

APR16-2016-000787

Abstract for an Invited Paper
for the APR16 Meeting of
the American Physical Society

The Origin of our Universe: From Quantum to Cosmos

THOMAS HERTOOG, KU Leuven

The discovery in the late 1920s that our universe expands fundamentally changed the discussion about its origin. I first review the scientific, historical and philosophical background behind this discovery. A key player in this was Georges Lemaitre who was also a Catholic priest. Respecting meticulously the differences in methodology and language between science and religion he was first to conceive of a physical origin of our universe, based on quantum theory. Today Lemaitre's vision is realised concretely in inflationary cosmology where a phase of rapid expansion generates the seeds for a complex universe starting from a simple natural beginning. A fuzzy quantum origin however gives rise to a multiverse of possible universes. I discuss some of the challenges associated with the development of a truly predictive multiverse cosmology that is falsifiable to observers within one of its histories.