical Review D Rapid Communications* **102** (2020) 021301. DOI: https://doi.org/10.1103/PhysRevD.102.021301.

24. *"Induced gravitational waves as a probe of thermal history of the universe"*
Guillem Domènech, **Shi Pi** and Misao Sasaki. arXiv:2005.12314 [gr-qc]. *Journal of Cosmology and Astroparticle Physics* **08** (2020) 017. DOI: https://doi.org/10.1088/1475-7516/2020/08/017.

25. *"Gravitational Waves Induced by Scalar Perturbations with a Lognormal Peak"*
Shi Pi* and M. Sasaki. arXiv:2005.12306 [gr-qc]. *Journal of Cosmology and Astroparticle Physics* **09** (2020) 037. DOI: https://doi.org/10.1088/1475-7516/2020/09/037.

26. "Measuring the gravitomagnetic distortion from rotating halos I: methods" Chengfeng Tang, Pierre Zhang, Wentao Luo*, Nan Li, Y-Fu Cai*, and **Shi Pi**. arXiv:2009.12011 [astro-ph.CO]. *Astrophysics Journal* **911**, no.1, 44 (2021). DOI: httpe:doi.org/10.3847/1538-4357/abe69e.

27. "Primordial black holes and gravitational waves from resonant amplification during inflation" Zihan Zhou, Jie Jiang, Yi-Fu Cai*, Misao Sasaki*, and **Shi Pi**. arXiv:2010.03537 [astro-ph.CO]. *Physical Review D* **102** (2020) 10, 103527. DOI: `httpe://doi.org/10.1103/PhysRevD.102.103527`.
28. *"NANOGrav Hints on Planet-Mass Primordial Black Holes"*
Guillem Domènech and **Shi Pi**. arXiv:2010.03976 [astro-ph.CO] *Science China: Physics, Mechanics, and Astronomy* **65** (2022) 3, 230411. DOI: `https://doi.org/10.1007/s11433-021-1839-6`.
29. *"The Gravitational-Wave Physics II: Progress"*
LigongBian, Rong-Gen Cai, Shuo Cao, Zhoujian Cao, He Gao, Zong-Kuan Guo, Kejia Lee, Di Li, Jing Liu, Youjun Lu, **Shi Pi**, Jian-Min Wang, Shao-Jiang Wang, Yan Wang, Tao Yang, Xing-Yu Yang, Shenghua Yu, and Xin Zhang. arXiv:2106.10235 [gr-qc]. *Science China: Physics, Mechanics, and Astronomy* **64** (2021) 12, 120401. DOI: `https://doi.org/10.1007/s11433-021-1781-x`.
30. *"Primordial Black Hole Formation in Non-Minimal Curvaton Scenario"*
Shi Pi* and Misao Sasaki. arXiv: 2112.12680 [astro-ph.CO]. *Physical Review D*, **108** (2023) 10, L101301. DOI:https://doi.org/10.1103/PhysRevD.108.L101301.
31. *"Primordial Black Hole Formation in Starobinsky's Linear Potential Model"*
Shi Pi and Jianing Wang*. arXiv: 2209.14183 [astro-ph.CO]. *Journal of Cosmology and Astroparticle Physics*, **06** (2023) 018. DOI: `https://doi.org/10.1088/1475-7516/2023/06/018`.
32. *"Logarithmic Duality of the Curvature Perturbation"*
Shi Pi* and Misao Sasaki. arXiv: 2211.13932 [astro-ph.CO]. *Physical Review Letters*, **131** (2023) 1, 011002. DOI: `https://doi.org/10.1103/PhysRevLett.131.011002`.
33. *"Axion Universal Gravitational Wave Interpretation of Pulsar Timing Array Data"*
Kaloian Lozanov*, **Shi Pi**, Misao Sasaki, Volodymyr Takhistov, Ao Wang. arXiv: 2310.03594 [astro-ph.CO]. Accepted by CQG.
34. *"Induced Gravitational Wave interpretation of PTA data: a complete study for general equation of state"*
Guillem Domènech, **Shi Pi**, Ao Wang*, and Jianing Wang. 2402.18965 [astro-ph.CO]. *Journal of Cosmology and Astroparticle Physics*, **08** (2024) 054. DOI: `https://doi.org/10.1088/1475-7516/2024/08/054`.
35. *"Non-Gaussianities in primordial black hole formation and induced gravitational waves"*
Shi Pi*. 2404.06151 [astro-ph.CO]. Invited chapter (Chapter 8: *Non-Gaussianities*) to the book *Primordial Black Holes*, Springer 2024, Ed. Christian Byrnes, Gabriele Franciolini, Tomohiro Harada, Paolo Pani, and Misao Sasaki.
36. *"Revisiting the Ultraviolet Tail of the Primordial Gravitational Wave"*
Shi Pi, Misao Sasaki, Ao Wang*, and Jianing Wang. arXiv: 2310.03594 [astro-ph.CO]. *Physical Review D* **110** (2024) 10, 103529. DOI:`https://doi.org/10.1103/PhysRevD.110.103529`.
37. *"Secondary Gravitational Waves in Non-local Starobinsky inflation"*
Andrea Addazi, Alexey S. Koshelev, **Shi Pi**, and Anna Tokareva*. arXiv:2408.04004 [gr-qc].
38. *"Extended δN formalism"*
Danilo Artigas*, **Shi Pi***, and Takahiro Tanaka*. arXiv:2408.09964 [astro-ph.CO].
39. *"Constant roll and non-Gaussian tail in light of logarithmic duality"*
Ryoto Inui, Hayato Motohashi, **Shi Pi**, Yuichiro Tada, and Shuichiro Yokoyama*. arXiv:2409.13500 [astro-ph.CO].
40. *"Primordial black holes and induced gravitational waves from logarithmic non-Gaussianity"*
Ryoto Inui, Cristian Joana, Hayato Motohashi, **Shi Pi**, Yuichiro Tada, and Shuichiro Yokoyama*. arXiv:2409.13500 [astro-ph.CO].

