Johannes U. Lange

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RESEARCH INTERESTS

Cosmology, Galaxy-Halo Connection, Galaxy Formation, Statistical Methods and Machine Learning

EDUCATION

Yale University 08/2014 – 08/2019
M.Sc., M.Phil, Ph.D. in Astronomy
Thesis Advisor: Frank van den Bosch

Ruprecht-Karls-Universität Heidelberg 09/2012 – 08/2014
Master of Science in Physics

Freie Universität Berlin 10/2009 – 08/2012
Bachelor of Science in Physics

POSITIONS

University of Michigan 09/2022 – 08/2026
Leinweber Center for Theoretical Physics Fellow

Stanford University 09/2021 – 08/2022
Stanford–Santa Cruz Cosmology Postdoctoral Fellow

University of California, Santa Cruz 09/2019 – 08/2021
Stanford–Santa Cruz Cosmology Postdoctoral Fellow

TEACHING

Certificate of College Teaching Preparation, Yale University 2014-2019
The Certificate of College Teaching Preparation (CCTP) is an opportunity for graduate students to engage in a comprehensive training program in effective college teaching. The CCTP includes workshops in effective science teaching, advanced workshops, participation in discussion groups, reflections on teaching and designing a teaching portfolio.

Teaching Fellow, Yale University Spring 2016, Spring 2018
Course: Astrostatistics and Data Mining
Responsibilities: Designed and delivered weekly 45-minutes hands-on coding training for small groups of students. Also graded problem sets and wrote corresponding solutions.

Teaching Fellow, Yale University Fall 2017, Fall 2014
Course: Introduction to Astronomical Observing
Responsibilities: Mentored small student groups during regular astronomical observing labs at Yale Leitner Family Observatory. Also evaluated lab reports submitted by students.

Teaching Fellow, Yale University Fall 2015
Course: Introduction to Cosmology
Responsibilities: Designed and delivered weekly active learning-centered discussion sections for small groups of students. Also graded problem sets and exams.

Teaching Fellow, Yale University Spring 2015
Course: Gravity, Astrophysics, and Cosmology
Responsibilities: Graded homework and mentored students for final project.

FIRST-AUTHOR PUBLICATIONS

[10] **J. U. Lange**, A. P. Hearin, A. Leauthaud, F. C. van den Bosch, H. Guo, and J. DeRose. "Five per cent measurements of the growth rate from simulation-based modelling of redshift-space clustering in BOSS LOWZ". *MNRAS* 509.2 (Jan. 2022), pp. 1779–1804.

[9] **J. U. Lange**, A. Leauthaud, S. Singh, H. Guo, R. Zhou, T. L. Smith, and F.-Y. Cyr-Racine. "On the halo-mass and radial scale dependence of the lensing is low effect". *MNRAS* 502.2 (Apr. 2021), pp. 2074–2086.

[8] **J. U. Lange**, F. C. van den Bosch, A. R. Zentner, K. Wang, A. P. Hearin, and H. Guo. "Cosmological Evidence Modelling: a new simulation-based approach to constrain cosmology on non-linear scales". *MNRAS* 490.2 (Dec. 2019), pp. 1870–1878.

[7] **J. U. Lange**, X. Yang, H. Guo, W. Luo, and F. C. van den Bosch. "New perspectives on the BOSS small-scale lensing discrepancy for the Planck ΛCDM cosmology". *MNRAS* 488.4 (Oct. 2019), pp. 5771–5787.

[6] **J. U. Lange**, F. C. van den Bosch, A. R. Zentner, K. Wang, and A. S. Villarreal. "Updated results on the galaxy-halo connection from satellite kinematics in SDSS". *MNRAS* 487.3 (Aug. 2019), pp. 3112–3129.

[5] **J. U. Lange**, F. C. van den Bosch, A. R. Zentner, K. Wang, and A. S. Villarreal. "Maturing satellite kinematics into a competitive probe of the galaxy-halo connection". *MNRAS* 482.4 (Feb. 2019), pp. 4824–4845.

