

# YANG MA

INFN, Sezione di Bologna  $\diamond$  Via Irnerio 46, 40126 Bologna, Italy

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🌐 <https://yangphy.github.io>

## PROFESSIONAL PREPARATION

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### Ph.D. in Physics

University of Pittsburgh, PA, U.S.A.

August 2022

Advisor: Tao Han

### M.S. in Physics

Chongqing University, Chongqing, China

June 2016

## SKILLS

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**Programming Language:** C/C++, Fortran, Python, Shell script

**Handy Programs:** Mathematica, Matlab, L<sup>A</sup>T<sub>E</sub>X, Excel, Powerpoint, Linux (OS)

**HEP Packages:** MADGRAPH, Pythia, FeynRules, FeynArts, FeynCalc, FormCalc, WHIZARD, ManeParse

## POSITION HELD

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### Postdoctoral Researcher

INFN Bologna, Italy

September 2022 - present

### Graduate Teaching Fellow

Dept. Physics & Astronomy, University of Pittsburgh

May 2022 - July 2022

### Graduate Research Fellow

Dept. Physics & Astronomy, University of Pittsburgh

January 2022 - April 2022

### Arts & Sciences Pre-Doctoral Fellow

Kenneth P. Dietrich School of Arts & Sciences, University of Pittsburgh

September 2020 - December 2021

### Graduate Research Assistant

Dept. Physics & Astronomy, University of Pittsburgh

January 2020 - August 2020

### Graduate Teaching Assistant

Dept. Physics & Astronomy, University of Pittsburgh

September 2016 - January 2020

## AWARDS AND HONORS

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### DPF Student Travel Award

APS Division of Particles and Fields (DPF)

April 2022

### Thomas-Lain Scholarship

Dept. Physics & Astronomy, University of Pittsburgh

April 2021

### FGSA Award for Excellence in Graduate Research

American Physical Society (APS)

February 2021

### Arts & Sciences Graduate Fellowship

Kenneth P. Dietrich School of Arts & Sciences, University of Pittsburgh

September 2020

### Pitt Physics and Astronomy China Initiative (PACI) Scholarship

Dept. Physics & Astronomy, University of Pittsburgh

September 2016

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

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American Physical Society (APS) member	March 2021 - present
Organization of Chinese Physics & Astrophysics (OCPA) member	September 2021 - present
American Association for the Advancement of Science (AAAS) member	September 2021 - present

