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# Direct imaging of exoplanets with Coronagraphy

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## Abstract

The direct imaging of exoplanets represents a pivotal method for exploring planetary systems beyond our solar system. This technique faces significant challenges, primarily due to the extreme brightness contrast and small angular separation between exoplanets and their host stars. Coronagraphy has emerged as a powerful optical approach to suppress starlight and enhance the detection of faint planetary signals. This work provides an in-depth review of coronagraphic techniques, including phase masks, Lyot coronagraphs, vortex coronagraphs, and their integration with adaptive optics systems. Recent advancements in these methods are analyzed, alongside their application in state-of-the-art instruments such as the James Webb Space Telescope (JWST) and future observatories like the Extremely Large Telescope (ELT). The study also highlights the current limitations and technical challenges in advancing the field of exoplanet imaging.