Lau, Marie Wingyee

Personal and Contact Info

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Research Interests

Quasars, circumgalactic medium, massive galaxies, satellite galaxies, stellar abundances

Academic Appointments and Education

University of California, Riverside, Fall 2019–present

- Postdoctoral Scholar, supervised by Prof. Fred Hamann

University of California, Santa Cruz, Winter 2018–Summer 2019

- Postdoctoral Scholar, supervised by Prof. Piero Madau and Prof. Alexie Leauthaud

University of California, Santa Cruz, Fall 2012–Fall 2017

- Ph.D. in Astronomy 2017, advisor: Prof. J. Xavier Prochaska
- M.S. 2015

The Chinese University of Hong Kong, Fall 2008–Spring 2012

- B.S. Physics, with honors
- Exchange programs with University of California, Santa Barbara, and Berkeley

Grants, Honors and Awards

- Hubble Space Telescope Cycle-25, title: Observing AGN Feedback Down-the-Barrel Using Associated Absorbers at $z \lesssim 1.5$, ID: 15034, $132,631, Space Telescope Science Institute, 2017
- Graduate Student Association Travel Grant, UC Santa Cruz, 2017
- NEXSI Fellowship, UC Santa Cruz, 2012
- Regents' Fellowship, UC Santa Cruz, 2012
- Student speech representative at scholarship presentation ceremony, The Chinese University of Hong Kong, 2012
- Nine scholarships totaling the full tuition for academic excellence and international exchanges, The Chinese University of Hong Kong, 2008–2012
- Summer Undergraduate Research Fellowship, California Institute of Technology, 2011

Telescope Proposals and Observing Experience

- Keck Observatory Keck II/KCWI: *Mapping the Extended Infall/Outflow Gas Around Extremely Red Quasars*, co-Investigator, 1.5 nights in 2019A, 2018B
- Lick Observatory Shane/Kast: *A Potentially Transformative Approach to Cluster Cosmology*, Principal Investigator, 22 nights in 2018B, 2018A, 2017A
- Lick Observatory Shane/Kast: *Nature of Mid-infrared Flares in Nearby Galaxies: Tidal Disruption Events or Turn-on AGN?*, co-Investigator, 4 nights in 2018A
- Lick Observatory Shane/Kast: *Late-time Optical Spectral Signatures of Tidal Disruption Candidates*, Principal Investigator, 22 nights in 2017A, 2016A, 2015A
- Lick Observatory Shane/Kast: *To Explore Emission Lines on Large Spatial Scales of Red Galaxies Hosting Intermediate-mass Black Holes*, co-Investigator, 6 nights in 2017A

- Lick Observatory Shane/Kast: *The* HI *Gas of* 2175 Å *Absorbers*, co-Investigator, 20 nights in 2015B, 2015A, 2014B, 2014A
- Keck Observatory Keck I/LRIS: *Resolving the Small-scale Structure of the Circumgalactic Medium*, co-Investigator, 9 nights in 2017A, 2015B, 2015A, 2014B
- Keck Observatory Keck II/ESI: *Circumgalactic Medium Studies at* $z \sim 2$ *with Close Quasar Pairs*, co-Investigator, 4 nights in 2014B, 2014A, 2013B
- Keck Observatory Keck II/ESI, 4 nights; Keck II/KCWI, 0.5 night, observer
- Lick Observatory Shane/Kast, 60 nights; ShaneAO/ShARCS, 2 nights, observer
- Large Binocular Telescope Observatory/LUCI, 2 nights, observer
- Palomar Observatory 200-inch Hale/Cosmic Web Imager, 2 nights, observer

Contributed Talks

- 15 seminars at research institutions.
- 11 presentations at conferences in USA, Chile, France, and Germany.

Professional Service

- Referee for The Astrophysical Journal, and the Monthly Notices of the Royal Astronomical Society, 2015–present
- Member of Thirty Meter Telescope International Science Development Team, 2018–present
- Judge for Chamberliss Student Poster Competition of American Astronomical Society, 2018
- Proposal reviewer for Hubble Space Telescope Cycle 25 Mid-cycle, 2017–2018
- Co-organizer of colloquium and prospective student visit, UC Santa Cruz, 2017, 2015
- Vice-president of a sub-Society of Physics Students, The Chinese University of Hong Kong, 2009–2011
- United College Student Union sub-Committee, The Chinese University of Hong Kong, 2009–2011

Teaching, Mentoring and Outreach

- Mentor for a senior thesis under the STEM Diversity Program LAMAT, UC Santa Cruz, 2017–present
- Mentor for three high school interns under the Science Internship Program, UC Santa Cruz, 2017, 2016
- Mentor for the Siemens Competition in Math, Science & Technology, 2017, 2016
- Teaching Assistant for the California State Summer School for Mathematics and Science (COSMOS), 2017, 2016
- Teaching Assistant for ASTR/PHYS 9B: Introduction to Research in Physics and Astrophysics, UC Santa Cruz, Spring 2017
- Teaching Assistant for ASTR 2: Overview of the Universe, UC Santa Cruz, Winter 2017, Fall 2016, Spring 2016, Winter 2016, Fall 2015
- On-call for Ask-An-Astronomer, UC Santa Cruz, 2014–2016
- Teaching Assistant for ASTR 6: The Space-Age Solar System, UC Santa Cruz, Winter 2015
- Teaching Assistant for ASTR 1: Introduction to the Cosmos, UC Santa Cruz, Fall 2012
- Private tutor for high school students in English and Mathematics, 2003–2008

