Yong Du

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CAREER

Post-doc 2020-
CAS Key Laboratory of Theoretical Physics, Institute of Theoretical Physics, Chinese Academy of Science

Visiting scholar 2019-2020
CAS Key Laboratory of Theoretical Physics, Institute of Theoretical Physics, Chinese Academy of Science

Visiting scholar 2018-2018
Department of Physics and Astronomy, University of Pittsburgh

Visiting scholar 2014-2014
Department of Physics, University of Massachusetts-Amherst

EDUCATION

Ph.D. in Physics 2015-2020
Department of Physics, University of Massachusetts-Amherst
Thesis Advisor: Michael J. Ramsey-Musolf; Academic Advisor: Jennie Traschen

Ph.D. candidate in Physics (Transferred to the University of Massachusetts-Amherst in 2015 fall) 2012-2015
School of Physics, Nanjing University
Advisor: Yeuk-Kwan Edna Cheung

B.S. in Physics 2008-2012
School of Physical Engineering, Zhengzhou University
Advisor: Er-Jun Liang

CURRENT RESEARCH INTERESTS

- Electroweak precision physics at NNLO and above;
- General neutrino physics and its connection to new physics;
- Formal development and phenomenological aspects of effective field theories;

- Dark matter production mechanisms and its detection;
- Phenomenology of new physics at colliders.

SELECTED TEACHING

- PHY811: Field Theory I (Grader)
- PHY605: Methods of Mathematical Physics (Grader)
- PHY424: Quantum Mechanics (Grader)
- PHY281: Computational Physics (Grader)

PUBLICATIONS

12. **Yong Du**, X.-X. Li, and J.-H. Yu, "Neutrino seesaw models at one-loop matching: Discrimination by effective operator" , 2201.04646
11. **Yong Du**, F. Huang, H.-L. Li, Y.-Z. Li, and J.-H. Yu, "Revisit Dark Matter Freeze-in and Freeze-out through Phase-Space Distribution" , 2111.01267
10. L. A. Anchordoqui *et al*, "The Forward Physics Facility: Sites, Experiments, and Physics Potential" , 2109.10905
9. **Yong Du**, H.-L. Li, J. Tang, S. Vihonen and J.-H. Yu, "Exploring SMEFT Induced Non-Standard Interactions from COHERENT to Neutrino Oscillations" , 2106.15800
8. **Yong Du**, "Searching for new physics through neutrino non-standard interactions" , 2105.06191
7. **Yong Du** and J.-H. Yu, "Neutrino non-standard interactions meet precision measurements of $N_{\rm eff}$" , JHEP 05 (2021) 058
6. **Yong Du**, H.-L. Li, J. Tang, S. Vihonen and J.-H. Yu, "Non-standard interactions in SMEFT confronted with terrestrial neutrino experiments" , JHEP 03 (2021) 019
5. **Yong Du**, "Collider probes of real triplet scalar dark matter" , PoS LHCP2020 (2021) 232
4. **Yong Du**, F. Huang, H.-L. Li and J.-H. Yu, "Freezing-in Dark Matter from Secret Neutrino Interactions" , JHEP 12 (2020) 207
3. C.-W. Chiang, G. Cottin, **Yong Du**, K. Fuyuto and M. J. Ramsey-Musolf, "Collider Probes of Real Triplet Scalar Dark Matter" , JHEP 01 (2021) 198
2. **Yong Du**, A. Freitas, H.H. Patel and M. J. Ramsey-Musolf, "Parity-Violating Møller Scattering at Next-to-Next-to-Leading Order: Closed Fermion Loops" , Phys.Rev.Lett. 126 (2021) 13, 131801
1. **Yong Du**, A. Dunbrack, M. J. Ramsey-Musolf and J.-H. Yu, "Type-II Seesaw Scalar Triplet Model at a 100 TeV *pp* Collider: Discovery and Higgs Portal Coupling Determination" ,JHEP 1901 (2019) 101.

TALKS

22. PKU HEP Seminar and Workshop
Peking University, 209 Chengfu Road, Haidian District, Beijing, China
Invited talk: **Neutrino non-standard interactions in EFTs: Low-energy experiments**

21. EF04 Topical Group Community Meeting
(*virtual*)
Invited talk: **Global fit for 4-fermion operators & operators at Z-pole**

20. The 2021 International Workshop on the High Energy Circular Electron Positron Collider (CEPC 2021)
Nanjing University, Nanjing, Jiangsu, China
Invited talk: **Global fit with operators in W/Z-pole and 4-fermion**

19. 49th SLAC Summer Institute (SSI 2021)
SLAC, CA, USA (*virtual*)
Poster presentation: **Constraining neutrino non-standard interactions from low energy neutrino experiments**

18. 2021 Meeting of the Division of Particles and Fields of the American Physical Society (DPF21, July 2021)
Florida State University, FL, USA (*virtual*)
Parallel talk: **Neutrino non-standard interactions revisited in effective field theories**

17. The 28th International Workshop on Weak Interactions and Neutrinos (WIN2021, June 2021)
University of Minnesota, MN, USA (*virtual*)
Poster presentation: **Implications on the UV from neutrino non-standard interactions in the EFT approach**

