

ADVANCED INSTRUMENTATION SEMINARS

WEDNESDAY, MARCH 12, 2014

1:30 PM – 2:30 PM

KAVLI 3RD FLOOR CONF. ROOM, BLDG. 51

GEMINI PLANET FINDER



GUEST SPEAKER -
BRUCE MACINTOSH
STANFORD



More than a thousand extrasolar planets are now known, but almost all detected through indirect methods - Doppler shifts of the parent star or dimming of the star as the planet transits it. A handful of planets have been directly imaged, blocking out the parent star to spatially resolve it from the planet. This is extremely challenging - with current technology limited to massive young planets $\sim 10^4$ fainter than their host star. The Gemini Planet Imager (GPI) is a new dedicated instrument intended only for exoplanet imaging. It combines advanced adaptive optics, precision wavefront sensing, diffraction-blocking masks, and an infrared imaging spectrograph to discover and characterize giant exoplanets at contrast levels up to 10^7 . GPI was constructed by a US/Canadian consortium including the Lawrence Livermore National Laboratory, UCLA, JPL, AMNH, and the Canadian National Research Council. GPI required a number of novel technologies such as silicon MEMS deformable mirrors, and an integrated approach to design oriented towards its specific science goals. It has now been deployed on the 8-m Gemini South telescope, with first light in november 2013.

I will discuss the design and construction of the Gemini Planet imager, including the process of moving from science requirements to design concept, a simple Fourier optics analysis of the instrument, systems engineering, the integration and test process, and present first-light results from the observing run.

<http://www-group.slac.stanford.edu/ais>