

COLLOQUIUM

The First Glimpse of the First Galaxies with JWST

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Abstract: One of the last great unknowns in our history of the universe is when and how the first galaxies emerged after the Big Bang. These galaxies transformed the cosmos – they illuminated the invisible scaffolding of dark matter that underpins the universe, they ionized the intergalactic reservoirs of hydrogen, and they synthesized the elements that would one day seed life on Earth. Thanks to JWST, these enigmatic galaxies are finally coming into view. In this talk I will present early results on these systems from JWST's first year of operations. I will discuss new classes of galaxies that JWST is revealing, with a focus on extremely luminous early galaxies whose emergence at such early times is challenging our models of galaxy evolution. I will describe novel strategies to hone in on the elusive protagonists of cosmic reionization, the last



large-scale process that touched almost every baryon in the universe. In this context, I will discuss the surprising abundance of supermassive black holes that may prove significant contributors to reionization. Throughout, I will outline how the coming few years promise a once-in-a-generation expansion of the astrophysical frontier to the brink of the Big Bang.