

# YIMING ZHONG

5640 S Ellis Aveue, Chicago, Illinois 60637, USA

✉ yimingzhong@uchicago.edu 🏠 ymzhong.com

## PROFESSIONAL APPOINTMENTS

---

**Kavli Institute for Cosmological Physics, University of Chicago** 2019–  
KICP Fellow

Research on primordial non-Gaussianities, particle dark matter, galactic dynamics, supermassive black holes, and the Galactic center gamma-ray excess.

**Department of Physics, Boston University** 2016–2019  
Postdoctoral Associate

Research on experimental design for dark sector and dark matter searches, collider phenomenology, dark matter self-interactions and novel properties of dark matter halos.

## EDUCATION

---

**C.N. Yang Institute for Theoretical Physics, Stony Brook University** 2010–2016  
Ph.D. Physics

Thesis title: “[Searching for Dark Sectors](#)”, Advisor: Rouven Essig

**Perimeter Institute for Theoretical Physics & University of Waterloo** 2009–2010  
M.S. Physics

Master essay: The Tree-level Britto-Cachazo-Feng-Witten Recursion Relation, Advisor: David Skinner

**Nankai University** 2005-2009  
B.S. Physics

Thesis title: Interferometer based on Photonic Crystal Fiber

## RESEARCH INTEREST

---

Astrophysics, cosmology, and their intersections with particle physics.

## FELLOWSHIPS & AWARDS

---

2022 NSFC Excellent Young Scholars Overseas, National Natural Science Foundation of China (NSFC)

2019 KICP Fellowship, U. Chicago; Leinweber Research Fellowship, U. Michigan (declined);  
Distinguished Referee of the European Physical Journal

2016 Max Dresden Prize (Best Thesis Prize), Stony Brook University

2015 Rosaline and Milton Serman Award, Stony Brook University; PITT PACC Travel Award,  
U. Pittsburgh; Sigma Xi Travel Prize, Stony Brook University

2014 Di Tian Prize, Stony Brook University

2013 Peter B. Kahn Fellowship, Stony Brook University

2009 Perimeter Scholars International Award, Perimeter Institute for Theoretical Physics

2007 National Scholarship, Ministry of Education of China

## RESEARCH PAPERS <sup>†</sup> [[ADS](#)] [[Google Scholar](#)] [[INSPIRE](#)]

---

h-index: 25, i10-index: 27

1. Samuel D. McDermott, Yi-Ming Zhong, and Ilias Cholis, “[A Phantom Menace: On the Morphology of the Galactic Center Excess](#)”, accepted by *Mon. Not. R. Astron. Soc.*, arXiv:2209.00006. (Authorship follows contribution order.)
2. Daniel Gilman, Yi-Ming Zhong, and Jo Bovy, “[Constraining resonant dark matter self-interactions with strong gravitational lenses](#)”, submitted to *Phys. Rev. D*, arXiv:2207.13111. (Authorship follows contribution order.)
3. Henning Bahl, Wen Han Chiu, Christina Gao, Lian-Tao Wang, and Yi-Ming Zhong, “[Tripling down on the  \$W\$  boson mass](#)”, *Eur. Phys. J. C* **82**, 944 (2022).
4. Manuel A. Buen-Abad, Rouven Essig, David McKeen, and Yi-Ming Zhong, “[Cosmological Constraints on Dark Matter Interactions with Ordinary Matter](#)”, *Phys. Rep.* **961**, 1-35 (2022).
5. Wei-Xiang Feng\*, Hai-Bo Yu, and Yi-Ming Zhong, “[Dynamical Instability of Collapsed Dark Matter Halos](#)”, *J. Cosmol. Astropart. Phys.* **05**, 036 (2022).
6. Ilias Cholis, Yi-Ming Zhong, Samuel D. McDermott, and Joseph P. Surdutovich\*, “[The Return of the Templates: Revisiting the Galactic Center Excess with Multi-Messenger Observations](#)”, *Phys. Rev. D* **105**, 103023 (2022). (Authorship follows contribution order.)
7. Lian-Tao Wang, Zhong-Zhi Xianyu, and Yi-Ming Zhong, “[Precision Calculation of Inflation Correlators at One Loop](#)”, *J. High Energy Phys.* **02**, 085 (2022).
8. Wei-Xiang Feng\*, Hai-Bo Yu, and Yi-Ming Zhong, “[Seeding Supermassive Black Holes with Self-interacting Dark Matter: A Unified Scenario with Baryons](#)”, *Astrophys. J. Lett.* **914**, L26 (2021).
9. Christina Gao, Jia Liu, Lian-Tao Wang, Xiao-Ping Wang, Wei Xue, and Yi-Ming Zhong, “[Re-examining the Solar Axion Explanation for the XENON1T Excess](#)”, *Phys. Rev. Lett.* **125**, 131806 (2020).
10. Ran Huo, Hai-Bo Yu, and Yi-Ming Zhong, “[The Structure of Dissipative Dark Matter Halos](#)”, *J. Cosmol. Astropart. Phys.* **06**, 051 (2020).
11. Yi-Ming Zhong, Samuel McDermott, Ilias Cholis, and Patrick Fox, “[Testing the Sensitivity of the Galactic Center Excess to the Point Source Mask](#)”, *Phys. Rev. Lett.* **124**, 231103 (2020). (Authorship follows contribution order.)

