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## The First Chapters of Galaxy and Black Hole Build-up Revealed by JWST

*Tuesday 22 July 2025 09:00 (30 minutes)*

The first deep images with the James Webb Space Telescope (JWST) have transformed our view of the Universe. From day one, JWST produced one surprise after another: from unexpectedly luminous candidate galaxies at  $z > 10$ , to an abundant, new class of obscured black holes, to massive quiescent galaxies when the Universe was only 1-2 Gyr old. With its unparalleled imaging and spectroscopic capabilities, JWST immediately extended our cosmic horizon into uncharted territory, with galaxies spectroscopically confirmed to  $z \sim 14$  and candidates identified out to  $z \sim 16$ , only  $\sim 250$ -300 Myr after the Big Bang. We are thus at the brink of finding the first galaxies that ended the cosmic Dark Ages and started the reionization of the Universe. Furthermore, a surprising number of galaxies show broad-line emission in the early Universe indicating a very rapid build-up of early black holes. This includes an enigmatic new population known as ‘Little Red Dots’, characterized by their compact morphology and extremely red rest-frame optical colors. In this talk, I will review how far we have come in understanding early galaxy and black hole build-up thanks to the revolutionary new data with JWST over the past  $\sim 3$  years and discuss the implications for models of cosmic dawn.

### Collaboration(s)

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