

Johannes Ulf Lange

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RESEARCH INTERESTS

Galaxy-Halo Connection, Galaxy Formation Theory, Cosmology, Large-Scale Structure, Statistical Methods and Machine Learning

EDUCATION

Yale University M.Sc., M.Phil, Ph.D. in Astronomy	08/2014 – 08/2019
Ruprecht-Karls-Universität Heidelberg Master of Science in Physics	09/2012 – 08/2014
Freie Universität Berlin Bachelor of Science in Physics	10/2009 – 08/2012

RESEARCH

University of California, Santa Cruz Stanford–Santa Cruz Cosmology Fellow	09/2019 – 08/2021
Yale University Graduate Student Researcher The Galaxy-Halo Connection Advisor: Frank van den Bosch	08/2014 – 08/2019
Shanghai Jiao Tong University Visiting Scholar The Non-Linear Galaxy Clustering and Lensing in BOSS Advisor: Xiaohu Yang	05/2018 – 07/2018
Kavli Institute for Theoretical Physics KITP Graduate Fellow The Galaxy-Halo Connection	01/2017 – 07/2017
The Chinese University of Hong Kong Postgraduate Research Exchange Program Dark Matter Annihilation and the Cosmic Gamma-Ray Background Advisor: Ming Chung Chu	08/2013 – 07/2014
German Electron Synchrotron (DESY) Bachelor Thesis The average GeV-band Emission from Gamma-Ray Bursts Advisor: Martin Pohl	04/2012 – 07/2012

PUBLICATIONS – 8 FIRST AUTHOR, 15 TOTAL

- [15] **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”. In: *MNRAS* (Sept. 2019), p. 2289. arXiv: 1909.03107 [astro-ph.CO].
- [14] 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”. In: *MNRAS* 488.4 (Oct. 2019), pp. 4984–5013. arXiv: 1908.07547 [astro-ph.CO].
- [13] **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 Λ CDM cosmology”. In: *MNRAS* 488.4 (Oct. 2019), pp. 5771–5787. arXiv: 1906.08680 [astro-ph.CO].
- [12] **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”. In: *MNRAS* 487.3 (Aug. 2019), pp. 3112–3129. arXiv: 1811.03596 [astro-ph.CO].
- [11] 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”. In: *MNRAS* (June 2019), p. 1686. arXiv: 1903.09656 [astro-ph.CO].
- [10] A. R. Zentner, A. Hearin, F. C. van den Bosch, **J. U. Lange**, and A. Villarreal. “Constraints on assembly bias from galaxy clustering”. In: *MNRAS* 485.1 (May 2019), pp. 1196–1209. arXiv: 1606.07817 [astro-ph.GA].
- [9] **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”. In: *MNRAS* 482 (Feb. 2019), pp. 4824–4845. arXiv: 1810.10511 [astro-ph.CO].
- [8] 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”. In: *MNRAS* 477 (June 2018), pp. 359–383. arXiv: 1705.06347.
- [7] **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”. In: *MNRAS* 473 (Jan. 2018), pp. 2830–2851. arXiv: 1705.05043.
- [6] 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 inimitable nature of assembly bias: the impact of halo definition on assembly bias”. In: *MNRAS* 472 (Nov. 2017), pp. 1088–1105. arXiv: 1705.04327.
- [5] E. J. Nelson et al, including **J. U. Lange**. “Where Stars Form: Inside-out Growth and Coherent Star Formation from HST H α Maps of 3200 Galaxies across the Main Sequence at $0.7 < z < 1.5$ ”. In: *ApJ* 828, 27 (Sept. 2016), p. 27. arXiv: 1507.03999.
- [4] I. G. Momcheva et al, including **J. U. Lange**. “The 3D-HST Survey: Hubble Space Telescope WFC3/G141 Grism Spectra, Redshifts, and Emission Line Measurements for $\sim 100,000$ Galaxies”. In: *ApJS* 225, 27 (Aug. 2016), p. 27. arXiv: 1510.02106.
- [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 $z \sim 1$ ". In: *ApJL* 819, L4 (Mar. 2016), p. L4. arXiv: 1602.05967.
- [2] **J. U. Lange** and M.-C. Chu. "Can galactic dark matter substructure contribute to the cosmic gamma-ray anisotropy?" In: *MNRAS* 447 (Feb. 2015), pp. 939–947. arXiv: 1412.5749.
- [1] **J. Lange** and M. Pohl. "The average GeV-band emission from gamma-ray bursts". In: *A&A* 551, A89 (Mar. 2013), A89. arXiv: 1301.2914 [astro-ph.HE].

TALKS

Santa Cruz Galaxy Workshop University of California, Santa Cruz	08/2019
Research Progress Meeting (invited) Lawrence Berkeley National Laboratory	01/2019
CCAPP Seminar (invited) Center for Cosmology and AstroParticle Physics	01/2019
Cosmology Seminar Max Planck Institute for Astrophysics	12/2018
Cosmology Lunch Center for Cosmology and AstroParticle Physics	10/2018
NYU-CCA LSS Group Meeting Center for Computational Astrophysics	10/2018
BCCP Seminar (invited) University of California, Berkeley	09/2018
CosmoClub University of California, Santa Cruz	09/2018
SUGAR-RUSH Conference Shanghai Jiao Tong University	06/2018
KIPAC Tea Talk SLAC National Accelerator Laboratory	03/2018
Astronomy Seminar University of California, Riverside	03/2018
Galaxy Coffee Max Planck Institute for Astronomy	01/2018
The Galaxy-Halo Connection Across Cosmic Time (invited) Kavli Institute for Theoretical Physics	07/2017
Quantifying and Understanding the Galaxy-Halo Connection Kavli Institute for Theoretical Physics	05/2017

Astroparticle Physics Seminar German Electron Synchrotron (DESY)	07/2014
Conference of the Physical Society of Hong Kong Hong Kong Baptist University	06/2014
IAS Workshop on New Perspectives in Cosmology Hong Kong University of Science and Technology	05/2014

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 Leitner Family Observatory & Planetarium, New Haven, CT, February 2018
- Talk at Open Labs Science Cafe, Yale University, New Haven, CT, October 2017
- Member of Open Labs, Yale University, New Haven, CT, since 2016
- Tutor at New Haven Reads, New Haven, CT, 2015 - 2018
- Member of UCSB Physics Circus, UC Santa Barbara, Santa Barbara, CA, 2012

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

- Stanford-Santa Cruz Cosmology Fellowship
- KITP Graduate Fellowship Program
- 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