

List of publications

Florent Leclercq

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Refereed Journal Articles

- 24.** *COMoving Computer Acceleration (COCA): N-body simulations in an emulated frame of reference*
D. J. Bartlett, M. Chiarenza, L. Doerer, [F. Leclercq](#)
A&A **694**, A287 (2025), [arXiv:2409.02154](#) [astro-ph.IM] (citations: **5**)
- 23.** *Euclid. I. Overview of the Euclid mission*
Euclid Collaboration: Y. Mellier, *et al.* (2305 authors)
A&A, in press, (2024), [arXiv:2405.13491](#) [astro-ph.CO] (citations: **242**)
- 22.** *Bayesian Inference of Initial Conditions from Non-Linear Cosmic Structures using Field-Level Emulators*
L. Doerer, D. Jamieson, S. Stopyra, G. Lavaux, [F. Leclercq](#), J. Jasche
MNRAS **535**, 1258 (2023), [arXiv:2312.09271](#) [astro-ph.CO] (citations: **19**)
- 21.** *Luminous giants populate the dense Cosmic Web: The radio luminosity-environmental density relation for radio galaxies in action*
M. S. S. L. Oei, R. J. van Weeren, M. J. Hardcastle, A. R. D. J. G. I. B. Gast, [F. Leclercq](#), H. J. A. Röttgering, P. Dabhade, T. W. Shimwell, A. Botteon
A&A **686**, A137 (2024), [arXiv:2404.17776](#) [astro-ph.CO] (citation: **1**)
- 20.** *Field-Based Physical Inference From Peculiar Velocity Tracers*
J. Prideaux-Ghee, [F. Leclercq](#), G. Lavaux, A. Heavens, J. Jasche
MNRAS **518**, 4191 (2023), [arXiv:2204.00023](#) [astro-ph.CO] (citations: **14**)
- 19.** *An intergalactic medium temperature from a giant radio galaxy*
M. S. S. L. Oei, R. J. van Weeren, M. J. Hardcastle, F. Vazza, T. W. Shimwell, [F. Leclercq](#), M. Brüggen, H. J. A. Röttgering
MNRAS **518**, 240 (2023), [arXiv:2210.10156](#) [astro-ph.GA] (citations: **7**)
- 18.** *Simulation-based inference of Bayesian hierarchical models while checking for model misspecification*
[F. Leclercq](#)
Physical Sciences Forum **5**, 4 (2022), [arXiv:2209.11057](#) [stat.ME] (citations: **3**)
- 17.** *Filamentary Baryons and Where to Find Them: A forecast of synchrotron radiation from merger and accretion shocks in the local Cosmic Web*
M. S. S. L. Oei, R. J. van Weeren, F. Vazza, [F. Leclercq](#), A. Gopinath, H. J. A. Röttgering
A&A **662**, A87 (2022), [arXiv:2203.05365](#) [astro-ph.CO] (citations: **8**)
- 16.** *Kernel-Based Emulator for the 3D Matter Power Spectrum from CLASS*
A. Mootoivaloo, A. H. Jaffe, A. F. Heavens, [F. Leclercq](#)
Astronomy and Computing **38**, 100508 (2022), [arXiv:2105.02256](#) [astro-ph.CO] (citations: **29**)
- 15.** *On the accuracy and precision of correlation functions and field-level inference in cosmology*
[F. Leclercq](#), A. Heavens
MNRAS Letters **506**, L85 (2021), [arXiv:2103.04158](#) [astro-ph.CO] (citations: **22**)
- 14.** *Velocity debiasing for Hubble constant measurements from standard sirens*
S. Mukherjee, G. Lavaux, F. R. Bouchet, J. Jasche, B. D. Wandelt, S. M. Nissanke, [F. Leclercq](#), K. Hotokezaka
A&A **646**, A65 (2020), [arXiv:1909.08627](#) [astro-ph.CO] (citations: **98**)

