

Publication List Leander Thiele

December 15, 2025

G. Fabbian, F. Bianchini, A. Sabyr, J.C. Hill, C.C. Lovell, **L. Thiele**, D.N. Spergel, *A new constraint on the y -distortion with FIRAS: implications for feedback models in galaxy formation and cosmic shear measurements*, 2025, [arXiv:2512.03038](#) [astro-ph.CO]

A. Tokiwa, A.E. Bayer, J. Armijo, J. Liu, R. Terasawa, **L. Thiele**, M. Alvarez, L. Blot, M. Takada, *Impact of Simulation Box Size for Weak Lensing: Replication and Super-Sample Effects*, 2025, [arXiv:2511.20423](#) [astro-ph.CO]

B. Barthe-Gold, N.-M. Nguyen, **L. Thiele**, *Reconstructing the local density field with combined convolutional and point cloud architecture*, 2025, [arXiv:2510.08573](#) [astro-ph.CO], poster at ML4PS workshop NeurIPS 2025

B.Y. Wang, **L. Thiele**, *Set-based Implicit Likelihood Inference of Galaxy Cluster Mass*, 2025, [arXiv:2507.20378](#) [cs.LG], spotlight talk at ML4Astro workshop (colocated with ICML 2025)

J.A. Cowell, J. Armijo, **L. Thiele**, G.A. Marques, C.P. Novaes, D. Grandón, S. Cheng, M. Shirasaki, D. Alonso, J. Liu, *First Constraints from Marked Angular Power Spectra with Subaru Hyper Suprime-Cam Survey First-Year Data*, 2025, [arXiv:2507.12315](#) [astro-ph.CO]

L. Thiele, A.E. Bayer, N. Takeishi, *Simulation-Efficient Cosmological Inference with Multi-Fidelity SBI*, 2025, [arXiv:2507.00514](#) [astro-ph.CO], poster at ML4Astro workshop (colocated with ICML 2025)

E. Calabrese, J.C. Hill, H.T. Jense, A. LaPosta, et al (incl. **L. Thiele**), *The Atacama Cosmology Telescope: DR6 Constraints on Extended Cosmological Models*, 2025, JCAP 11, 063, [arXiv:2503.14454](#) [astro-ph.CO]

C. Jacobus, **L. Thiele**, P. Harrington, J. Liu, Z. Lukic, *Enhancing Cosmological Simulations with Efficient and Interpretable Machine Learning in the Gabor Wavelet Basis*, 2024, poster at Workshop on Machine Learning and the Physical Sciences (NeurIPS 2024)

L. Thiele, *De-baryonifying halos via optimal transport*, 2024, [arXiv:2411.18399](#) [astro-ph.CO]

J. Armijo, G.A. Marques, C.P. Novaes, **L. Thiele**, J.A. Cowell, D. Grandón, M. Shirasaki, J. Liu, *Cosmological constraints using Minkowski functionals from the first year data of the Hyper Suprime-Cam*, 2024, [arXiv:2410.00401](#) [astro-ph.CO]

C.P. Novaes, **L. Thiele**, J. Armijo, S. Cheng, J.A. Cowell, G.A. Marques, E.G.M. Ferreira, M. Shirasaki, K. Osato, J. Liu, *Cosmology from HSC Y1 Weak Lensing with Combined Higher-Order Statistics and Simulation-based Inference*, 2024, [arXiv:2409.01301](#) [astro-ph.CO]

A. Kogut, E. Switzer, D. Fixsen, N. Aghanim, J. Chluba, D. Chuss, J. Delabrouille, C. Dvorkin, B. Hensley, J.C. Hill, B. Maffei, A. Pullen, A. Rotti, A. Sabyr, **L. Thiele**, E. Wollack, I. Zelko, *The Primordial Inflation Explorer (PIXIE): Mission Design and Science Goals*, 2024, [arXiv:2405.20403](#) [astro-ph.CO]

S. Cheng, G.A. Marques, D. Grandón, **L. Thiele**, M. Shirasaki, B. Ménard, J. Liu, *Cosmological constraints from weak lensing scattering transform using HSC Y1 data*, 2024, [arXiv:2404.16085](#) [astro-ph.CO]

