

## News from the Dark 8



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# Why we need to care about unobservable modes

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In the coming decades, large observational efforts will allow us to map the distribution of the large scale structure of the Universe, the cosmic web. The main purpose of these galaxy surveys is to extract the information present in the observed density fluctuations, to deepen our understanding of gravity and the dark sector. However, from observations of the Cosmic Microwave Background, we know that there are also fluctuations on ultra-large scales, scales larger than these future surveys. In this talk, I will discuss the impact of these modes. They effectively renormalise the mean matter density and are essentially unobservables; however they increase cosmic variance by their coupling to observed modes. This increase of uncertainties is called super-sample covariance and has been the subject of intense research since the 2010s. While not giving a comprehensive review of the field, I will present some of my contributions to it and showcase the expected impact for the coming European survey Euclid.

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