13. *Parameter Inference for Weak Lensing using Gaussian Processes and MOPED*
A. Mootoivaloo, A. F. Heavens, A. H. Jaffe, [F. Leclercq](#)
MNRAS **497**, 2213 (2020), [arXiv:2005.06551 \[astro-ph.CO\]](#) (citations: **24**)
 12. *Perfectly parallel cosmological simulations using spatial comoving Lagrangian acceleration*
[F. Leclercq](#), B. Faure, G. Lavaux, B. D. Wandelt, A. H. Jaffe, A. F. Heavens, W. J. Percival, C. Noûs
A&A **639**, A91 (2020), [arXiv:2003.04925 \[astro-ph.CO\]](#) (citations: **11**)
 11. *Primordial power spectrum and cosmology from black-box galaxy surveys*
[F. Leclercq](#), W. Enzi, J. Jasche, A. Heavens
MNRAS **490**, 4237 (2019), [arXiv:1902.10149 \[astro-ph.CO\]](#) (citations: **19**)
 10. *Bayesian optimisation for likelihood-free cosmological inference*
[F. Leclercq](#)
Physical Review D **98**, 063511 (2018), [arXiv:1805.07152 \[astro-ph.CO\]](#) (citations: **54**)
 9. *The phase-space structure of nearby dark matter as constrained by the SDSS*
[F. Leclercq](#), J. Jasche, G. Lavaux, B. Wandelt, W. Percival
JCAP **6**, 49 (2017), [arXiv:1601.00093 \[astro-ph.CO\]](#) (citations: **22**)
 8. *Cosmological N-body simulations including radiation perturbations*
J. Brandbyge, C. Rampf, T. Tram, [F. Leclercq](#), C. Fidler, S. Hannestad
MNRAS Letters **466**, L68 (2017), [arXiv:1610.04236 \[astro-ph.CO\]](#) (citations: **29**)
 7. *Comparing cosmic web classifiers using information theory*
[F. Leclercq](#), G. Lavaux, J. Jasche, B. Wandelt
JCAP **8**, 27 (2016), [arXiv:1606.06758 \[astro-ph.CO\]](#) (citations: **15**)
 6. *Cosmic web-type classification using decision theory*
[F. Leclercq](#), J. Jasche, B. Wandelt
A&A Letters **576**, L17 (2015), [arXiv:1503.00730 \[astro-ph.CO\]](#) (citations: **21**)
 5. *Bayesian analysis of the dynamic cosmic web in the SDSS galaxy survey*
[F. Leclercq](#), J. Jasche, B. Wandelt
JCAP **6**, 15 (2015), [arXiv:1502.02690 \[astro-ph.CO\]](#) (citations: **51**)
 4. *Dark matter voids in the SDSS galaxy survey*
[F. Leclercq](#), J. Jasche, P. M. Sutter, N. Hamaus, B. Wandelt
JCAP **3**, 47 (2015), [arXiv:1410.0355 \[astro-ph.CO\]](#) (citations: **37**)
 3. *Past and present cosmic structure in the SDSS DR7 main sample*
J. Jasche, [F. Leclercq](#), B. D. Wandelt
JCAP **1**, 36 (2015), [arXiv:1409.6308 \[astro-ph.CO\]](#) (citations: **78**)
 2. *One-point remapping of Lagrangian perturbation theory in the mildly non-linear regime of cosmic structure formation*
[F. Leclercq](#), J. Jasche, H. Gil-Marín, B. Wandelt
JCAP **11**, 48 (2013), [arXiv:1305.4642 \[astro-ph.CO\]](#) (citations: **33**)
 1. *Main Sequence Stars with Asymmetric Dark Matter*
F. Iocco, M. Taoso, [F. Leclercq](#), G. Meynet
Physical Review Letters **108**, 061301 (2012), [arXiv:1201.5387 \[astro-ph.SR\]](#) (citations: **51**)
- Other Refereed Publications**
2. *Rubin-Euclid Derived Data Products: Initial Recommendations*
L. P. Guy, J. C. Cuillandre, *et al.* (120 authors)
Zenodo, 5836022 (2022), [arXiv:2201.03862 \[astro-ph.IM\]](#) (citations: **4**)

1. *One-point statistics of the Lagrangian displacement field*
Addendum to *One-point remapping of Lagrangian perturbation theory in the mildly non-linear regime of cosmic structure formation*
[F. Leclercq](#), J. Jasche, B. Wandelt
JCAP **4**, 26 (2015), [arXiv:1507.08664](#) [astro-ph.CO] (citations: **2**)