- D. Grandón, G.A. Marques, **L. Thiele**, S. Cheng, M. Shirasaki, J. Liu, *Impact of baryonic feedback on HSC Y1 weak lensing non-Gaussian statistics*, 2024, PRD 110, 103539, [arXiv:2403.03807](#) [[astro-ph.CO](#)]
- G.A. Marques, J. Liu, M. Shirasaki, **L. Thiele**, D. Grandón, K.M. Huf-
fenberger, S. Cheng, J. Harnois-Déraps, K. Osato, W.R. Coulton, *Cosmology
from weak lensing peaks and minima with Subaru Hyper Suprime-Cam survey
first-year data*, 2023, MNRAS 528, 3, [arXiv:2308.10866](#) [[astro-ph.CO](#)]
- L. Thiele**, E. Massara, A. Pisani, C. Hahn, D.N. Spergel, S. Ho, B. Wandelt,
Neutrino mass constraint from an Implicit Likelihood Analysis of BOSS voids,
2023, ApJ 969, 89, [arXiv:2307.07555](#) [[astro-ph.CO](#)]
- L. Thiele**, G.A. Marques, J. Liu, M. Shirasaki, *Cosmological constraints
from HSC Y1 lensing convergence PDF*, 2023, PRD 108, 123526, [arXiv:2304.05928](#) [[astro-ph.CO](#)]
- A.M. Delgado, D. Anglés-Alcázar, **L. Thiele**, M. Ntampaka, S. Pandey,
K. Lehman, R.S. Somerville, S. Genel, F. Villaescusa-Navarro, *Predicting the
impact of feedback on matter clustering with machine learning in CAMELS*,
2023, MNRAS 526, 4, [arXiv:2301.02231](#) [[astro-ph.GA](#)]
- D. Wadekar, **L. Thiele**, J.C. Hill, S. Pandey, F. Villaescusa-Navarro, D.N.
Spergel, M. Cranmer, D. Nagai, D. Anglés-Alcázar, S. Ho, L. Hernquist, *The
SZ flux-mass (Y-M) relation at low halo masses: improvements with symbolic
regression and strong constraints on baryonic feedback*, 2022, MNRAS 522, 2,
[arXiv:2209.02075](#) [[astro-ph.CO](#)]
- B.K.K. Lee, W. Coulton, **L. Thiele**, S. Ho, *An exploration of the properties
of cluster profiles for the thermal and kinetic Sunyaev-Zel'dovich effects*, 2022,
MNRAS 517, 420, [arXiv:2205.01710](#) [[astro-ph.CO](#)]
- L. Thiele**, M. Cranmer, W. Coulton, S. Ho, D.N. Spergel, *Predicting the
Thermal Sunyaev-Zel'dovich Field using Modular and Equivariant Set-Based
Neural Networks*, 2022, MLST 3, 035002, [arXiv:2203.00026](#) [[astro-ph.CO](#)],
poster at the Fourth Workshop on Machine Learning and the Physical Sciences
(NeurIPS 2021)
- L. Thiele**, D. Wadekar, J.C. Hill, N. Battaglia, J. Chluba, F. Villaescusa-
Navarro, L. Hernquist, M. Vogelsberger, D. Anglés-Alcázar, F. Marinacci, *Percent-
level constraints on baryonic feedback with spectral distortion measurements*,
2022, PRD 105, 083505, [arXiv:2201.01663](#) [[astro-ph.CO](#)]
- D. Wadekar, **L. Thiele**, F. Villaescusa-Navarro, J.C. Hill, D.N. Spergel,
M. Cranmer, N. Battaglia, D. Anglés-Alcázar, L. Hernquist, S. Ho, *Augmenting
astrophysical scaling relations with machine learning: application to reducing the
SZ flux-mass scatter*, 2022, PNAS 120(12), [arXiv:2201.01305](#) [[astro-ph.CO](#)]
- F. Villaescusa-Navarro, S. Genel, D. Anglés-Alcázar, L.A. Perez, P. Villanueva-
Domingo, D. Wadekar, H. Shao, F.G. Mohammad, S. Hassan, E. Moser, E.T.
Lau, L.F.M.P. Valle, A. Nicola, **L. Thiele**, Y. Jo, O.H.E. Philcox, B.D. Op-
penheimer, M. Tillman, C. Hahn, N. Kaushal, A. Pisani, M. Gebhardt, A.M.
Delgado, J. Caliendo, C. Kreisch, K.W.K. Wong, W.R. Coulton, M. Eickenberg,
G. Parimbelli, Y. Ni, U.P. Steinwandel, V. La Torre, R. Dave, N. Battaglia,
D. Nagai, D.N. Spergel, L. Hernquist, B. Burkhart, D. Narayanan, B. Wan-
delt, R.S. Somerville, G.L. Bryan, M. Viel, Y. Li, V. Irsic, K. Kraljic, M. Vo-
gelsberger, *The CAMELS project: public data release*, 2022, ApJS 265, 54,

arXiv:2201.01300 [astro-ph.CO]

