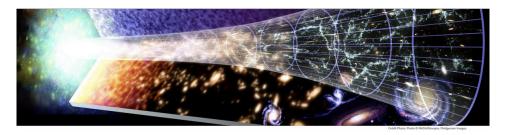ID de Contribution: **18**   Type: **Non spécifié**

candl: Cosmic Microwave Background Analysis with a Differentiable Likelihood

mercredi 22 mai 2024 14:25 (20 minutes)

In this talk I present candl: a JAX-powered, differentiable, python-based likelihood for Cosmic Microwave Background (CMB) data. Ground-based CMB experiments will allow us to substantially improve on the cosmological constraints from the Planck mission in the immediate future. However, any result hinting at physics beyond the standard model can only be embraced with confidence if the underlying analysis pipeline is demonstrably robust. candl provides a flexible and easy-to-use likelihood framework, adhering to the mantra: with great data comes great responsibility. Thanks to JAX's automatic differentiation algorithm, calculating derivatives, and by extension Fisher matrices, of candl likelihoods is quick and easy. I demonstrate how the differentiation of candl likelihoods facilitates the construction of data robustness tests and aids in survey optimisation. Moreover, I show the use of gradient-based minimisers and samplers with candl likelihoods. candl comes with the latest primary CMB and lensing data from the South Pole Telescope and Atacama Cosmology Telescope collaborations. candl is pip-installable and publicly available on GitHub.

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