Yao-Yuan Mao

Curriculum Vitae

Department of Physics and Astronomy & PITT PACC
University of Pittsburgh
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POSITIONS

University of Pittsburgh, August 2016–
Samuel P. Langley Postdoctoral Fellow, PITT PACC

EDUCATION

Stanford University
Ph.D. Physics, June 2016
Thesis: "Modeling the distribution of dark matter and its connection to galaxies"
Thesis advisor: Risa H. Wechsler

National Taiwan University
B.S. Physics, minor in Atmospheric Sciences, June 2009

AWARDS

2016 Samuel P. Langley PITT PACC Postdoctoral Fellowship

2013 Paul Giddings Fellow, Kavli Institute for Particle Astrophysics and Cosmology

2012 Weiland Family Stanford Graduate Fellow, Stanford University

RESEARCH INTERESTS

Cosmology and theoretical astrophysics:
dark matter, N-body simulations, large-scale structures, dark substructures,
galaxy formation physics, the galaxy–halo connection, dwarf galaxies

PUBLICATIONS

22 refereed papers, with 500+ total citations from 400+ citing papers and h-index = 13.

2017 [34] J. L. Tinker, C. Hahn, Y.-Y. Mao, A. R. Wetzel, "Halo Histories vs. Galaxy Properties at $z = 0$, III: The Properties of Star-Forming Galaxies," arXiv:1705.08458

[33] M. Geha, R. H. Wechsler, Y.-Y. Mao *et al.*, "The SAGA Survey: I. Satellite Galaxy Populations Around Eight Milky Way Analogs," arXiv:1705.06743

[32] D. Campbell, F. C. van den Bosch, N. Padmanabhan, Y.-Y. Mao *et al.*, "The Galaxy Clustering Crisis in Abundance Matching," arXiv:1705.06347

[31] J. U. Lange *et al.*, "Brightest galaxies as halo centre tracers in SDSS DR7," arXiv:1705.05043

[30] A. S. Villarreal, A. R. Zentner, Y.-Y. Mao *et al.*, "The Immitigable Nature of Assembly Bias: The Impact of Halo Definition on Assembly Bias," arXiv:1705.04327

[29] Y.-Y. Mao, A. R. Zentner and R. H. Wechsler, "Beyond Assembly Bias: Exploring Secondary Halo Biases for Cluster-size Haloes," arXiv:1705.03888

[28] Y. Lu, A. Benson, A. Wetzel, Y.-Y. Mao *et al.*, "The importance of preventive feedback: inference from observations of the stellar masses and metallicities of Milky Way dwarf galaxies," arXiv:1703.07467

[27] A. Tenneti, Y.-Y. Mao *et al.*, "The Radial Acceleration Relation in Disk Galaxies in the MassiveBlack-II Simulation," arXiv:1703.05287

[26] J. L. Tinker, C. Hahn, Y.-Y. Mao, A. R. Wetzel and C. Conroy, "Halo Histories vs. Galaxy Properties at $z = 0$ II: Large-Scale Galactic Conformity," arXiv:1702.01121

[25] B. V. Lehmann, Y.-Y. Mao, M. R. Becker, S. W. Skillman and R. H. Wechsler, "The Concentration Dependence of the Galaxy-Halo Connection: Modeling Assembly Bias with Abundance Matching," ApJ, 834, 37

2016 [24] H. Desmond, Y.-Y. Mao, R. Wechsler, R. Crain and J. Schaye, "On the galaxy–halo connection in the EAGLE simulation," to appear in MNRAS, arXiv:1612.01029

[23] A. Drlica-Wagner *et al.*, "An Ultra-Faint Galaxy Candidate Discovered in Early Data from the Magellanic Satellites Survey," ApJL, 833, L5

[22] Y. Lu, A. Benson, Y.-Y. Mao *et al.*, "The connection between the host halo and the satellite galaxies of the Milky Way," ApJ, 830, 59

[21] J. Tinker, A. Wetzel, C. Conroy and Y.-Y. Mao, "Halo Histories vs. Galaxy Properties at $z = 0$, I: The Quenching of Star Formation," arXiv:1609.03388

[20] Y. Wang *et al.*, "Sussing Merger Trees: Stability and Convergence," MNRAS, 459, 1554

[19] A. P. Hearin *et al.*, "High-Precision Forward Modeling of Large-Scale Structure: An open-source approach with Halotools," arXiv:1606.04106