## PUBLICATIONS IN REFEREED JOURNALS

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1. T. Han, A. K. Leibovich, Y. Ma and X.-Z. Tan, *Higgs boson decay to charmonia via c-quark fragmentation*, *JHEP* **08** (2022) 073 [2202.08273].
2. T. Han, W. Kilian, N. Kreher, Y. Ma, J. Reuter, T. Striegl et al., *Precision Test of the Muon-Higgs Coupling at a High-energy Muon Collider*, *JHEP* **12** (2021) 162 [2108.05362].
3. D. Buarque et al., *Vector Boson Scattering Processes: Status and Prospects*, *Rev. Phys.* **8** (2022) 100071 [2106.01393].
4. T. Han, Y. Ma and K. Xie, *Quark and gluon contents of a lepton at high energies*, *JHEP* **02** (2022) 154 [2103.09844].
5. T. Han, Y. Ma and K. Xie, *High energy leptonic collisions and electroweak parton distribution functions*, *Phys. Rev. D* **103** (2021) L031301 [2007.14300].
6. Z. Sun and Y. Ma, *Inclusive productions of  $\Upsilon(1S, 2S, 3S)$  and  $\chi_b(1P, 2P, 3P)$  via the Higgs boson decay*, *Phys. Rev. D* **100** (2019) 094019 [1909.08548].
7. Z. Sun, X.-G. Wu, Y. Ma and S. J. Brodsky, *Exclusive production of  $J/\psi + \eta_c$  at the B factories Belle and Babar using the principle of maximum conformality*, *Phys. Rev. D* **98** (2018) 094001 [1807.04503].
8. Y. Ma and X.-G. Wu, *Renormalization scheme dependence of high-order perturbative QCD predictions*, *Phys. Rev. D* **97** (2018) 036024 [1707.09886].
9. J.-M. Shen, X.-G. Wu, Y. Ma and S. J. Brodsky, *The Generalized Scheme-Independent Crewther Relation in QCD*, *Phys. Lett. B* **770** (2017) 494 [1611.07249].
10. H.-Y. Bi, X.-G. Wu, Y. Ma, H.-H. Ma, S. J. Brodsky and M. Mojaza, *Degeneracy Relations in QCD and the Equivalence of Two Systematic All-Orders Methods for Setting the Renormalization Scale*, *Phys. Lett. B* **748** (2015) 13 [1505.04958].
11. H.-H. Ma, X.-G. Wu, Y. Ma, S. J. Brodsky and M. Mojaza, *Setting the renormalization scale in perturbative QCD: Comparisons of the principle of maximum conformality with the sequential extended Brodsky-Lepage-Mackenzie approach*, *Phys. Rev. D* **91** (2015) 094028 [1504.01260].
12. Y. Ma, X.-G. Wu, H.-H. Ma and H.-Y. Han, *General Properties on Applying the Principle of Minimum Sensitivity to High-order Perturbative QCD Predictions*, *Phys. Rev. D* **91** (2015) 034006 [1412.8514].
13. H.-B. Fu, X.-G. Wu and Y. Ma,  *$B \rightarrow K^*$  Transition Form Factors and the Semi-leptonic Decay  $B \rightarrow K^* \mu^+ \mu^-$* , *J. Phys. G* **43** (2016) 015002 [1411.6423].
14. H.-B. Fu, X.-G. Wu, H.-Y. Han, Y. Ma and H.-Y. Bi, *The  $\rho$ -meson longitudinal leading-twist distribution amplitude*, *Phys. Lett. B* **738** (2014) 228 [1409.3053].
15. G. Chen, X.-G. Wu, Z. Sun, Y. Ma and H.-B. Fu, *Photoproduction of doubly heavy baryon at the ILC*, *JHEP* **12** (2014) 018 [1408.4615].
16. H.-B. Fu, X.-G. Wu, H.-Y. Han and Y. Ma,  *$B \rightarrow \rho$  transition form factors and the  $\rho$ -meson transverse leading-twist distribution amplitude*, *J. Phys. G* **42** (2015) 055002 [1406.3892].

17. X.-G. Wu, Y. Ma, S.-Q. Wang, H.-B. Fu, H.-H. Ma, S. J. Brodsky et al., *Renormalization Group Invariance and Optimal QCD Renormalization Scale-Setting*, *Rept. Prog. Phys.* **78** (2015) 126201 [[1405.3196](#)].
18. S.-Q. Wang, X.-G. Wu, J.-M. Shen, H.-Y. Han and Y. Ma, *QCD improved electroweak parameter  $\rho$* , *Phys. Rev. D* **89** (2014) 116001 [[1402.0975](#)].
19. Z. Sun, X.-G. Wu, G. Chen, Y. Ma, H.-H. Ma and H.-Y. Bi, *Bottomonium production associated with a photon at a high luminosity  $e^+e^-$  collider with the one-loop QCD correction*, *Phys. Rev. D* **89** (2014) 074035 [[1401.2735](#)].
20. H.-B. Fu, X.-G. Wu, H.-Y. Han, Y. Ma and T. Zhong,  *$|V_{cb}|$  from the semileptonic decay  $B \rightarrow D\ell\bar{\nu}_\ell$  and the properties of the  $D$  meson distribution amplitude*, *Nucl. Phys. B* **884** (2014) 172 [[1309.5723](#)].

## OTHER PUBLICATIONS

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1. T. Han, Y. Ma and K. Xie, *Electroweak fragmentation at high energies: A Snowmass White Paper*, in *2022 Snowmass Summer Study*, 3, 2022, [2203.11129](#).
2. J. M. Campbell et al., *Event Generators for High-Energy Physics Experiments*, in *2022 Snowmass Summer Study*, 3, 2022, [2203.11110](#).
3. I. Adachi et al., *The International Linear Collider: Report to Snowmass 2021*, in *2022 Snowmass Summer Study*, 3, 2022, [2203.07622](#).
4. J. De Blas et al., *The physics case of a 3 TeV muon collider stage*, in *2022 Snowmass Summer Study*, 3, 2022, [2203.07261](#).
5. C. Aimè et al., *Muon Collider Physics Summary*, in *2022 Snowmass Summer Study*, 3, 2022, [2203.07256](#).