Research Experiences Outside of Astronomy

- Climate change sensitivity evaluation from spaceborne instrument measurements
- Determining cloud base and thickness from spaceborne imaging and lidar profiling
- Study on the occurence of high winds and gusts during Northeast monsoon in Hong Kong
- Mechanical vibration of thin plates (senior thesis)

Publications

- Findlay, J. R., Prochaska, J. X., Hennawi, J. F., Fumagalli, M., Myers, A. D., Bartle, S., Chehade, B., DiPompeo, M. A., Shanks, T., **Lau, M. W.**, & Rubin, K. H. R. *Quasars Probing Quasars. X. The Quasar Pair Spectral Database*, The Astrophysical Journal Supplement Series, Volume 236, Issue 2, article id. 44 (2018)
- **Lau, M. W.**, Prochaska, J. X., & Hennawi, J. F., *Quasars Probing Quasars. IX. The Kinematics Of the Circumgalactic Medium Surrounding $z \sim 2$ Quasars*, The Astrophysical Journal, Volume 857, Issue 2, article id. 126 (2018)
- Boyajian, T., et al. including **Lau, M. W.**, *The First Post-Kepler Brightness Dips of KIC 8462852*, The Astrophysical Journal Letters, Volume 853, Issue 1, article id. L8 (2018)
- Bose, S., & Dong, S., et al. including **Lau, M. W.**, *Gaia17biu/SN 2017egm in NGC 3191: The Closest Hydrogen-poor Superluminous Supernova to Date Is in a "Normal", Massive, Metal-rich Spiral Galaxy*, The Astrophysical Journal, Volume 853, Issue 1, article id. 57 (2018)
- Mathur, S., et al. including **Lau, M. W.**, *Space Telescope and Optical Reverberation Mapping Project. VII. Understanding the UV anomaly in NGC 5548 with X-Ray Spectroscopy*, The Astrophysical Journal, Volume 846, Issue 1, article id. 55 (2017)
- Pei, L., et al. including **Lau, M. W.**, *Space Telescope and Optical Reverberation Mapping Project. V. Optical Spectroscopic campaign and Emission-line Analysis for NGC 5548*, The Astrophysical Journal, Volume 837, Issue 2, article id. 131 (2017)
- **Lau, M. W.**, Prochaska, J. X., & Hennawi, J. F., *Quasars Probing Quasars. VIII. The Physical Properties of the Cool Circumgalactic Medium Surrounding $z \sim 2$–3 Massive Galaxies Hosting Quasars*, The Astrophysical Journal Supplement Series, Volume 226, Issue 2, article id. 25 (2016)
- Cai, Z., Fan, X., Peirani, S., Bian, F., Frye, B., McGreer, I., Prochaska, J. X., **Lau, M. W.**, Tejos, N., Ho, S., & Schneider, D. P., *MApping the Most Massive Overdensities Through Hydrogen (MAMMOTH) I: Methodology*, The Astrophysical Journal, Volume 833, Issue 2, article id. 135 (2016)
- Rubin, K. H. R., Hennawi, J. F., Prochaska, J. X., Simcoe, R. A., Myers, A., & **Lau, M. W.**, *Dissecting the Gaseous Halos of $z \sim 2$ Damped Lyα Systems with Close Quasar Pairs*, The Astrophysical Journal, Volume 808, Issue 1, article id. 38 (2015)
- Prochaska, J. X., **Lau, M. W.**, & Hennawi, J. F., *Quasars Probing Quasars. VII. The Pinnacle of the Cool Circumgalactic medium Surrounds Massive $z \sim 2$ Galaxies*, The Astrophysical Journal, Volume 796, Issue 2, article id. 140 (2014)
- Prochaska, J. X., Hennawi, J. F., Lee, K.-G., Cantalupo, S., Bovy, J., Djorgovski, S. G., Ellison, S. L., **Lau, M. W.**, Martin, C. L., Myers, A., Rubin, K. H. R., & Simcoe, R. A., *Quasars Probing Quasars. VI. Excess HI Absorption within One Proper Mpc of $z \sim 2$ Quasars*, The Astrophysical Journal, Volume 776, Issue 2, article id. 136 (2013)
- Jiang, Y., Aumann, H. H, **Lau, M. W.**, & Yung Y. L., *Climate Change Sensitivity Evaluation from AIRS and IRIS measurements*, Proceedings of the SPIE, Volume 8153, id. 81531Z (2011)

Work in Progress

- Lau, M. W., Smith, G. H., Cheng, E., Chen, B., *Surface Abundance Variations in Red Giants in Globular Clusters*
- Sallaberry, G. (advisee), Lau, M. W., Huang, S., Leauthaud, A., *Most Super Massive Galaxies are Central Galaxies*