---

<sup>†</sup>Author names are listed alphabetically (tradition in particle physics) unless specified.

\*Student co-supervised.

12. Rouven Essig, Samuel McDermott, Hai-Bo Yu, and Yi-Ming Zhong, “[Constraining Dissipative Dark Matter Self-Interactions](#)”, *Phys. Rev. Lett.* **123**, 121102 (2019).
13. Martin Schmaltz and Yi-Ming Zhong, “[The Leptoquark Hunter’s Guide: Large coupling](#)”, *J. High Energy Phys.* **01**, 132 (2019).
14. L. Marsicano\*, M. Battaglieri, A. Celentano, R. De Vita, and Yi-Ming Zhong, “[Probing Leptophilic Dark Sectors at Electron Beam Dump Facilities](#)”, *Phys. Rev. D* **98**, 115022 (2018).
15. Chien-Yi Chen, Jonathan Kozaczuk, and Yi-Ming Zhong, “[Exploring leptophilic dark matter with NA64- \$\mu\$](#) ”, *J. High Energy Phys.* **10**, 154 (2018).
16. Rouven Essig, Patrick Meade, Harikrishnan Ramani, and Yi-Ming Zhong, “[Higgs-Precision Constraints on Colored Naturalness](#)”, *J. High Energy Phys.* **09**, 085 (2017).
17. Bastian Diaz\*, Martin Schmaltz, and Yi-Ming Zhong, “[The leptoquark Hunter’s guide: Pair production](#)”, *J. High Energy Phys.* **10**, 11 (2017).
18. Chien-Yi Chen, Maxim Pospelov, and Yi-Ming Zhong, “[Muon Beam Experiments to Probe the Dark Sector](#)”, *Phys. Rev. D* **95**, 115005 (2017).
19. Chien-Yi Chen, Michel Lefebvre, Maxim Pospelov, and Yi-Ming Zhong, “[Diphoton Excess through Dark Mediators](#)”, *J. High Energy Phys.* **07**, 063 (2016).
20. Chien-Yi Chen, Qi-Shu Yan, Xiaoran Zhao, Zhijie Zhao, and Yi-Ming Zhong, “[Probing Triple-Higgs Productions via  \$4b2\gamma\$  at a 100 TeV Hadron Collider](#)”, *Phys. Rev. D* **93**, 013007 (2015).
21. David Curtin, Rouven Essig, and Yi-Ming Zhong, “[Uncovering Light Scalars with Exotic Higgs Decays to  \$b\bar{b}\mu^+\mu^-\$](#) ”, *J. High Energy Phys.* **06**, 025 (2015).
22. Bertrand Echenard, Rouven Essig, and Yi-Ming Zhong, “[Projections for Dark Photon Searches at Mu3e](#)”, *J. High Energy Phys.* **01**, 113 (2014).
23. David Curtin, Rouven Essig, Stefania Gori, Prerit Jaiswal, Andrey Katz, Tao Liu, Zhen Liu, David McKeen, Jessie Shelton, Matthew Strassler, Ze’ev Surujon, Brock Tweedie, and Yi-Ming Zhong, “[Exotic Decays of the 125 GeV Higgs Boson](#)”, *Phys. Rev. D* **90**, 075004 (2014). (Editor’s suggestion)
24. Rouven Essig, Jeremy Mardon, Michele Papucci, Tomer Volansky, and Yi-Ming Zhong, “[Constraining light dark matter with low-energy  \$e^+e^-\$  colliders](#)”, *J. High Energy Phys.* **11**, 167 (2013).