## SEMINARS AND COLLOQUIUM

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|---|----------------|
| 1. <i>The partonic picture and the SM expectation of high-energy lepton colliders</i><br>HEP Seminar, University of Notre Dame        | September 2022 |
| 2. <i>The partonic picture and the SM expectation of high-energy lepton colliders</i><br>HEP Seminar, University of Wisconsin-Madison | September 2022 |
| 3. <i>The partonic picture and the SM expectation of high-energy lepton colliders</i><br>HEP Special Seminar, University of Michigan  | September 2022 |
| 4. <i>The partonic picture and the SM expectation of high-energy lepton colliders</i><br>HEP Seminar, Northwestern University         | September 2022 |
| 5. <i>Higgs decay to charmonia and the charm-quark Yukawa coupling</i><br>HEP Seminar, Michigan State University                      | September 2022 |
| 6. <i>Higgs decay to charmonia and the charm-quark Yukawa coupling</i><br>HEP Seminar, Washington University in St. Louis             | August 2022    |
| 7. <i>The partonic picture and the SM expectation of high-energy lepton colliders</i><br>HEP Seminar, University of Minnesota         | August 2022    |
| 8. <i>Higgs decay to <math>J/\psi</math> via <math>c</math>-quark fragmentation</i><br>(Remote) Nuclear Physics Seminar, UCLA         | May 2022       |
| 9. <i>Higgs decay to charmonia and the charm quark Yukawa</i><br>PITT PACC Group Seminar, University of Pittsburgh                    | March 2022     |

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| 10. <i>Multi-boson production and the muon Yukawa coupling</i><br>(Remote) HEP Journal Club, University of Utah                             | October 2021   |
| 11. <i>Multi-boson production and the muon Yukawa coupling</i><br>PITT PACC Group Seminar, University of Pittsburgh                         | September 2021 |
| 12. <i>Parton contents of a lepton at high energies</i><br>(Remote) Particle Theory Seminar, Carleton University                            | May 2021       |
| 13. <i>The partonic picture at high-energy lepton colliders</i><br>(Remote) SLAC EPP Theory Seminar, SLAC                                   | April 2021     |
| 14. <i>The partonic picture at high-energy lepton colliders</i><br>(Remote) Particle Theory Seminar, Shandong University                    | April 2021     |
| 15. <i>Parton contents of a lepton at high energies</i><br>(Remote) HEP Seminar, Oklahoma State University                                  | April 2021     |
| 16. <i>QCD jet production at high energy lepton colliders</i><br>(Remote) PITT PACC Group Seminar, University of Pittsburgh                 | March 2021     |
| 17. <i>High energy lepton collisions and electroweak PDFs</i><br>(Remote) Particle Theory Seminar, Carleton University                      | October 2020   |
| 18. <i>High energy lepton collisions and electroweak PDFs</i><br>(Remote) PITT PACC Group Seminar, University of Pittsburgh                 | September 2020 |
| 19. <i>How much do we need polarized PDFs?</i><br>PITT PACC Group Seminar, University of Pittsburgh   | October 2019   |
| 20. <i>Renormalization scheme uncertainties in high order perturbative QCD results</i><br>PITT PACC Group Seminar, University of Pittsburgh | March 2019     |