B. Maffei, M.H. Abitbol, N. Aghanim, J. Aumont, E. Battistelli, J. Chluba, X. Coulon, P. De Bernardis, M. Douspis, J. Grain, S. Gervasoni, J.C. Hill, A. Kogut, S. Masi, T. Matsumara, C. O Sullivan, L. Pagano, G. Pisano, M. Remazeilles, A. Ritacco, A. Rotti, V. Sauvage, G. Savini, S.L. Stever, A. Tartari, **L. Thiele**, N. Trappe, *BISOU: a balloon project to measure the CMB spectral distortions*, 2021, 16th Marcel Grossmann Meeting, arXiv:2111.00246 [astro-ph.IM]

F. Villaescusa-Navarro, S. Genel, D. Anglés-Alcázar, **L. Thiele**, R. Dave, D. Narayanan, A. Nicola, Y. Li, P. Villanueva-Domingo, B. Wandelt, D.N. Spergel, R.S. Somerville, J.M. Zorrilla Matilla, F.G. Mohammad, S. Hassan, H. Shao, D. Wadekar, M. Eickenberg, K.W.K. Wong, G. Contardo, Y. Jo, E. Moser, E.T. Lau, L.F.M.P. Valle, L.A. Perez, D. Nagai, N. Battaglia, M. Vogelsberger, *The CAMELS Multifield Dataset: Learning the Universe's Fundamental Parameters with Artificial Intelligence*, 2021, ApJS 259, 61, arXiv:2109.10915 [cs.LG]

F. Villaescusa-Navarro, S. Genel, D. Anglés-Alcázar, D.N. Spergel, Y. Li, B. Wandelt, **L. Thiele**, A. Nicola, J.M. Zorrilla Matilla, H. Shao, S. Hassan, D. Narayanan, R. Dave, M. Vogelsberger, *Robust marginalization of baryonic effects for cosmological inference at the field level*, 2021, arXiv:2109.10360 [astro-ph.CO]

F. Villaescusa-Navarro, D. Anglés-Alcázar, S. Genel, D.N. Spergel, Y. Li, B. Wandelt, A. Nicola, **L. Thiele**, S. Hassan, J.M. Zorrilla Matilla, D. Narayanan, R. Dave, M. Vogelsberger, *Multifield Cosmology with Artificial Intelligence*, 2021, arXiv:2109.09747 [astro-ph.CO]

L. Thiele, Y. Guan, J.C. Hill, A. Kosowsky, D.N. Spergel, *Can small-scale baryon inhomogeneities resolve the Hubble tension? An investigation with ACT DR4*, 2021, PRD 104, 063535, arXiv:2105.03003 [astro-ph.CO]

L. Thiele, J.C. Hill, K.M. Smith, *Accurate Analytic Model for the Weak Lensing Convergence One-Point Probability Distribution Function and its Auto-Covariance*, 2020, PRD 102, 123545, arXiv:2009.06547 [astro-ph.CO]

L. Thiele, F. Villaescusa-Navarro, D.N. Spergel, D. Nelson, A. Pillepich, *Teaching neural networks to generate Fast Sunyaev Zel'dovich Maps*, 2020, ApJ 902, 129, arXiv:2007.07267 [astro-ph.CO]

R. Cayuso, O.J.C. Dias, F. Gray, D. Kubizňák, A. Margalit, J.E. Santos, R.G. Souza, **L. Thiele**, *Massive vector fields in Kerr–Newman and Kerr–Sen black hole spacetimes*, 2020, JHEP 159, arXiv:1912.08224 [hep-th]

L. Thiele, C.A.J. Duncan, D. Alonso, *Disentangling magnification in combined shear clustering analyses*, 2020, MNRAS 491, 1746, arXiv:1907.13205 [astro-ph.CO]

R. Cayuso, F. Gray, D. Kubizňák, A. Margalit, R.G. Souza, **L. Thiele**, *Principal Tensor Strikes Again: Separability of Vector Equations with Torsion*, 2019, PLB 795, 650, arXiv:1906.10072 [hep-th]

L. Thiele, J.C. Hill, K.M. Smith, *Accurate analytic model for the thermal Sunyaev-Zel'dovich one-point probability distribution function*, 2019, PRD 99, 103511, arXiv:1812.05584 [astro-ph.CO]

F. Dinc, M. Medvidovic, **L. Thiele**, *Effective Geometry Monte Carlo: A Fast and Reliable Simulation Framework for Molecular Communication*, 2019, IEEE Access 7, 28635

F. Dinc, **L. Thiele**, B. C. Akdeniz, *The effective geometry Monte Carlo algorithm: applications to molecular communication*, 2019, PLA 383, 2594, [arXiv:1809.06438](#) [cs.ET]