Johannes Ulf Lange

UC Santa Cruz, Astronomy & Astrophysics Department
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RESEARCH INTERESTS

Cosmology, Large-Scale Structure, Weak Gravitational Lensing, Galaxy-Halo Connection, Galaxy Formation Theory, 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

POSITION

Stanford–Santa Cruz Cosmology Fellow 09/2019 – 08/2023
UC Santa Cruz and Stanford University

SELECTED TALKS

DESI AI Meeting (invited) 12/2020
Dark Energy Spectroscopic Instrument Collaboration

Cosmology Seminar 10/2020
Lawrence Berkeley National Laboratory

The Galaxy-Halo Connection Across Cosmic Time (invited) 08/2020
Kavli Institute for Theoretical Physics

Santa Cruz Galaxy Workshop 08/2019
University of California, Santa Cruz

Research Progress Meeting (invited) 01/2019
Lawrence Berkeley National Laboratory

CCAPP Seminar (invited) 01/2019
Center for Cosmology and AstroParticle Physics

Cosmology Seminar 12/2018
Max Planck Institute for Astrophysics

BCCP Seminar (invited) 09/2018
University of California, Berkeley

SUGAR-RUSH Conference 06/2018
Shanghai Jiao Tong University

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

SKILLS

- Programming Languages – C/C++, Python, Cython, Java
- Scientific Applications – NumPy, SciPy, matplotlib, LaTeX, git
- Languages – German (native), English (fluent), Chinese (basic)

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 and Monthly Notices of the Royal Astronomical Society
- Co-Organizer for the KITP Online Conference "The Galaxy-Halo Connection Across Cosmic Time: Recent Updates", 08/2020
- Co-Organizer for the KIPAC Online Workshop "Precision Measurements and Modeling of Lensing and Clustering in the DESI Era", 07/2020
- Member of the UCSC Astronomy & Astrophysics Colloquium Committee
- Co-Organizer of the Weekly UCSC Cosmology and Galaxies Paper Discussion
- Member of the Dark Energy Spectroscopic Instrument (DESI) Collaboration

FIRST-AUTHOR PUBLICATIONS

[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". *arXiv e-prints*, arXiv:2011.02377 (Nov. 2020), arXiv:2011.02377.

[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. 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), p. L4.

[2] **J. U. Lange** and M. .-C. 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), A89.

CO-AUTHOR PUBLICATIONS

[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 (Sept. 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. 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. Villarreal. "The galaxy clustering crisis in abundance matching". *MNRAS* 477.1 (June 2018), pp. 359–383.

[2] I. G. Momcheva, G. B. Brammer, P. G. van Dokkum, R. E. Skelton, K. E. Whitaker, E. J. Nelson, M. Fumagalli, M. V. Maseda, J. Leja, M. Franx, H.-W. Rix, R. Bezanson, E. Da Cunha, C. Dickey, N. M. Förster Schreiber, G. Illingworth, M. Kriek, I. Labbé, **J. Ulf Lange**, B. F. Lundgren, D. Magee, D. Marchesini, P. Oesch, C. Pacifici, S. G. Patel, S. Price, T. Tal, D. A. Wake, A. van der Wel, and S. Wuyts. "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), p. 27.

[1] E. J. Nelson, P. G. van Dokkum, N. M. Förster Schreiber, M. Franx, G. B. Brammer, I. G. Momcheva, S. Wuyts, K. E. Whitaker, R. E. Skelton, M. Fumagalli, C. C. Hayward, M. Kriek, I. Labbé, J. Leja, H.-W. Rix, L. J. Tacconi, A. van der Wel, F. C. van den Bosch, P. A. Oesch, C. Dickey, and **J. Ulf Lange**. "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), p. 27.

TEACHING

- Certificate of College Teaching Preparation from Yale University
- Astrostatistics and Data Mining, Lab Leader, Yale University, Spring 2018
- Introduction to Astronomical Observing, Lab TA, Yale University, Fall 2017
- Astrostatistics and Data Mining, Lab Leader, Yale University, Spring 2016
- Introduction to Cosmology, Section Leader, Yale University, Fall 2015
- Gravity, Astrophysics, and Cosmology, Grader, Yale University, Spring 2015
- Introduction to Astronomical Observing, Lab TA, Yale University, Fall 2014

OUTREACH

- Talk at Astronomy on Tab, 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 05/19
- Talks at Open Labs Science Cafe, Yale University, New Haven, CT, 10/2017 and 04/19
- 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

REFERENCES

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