

TO THE FRONTIERS OF COSMIC ORIGINS: FROM FIRST BLACK HOLES TO LATEST PLANETS

JONATHAN TAN

CHALMERS UNIV. & UNIV. OF VIRGINIA

I discuss two grand challenges within cosmic origins studies. First, how do the supermassive black holes (SMBHs) that reside in the centers of large galaxies come into being? After a short review of different ideas, I present a model that aims to explain the birth of all SMBHs via a single mechanism and involves them being the very first objects to form after the Big Bang. Second, the most common planets, including habitable planets, in the Universe are now known to be “Super-Earths” orbiting close to low-mass stars, but how do they arise? I review models for their origin and then focus on the theory of Inside-Out Planet Formation (IOPF), which proposes they are forged in situ in the hottest inner regions of protoplanetary disks. I discuss the implications of IOPF for the chemical composition of the Super-Earths and potential causes of diversity of planetary system architectures.

13 SEP 2022

3:30 PM EDT

BELL ROOM (ERP 103)