




# Wei-Xiang Feng, Ph.D.





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## Education

- 2023  **Ph.D. University of California, Riverside** in Physics  
Dissertation: *Probing Dark Matter Physics With Supermassive Black Holes.*
- 2014  **M.S. National Tsing Hua University** in Physics.
- 2012  **B.S. National Kaohsiung Normal University** in Physics (major), Math (minor).





## Distinction






- 2022  **Dissertation Year Program Award.** University of California, Riverside
-  **Anne Kernan Award.** University of California, Riverside
- 2015  **President's Scholarship.** National Tsing Hua University, Hsinchu
- 2012  **Academic Excellence Award.** National Kaohsiung Normal University, Kaohsiung

## Research Experience

- 2023–  **Shuimu Postdoc Fellow.** Tsinghua University, Beijing
- 2017–23  **Graduate Student Researcher.** University of California, Riverside (2018–23)
-  **Visiting Scholar.** Academia Sinica, Taipei (2020–21)
- 2015–17  **Research Assistant.** National Tsing Hua University, Hsinchu







## Publications

- 1 **W.-X. Feng**, S. Bird, and H.-B. Yu, “Gravitational Waves from Primordial Black Hole Dark Matter Spikes,” *Astrophys. J.*, vol. 986, no. 2, p. 151, 2025.  DOI: 10.3847/1538-4357/adda2f. arXiv: 2411.05065 [astro-ph.CO].
- 2 **W.-X. Feng**, H.-B. Yu, and Y.-M. Zhong, “Dark Bondi Accretion Aided by Baryons and the Origin of JWST Little Red Dots,” Jun. 2025. arXiv: 2506.17641 [astro-ph.GA].
- 3 F. Jiang, Z. Jia, H. Zheng, *et al.*, “Formation of the Little Red Dots from the Core-collapse of Self-interacting Dark Matter Halos,” Mar. 2025. arXiv: 2503.23710 [astro-ph.GA].
- 4 B. Zhang, **W.-X. Feng**, and H. An, “Little Red Dots from Small-Scale Primordial Black Hole Clustering,” Jul. 2025. arXiv: 2507.07171 [astro-ph.CO].
- 5 **W.-X. Feng**, “On the Dynamical Instability of Monatomic Fluid Spheres in  $(N + 1)$ -Dimensional Spacetime,” *Astronomy*, vol. 2, no. 1, pp. 22–46, 2023.  DOI: 10.3390/astronomy2010004. arXiv: 2111.05341 [gr-qc].
- 6 G. B. Huxtable, N. Eltawil, **W.-X. Feng**, *et al.*, “Signatures of wakefield acceleration in astrophysical jets via gamma-rays and UHECRs,” *Monthly Notices of the Royal Astronomical Society*, vol. 522, no. 4, pp. 5402–5414, 2023, ISSN: 0035-8711.  DOI: 10.1093/mnras/stad1303. arXiv: 2009.12333 [astro-ph.HE].
- 7 **W.-X. Feng**, “Gravothermal phase transition, black holes and space dimensionality,” *Phys. Rev. D*, vol. 106, no. 4, p. L041501, 2022.  DOI: 10.1103/PhysRevD.106.L041501. arXiv: 2207.14317 [gr-qc].