RECENT TALKS

CONFERENCE TALKS (since 2017)

1. "Non-minimally coupled scalar field in R^2 gravity,",
The 27th Workshop on General Relativity and Gravitation in Japan (JGRG27), Hiroshima, Japan. Nov. 2017.
2. "Non-minimally coupled scalar field in R^2 gravity",
International Symposium on Cosmology and Particle Astrophysics (COSPA) 2017, Kyoto, Japan. Dec. 2017.
3. "Primordial Black Holes from the Scalar Field in R^2 Gravity",
Annual Conference for Chinese Society of Gravity and Astrophysics, Yangzhou, China. May 2018.

4. "Gravitational waves induced by non-Gaussian scalar perturbation",
   4th CosKASI-ICG-NAOC-YITP (CINY) Joint Workshop, National Astronomy Observatory, Beijing, China. Oct 2018.
5. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations,",
   The 28th Workshop on General Relativity and Gravitation in Japan (JGRG28), Tokyo, Japan. Nov. 2018.
6. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations",
   International Symposium on Cosmology and Particle Astrophysics (COSPA) 2018, Yangzhou, China. Nov. 2018.
7. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations,",
   Second Workshop on Particles, Gravitation and the Universe (PGU2018), Hanoi, Viet Nam. Dec. 2018.
8. "Stochastic Gravitational Waves Induced by Non-Gaussian Scalar Perturbations",
   3rd Young Scientists' Forum on Theoretical Physics and Interdisciplinary Studies, Beijing, China. Jan. 2019.
9. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations",
   2019 YITP Asian-Pacific Winter School and Workshop on Gravitation and Cosmology, Kyoto, Japan. Feb. 2019.
10. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations", invited talk,
    the 2019 CCNU-USTC Junior Cosmology Symposium, Wuhan, China. Apr. 2019.
11. "Quintessence Saves Higgs Instability",
    Accelerating Universe in the Dark, Kyoto, Japan. Mar. 2019.
12. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations",
    43rd Johns Hopkins Workshop, Kashiwa, Japan. June 2019.
13. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations", invited talk,
    2nd TDLI Mini-Workshop on "New Physics at Tera Scale", Shanghai, China. Aug. 2019.
14. "Universal Infrared Scaling of Stochastic Gravitational Wave Power Spectra",
    The 29th Workshop on General Relativity and Gravitation in Japan (JGRG29), Kobe, Japan. Nov. 2019.
15. "Universal Infrared Scaling of Stochastic Gravitational Wave Background", invited talk,
    New perspectives on cosmology, Pohang, Korea. Jan. 2020.
16. "Some Properties of Stochastic Gravitational Wave Background", invited talk,
    Spring workshop on gravity and cosmology, Jagiellonian University, Poland. May 27th, 2020. (online)
17. "An analytical formula for induced gravitational waves with a lognormal peak",
    14th International Conference on Gravitation, Astrophysics and Cosmology (14CGAC), Taipei, China. Aug 17th, 2020. (online)
18. "NANOGrav 12.5-yr Result and the Planet-mass PBHs",
    The online Workshop on General Relativity and Gravitation in Japan, Nagoya, Japan. Nov. 23rd, 2020. (online)
19. "NANOGrav 12.5-yr Result and the Planet-mass PBHs",
    2020 ITP Gravity and Cosmology Annual Meeting, Chongqing, China. Dec. 20th, 2020.
20. "NANOGrav 12.5-yr Result and the Planet-mass PBHs",
    2020/2021 Annual Meeting of Division of Gravity and Relativistic Astrophysics, Chinese Physics Society, Shenyang, China. Apr. 25th, 2021.
21. "NANOGrav 12.5-yr result and induced gravitational waves",, invited talk,
    Gravitational-Wave Primordial Cosmology, Paris, France. May 19th, 2021. (online)
22. "Probing the primordial black holes by stochastic gravitational wave background",
    SUSY 2021, Beijing, China. Aug. 23rd, 2021. (online)
23. "Primordial black holes from curvaton scenario",
    The 30th Workshop on General Relativity and Gravitation in Japan (JGRG30), Tokyo, Japan. Dec 6th, 2021. (online)
24. "Primordial black holes in the curvaton scenario", invited talk,
    String Theory, Gravity, and Cosmology 2022 (SGC2022), Pusan, Korea. June 22nd, 2022. (online)
25. "Primordial black holes in the curvaton scenario",
    2022 annual meeting of Division of Gravitation and Relativistic Astrophysics, Chinese Physical Society, Liyang, China. July 6th, 2022.

