

## Marie Wingyee Lau

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### PERSONAL AND CONTACT INFO

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Languages: IDL, Python, Mathematica  
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### RESEARCH INTERESTS

Circumgalactic medium, quasars, quasar absorption lines, galaxy formation, stellar abundances, spectroscopy

### ACADEMIC APPOINTMENTS AND EDUCATION

University of California, Santa Cruz, Winter 2018 - Present

- 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, 0.5 night in 2018B
- Lick Observatory Shane/Kast: *A Potentially Transformative Approach to Cluster Cosmology*, Principal Investigator, 12 nights in 2018B, 9 nights in 2018A, 1 night in 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, 6 nights in 2017A, 12 nights in 2016A, 4 nights in 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, 5 nights in 2015B, 5 nights in 2015A, 5 nights in 2014B, 5 nights in 2014A

- Keck Observatory Keck I/LRIS: *Resolving the Small-scale Structure of the Circumgalactic Medium*, co-Investigator, 2 nights in 2015B, 3 nights in 2015A, 2 nights in 2014B
- Keck Observatory Keck II/ESI: *Circumgalactic Medium Studies at  $z \sim 2$  with Close Quasar Pairs*, co-Investigator, 2 nights in 2014B, 1 night in 2014A, 1 night in 2013B
- Lick Observatory Shane/Kast, 60 nights, observer
- Lick Observatory ShaneAO/ShARCS, 2 nights, observer
- Keck Observatory Keck II/ESI, 4 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.
- 9 presentations at conferences in USA, Chile, France, and Germany.

#### PROFESSIONAL SERVICE

- 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 graduate student visit, UC Santa Cruz, 2017, 2015
- Referee for the Monthly Notices of the Royal Astronomical Society, 2015
- Vice-President and Publication of the sub-Society of Physics Students, The Chinese University of Hong Kong, 2009 - 2011
- United College Student Union Supervisory Committee, The Chinese University of Hong Kong, 2009 - 2011

#### TEACHING, MENTORING AND OUTREACH

- Co-mentor for an undergraduate student for measuring satellite fractions of massive galaxies, 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, project titled Surface Compositions of Red Giant Stars in Globular Clusters, 2017, 2016
- Teaching Assistant for 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
- 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 occurrence 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, **51 pp.** (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 Ly $\alpha$  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., Cheng, E., Chen, B., Smith, G. H., *Surface Abundance Variations in Red Giants in Globular Clusters*