# Themes and motivations in ∞-cosmology

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On Monday the 19th of September 2022 I will be speaking at the Categories and Companions Symposium 2022 on the value of pursuing unlikely ideas in a talk entitled *"Themes and Motivations in ∞-Cosmology"*.

## Abstract

In this talk, we review the current state of the art in *model agnostic* ∞-category theory, which seeks to provide a unified account of ∞-category theory freed from the straight jacket of a specific model.

In particular, we shall focus on the theory of *∞-cosmoi* [1], a general framework for the development of *fibrational ∞-category theories*. The key novelty of this approach is that it allows both for the model independent, *synthetic* development of ∞-categorical results and for the transport of *analytically* derived such results from one model to another.

This talk, however, is not intended to provide a thorough going mathematical introduction to ∞-cosmology, largely because Emily Riehl and I have written a long and detailed graduate text *Elements of ∞-Category Theory* for that purpose. Instead, I would like to dwell on some underlying *"philosophical"* themes and motivations that have shaped the development of ∞-cosmology. Some of these, including the key application of traditional, Australian-style *2-category theory*, started as experiments in the application of somewhat unlikely, low dimensional, methods to the expression of the category theory of ∞-categories. Indeed, to our own great surprise, these have proved to be *unreasonably effective* tools which now form the cornerstone of the development discussed in The Elements [1].

My hope is to encourage symposium participants to embrace experimentation with unlikely ideas during their time at MATRIX. In many cases, of course, these will remain only mirages of useful mathematics, but in an important minority they will lead to powerful new insights and inspirations.

## References

[1]     E. Riehl, D. Verity, Elements of ∞-category theory, Cambridge University Press, 2022.