## COMMUNITY WHITE-PAPER REPORTS & OTHER PUBLICATIONS

---

1. Daniel Green *et al* (Yi-Ming Zhong included), “[Snowmass Theory Frontier: Astrophysics and Cosmology](#)”, arXiv:2209.06854.
2. Philip Ilten *et al* (Yi-Ming Zhong included), “[Experiments and Facilities for Accelerator-Based Dark Sector Searches](#)”, arXiv:2206.04220.
3. Arka Banerjee *et al* (Yi-Ming Zhong included), “[Snowmass2021 Computational Frontier White Paper: Cosmological Simulations and Modeling](#)”, arXiv:2203.07347.

4. Rebecca K. Leane *et al* (Yi-Ming Zhong included), “[Snowmass2021 Cosmic Frontier White Paper: Puzzling Excesses in Dark Matter Searches and How to Resolve Them](#)”, arXiv:2203.06859.
5. John Arrington *et al* (Yi-Ming Zhong included), “[Physics Opportunities for the Fermilab Booster Replacement](#)”, arXiv:2203.03925.
6. Snowmass 2021 Letter of Interest, “[Cosmological Collider: Precision calculation and probes of new physics](#)”, “[Novel Properties of Self-Interacting Dark Matter Halos](#)”, “[Understanding the Galactic Center Gamma-Ray Excess](#)”, “[Rare muon decays and light new physics](#)”, “[Photon-beam experiments and new light physics](#)”, Aug 2020.
7. Roberto Contino *et al* (Yi-Ming Zhong included), “[US Cosmic Visions: New Ideas in Dark Matter 2017: Community Report](#)”, arXiv:1707.04591.
8. J. Alexander *et al* (Yi-Ming Zhong included), “[Dark Sectors 2016 Workshop: Community Report](#)”, arXiv:1608.08632.
9. M. Cepeda *et al* (Yi-Ming Zhong included), “[Higgs Physics at the HL-LHC and HE-LHC](#)”, *CERN Yellow Rep.* **7**, 221-584 (2019).
10. A. Abada *et al* (Yi-Ming Zhong included), “[FCC Physics Opportunities](#)”, *Eur. Phys. J. C* **79**, 6 (2019). “[FCC-ee: The Lepton Collider](#)”, “[FCC-hh: The Hadron Collider](#)”, “[HE-LHC: The High-Energy Large Hadron Collider](#)” *Eur. Phys. J. Spec. Top.* **228**, 2, 4, 5 (2019) Roberto Contino *et al* (Yi-Ming Zhong included), “[Physics at the FCC-hh, a 100 TeV  \$pp\$  collider: Higgs and EW symmetry breaking studies](#)”, *CERN Yellow Rep.* **3**, 225-440 (2017).
11. The CEPC Study Group (Yi-Ming Zhong included), “[CEPC Conceptual Design Report](#)”, arXiv:1811.10545.

## INVITED SEMINARS

---

1. Nov 2022, University of Oxford, Oxford, UK
2. Nov 2022, King’s College London, London, UK
3. Oct 2022, Hong Kong University of Science and Technology, Hong Kong, China
4. Oct 2022, Chinese University of Hong Kong, Hong Kong, China
5. Oct 2022, City University of Hong Kong, Hong Kong, China
6. Jun 2022, City University of Hong Kong, Hong Kong, China (remote)
7. May 2022, University of Cincinnati, OH, USA (remote)
8. Apr 2022, University of Illinois Urbana-Champaign, IL, USA
9. Apr 2022, Fudan University, Shanghai, China (remote)
10. Mar 2022, University of California Riverside, IL, USA
11. Mar 2022, Carnegie Observatories, CA, USA