16. Phenomenology 2021 Symposium (May 2021)
University of Pittsburgh, PA, USA (*virtual*)
Parallel talk: **Implications on new physics from neutrino non-standard interactions in the EFT framework**

15. Higgs and Effective Field Theory 2021 (HEFT 2021, April 2021)
University of Science and Technology of China, Hefei, China
Plenary talk: **Exploring the ultraviolet from neutrino oscillations and $N_{\mathbf{eff}}$ in the EFT framework**

14. Beyond Standard Model: From Theory to Experiment, (BSM-2021, March 2021)
Zewail City of Science and Technology & Sabancı University (*virtual*)
Parallel talk: **Searching for new physics through neutrino non-standard interactions**

13. The XIX International Workshop on Neutrino Telescopes, (NeuTel2021, February 2021)
INFN Sezione di Padova & Physics and Astronomy Department of Padova University (*virtual*)
Parallel talk: **Constraints on neutrino non-standard interactions: From neutrino oscillations to precision cosmology**

12. The 6th China LHC Physics Workshop (CLHCP2020, November 2020)
Tsinghua University, Beijing, China (*virtual*)

Parallel talk: **Discovery of the real and complex triplet models at the LHC and future colliders**

11. SLAC Summer Institute 2020 (SSI 2020, August 2020)
SLAC, CA, USA (*virtual*)
Poster presentation: **Freeze-in Dark Matter from Secret Neutrino Interactions**

10. The XXIX International Conference on Neutrino Physics and Astrophysics (Neutrino 2020, June-July 2020)
Chicago, Illinois USA (*virtual*)
Poster presentation: **Freeze-in Dark Matter from Secret Neutrino Interactions**

9. The Seventh Dark Matter@LHC 2020 Workshop (DM@LHC, June 2020)
DESY, Hamburg, Germany (*virtual*)
Plenary talk: **Probing the real triplet scalar dark matter at colliders**

8. The Seventh Workshop of the LHC LLP Community (LHC LLP, May 2020)
CERN (*virtual*)
Plenary talk: **Collider probes of real triplet scalar dark matter**

7. The Eighth Annual Large Hadron Collider Physics (LHCP2020, May 2020)
International Conference Centre of Sorbonne Universite, Paris, France (*virtual*)
Theory poster presentation in the "Dark Sector BSM": **Collider probes of real triplet scalar dark matter**

6. Phenomenology 2020 Symposium (May 2020)
University of Pittsburgh, PA, USA (*virtual*)
Parallel talk: **Collider probes of real triplet scalar dark matter**

5. LoopFest XVIII (August 2019)
Fermilab, IL, USA
Plenary talk: **Two-loop fermionic contributions to polarized Moller scattering asymmetries**

4. Opportunities at Future High Energy Colliders (June-July 2019)
IFT, Madrid, Spain
Plenary talk: **Type-II seesaw scalar triplet at a 100 TeV pp collider**

3. Phenomenology 2019 Symposium (May 2019)
University of Pittsburgh, PA, USA
Parallel talk: **Type-II seesaw scalar triplet at a 100 TeV pp collider**

2. Seminar talk (April 2019)
University of Massachusetts-Amherst, MA, USA
Minimal dark matter at a 100 TeV collider

1. Seminar talk (November 2018)
University of Massachusetts-Amherst, MA, USA
Type-II seesaw scalar triplet at a 100 TeV pp collider

GRANTS

- Graduate Student Travel Grant, Department of Physics, University of Massachusetts-Amherst, $600 (2019).
- National University Student Innovation Program, Ministry of Education of the People's Republic of China, RMB 40000 (PI 2010 - 2012).

SKILLS

- **Computing Skills:**
  - **Mathematica**: Developed own code for symbolically evaluating 2-loop Feynman integrals based on method of regions; Developed own code for precision $N_{\rm eff}$ calculation.
  - **Python**: Developed own Python and Mathematica code for dark matter relic density calculation.
  - **Also very familiar with**: FeynArts, Package-X, FIRE, COLLIER, FeynCalc, LoopTools, REDUCE, LanHEP, CalcHEP, FeynRules, MicrOMEGAs, MadGraph, Delphes, Pythia, ROOT, C++, C, bash, CLASS, MontePython, Wilson, GLoBES etc.
- **Language:**
  - English (fluent–five years' teaching experience at the University of Massachusetts-Amherst.)
  - Mandarin (native)

AWARDS

- **May 2013**, Freshman Scholarship for Graduate Students, Nanjing University (Awarded to top 5)
- **Oct. 2011**, National English Contest for College Students, National Rank: 3, Zhengzhou University
- **2011**, First-class scholarship, Zhengzhou University
- **Sep. 2010**, National Computer Examination Certificate, 2 Grade, C programming Language, Zhengzhou University
- **2010**, National Endeavor Fellowship, Zhengzhou University
- **2009**, Second-class scholarship, Zhengzhou University
- **2009**, Merit Student, Zhengzhou University

REFERENCES

Ayres Freitas

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Department of Physics & Astronomy,
University of Pittsburgh, Pittsburgh, PA 15260, USA
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Michael Ramsey-Musolf

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