

# **COSMIC HORIZONS & BEFORE THE BIG BANG: INSPIRING PHYSICS THROUGH UNIVERSAL MYSTERIES**

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## **THEME**

Engaging students in STEM education

## **AIMS AND BACKGROUND**

Cosmology, the study of the life and times of the entire universe, is one of the great successes of modern science. Reflecting several centuries of observation, experimentation and hard thinking about the universe, this success is to be celebrated. But this success masks several uncomfortable truths about our understanding of the universe, mysteries that reveal that cosmology is still very much a work in progress. In this talk, I will present an overview of these mysteries, from the dark matter and dark energy that shape the cosmos, to bigger questions of cosmic birth and the infinite future ahead. These then lead to pondering the ultimate nature of our universe, and its potential place in a larger ensemble of universes—the multiverse. These represent the challenges facing modern cosmologists. The goal will not be to present a series of facts, but more discussion points of what may be beyond our current cosmic horizons, and, importantly, how to separate the science from the science fiction.