- 8 **W.-X. Feng**, A. Parisi, C.-S. Chen, and F.-L. Lin, “Self-interacting dark scalar spikes around black holes via relativistic Bondi accretion,” *JCAP*, vol. 08, no. 08, p. 032, 2022.  DOI: 10.1088/1475-7516/2022/08/032. arXiv: 2112.05160 [astro-ph.HE].
- 9 **W.-X. Feng**, H.-B. Yu, and Y.-M. Zhong, “Dynamical instability of collapsed dark matter halos,” *JCAP*, vol. 05, no. 05, p. 036, 2022.  DOI: 10.1088/1475-7516/2022/05/036. arXiv: 2108.11967 [astro-ph.CO].
- 10 **W.-X. Feng**, H.-B. Yu, and Y.-M. Zhong, “Seeding Supermassive Black Holes with Self-interacting Dark Matter: A Unified Scenario with Baryons,” *Astrophys. J. Lett.*, vol. 914, no. 2, p. L26, 2021.  DOI: 10.3847/2041-8213/ac04b0. arXiv: 2010.15132 [astro-ph.CO].
- 11 **W.-X. Feng**, C.-Q. Geng, and L.-W. Luo, “The Buchdahl stability bound in Eddington-inspired Born-Infeld gravity,” *Chin. Phys. C*, vol. 43, no. 8, p. 083107, 2019.  DOI: 10.1088/1674-1137/43/8/083107. arXiv: 1810.06753 [gr-qc].
- 12 **W.-X. Feng**, C.-Q. Geng, W. F. Kao, and L.-W. Luo, “Equation of State of Neutron Stars with Junction Conditions in the Starobinsky Model,” *Int. J. Mod. Phys. D*, vol. 27, no. 01, p. 1750186, 2017.  DOI: 10.1142/S0218271817501863. arXiv: 1702.05936 [gr-qc].

## Presentations

### Seminars

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|---------|--|
| 2024–25 |  <b>Gravitational Waves from Primordial Black Hole Dark Matter Spikes?</b><br>Inst. of Physics, Academia Sinica, Taipei, Taiwan (Feb. 14, 25)<br>Inst. of Theoretical Physics, CAS, Beijing, China (Dec. 18, 24)<br>Kavli IPMU, The University of Tokyo, Tokyo, Japan (Dec. 10, 24)<br>Dept. of Physics, City University of Hong Kong, Hong Kong (Nov. 15, 24)<br>Purple Mountain Observatory, CAS, Nanjing, China (Nov. 12, 24)  |
| 2022–23 |  <b>Supermassive Black Holes, Dark Matter, and the Relativistic Instability</b><br>Dept. of Physics, Tsinghua University (online), Beijing, China (Feb. 23, 23)<br><br> <b>Gravothermal Phase Transition, Black Holes and Space Dimensionality</b><br>Dept. of Physics, National Tsing Hua University, Hsinchu, Taiwan (Sept. 29, 22)<br>Inst. of Physics, Academia Sinica, Taipei, Taiwan (Sept. 21, 22)  |
| 2020–21 |  <b>Supermassive Black Holes:</b><br><b>Direct Collapse Scenario from Self-interacting Dark Matter</b><br>Dept. of Physics and Astronomy, University of California, Riverside, USA (Feb. 17, 21)<br>Inst. of Physics, Academia Sinica, Taipei, Taiwan (Oct. 16, 20)<br>Dept. of Physics, National Taiwan Normal University, Taipei, Taiwan (Aug. 31, 20)<br><br> <b>Why 3+1? From the Viewpoint of Dynamical Instability</b><br>Inst. of Physics, Academia Sinica, Taipei, Taiwan (Mar. 17, 21)<br>Dept. of Physics, National Taiwan Normal University, Taipei, Taiwan (Dec. 22, 20) |
| 2018    |  <b>On the Existence of Buchdahl’s Stability in EiBI Gravity</b><br>National Center for Theoretical Sciences, Hsinchu, Taiwan (Aug. 29, 18)   |

### Conferences

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| 2024–25 |  <b>Dark Bondi Accretion Aided by Baryons and the Origin of JWST Little Red Dots</b><br><i>Valencia Workshop on the Small-Scale Structure of the Universe and Self-Interacting Dark Matter</i><br>The Instituto de Física Corpuscular, Spanish Research Council (Consejo Superior de Investigaciones Científicas, CSIC), and the University of Valencia, Valencia, Spain (June. 13, 25) |
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## Presentations (continued)

