

Lau, Marie Wingyee

PERSONAL AND CONTACT INFO

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Languages: IDL, Python, Mathematica, English, Chinese
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RESEARCH INTERESTS

Dust obscured quasars, quasar feedback, quasar host galaxy feeding, circumgalactic medium

ACADEMIC APPOINTMENTS AND EDUCATION

University of California, Riverside, Fall 2018–present

- Postdoctoral Scholar, supervised by Prof. Fred Hamann

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

- Interim 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-29, title: Probing Feeding and Feedback in the Circumgalactic Medium of Quasars via Direct Detection of Inflows, ID: 16622, \$178,202, Space Telescope Science Institute, 2021
- Funds for Astronomical Meetings: Outreach to Underrepresented Scientists (FAMOUS) travel grant, American Astronomical Society, 2020
- 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
- Next Generation Telescope Science Institute (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

- Co-Investigator of *Mapping the Extended Infall/Outflow Gas Around Extremely Red Quasars*, awarded 3.5 nights at Keck Observatory Keck II/KCWI
- Co-Investigator of *Extreme Quasar Feedback at the Peak of the Galaxy Formation Epoch*, awarded 7 nights at Keck Observatory Keck I/OSIRIS

- Principal Investigator of *Quasar Feeding and Feedback via Down-the-barrel Inflows*, awarded 4 nights at Lick Observatory Shane/Kast
- Principal Investigator of *A Potentially Transformative Approach to Cluster Cosmology*, awarded 22 nights at Lick Observatory Shane/Kast
- Co-Investigator of *Nature of Mid-infrared Flares in Nearby Galaxies: Tidal Disruption Events or Turn-on AGN?*, awarded 4 nights at Lick Observatory Shane/Kast
- Principal Investigator of *Late-time Optical Spectral Signatures of Tidal Disruption Candidates*, awarded 22 nights at Lick Observatory Shane/Kast
- Co-Investigator of *To Explore Emission Lines on Large Spatial Scales of Red Galaxies Hosting Intermediate-mass Black Holes*, awarded 6 nights at Lick Observatory Shane/Kast
- Co-Investigator of *The HI Gas of 2175 Å Absorbers*, awarded 20 nights at Lick Observatory Shane/Kast
- Co-Investigator of *Resolving the Small-scale Structure of the Circumgalactic Medium*, awarded 9 nights at Keck Observatory Keck I/LRIS
- Co-Investigator of *Circumgalactic Medium Studies at $z \sim 2$ with Close Quasar Pairs*, awarded 4 nights at Keck Observatory Keck II/ESI
- Observer at Keck Observatory Keck I/OSIRIS, served 2.5 nights; Keck II/ESI, served 4 nights; Keck II/KCWI, served 3.5 nights
- Observer at Lick Observatory Shane/Kast, served 60 nights; ShaneAO/ShARCS, served 2 nights
- Observer at Large Binocular Telescope Observatory/LUCI, served 2 nights
- Observer at Palomar Observatory 200-inch Hale/Cosmic Web Imager, served 2 nights

SEMINARS AND CONFERENCES

- Invited to Fundamentals of Gaseous Halos Program, Kavli Institute for Theoretical Physics, 2021
- Invited contribution at Santa Cruz Galaxy Formation Workshop, UC Santa Cruz, 2017
- Invited contribution at Inter[Stellar and Galactic] Medium Program of Studies Winter Writing Workshop, UC Santa Cruz, 2016
- Invited contribution at Intergalactic Matters, Max Planck Institute for Astronomy, 2014
- 16 contributed seminars at research institutions
- 16 contributed presentations at conferences in USA, Chile, and France

PROFESSIONAL SERVICES

- Postdoc liaison/member of the Physics Organization for Womxn and the Under-represented, UC Riverside, 2018–present
- Judge for Chambliss Astronomy Achievement Student Awards of the American Astronomical Society, 2018–present
- Time allocation committee/proposal reviewer for Hubble Space Telescope, 2017–present
- Referee for The Astrophysical Journal, and for the Monthly Notices of the Royal Astronomical Society, 2015–present
- Co-organizer of department colloquia and prospective student visits, 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

- Co-mentor for a graduate thesis, UC Riverside, 2018–present
- Mentor for an undergraduate senior thesis under the STEM Diversity Program Lamat, UC Santa

