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Extremely Efficient Cosmological Perturbation Theory with FAST-PT

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Cosmological perturbation theory is a powerful tool to model observations of large-scale structure in the weakly non-linear regime. However, even at next-to-leading order, it results in computationally expensive mode-coupling integrals. In this talk, I will focus on the physics of our extremely efficient algorithm, FAST-PT. I will show how the algorithm can be applied to calculate 1-loop power spectra for several cosmological observables, including the matter density, galaxy bias, galaxy intrinsic alignments, the Ostriker-Vishniac effect, the secondary CMB polarization due to baryon flows, and redshift-space distortions. Our public code is written in Python and is easy to use and adapt to additional applications.

Authors: FANG, Xiao (The Ohio State University); Dr BLAZEK, Jonathan (Institute of Physics, Laboratory of Astrophysics, Ecole Polytechnique Fédérale de Lausanne (EPFL), Observatoire de Sauverny); Dr MCEWEN, Joseph (The Ohio State University); HIRATA, Christopher (Ohio State University)

Presenter: FANG, Xiao (The Ohio State University)

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