



San Mateo County Astronomical Society



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SMCAS General Meeting and Presentation on March 4, 2016

Dr. Eric Nielsen

Postdoctoral Researcher
SETI Institute; Stanford University

The Gemini Planet Imager: Discovering Young Jupiters Around Other Stars

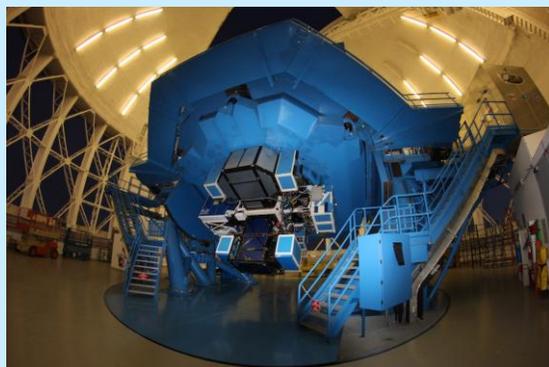
Friday, March 4, 2016 , [College of San Mateo, Building 36](#)

SMCAS General meeting at 7:00 p.m. ISC Room, room 110

Presentation at 8:00 p.m. [Planetarium](#)

Free and open to the public, free parking.

The Gemini Planet Imager, or GPI, is one of the most advanced astronomical imaging systems built to date, designed specifically to detect and characterize planets orbiting other stars. While most of the planets beyond our solar system have been discovered by indirect methods, such as Doppler



spectroscopy or transits, instruments like GPI allow us to take images of planetary systems and study the atmospheres and compositions of planets. Imaging planets around other stars is an enormous technical challenge, since even in the best cases planets are a million times fainter than their star (similar to a firefly next to a lighthouse) separated by just one arcsecond, the width of a dime held a mile away. Over the past decade advances in adaptive optics (where a deformable mirror corrects the distortion caused by atmospheric turbulence a thousand times a second),

detector technology, and image processing techniques have allowed astronomers to begin discovering planets by imaging them, and studying the light they emit.

From the Gemini South telescope in Chile the GPI Exoplanet Survey has been searching for planets around almost 200 young, nearby stars so far, with another 400 stars left to be observed. Over a hundred astronomers and engineers have made the instrument and the survey a reality. Eric will discuss the instrument, the survey, and what we've learned from imaging giant planets orbiting



other stars. He will also discuss 51 Eridani b, a planet discovered by GPI that's twice the mass of Jupiter but very young by astronomical standards: born 40 million years after the last of the dinosaurs died out. Finally, he will look ahead to the future prospects of direct imaging, including the planned NASA WFIRST space telescope and its prospects for imaging lower mass planets around the closest stars to the Sun.

Dr. Eric Nielsen is a postdoctoral researcher at the SETI Institute and Stanford University. He received his undergraduate degree at UC Berkeley and obtained his PhD in Astronomy at the University of Arizona in 2011, and then became a postdoctoral researcher at the University of Hawaii at Manoa until 2014. Eric has been involved in numerous planet searches over his career, starting with the California and Carnegie Planet Search, the VLT and MMT Simultaneous Differential Imaging Survey, the Gemini/NICI Planet-Finding Campaign, and the Gemini Planet Imager Exoplanet Survey. Eric's research interests include measuring the orbits of planets, determining the ages of stars, studying planetary and brown dwarf companions, and determining how many stars have long-period giant planets and mapping out their orbital distribution.