[18] Y. D. Hezaveh, N. Dalal, D. P. Marrone, Y.-Y. Mao *et al.*, "Detection of lensing substructure using ALMA observations of the dusty galaxy SDP.81," ApJ, 823, 37

[17] A. J. Deason, Y.-Y. Mao and R. H. Wechsler, "The Eating Habits of Milky Way Mass Halos: Destroyed Dwarf Satellites and the Metallicity Distribution of Accreted Stars," ApJ, 821, 5

2015 [16] P. Behroozi *et al.*, "Major Mergers Going Notts: Challenges for Modern Halo Finders," MNRAS, 454, 3020

[15] A. Drlica-Wagner *et al.* (The DES Collaboration), "Eight Ultra-faint Galaxy Candidates Discovered in Year Two of the Dark Energy Survey," ApJ, 813, 109

[14] Y.-Y. Mao, M. Williamson and R. H. Wechsler, "The Dependence of Subhalo Abundance on Halo Concentration," ApJ, 810, 21

[13] P. A. Thomas *et al.*, "Sussing Merger Trees: A proposed Merger Tree data format," arXiv:1508.05388

2014 [12] J. Lee *et al.*, "Sussing Merger Trees: The Impact of Halo Merger Trees on Galaxy Properties in a Semi-Analytic Model," MNRAS, 445, 4197

[11] S. Avila *et al.*, "Sussing Merger Trees: the influence of the halo finder," MNRAS, 441, 3488

[10] Y.-Y. Mao, L. E. Strigari and R. H. Wechsler, "Connecting Direct Dark Matter Detection Experiments to Cosmologically Motivated Halo Models," PhRvD, 89, 063513

2013 [9] C. Srisawat *et al.*, "Sussing Merger Trees: The Merger Trees Comparison Project," MNRAS, 436, 150

[8] H.-Y. Wu, O. Hahn, R. H. Wechsler, P. S. Behroozi and Y.-Y. Mao, "Rhapsody: II. Subhalo Properties and the Impact of Tidal Stripping From a Statistical Sample of Cluster-Size Halos," ApJ, 767, 23

[7] Y.-Y. Mao, L. E. Strigari, R. H. Wechsler, H.-Y. Wu and O. Hahn, "Halo-to-Halo Similarity and Scatter in the Velocity Distribution of Dark Matter," ApJ, 764, 35

[6] H.-Y. Wu, O. Hahn, R. H. Wechsler, Y.-Y. Mao and P. S. Behroozi, "Rhapsody: I. Structural Properties and Formation History From a Statistical Sample of Re-simulated Cluster-size Halos," ApJ, 763, 70

2012 [5] T.-W. Chiu, T.-H. Hsieh and Y.-Y. Mao, "Pseudoscalar Meson in Two Flavors QCD with the Optimal Domain-Wall Fermion," PhLB, 717, 420

2011 [4] T.-W. Chiu, T.-H. Hsieh and Y.-Y. Mao, "Topological Susceptibility in Two Flavors Lattice QCD with the Optimal Domain-Wall Fermion," PhLB, 702, 131

2010 [3] W.-S. Hou, Y.-Y. Mao and C.-H. Shen, "Leading Effect of CP Violation with Four Generations," PhRvD, 82, 036005

2009 [2] Y.-Y. Mao and T.-W. Chiu, "Topological Susceptibility to the One-Loop Order in Chiral Perturbation Theory," PhRvD, 80, 034502

[1] C.-F. Lee, Y.-Y. Mao and B. Reipurth, "Infall and rotation motions in the HH 111 protostellar system: A flattened envelope in transition to a disk?" ApJ, 694, 1395

(Please visit https://yymao.github.io/ads to see an up-to-date list.)

PRESENTATIONS AND CONFERENCES

(§invited presentations; *contributed presentations; †poster presentations; $^{\diamond}$organizing committee)

2017 §LSST DESC Collaboration Meeting, Stony Brook U. & BNL, Jul 10–14

*DESI Collaboration Meeting, LBNL, Jun 19–23

§Quantifying and Understanding the Galaxy–Halo Connection, KITP, May 15–19

*LSST DESC Hack Week, Fermilab, Apr 3–7

*LSST DESC Collaboration Meeting, SLAC, Feb 13–17

2016 DESI Collaboration Workshop, OSU, Dec 7–9

$^{\diamond}$LSST DESC Hack Week, CMU, Nov 7–11

§Statistical Challenges in Modern Astronomy VI, CMU, Jun 6-10

*DES Collaboration Meeting, SLAC, May 9–13

*Special Seminar, Academia Sinica Institute of Astronomy and Astrophysics, Mar 24