[4] **J. U. Lange**, F. C. van den Bosch, A. Hearin, D. Campbell, A. R. Zentner, A. S. Villarreal, and Y.-Y. Mao. "Brightest galaxies as halo centre tracers in SDSS DR7". *MNRAS* 473.2 (Jan. 2018), pp. 2830–2851.

[3] **J. U. Lange**, P. G. van Dokkum, I. G. Momcheva, E. J. Nelson, J. Leja, G. Brammer, K. E. Whitaker, and M. Franx. "Evidence for Non-stellar Rest-frame Near-IR Emission Associated with Increased Star Formation in Galaxies at z ~1". *ApJL* 819.1, L4 (Mar. 2016).

[2] **J. U. Lange** and M. .-. Chu. "Can galactic dark matter substructure contribute to the cosmic gamma-ray anisotropy?" *MNRAS* 447.1 (Feb. 2015), pp. 939–947.

[1] **J. Lange** and M. Pohl. "The average GeV-band emission from gamma-ray bursts". *A&A* 551, A89 (Mar. 2013).

CO-AUTHOR PUBLICATIONS

[15] B. Abareshi et al. "Overview of the Instrumentation for the Dark Energy Spectroscopic Instrument". *arXiv e-prints*, arXiv:2205.10939 (May 2022).

[14] K. Dawson, A. Hearin, K. Heitmann, M. Ishak, **J. Ulf Lange**, M. White, and R. Zhou. "Snowmass2021 Cosmic Frontier White Paper: High Density Galaxy Clustering in the Regime of Cosmic Acceleration". *arXiv e-prints*, arXiv:2203.07291 (Mar. 2022).

[13] R. Ruggeri et al. "A data compression and optimal galaxy weights scheme for Dark Energy Spectroscopic Instrument and weak lensing datasets". *arXiv e-prints*, arXiv:2208.01031 (Aug. 2022).

[12] K. Wang, Y.-Y. Mao, A. R. Zentner, H. Guo, **J. U. Lange**, F. C. van den Bosch, and L. Mezini. "Evidence of Galaxy Assembly Bias in SDSS DR7 Galaxy Samples from Count Statistics". *arXiv e-prints*, arXiv:2204.05332 (Apr. 2022).

[11] A. Leauthaud et al. "Lensing without borders - I. A blind comparison of the amplitude of galaxy-galaxy lensing between independent imaging surveys". *MNRAS* 510.4 (Mar. 2022), pp. 6150–6189.

[10] S. Huang, A. Leauthaud, C. Bradshaw, A. Hearin, P. Behroozi, **J. Lange**, J. Greene, J. DeRose, J. S. Speagle, and E. Xhakaj. "The outer stellar mass of massive galaxies: A simple tracer of halo mass with scatter comparable to richness and reduced projection effects". *MNRAS* (July 2022).

[9] E. Xhakaj, A. Leauthaud, **J. Lange**, A. Hearin, B. Diemer, and N. Dalal. "Beyond mass: detecting secondary halo properties with galaxy-galaxy lensing". *MNRAS* 514.2 (Aug. 2022), pp. 2876–2890.

[8] K. Wang, Y.-Y. Mao, A. R. Zentner, **J. U. Lange**, F. C. van den Bosch, and R. H. Wechsler. "Concentrations of dark haloes emerge from their merger histories". *MNRAS* 498.3 (Nov. 2020), pp. 4450–4464.

[7] F. C. van den Bosch, **J. U. Lange**, and A. R. Zentner. "Basilisk: Bayesian hierarchical inference of the galaxy-halo connection using satellite kinematics - I. Method and validation". *MNRAS* 488.4 (Oct. 2019), pp. 4984–5013.

[6] K. Wang, Y.-Y. Mao, A. R. Zentner, F. C. van den Bosch, **J. U. Lange**, C. M. Schafer, A. S. Villarreal, A. P. Hearin, and D. Campbell. "How to optimally constrain galaxy assembly bias: supplement projected correlation functions with count-in-cells statistics". *MNRAS* 488.3 (Sept. 2019), pp. 3541–3567.

[5] A. R. Zentner, A. Hearin, F. C. van den Bosch, **J. U. Lange**, and A. S. Villarreal. "Constraints on assembly bias from galaxy clustering". *MNRAS* 485.1 (May 2019), pp. 1196–1209.