## CONFERENCE AND WORKSHOP TALKS

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|---|----------------|
| 1. <i>EW and QCD physics at the muon collider</i><br>Parallel talk at Muon Collider Collaboration Meeting 2022, CERN  | October 2022   |
| 2. <i>Higgs decay to charmonia via c-quark fragmentation</i><br>Invited plenary talk at QWG 2022, GSI Darmstadt   | September 2022 |
| 3. <i>Higgs decay to charmonia and the charm-quark Yukawa coupling</i><br>(Remote) Invited talk at the SYSU-PKU Collider Physics forum For Young Scientists | September 2022 |
| 4. <i>Higgs decay to <math>J/\psi</math> via c-quark fragmentation</i><br>(Remote) Parallel talk at ICHEP 2022, Bologna                                     | July 2022      |
| 5. <i>Higgs decay to <math>J/\psi</math> via c-quark fragmentation</i><br>Parallel talk at Pheno 2022, University of Pittsburgh                             | May 2022       |
| 6. <i>Multi-boson production and the muon Yukawa coupling</i><br>Contributed talk at APS April Meeting 2022, New York                                       | April 2022     |
| 7. <i>Multi-boson production and the muon Yukawa coupling</i><br>PIKIMO 11, University of Pittsburgh  | December 2021  |
| 8. <i>Electroweak parton distributions and fragmentations for high-energy lepton colliders</i><br>(Remote) Snowmass EF04 Topical Group Community Meeting    | October 2021   |

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| 9. <i>Higgs boson decay to <math>J/\psi</math> via <math>c</math>-quark fragmentation</i><br>(Remote) Parallel talk at Higgs 2021 Conference, Stony Brook University | October 2021   |
| 10. <i>The partonic picture at high-energy lepton colliders</i><br>(Remote) Parallel talk at SUSY 2021, Shanghai   | August 2021    |
| 11. <i>QCD jet production at a high energy muon collider</i><br>(Remote) Parallel talk at EPS-HEP 2021, DESY   | July 2021      |
| 12. <i>Quark and gluon contents of a lepton at high energies</i><br>(Remote) Parallel talk at the DPF meeting, Florida State University                              | July 2021      |
| 13. <i>Quark and gluon contents of a lepton at high energies</i><br>(Remote) Parallel talk at Pheno 2021, University of Pittsburgh                                   | May 2021       |
| 14. <i>The partonic picture at high-energy lepton colliders</i><br>(Remote) Parallel talk at PPC 2021, University of Oklahoma  | May 2021       |
| 15. <i>Electroweak parton distribution functions at a high-energy muon collider</i><br>(Remote) Contributed talk at APS April Meeting 2021                           | April 2021     |
| 16. <i>QCD jet production at a high energy muon collider</i><br>(Remote) Talk at Muon Collider Physics and Simulation Meeting, CERN                                  | March 2021     |
| 17. <i>The electroweak parton distribution functions - Necessity and application</i><br>(Remote) Student talk at Theoretical Advanced Study Institute (TASI 2020)    | June 2020      |
| 18. <i>The electroweak parton distribution functions</i><br>(Remote) Parallel talk at Pheno 2020, University of Pittsburgh   | May 2020       |
| 19. <i>QCD Scale-setting problem in Future Chinese Collider physics</i><br>Parallel talk at CEPC-SppC Study Group Meeting, IHEP, Beijing                             | September 2015 |

## CONFERENCES AND WORKSHOPS ATTENDED

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| 1. Muon Collider Collaboration Meeting 2022, CERN  | October 2022   |
| 2. The 15th International Workshop on Heavy Quarkonium (QWG 2022)<br>GSI Darmstadt   | September 2022 |
| 3. Snowmass Community Summer Study Workshop (Snowmass 2022), Seattle   | July 2022      |
| 4. XLI International Conference on High Energy Physics (ICHEP 2022), Bologna   | July 2022      |
| 5. LoopFest XX, University of Pittsburgh   | May 2022       |
| 6. Phenomenology Symposium 2022 (Pheno 2022)<br>University of Pittsburgh   | May 2022       |
| 7. APS April Meeting 2022, New York  | April 2022     |
| 8. PIKIMO 11, University of Pittsburgh (hybrid)  | December 2021  |
| 9. Higgs 2021<br>Stony Brook University & Brookhaven National Laboratory (remote)  | October 2021   |
| 10. The XXVIII International Conference on Supersymmetry and Unification of<br>Fundamental Interactions (SUSY 2021), Shanghai (remote) | August 2021    |
| 11. European Physical Society Conference on High Energy Physics 2021 (EPS-HEP 2021)<br>DESY (remote)                                   | July 2021      |

