

Abstract Submitted  
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**Modified gravity in N-body simulations**<sup>1</sup> ESKE PEDERSEN, Univ of Texas - Dallas — In recent years there have been suggested many extensions to Einstein's general relativity, in an attempt to explain the acceleration of the universe without invoking Dark energy. We normally refer to this group of theories as modified gravity. However how do we test modified gravity theories on the non-linear scale? For the last ten years or so we have been building N-body simulations that mainly simulate one or two of these theories, to test the theories on the non-linear scale. What I will discuss is an attempt on instead of creating simulations just for one theory, creating an effective framework that can be adapted to either specific theories or an effective parameterization. The framework we are introducing is inspired by a recently proposed Parameterized Post-Friedmann Framework for Modified Gravity. The talk will be an introduction to this implementation in Gadget-2 and how I did this, and in the end we will discuss how to move on and possible frameworks to implement instead. Gadget-2 is one of the most trusted N-body simulation codes of the recent decades, and was used to create the millennium simulation.

<sup>1</sup>work done collaborating with Steen Hannestad, AU DK, and Mustapha Ishak-Boushaki UTD

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