*SnowPAC 2016: The Galaxy–Halo Connection, Mar 13–18

*LSST DESC Collaboration Meeting, SLAC, Mar 7–11

*KIPAC Tea Talk, Feb 9

*Essential Cosmology for the Next Generation 2016, Jan 10–16

2015 *Large Scale Seminar, The Institute for Theory and Computation, Harvard–Smithsonian Center for Astrophysics, Nov 17

*Brown Bag Lunch, Kavli Institute for Astrophysics and Space Research, Massachusetts Institute of Technology, Nov 16

*Galaxy Lunch, Yale University, Oct 28

*Informal Astro Seminar, New York University, Oct 23

*Astronomy Seminar, Columbia University, Oct 22

*Cosmology Seminar, University of California, Berkeley, Oct 13

†(re)Solving Galaxies in the Era of Extremely Large Telescopes, GMT Community Science Meeting, Pacific Grove, CA, Oct 1–3

*Santa Cruz Galaxy Workshop, University of California, Santa Curz, Aug 20

†Local Group Astrostatistics, MIRA, University of Michigan, Ann Arbor, Jun 1–4

§Mitchell Workshop, Taxes A&M University, May 21

*The Life and Death of Satellite Galaxies Workshop, Lorentz Center, Apr 30

2014 *CCAPP Workshop, Ohio State University, Nov 25

†Potsdam Thinkshop: Satellite galaxies and dwarfs in the local group, Leibniz-Institut für Astrophysik Potsdam, Aug 25–29

2013 *Lunch Talk, Academia Sinica Institute of Astronomy and Astrophysics, Dec 2

*KIPAC @ 10, Sep 4

Santa Cruz Galaxy Workshop, University of California, Santa Curz, Aug 12–16

*Sussing Merger Trees, West Sussex, UK, Jul 8–13

§SCIPP Seminar, University of California, Santa Curz, Jun 11

*Hunting for Dark Matter, Kavli Institute for Theoretical Physics, May 13–Jun 7

Closing in on Dark Matter, Aspen Center for Physics, Jan 28–Feb 3

Jerusalem Winter School in Theoretical Physics: Early Galaxy Formation in LCDM Cosmology, Israel Institute for Advanced Studies, Dec 31–Jan 10

2012 Sackler Colloquia: Dark Matter Universe: On the Threshold of Discovery, Irvine, CA, Oct 18–20

Santa Cruz Galaxy Workshop, University of California, Santa Curz, Aug 13–17

International Summer School on AstroComputing: AstroInformatics, University of California High-Performance AstroComputing Center, Jul 9–20

*KIPAC Tea Talk, Mar 20

SCIENTIFIC COLLABORATIONS

Full Member, LSST Dark Energy Science Collaboration (LSST-DESC), 2017–present

Member, Dark Energy Spectroscopic Instrument (DESI), 2016–present

Member, LSST Dark Energy Science Collaboration (LSST-DESC), 2015–present

Participant, Dark Energy Survey (DES), 2015–2016

Member, Satellites Around Galactic Analogs Survey (SAGA), 2013–present

COMMUNITY SERVICE

Referee, The Astrophysical Journal

Referee, Monthly Notices of the Royal Astronomical Society

DEPARTMENTAL SERVICE

Organizer and lecturer, Computing Boot Camp, Kavli Institute for Particle Astrophysics and Cosmology, 2015

Intellectual Life Committee, Kavli Institute for Particle Astrophysics and Cosmology, 2015–2016

TEACHING EXPERIENCE

Stanford University

Head Teaching Assistant, Electricity and Optics, Winter 2013
Teaching Assistant, Computational Physics, Fall 2012
Teaching Assistant, Electricity and Optics, Winter 2011
Teacher, Stanford ESP Splash! Program, 2010–2014

MEDIA COVERAGE

2016 AAS NOVA
featuring our analysis of the destroyed satellites using the zoom-in simulations of Milky Way-size halos

Stanford News, APOD *etc.*
mentioning the discovery of a dark substructure with ALMA strong lensing

2015 Fermilab, SLAC Today, *etc.*
mentioning the new dwarf galaxy candidates discovered by the Dark Energy Survey

2013 SLAC Today, NewScientist, *etc.*
mentioning our work on the velocity distribution of dark matter in the Milky Way

2012 Symmetry Magazine
mentioning our work on the "Rhapsody" zoom-in simulations of cluster-size halos