26. "Starobinsky's linear potential model revisited", *The 31st Workshop on General Relativity and Gravitation in Japan (JGRG31)*, Tokyo, Japan. Oct 24th, 2022.
27. "Starobinsky's linear potential model revisited", *The 9th Korea-Japan Workshop on Dark Energy*, Seoul, Korea. Nov 18th, 2022. (online)
28. "Logarithmic Duality of the Curvature Perturbation", *Annual Meeting of the Chinese Physics Society Gravity and Relativistic Astrophysics Division*, Chongqing, China. April 23rd, 2023.

SEMINAR TALKS (since 2018)

29. "Quintessence saves Higgs instability",
Physics Department, Taiwan University, Taipei. Oct. 2018.
30. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations",
Tokyo University of Science, Tokyo, Japan. Mar. 2019.
31. "Gravitational Waves Induced by non-Gaussian Scalar Perturbations",
Institute for High Energy Physics, Beijing, China. Apr. 11th, 2019.
32. "Stochastic Background of Gravitational Waves",
Kavli Institute of Astronomy and Astrophysics, Peking University, Beijing, China. Apr. 12th , 2019.
33. "Stochastic Background of Gravitational Waves",
School of Physics, Wuhan University, Wuhan, China. Apr. 28th, 2019.
34. "Stochastic Background of Gravitational Waves",
Physics Department, Fudan University, Shanghai, China. May 17th, 2019.
35. "Stochastic Background of Gravitational Waves",
Astronomy Department, Shanghai Jiaotong University, Shanghai, China. Aug. 5th, 2019.
36. "Universal Infrared Scaling of the Gravitational Wave Spectra",
Institute for Theoretical Physics, Beijing, China. Nov. 7th, 2019.
37. "Stochastic Background of Gravitational Waves",
Physics Department, Nankai University. Tianjin, China. Dec. 12th, 2019.
38. "Some Properties of Stochastic Gravitational Wave Background",
Institute for High Energy Physics, Chinese Academy of Sciences, Beijing, China. June 18th, 2020. (online)
39. "Some Properties of Stochastic Gravitational Wave Background",
The Interdisciplinary Center for Theoretical Study, University of Science and Technology of China, Hefei, China. July 24th, 2020.
40. "Some Properties of Stochastic Gravitational Wave Background",
Physics Department, Zhejiang University, Hangzhou, China. Sept. 9th, 2020.
41. "Stochastic Background of Induced Gravitational Waves: Recent Developments",
Kavli IPMU, the University of Tokyo, Kashiwa, Japan Oct. 16th, 2020. (online)
42. "Stochastic Background of Induced Gravitational Waves: Recent Developments",
Astronomy Department, University of Science and Technology of China, Hefei, China. Oct. 23rd, 2020.
43. "Stochastic Background of Induced Gravitational Waves: Recent Developments",
Physics Department, Tsinghua University, Beijing, China. Oct. 30th, 2020.
44. "Stochastic Background of Induced Gravitational Waves: Recent Developments",
Center for Gravitation and Cosmology, Yangzhou University, Yangzhou, China. Nov. 4th, 2020.
45. "Stochastic Induced Gravitational Wave Background: Recent Developments",
Physics Department, Swansea University, United Kingdom. Nov. 11th, 2020. (online)
46. "Stochastic Induced Gravitational Wave Background: Recent Developments",
RESCEU, the University of Tokyo, Japan. Feb. 8th, 2020. (online)
47. "Stochastic Induced Gravitational Wave Background: Recent Developments",
Kavli IPMU, the University of Tokyo, Japan. Feb. 17th, 2020. (online)
48. "Induced gravitational waves to explain the NANOGrav 12.5-yr data",
Huazhong University of Science and Technology, Wuhan, China. June 2nd, 2021.
49. "Induced gravitational waves to explain the NANOGrav 12.5-yr data",
Center for Joint Studies, Tianjin University. Tianjin, China. June 10th, 2021.