[4] A. S. Villarreal, A. R. Zentner, Y.-Y. Mao, C. W. Purcell, F. C. van den Bosch, B. Diemer, **J. U. Lange**, K. Wang, and D. Campbell. "The immitigable nature of assembly bias: the impact of halo definition on assembly bias". *MNRAS* 472.1 (Nov. 2017), pp. 1088–1105.

[3] D. Campbell, F. C. van den Bosch, N. Padmanabhan, Y.-Y. Mao, A. R. Zentner, **J. U. Lange**, F. Jiang, and A. S. Villarreal. "The galaxy clustering crisis in abundance matching". *MNRAS* 477.1 (June 2018), pp. 359–383.

[2] I. G. Momcheva et al. "The 3D-HST Survey: Hubble Space Telescope WFC3/G141 Grism Spectra, Redshifts, and Emission Line Measurements for ~100,000 Galaxies". *ApJS* 225.2, 27 (Aug. 2016).

[1] E. J. Nelson et al. "Where Stars Form: Inside-out Growth and Coherent Star Formation from HST Hα Maps of 3200 Galaxies across the Main Sequence at $0.7 < z < 1.5$". *ApJ* 828.1, 27 (Sept. 2016).

INVITED TALKS

HEAP Seminar 12/2021
University of Utah

Astronomy Colloquium 09/2021
Swinburne University of Technology

Growth of Structure Webinar (Redshift-Space Distortions) 07/2021
University of California, Santa Cruz

Growth of Structure Webinar (Lensing + Clustering) 06/2021
University of California, Santa Cruz

Research Progress Meeting 01/2019
Lawrence Berkeley National Laboratory

CCAPP Seminar 01/2019
Center for Cosmology and AstroParticle Physics

BCCP Seminar 09/2018
University of California, Berkeley

The Galaxy-Halo Connection Across Cosmic Time 07/2017
Kavli Institute for Theoretical Physics

OUTREACH

- Invited KIPAC Public Lecture, Palo Alto, CA, 07/2022
- Class at Stanford Splash, Palo Alto, CA, 11/2021
- Talk at Astronomy on Tap, New Haven, CT, 06/2019
- Talk at Institute for Learning in Retirement, New Haven, CT, 04/2019
- Talks at Leitner Family Observatory, New Haven, CT, 02/2018 and 05/2019
- Talks at Open Labs Science Cafe, Yale University, New Haven, CT, 10/2017 and 04/2019

- Member of Open Labs, Yale University, New Haven, CT, 2016 - 2019
- Tutor at New Haven Reads, New Haven, CT, 2015 - 2018
- Member of UCSB Physics Circus, UC Santa Barbara, Santa Barbara, CA, 2012

HONORS AND AWARDS

- Brouwer Ph.D. Thesis Prize, Yale University
- Cosmology Fellowship, University of California, Santa Cruz and Stanford University
- Graduate Fellowship Program, Kavli Institute for Theoretical Physics
- Henry A. Smith Fellowship, Yale University
- DAAD (German Academic Exchange Service) Scholarship
- Deutschlandstipendium National Scholarship Program
- Ernst Reuter Scholarship, Free University of Berlin
- Dean's List, University of California, Santa Barbara

LEADERSHIP AND SERVICE

- Referee for Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society and The Astrophysical Journal
- Member of the Stanford Physics Equity & Inclusion Committee, 2021 - 2022
- Interim Co-Chair of the Dark Energy Spectroscopic Instrument (DESI) C^3 Working Group, 2022
- Member of the DESI Early Career Scientists Committee, 2021 - 2022
- Mentor for the DESI Diversity, Equity, and Inclusion Mentorship Program, 2021 - present
- Member of the UCSC Astronomy Department Colloquium Committee, 2019 - 2020
- Organizer for the KITP Online Conference "The Galaxy-Halo Connection Across Cosmic Time: Recent Updates", 08/2020
- Organizer for the KIPAC Online Workshop "Precision Measurements and Modeling of Lensing and Clustering in the DESI Era", 07/2020

REFERENCES

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