

Revealing Exoplanets through High-Contrast Imaging with the Gemini Planet Imager

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Rm 184 NSH

Dr. Jeff Chilcote, Dunlap Institute for Astronomy and Astrophysics, University of Toronto

The past two decades have seen major advances in our understanding of the formation of planetary systems beyond our own solar system. To date, the techniques that have detected the vast majority of planets around other stars are most sensitive to planets close to their host stars, generally within the “ice line” at which volatiles condense. Our ability to directly probe the outer regions of planetary systems is rapidly advancing, and now a new generation of astronomical instruments dedicated to imaging at high-contrast is beginning operations on sky. By combining a 1700-actuator adaptive optics system, an apodized-pupil Lyot coronagraph, a precision interferometric infrared wavefront sensor, and an integral field spectrograph, the Gemini Planet Imager’s goal is more than an order of magnitude improvement in contrast compared to existing high contrast systems. I will discuss the construction, first light and commissioning of the Gemini Planet Imager as well as describe our work characterizing the young jovian planet beta Pictoris b. Finally, I will discuss the aims and design of our upcoming survey of young nearby stars to characterize their planetary systems.