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Opening a New Chapter of Exoplanet Science with JWSTt

With Dr. Ian Wong

It has been more than 25 years since the first detection of an exoplanet orbiting a Sun-like star. In that time, the discovery of thousands of confirmed exoplanets has revolutionized our understanding of planetary systems across the galaxy. Armed with a powerful arsenal of observational techniques, astronomers have leveraged both ground- and space-based facilities to expand our picture of exoplanet demographics and characterize these alien worlds with ever increasing detail. The latest generation of spectroscopic instruments and cutting-edge observing strategies have enabled us to examine the composition and dynamics of exoplanetary atmospheres, revealing an incredible diversity of molecular species, cloud types, and physical processes, many of which are not seen in our own Solar System. The results of these studies have in turn challenged our conceptions of planet formation and evolution, and there remain countless open questions with foundational implications for astronomy. The launch of the James Webb Space Telescope (JWST) ushered in a new age of exoplanet science. The suite of next-generation instruments onboard dramatically broadens the accessible wavelength range and greatly improve the sensitivity of observations, allowing us to synthesize exquisite three-dimensional views of exoplanet atmospheres for the first time. In this talk, I will provide a brief overview of exoplanets – from discovery to characterization – and outline some of the exciting science that will be made possible by JWST.