List of publications

Astronomy

[1] **Jakob Robnik** and Uroš Seljak. "Kepler data analysis: Non-Gaussian noise and Fourier Gaussian process analysis of star variability". In: *The Astronomical Journal* 159.5 (2020), p. 224. DOI: 10.3847/1538-3881/ab8460.

[2] Yan Liang, **Jakob Robnik**, and Uroš Seljak. "Kepler-90: Giant transit-timing variations reveal a super-puff". In: *The Astronomical Journal* 161.4 (2021), p. 202. DOI: 10.3847/1538-3881/abe6a7.

[3] **Jakob Robnik** and Uroš Seljak. "Matched filtering with non-Gaussian noise for planet transit detections". In: *Monthly Notices of the Royal Astronomical Society* 504.4 (2021), pp. 5829–5839. DOI: 10.1093/mnras/stab1178.

[4] **Jakob Robnik**, Adrian E Bayer, Maria Charisi, Zoltán Haiman, Allison Lin, and Uroš Seljak. "Periodicity significance testing with null-signal templates: reassessment of PTF's SMBH binary candidates". In: *Monthly Notices of the Royal Astronomical Society* 534.2 (2024), pp. 1609–1620. DOI: 10.1093/mnras/stae2220.

[5] **Jakob Robnik** and Uroš Seljak. "Reassessment of Kepler's habitable zone Earth-like exoplanets with data-driven null-signal templates". In: *Accepted at PNAS (but not yet published)* (2025). DOI: 10.48550/arXiv.2509.07409.

Computational statistics

[1] Adrian E Bayer, Uroš Seljak, and **Jakob Robnik**. "Self-calibrating the look-elsewhere effect: fast evaluation of the statistical significance using peak heights". In: *Monthly Notices of the Royal Astronomical Society* 508.1 (2021), pp. 1346–1357. DOI: 10.1093/mnras/stab2331.

[2] **Jakob Robnik** and Uroš Seljak. "Statistical significance testing for mixed priors: a combined Bayesian and frequentist analysis". In: *Entropy* 24.10 (2022), p. 1328. DOI: 10.3390/e24101328.

[3] **Jakob Robnik**, G Bruno De Luca, Eva Silverstein, and Uroš Seljak. "Microcanonical Hamiltonian Monte Carlo". In: *Journal of Machine Learning Research* 24.311 (2023), pp. 1–34. URL: https://www.jmlr.org/papers/v24/22-1450.html.

[4] **Jakob Robnik** and Uroš Seljak. "Fluctuation without dissipation: Microcanonical Langevin Monte Carlo". In: *Proceedings of the 6th Symposium on Advances in Approximate Bayesian Inference*. Vol. 253. PMLR. 2024, pp. 111–126. URL: https://proceedings.mlr.press/v253/robnik24a.html.

[5] **Jakob Robnik**, Reuben Cohn-Gordon, and Uroš Seljak. "Black-box unadjusted Hamiltonian Monte Carlo". In: *Submitted to NeurIPS (awaiting decision)*. (2025). DOI: https://doi.org/10.48550/arXiv.2412.08876.

[6] **Jakob Robnik**, Reuben Cohn-Gordon, and Uroš Seljak. "Metropolis Adjusted Microcanonical Hamiltonian Monte Carlo". In: *Submitted to NeurIPS (awaiting decision)*. (2025). DOI: https://doi.org/10.48550/arXiv.2503.01707.

[7] Emanuel Sommer, **Jakob Robnik**, Giorgi Nozadze, Uroš Seljak, and David Rügamer. "Microcanonical Langevin Ensembles: Advancing the Sampling of Bayesian Neural Networks". In: *The Thirteenth International Conference on Learning Representations*. 2025. URL: https://openreview.net/forum?id=QMtrW8Ej98.

High energy physics

In these papers I was the leading author, but following the standards in the field the authors appear alphabetically:

[1] Robert Brandenberger, Lavinia Heisenberg, and **Jakob Robnik**. "Non-singular black holes with a zero-shear S-brane". In: *Journal of High Energy Physics* 2021.5 (2021), pp. 1–26. DOI: 10.1007/JHEP05(2021)090.

[2] Robert Brandenberger, Lavinia Heisenberg, and **Jakob Robnik**. "Through a black hole into a new universe". In: *International Journal of Modern Physics D* 30.14 (2021), p. 2142001. DOI: 10.1142/S0218271821420013.