50. "Probing Primordial Black Holes by Stochastic Gravitational Waves",
School of Physics, Peking University, Beijing, China. Dec. 9th, 2021.

51. "Nonlinearities of the curvature perturbation and its application in primordial black hole formation",
Physics Department, Zhejiang University of Science and Technology, Hangzhou, China. Aug. 15, 2023.

52. "Non-Gaussianities of the curvature perturbation and its application in primordial black hole formation",
Physics Department, Shanghai University, Shanghai, China. Nov. 7, 2023.

53. "Non-Gaussianities of the curvature perturbation and its application in primordial black hole formation",
School of Physics and Astronomy, Shanghai Jiaotong University, Shanghai, China. Nov. 9, 2023.

54. "Non-Gaussianities of the curvature perturbation and its application in primordial black hole formation",
School of Science, Northeastern University, Shenyang, China. Nov. 21, 2023.

COLLOQUIUM TALKS

55. "Stochastic Gravitational Waves",
Astronomy Department, Beijing Normal University, Beijing, China. 25th Oct 2018.

56. "Stochastic Gravitational Waves",
Interdisciplinary Center for Theoretical Study, University of Science and Technology of China. Hefei, China. Nov 2018.

57. "Gravitational Waves and Cosmology",
Physics Department, Three Gorges University, Yichang, China. 7th May 2019.

58. "Stochastic Background of Gravitational Waves",
Shanghai Astronomy Observatory, Shanghai, China. 10th May 2019.

59. "Stochastic Gravitational Waves Induced by Scalar Perturbations",
Kavli Institute of Astronomy and Astrophysics, Peking University, Beijing, China. June 17th, 2021.

60. "Stochastic Gravitational Waves from Primordial Black Holes",
Department of Astronomy, Tsinghua University, Beijing, China. Dec. 16th, 2021.

COURSES/LECTURES

61. "Stochastic Gravitational Waves from the Early Universe",
Summer School on GRAVITATIONAL WAVE ASTRONOMY. International Center for Theoretical Sciences, Tata Institute of Fundamental Research. July 5-16, 2021.

62. "Stochastic Gravitational Waves from the Early Universe",
UFITS Summer School on Cosmology, University of Science and Technology of China. July 27 - Aug 2, 2021.

63. "Stochastic Gravitational Waves from the Early Universe",
Mini Summer School on Cosmology, Fudan University. Oct 10 - Oct 13, 2021.

64. "Gravitational Wave and Primordial Black Hole",
UFITS Summer School on Cosmology, University of Science and Technology of China. July 27 - Aug 2, 2021.

65. "Primordial black holes/gravitational waves", *UFITS Summer School 2023*, Guizhou, China. August 1st, 2023.

66. "Primordial black holes", *International Summer Institute of Phenomenology and Cosmology 2024*, Linyi, China. Aug 3rd, 2024.

CONFERENCES ORGANIZED

67. YITP International Molecule-type Workshop "Revisiting cosmological non-linearities in the era of precision surveys",
YITP, Kyoto Japan. July 13-28, 2023.

68. International Mini Workshop "Gravitational Waves from the Early Universe",
ITP-CAS, Beijing China. Oct 13-16, 2023.

69. CAS Key Laboratory Annual Meeting "Gravity and Cosmology",
Chunhuiyuan Hotel, Beijing China. Dec 9-11, 2023.

70. The 2nd International Workshop "Gravitational Waves and the Early Universe"
Zhongguanxinyuan Hotel, Beijing China. April 9 - 11, 2024.