- **Gravitational Waves from Primordial Black Hole Dark Matter Spikes?**  
*Cross Strait Conference for Experimental and Theoretical Particle Physics*  
Zhengzhou University, Zhengzhou, China (Apr. 28, 25)  
*The 33rd Workshop on General Relativity and Gravitation in Japan (JGRG33)*  
Kindai University, Osaka, Japan (Dec. 02, 24)  
*KIAA Research Forum for Postdoctoral Scholars in Astronomy and Astrophysics*  
Kavli Inst. for Astron. & Astroph. (KIAA), Peking University, Beijing, China (Nov. 27, 24)
- **Gravothermal Phase Transition, Black Holes and Space Dimensionality**  
*International Symposium on Cosmology and Particle Astrophysics 2024 (CosPA 2024)*  
Ningbo University & Intercontinental Ningbo, Ningbo, China (Jun. 16, 24)
- 2023 ■ **Relativistic Bondi Accretion and the BEC Dark Matter Spike**  
*The 32nd Texas Symposium on Relativistic Astrophysics*  
Tsung-Dao Lee Institute & Everbright International Hotel, Shanghai, China (Dec. 12, 23)  
*The 32nd Workshop on General Relativity and Gravitation in Japan (JGRG32)*  
(as the 23rd International Conference of Graduate School of Mathematics)  
Nagoya University, Nagoya, Japan (Nov. 30, 23)
- **Seeding Supermassive Black Holes**  
*Pollica Summer Workshop on Self-Interacting Dark Matter: Models, Simulations and Signals*  
Pollica Physics Centre, Castello dei Principi Capano, Pollica, Italy (Jun. 20, 23)
- **Supermassive Black Holes, Dark Matter, and the Relativistic Instability**  
*SoCal Grad Strings & Fields 2023*  
University of California, Los Angeles, California, USA (Mar. 25, 23)
- 2021–22 ■ **Seeding Supermassive Black Holes with Self-interacting Dark Matter**  
*Theoretical Advanced Study Institute in Particle Theory (TASI) 2022*  
University of Colorado, Boulder, Colorado, USA (Jun. 13, 22)
- **Dynamical instability and the Space Dimensionality**  
*31st Midwest Relativity Meeting*  
University of Illinois, Urbana-Champaign, Illinois, USA (Nov. 13, 21)
- **Seeding Supermassive Black Holes: A Unified Scenario with Baryons**  
*COSMOS'21 (hybrid)*  
University of Illinois, Urbana-Champaign, Illinois, USA (Aug. 03, 21)
- 2019–20 ■ **Seeding Supermassive Black Holes**  
*NCTS Dark Physics Workshop*  
National Center for Theoretical Sciences, Hsinchu, Taiwan (Jan. 09, 20)
- **Self-interacting Dark Matter and the Early Formation of Supermassive Black Hole**  
*NCTS annual theory meeting 2019: particle, cosmology and strings*  
National Center for Theoretical Sciences, Hsinchu, Taiwan (Dec. 13, 19)
- 2017–18 ■ **Buchdahl's stability bound in EiBI gravity**  
*The 5th International Workshop on Dark Matter, Dark Energy and Matter-antimatter Asymmetry*  
Fo-Guang-Shan, Kaohsiung, Taiwan (Dec. 30, 18)  
*NCTS annual theory meeting 2018: particle, cosmology and stringy*  
National Center for Theoretical Sciences, Hsinchu, Taiwan (Dec. 18, 18)
- **On the existence of Buchdahl's stability bound in EiBI gravity**  
*Math Connections 2018*  
University of California, Riverside, California, USA (May 19, 18)
- 2014–15 ■ **EoS of Neutron Stars with Junction Condition Approach in the  $R^2$  Model**  
*Workshop on Dark Physics of the Universe*  
National Center for Theoretical Sciences, Hsinchu, Taiwan (Dec. 20, 15)

## Presentations (continued)

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- **Modified Gravity on Neutron Star: Numerical Study**  
*7<sup>th</sup> Joint NCTS/FGCPA-LeCosPA Meeting on Dark Energy*  
National Center for Theoretical Sciences, Hsinchu, Taiwan (May 28, 14)

## Skills

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- Languages     ■ Native Taiwanese, Chinese (Mandarin), Fluent English.
- Programs     ■ Python, Fortran, Mathematica, Gnuplot
- Misc.        ■ Academic research, teaching,  $\LaTeX$  typesetting and publishing.

## References

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Available on Request