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. **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].

5. 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].

6. **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].

7. **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].

8 **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].

9 **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].

10 **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. 083 107, 2019. DOI: 10.1088/1674-1137/43/8/083107. arXiv: 1810.06753 [gr-qc].

11 **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. 1 750 186, 2017. DOI: 10.1142/S0218271817501863. arXiv: 1702.05936 [gr-qc].

Presentations

Seminars

2024–25 **Gravitational Waves from Primordial Black Hole Dark Matter Spikes?**
Inst. of Physics, Academia Sinica, Taipei, Taiwan (Feb. 14, 25)
Inst. of Theoretical Physics, CAS, Beijing, China (Dec. 18, 24)
Kavli IPMU, The University of Tokyo, Tokyo, Japan (Dec. 10, 24)
Dept. of Physics, City University of Hong Kong, Hong Kong (Nov. 15, 24)
Purple Mountain Observatory, CAS, Nanjing, China (Nov. 12, 24)

2022–23 **Supermassive Black Holes, Dark Matter, and the Relativistic Instability**
Dept. of Physics, Tsinghua University (online), Beijing, China (Feb. 23, 23)

Gravothermal Phase Transition, Black Holes and Space Dimensionality
Dept. of Physics, National Tsing Hua University, Hsinchu, Taiwan (Sept. 29, 22)
Inst. of Physics, Academia Sinica, Taipei, Taiwan (Sept. 21, 22)

2020–21 **Supermassive Black Holes:**
Direct Collapse Scenario from Self-interacting Dark Matter
Dept. of Physics and Astronomy, University of California, Riverside, USA (Feb. 17, 21)
Inst. of Physics, Academia Sinica, Taipei, Taiwan (Oct. 16, 20)
Dept. of Physics, National Taiwan Normal University, Taipei, Taiwan (Aug. 31, 20)

Why 3+1? From the Viewpoint of Dynamical Instability
Inst. of Physics, Academia Sinica, Taipei, Taiwan (Mar. 17, 21)
Dept. of Physics, National Taiwan Normal University, Taipei, Taiwan (Dec. 22, 20)

2018 **On the Existence of Buchdahl's Stability in EiBI Gravity**
National Center for Theoretical Sciences, Hsinchu, Taiwan (Aug. 29, 18)

Conferences

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

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. & Astrophy. (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 5 th 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)

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

Skills

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

References

Available on Request