Cruz, 2017–2019

- Mentor for the Science Internship Program for high school students, 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 (COS-MOS; led high school students on pre-scripted projects), 2017, 2016
- Teaching Assistant for ASTR/PHYS 9B: Introduction to Research in Physics and Astrophysics (organized research project groups and cooperative homework labs), 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 (answered questions from general public), 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, with Prof. Y. L. Yung, at Caltech
- Determining cloud base and thickness from spaceborne imaging and lidar profiling, with Prof. Y. L. Yung, at Caltech/Jet Propulsion Laboratory
- Study on the occurrence of high winds and gusts during Northeast monsoon in Hong Kong, at Hong Kong Observatory
- Mechanical vibration of thin plates (senior thesis), with Prof. Kenneth Young, The Chinese University of Hong Kong

PUBLICATIONS

- **Lau, M. W.**, Hamann, F., Gillette, J., Perrotta, S., Rupke, D. S. N., Wylezalek, D., & Zakamska, N. L., 2022, Probing the Inner Circumgalactic Medium and Quasar Illumination around the Reddest ‘Extremely Red Quasar’ (ERQ), submitted to MNRAS, arXiv:2203.06203
- Fu, H., Xue, R., Prochaska, J. X., Stockton, A., Ponnada, S., **Lau, M. W.**, Cooray, A., & Narayanan, D., 2021, A Long Stream of Metal-Poor Cool Gas Around A Massive Starburst Galaxy at $z=2.67$, *The Astrophysical Journal*, Volume 908, Issue 2, article id. 188
- Horne, K., De Rosa, G., Peterson, B. M., et al. including **Lau, M. W.**, 2021, Space Telescope and Optical Reverberation Mapping Project. IX. Velocity-Delay Maps for Broad Emission Lines in NGC 5548, *The Astrophysical Journal*, Volume 907, Issue 2, id. 76
- Williams, P. R., Pancoast, A., Treu, T., et al. including **Lau, M. W.**, 2020, Space Telescope and Optical Reverberation Mapping Project. XII. Broad-Line Region Modeling of NGC 5548, *The Astrophysical Journal*, Volume 902, Issue 1, article id. 74
- Kriss, G. A., De Rosa, G., Ely, J., et al. including **Lau, M. W.**, 2019, Space Telescope and Optical Reverberation Mapping Project. VIII. Modeling the Ultraviolet Spectrum of the Seyfert 1 Galaxy NGC5548, *The Astrophysical Journal*, Volume 881, Issue 2, article id. 153
- 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., 2018, Quasars Probing Quasars. X. The Quasar Pair Spectral Database, *The Astrophysical Journal Supplement Series*, Volume 236, Issue 2, article id. 44
- **Lau, M. W.**, Prochaska, J. X., & Hennawi, J. F., 2018 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

- Boyajian, T., Alonso, R., Ammerman, A., et al. including **Lau, M. W.**, 2018, The First Post-Kepler Brightness Dips of KIC 8462852, 2018, The Astrophysical Journal Letters, Volume 853, Issue 1, article id. L8
- Bose, S., Dong, S., Pastorello, A., et al. including **Lau, M. W.**, 2018, 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
- Mathur, S., Gupta, A., Page, K., et al. including **Lau, M. W.**, 2017, Space Telescope and Optical Reverberation Mapping Project. VII. Understanding the UV Anomaly in NGC 5548 with X-Ray Spectroscopy, 2017, The Astrophysical Journal, Volume 846, Issue 1, article id. 55
- Prochaska, J. X., **Lau, M. W.**, & Hennawi, J. F., VizieR Online Data Catalog: Circumgalactic medium surrounding $z \sim 2$ quasars (Prochaska+, 2014), VizieR On-line Data Catalog: J/ApJ/796/140. (2017)
- Pei, L., Fausnaugh, M. M., Barth, A. J., et al. including **Lau, M. W.**, 2017, 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
- **Lau, M. W.**, Prochaska, J. X., & Hennawi, J. F., 2016, 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
- 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., 2016, MAPPING the Most Massive Overdensities Through Hydrogen (MAMMOTH) I: Methodology, The Astrophysical Journal, Volume 833, Issue 2, article id. 135
- Rubin, K. H. R., Hennawi, J. F., Prochaska, J. X., Simcoe, R. A., Myers, A., & **Lau, M. W.**, 2015, Dissecting the Gaseous Halos of $z \sim 2$ Damped Ly α Systems with Close Quasar Pairs, The Astrophysical Journal, Volume 808, Issue 1, article id. 38
- Prochaska, J. X., **Lau, M. W.**, & Hennawi, J. F., 2014, 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
- 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., 2013, 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
- Jiang, Y., Aumann, H. H., **Lau, M. W.**, & Yung Y. L., 2011, Climate Change Sensitivity Evaluation from AIRS and IRIS measurements, Proceedings of the SPIE, Volume 8153, id. 81531Z