12. Mar 2022, California Institute of Technology, CA, USA
13. Mar 2022, Tsinghua University, Beijing, China (remote)
14. Nov 2021, University of Wisconsin–Madison, WI, USA
15. Nov 2021, University of Florida, FL, USA (remote)
16. Oct 2021, Argonne National Laboratory, IL, USA (remote)
17. Apr 2021, University of Notre Dame, IN, USA (remote)
18. Mar 2021, Carleton University, ON, Canada (remote)
19. Mar 2021, Brown University, RI, USA (remote)
20. Dec 2020, Peking University, Beijing, China (remote)
21. Nov 2020, University of Minnesota, MN, USA (remote)
22. Oct 2020, Nankai University, Tianjin, China (remote)
23. Jun 2020, Perimeter Institute for Theoretical Physics, ON, Canada (remote)
24. Mar 2020, Fermi National Accelerator Laboratory, IL, USA (remote)
25. Mar 2020, Argonne National Laboratory, IL, USA (cancelled)
26. Nov 2019, Cornell University, NY, USA
27. Oct 2019, University of Cincinnati, OH, USA
28. Apr 2019, Center for Theoretical Physics of the Universe, Institute for Basic Science, Daejeon, South Korea
29. Apr 2019, Seoul National University, Seoul, South Korea
30. Apr 2019, Zhejiang University, Hangzhou, China
31. Nov 2018, Johns Hopkins University, MD, USA
32. Nov 2018, University of Maryland, MD, USA
33. Oct 2018, Lawrence Berkeley National Laboratory, CA, USA
34. Oct 2018, University of California Davis, CA, USA
35. Sep 2018, Harvard University, MA, USA
36. Feb 2018, University of Massachusetts at Amherst, MA, USA
37. Jan 2018, T.D. Lee Institute, Shanghai Jiaotong University, Shanghai, China
38. Dec 2017, Tsinghua University, Beijing, China
39. Dec 2017, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China
40. Mar 2017, Massachusetts Institute of Technology, MA, USA

41. Jun 2016, University of California Riverside, CA, USA
42. Jun 2016, SLAC National Accelerator Laboratory, CA, USA
43. Apr 2016, Boston University, MA, USA
44. Nov 2015, Perimeter Institute for Theoretical Physics, ON, Canada

## **INVITED TALKS AT INTERNATIONAL CONFERENCES**

---

1. Feb 2023, Lighting new Lampposts for Dark Matter and Beyond the Standard Model, Stony Brook, NY, USA
2. Sep 2022, ICTP-SAIFR Program on New Directions in Particle Physics, São Paulo, Brazil (declined)
3. Mar 2022, New Methods and Ideas at the Frontiers of Particle Physics (Winter Aspen 2022), Aspen, CO, USA
4. Jul 2021, Dark Matter from the Laboratory to the Cosmos, Aspen, CO, USA
5. Jun 2021, Discovering the New Physics of  $g - 2$  with Fixed Target Muon Facilities at Fermilab, Batavia, IL, USA (remote)
6. Mar 2021, The 1st Workshop on New Light Physics and Photon-beam Experiments, Newport News, VA, USA (remote)
7. Mar 2020, Prospecting for New Physics through Flavor, Dark Matter and Machine Learning (Winter Aspen 2020), Aspen, CO, USA (cancelled)
8. Feb 2020, Lighting new Lampposts for Dark Matter and Beyond the Standard Model, Stony Brook, NY, USA
9. Jun 2019, Indirect Searches for New Physics across the Scale, Mainz, Germany
10. Apr 2019, Korea Physical Society Spring Meeting, Daejeon, South Korea
11. Apr 2019, Workshop on the Circular Electron-Positron Collider, EU Edition 2019, Oxford, UK (declined)
12. Oct 2018, Implication Workshop 2018, Geneva, Switzerland (declined)
13. Oct 2018, The 2018 International Workshop on Future Linear Colliders, Arlington, TX, USA (declined)
14. Sep 2018, 10th International Workshop on The CKM Unitarity Triangle (CKM 2018), Heidelberg, Germany
15. Aug 2018, The Flavor of New Physics in Collisions, Aspen, CO, USA
16. May 2018, The Small-scale Structure of Cold(?) Dark Matter, Santa Barbara, CA, USA
17. Jan 2018, The 2nd Future Circular Collider Workshop, Geneva, Switzerland
18. Jan 2018, High Energy Program 2018, Hong Kong, China

19. Mar 2017, U.S. Cosmic Visions: New Ideas in Dark Matter, College Park, MD, USA
20. May 2016, Belle II Theory Interface Platform Workshop, Pittsburgh, PA, USA
21. Apr 2016, Dark Sector Workshop, Menlo Park, CA, USA
22. Mar 2015, LHC Higgs Cross Section Working Group 3 (WG3): Exotic Higgs Decays Kick-off Meeting, Geneva, Switzerland (remote)