Submitted Articles

4. *Euclid: Field-level inference of primordial non-Gaussianity and cosmic initial conditions*
A. Andrews, J. Jasche, G. Lavaux, [F. Leclercq](#), et al (150 authors)
[arXiv:2412.11945](#) [astro-ph.CO] (citation: **1**)
3. *Diagnosing Systematic Effects Using the Inferred Initial Power Spectrum*
T. Hoellinger, [F. Leclercq](#)
[arXiv:2412.04443](#) [astro-ph.CO]
2. *Higher-order statistics of the large-scale structure from photometric redshifts*
E. Tsaprazi, J. Jasche, G. Lavaux, [F. Leclercq](#)
[arXiv:2301.03581](#) [astro-ph.CO] (citations: **11**)
1. *Systematic-free inference of the cosmic matter density field from SDSS3-BOSS data*
G. Lavaux, J. Jasche, [F. Leclercq](#)
[arXiv:1909.06396](#) [astro-ph.CO] (citations: **49**)

Conference Proceedings

4. *Probabilistic cartography of the large-scale structure*
[F. Leclercq](#), J. Jasche, G. Lavaux, B. Wandelt
Proceedings of the “Rencontres du Vietnam” 2015, Cosmology 50 years after CMB discovery, 16-22 August 2015, Quy Nhon, Vietnam
[arXiv:1512.02242](#) [astro-ph.CO] (citations: **4**)
3. *Bayesian inference of the initial conditions from large-scale structure surveys*
[F. Leclercq](#)
Proceedings of the IAU Symposium 308, “The Zel’dovich Universe: Genesis and Growth of the Cosmic Web”, 23-28 June 2014, Tallinn, Estonia
[doi:10.1017/S1743921316009984](#), [arXiv:1410.2271](#) [astro-ph.CO]
2. *Bayesian large-scale structure inference: initial conditions and the cosmic web*
[F. Leclercq](#), B. Wandelt
Proceedings of the IAU Symposium 306, “Statistical Challenges in 21st Cosmology”, 25-29 May 2014, Lisbon, Portugal
[doi:10.1017/S1743921314011120](#), [arXiv:1410.1546](#) [astro-ph.CO] (citations: **2**)
1. *Bayesian inference of dark matter voids in galaxy surveys*
[F. Leclercq](#)
Proceedings of the “Rencontres de Moriond”, Cosmology session 2014, 22-29 March 2014, La Thuile, Italy
[arXiv:1410.0865](#) [astro-ph.CO]

Book Chapters

1. *Cosmology: from theory to data, from data to theory*
[F. Leclercq](#), A. Pisani, B. Wandelt
Lectures given at the International School of Physics Enrico Fermi “New Horizons for Observational Cosmology”, June 30-July 6, 2013, Varenna, Italy
[doi:10.3254/978-1-61499-476-3-189](#), [arXiv:1403.1260](#) [astro-ph.CO] (citations: **4**)

PhD Thesis

- Bayesian large-scale structure inference and cosmic web analysis*
[F. Leclercq](#)
Institut d’Astrophysique de Paris, 2015
[tel-01265548](#), [arXiv:1512.04985](#) [astro-ph.CO] (citations: **11**)

- Blog articles**
3. *Simulating the Universe on a mobile phone*
[F. Leclercq](#), G. Lavaux
25-05-2020, [Personal website](#) · [Aquila Consortium website](#)
 2. *Evolution of cosmological simulations over the last 50 years*
[F. Leclercq](#)
08-04-2020, [Personal website](#) · Repository: [GitHub:florent-leclercq/Moore_law_cosmosims](#)
 1. *Algorithms for likelihood-free cosmological data analysis*
[F. Leclercq](#)
25-04-2019, [Personal website](#) · [Aquila Consortium website](#)
- Public Data and Codes**
3. *pySELF*
Python implementation of the *Simulator Expansion for Likelihood-Free Inference* (SELF) algorithm.
[F. Leclercq](#)
[doi:10.5281/zenodo.3341588](https://doi.org/10.5281/zenodo.3341588), [GitHub:florent-leclercq/pyselfi](#),
<http://pyselfi.florent-leclercq.eu>
 2. *SIMBELMYNĚ*
A hierarchical probabilistic simulator to generate synthetic galaxy survey data
[F. Leclercq](#)
Additional contributions from: B. Faure, M. M. Ali Mohamed
[BitBucket:florent-leclercq/simbelmyne](#), <http://simbelmyne.florent-leclercq.eu>
 1. *The BORG SDSS data release*
Public release of data products following the BORG SDSS analysis
[F. Leclercq](#), J. Jasche, B. Wandelt
Additional contributions from: N. Hamaus, G. Lavaux, P. M. Sutter
[doi:10.5281/zenodo.1455729](https://doi.org/10.5281/zenodo.1455729), [GitHub:florent-leclercq/borg_sdss_data_release](#),
<http://data.florent-leclercq.eu>

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