



# COLLOQUIUM DFA

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AULA ROSTAGNI

YOUTUBE STREAMING

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### *Is the Standard Model of Cosmology Broken, Breaking, or Healthy?*

**Abstract:** Today's standard model of cosmology was formulated in its present form 25 years ago. The model can describe the evolution of the Universe over its entire 14-billion-year history, starting from the time of cosmic inflation, approximately  $10^{-33}$  seconds after the bang. One troubling aspect of the standard cosmological model is that it posits that 95% of the present mass and energy in the universe is "dark." In addition, a new generation of space telescopes and terrestrial experiments is interrogating the model with unprecedented precision. Have we found the threads that will lead to unravelling of our standard cosmological model?

**Edward W. Kolb** (known to most as Rocky) is the Arthur Holly Compton Distinguished Professor of Astronomy and Astrophysics and a member of the Enrico Fermi Institute and the Kavli Institute for Cosmological Physics, at the University of Chicago. From 2006-2012 he served as Chair of the Department, from 2013-2018 Dean of the Division of the Physical Sciences, and from 2019-2021 Director of the Kavli Institute. In 1983 he was a founding head of the Theoretical Astrophysics Group and in 2004 the founding Director of the Particle Astrophysics Center at Fermilab.

Kolb is a Fellow of the American Academy of Arts and Sciences and a Fellow of the American Physical Society. He was the recipient of the 2024 Julius Edgar Lilienfeld Prize of the American Physical Society, the 2003 Oersted Medal of the American Association of Physics Teachers for notable contributions to the teaching of physics, the 1993 Quantrell Prize for teaching excellence at the University of Chicago, and the 2009 Excellence in Teaching Award from the Graham School of the University of Chicago. His book for the general public, *Blind Watchers of the Sky*, received the 1996 Emme Award of the American Aeronautical Society. Kolb's research was recognized by the 2010 Dannie Heineman Prize for Astrophysics, awarded by the American Astronomical Society and the American Institute for Physics. He holds an honorary degree, Doctor Honoris Causa, from the University of Lyon, France, and was the recipient of the J. Hans D. Jensen Prize of the University of Heidelberg.

The field of Rocky's research is the application of elementary-particle physics to the very early Universe. In addition to over 200 scientific papers, he is a co-author of *The Early Universe*, the standard textbook on particle physics and cosmology.