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| 12. 2021 Meeting of the Division of Particles and Fields of the APS (DPF21)<br>Florida State University (remote)                         | July 2021      |
| 13. Phenomenology Symposium 2021 (Pheno 2021)<br>University of Pittsburgh (remote)   | May 2021       |
| 14. XIV International Workshop on Interconnections between Particle Physics<br>and Cosmology (PPC 2021), University of Oklahoma (remote) | May 2021       |
| 15. APS April Meeting 2021 (remote)  | April 2021     |
| 16. Muon Collider Physics and Simulation Meeting (remote)  | March 2021     |
| 17. PITT PACC Workshop: Muon collider physics<br>University of Pittsburgh (remote)   | November 2020  |
| 18. Phenomenology Symposium 2020 (Pheno 2020)<br>University of Pittsburgh (remote)   | May 2020       |
| 19. Phenomenology Symposium 2020 (Pheno 2019)<br>University of Pittsburgh  | May 2019       |
| 20. PITT PACC Workshop: BSM circa 2020<br>University of Pittsburgh   | March 2019     |
| 21. Phenomenology Symposium 2020 (Pheno 2018)<br>University of Pittsburgh  | May 2018       |
| 22. Phenomenology Symposium 2020 (Pheno 2017)<br>University of Pittsburgh  | May 2017       |
| 23. The CEPC-SppC Study Group Meeting<br>Institute of High Energy Physics (IHEP), Beijing  | September 2015 |

## SUMMER SCHOOLS ATTENDED

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| 1. <b>CTEQ 2022</b> , University of Pittsburgh<br><i>CTEQ School on QCD and Electroweak Phenomenology</i>             | July 2022   |
| 2. <b>SSI 2021</b> , SLAC<br><i>49th SLAC SUMMER INSTITUTE: The Higgs State Fair</i>                                  | August 2021 |
| 3. <b>HCPSS 2020</b> , Fermilab<br><i>15th annual Fermilab-CERN Hadron Collider Physics Summer School</i>             | August 2020 |
| 4. <b>TASI 2020</b> , University of Colorado Boulder<br><i>The Obscure Universe: Neutrinos and Other Dark Matters</i> | June 2020   |
| 5. <b>CTEQ 2019</b> , University of Pittsburgh<br><i>CTEQ School on QCD and Electroweak Phenomenology</i>             | July 2019   |
| 6. <b>CTEQ 2017</b> , University of Pittsburgh<br><i>CTEQ School on QCD and Electroweak Phenomenology</i>             | July 2017   |

## REFeree SERVICE

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- The European Physical Journal C (EPJ C)  $\times 1$
- Journal of Physics Communications (J. Phys. Commun.)  $\times 1$

## TEACHING EXPERIENCE

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## Graduate Teaching Fellow (instructor) at the University of Pittsburgh

- PHYS 0174 - *Basic Physics, Science and Engineering 1*, Summer 2022  
Covers Mechanics and Wave

## Graduate Teaching Assistant at the University of Pittsburgh

- PHYS 0219 - *Basic Laboratory Physics for Science and Engineering*  
Fall 2016, Spring 2017, and Fall 2018
- PHYS 0212 - *Introduction to Laboratory Physics*  
Fall 2017, Spring 2018, and Summer 2018
- PHYS 0110 - *Introduction to Physics 1*, Summer 2018  
Covers Mechanics, Heat and Thermodynamics, and Waves
- PHYS 0111 - *Introduction to Physics 2*, Summer 2017  
Covers Thermodynamics, Electromagnetism, Optics, Special Relativity, and Quantum Physics
- PHYS 0175 - *Basic Physics, Science and Engineering 2*, Spring 2019 and Summer 2021  
Covers Electromagnetism, Elementary Quantum Mechanics, and Atomic Structure

## Graduate Teaching Assistant at Chongqing University

- College Physics I - *Classical Mechanics and Electromagnetism*, Spring 2014
- College Physics II - *Thermodynamics, Optics and Special Relativity*, Fall 2013

## MENTORING EXPERIENCE

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- Dept. Physics & Astronomy Graduate Student Mentor August 2021 - May 2022  
Mentor three first year graduate students
- Assist to guide one visiting graduate student (*Xiaoze Tan*) December 2019 - December 2020  
(*JHEP* **08** (2022) 073 [[2202.08273](#)])
- Assist to guide one visiting undergraduate student June 2019 - August 2019