## **OTHER TALKS AT INTERNATIONAL CONFERENCES**

1. Nov 2022, ICTP-SAIFR Workshop on the Nature of Dark Matter, São Paulo, Brazil (declined)
2. May 2022, Phenomenology 2022 Symposium, Pittsburgh, PA, USA
3. Dec 2021, Dark Sectors and Astroparticle Physics: Axions, Neutrinos, Black Holes and Gravitational Waves, Tokyo, Japan (remote)
4. Dec 2021, The 11th Meeting for Phenomenology in Illinois, Kentucky, Indiana, Michigan, and Ohio (PIKIMO 11), Pittsburgh, PA, USA (remote)
5. Nov 2021, Brookhaven Forum 2021, Upton, NY, USA (remote)
6. Aug 2021, The 24th International Conference on Particle Physics and Cosmology, Champaign, IL, USA (remote)
7. May 2021, Workshop on Potential Fermilab Muon Campus and Storage Ring Experiments, Batavia, IL, USA (remote)
8. Jul 2019, Meeting of the American Physical Society Division of Particles and Fields, Boston, MA, USA
9. Sep 2018, DESY Theory Workshop: Particle Physics Challenges, Hamburg, Germany
10. Mar 2017, Beyond WIMPs: from Theory to Detection, Stony Brook, NY, USA
11. Aug 2015, Brookhaven Forum 2015, Upton, NY, USA
12. May 2015, Phenomenology 2015 Symposium, Pittsburgh, PA, USA
13. Apr 2015, American Physical Society April Meeting, Baltimore, MD, USA
14. Jun 2014, Action at a Distance, Waterloo, ON, Canada (remote)
15. May 2014, Phenomenology 2014 Symposium, Pittsburgh, PA, USA
16. Oct 2013, Dark Matter Paradigm, Princeton, NJ, USA
17. May 2013, Brookhaven Forum 2013, Upton, NY, USA

## SERVICE TO PROFESSION

---

**Organizer** for Jefferson Lab workshop, “[1st Workshop on New Light Physics and Photon-beam Experiments](#)”, Mar 2021

**Convener** for SLAC workshop, “[Exotic Higgs Decays Meeting](#)”, Nov 2016; “[Phenomenology 2022 Symposium](#)”, May 2022.

**Referee** for *Physical Review D*, *Journal of Cosmology and Astroparticle Physics*, *Journal of High Energy Physics*, *Monthly Notices of the Royal Astronomical Society*, *Nuclear Physics B*, *Physics Letters B*, and *European Physical Journal C*.

**Contributor** for multiple White Papers and Letters of Interest of Snowmass 2021, the Conceptional Design Reports of the Circular Electron Positron Collider (CEPC) and the Future Circular Collider (FCC).

**Co-organizer** of the theory seminar and journal club at BU (2017–2019), the joint postdoc lunch journal club at BU, Harvard, and MIT (2016–2019), the KICP seminar (2019–2020), and the particle cosmology journal club at the UChicago (2019–2022).

## TEACHING AND MENTORING EXPERIENCE

---

### Teaching Assistant

Responsibilities included grading, supervising group discussions and laboratories, holding office hours, and developing assignments and exams

- Theoretical Particle Physics, Fall 2015, Stony Brook University
- Classical Physics C, 2011–2012, Stony Brook University

### Tutorial

“Hands on start to MadGraph” at JLab’s 1st Workshop on New Light Physics and Photon-beam Experiments, Mar 2021

### Mentoring Experience

Yunjia Bao (graduate student at U. Chicago), since 2022, 1 paper in preparation.  
Wei-Xiang Feng (graduate student at UC Riverside), since 2019, 2 papers, 1 papers in preparation → postdoc at Tsinghua U., China.

## COMMUNITY INVOLVEMENT & OUTREACH

---

**Chinese Translator** of the popular science book

- “*Time reborn: From the Crisis in Physics to the Future of the Universe*”, Zhejiang People’s Publishing House, 2017. [a](#)
- “*The Greatest Story Ever Told—So Far: Why Are We Here?*”, Zhejiang People’s Publishing House, 2019. [a](#)
- “*The Theoretical Minimum: What You Need to Know to Start Doing Physics*”, (to be published).

The published books received 100+ reviews on douban.com, a book review website.



**Participant** of the [KICP Lifelong Learning Outreach Program](#) (2019–2023), public talks at Conard Sulzer Public Library, Chicago Cultural Center, and Chicago Department of Family and Support Services.

## **MEDIA COVERAGE**

---

[UChicago News](#) on the work of first supermassive black holes and self-interacting dark matter.

[Phys.org](#) on the work of the Galactic center excess.

[Live Science](#) on the works of leptoquark.