NAU NORTHERN ARIZONA UNIVERSITY

Department of Astronomy and Planetary Science

ASTRONOMY COLLOQUIUM

KATE MINKER
LOWELL OBSERVATORY

Asteroids are the leftover building blocks that accreted to form the terrestrial planets. As such, they tell us about the initial conditions that existed in our solar nebula some 4.6 Gyrs ago. In particular, their density and internal structure result directly from their place and time of formation. Large asteroids with satellites represent the best opportunity to probe these fundamental parameters, and high-angular resolution imaging techniques provide the most effective tool to study these objects without visitation. Furthermore, rapidly improving instrumental capabilities allow for detailed topographic studies from exclusively ground-based observations. I will discuss how recent developments in instrumentation and image processing techniques have allowed us to improve our understanding of asteroid shapes, internal structure, satellite dynamics, and the formation processes that create these systems.

WHEN:

Monday,
November 9th,
3:45 PM

WHERE:

Physical Sciences,
Bldg. 19,
Room 103



ZOOM IN: IMAGING OF ASTEROIDS AND THEIR SATELLITES AT HIGH ANGULAR RESOLUTION

Dr. Kate Minker research focuses on small bodies in the Solar System. In particular, she studies the binarity, shape, and collisional history of asteroids. She earned her Bachelor's degree in Astronomy from the University of Maryland, and later her Master's and PhD from the Université Côte d'Azur in Nice, France. A portion of her dissertation research was conducted at the European Southern Observatory in Santiago, Chile.

Her work makes use of large telescopes like the Very Large Telescope and the Large Binocular Telescope to study asteroids with very high angular-resolution (or "zoomed-in") ground-based imaging, primarily by use of optical-wavelength adaptive optics (AO) imaging. This allows for an asteroid's shape to be resolved to a high level of detail, enabling the identification of small surface features like craters. It also allows for the position and motion of an asteroid's moon to be precisely studied. By combining the gravitational field experienced by the satellite to the expected gravitational field from the asteroid's shape, this provides a peek into the asteroid's interior- a feat typically only possible through spacecraft visitation!

Her other work includes spectral observations to study the composition of asteroid families and potential meteorite sources, statistical studies of binary systems, and speckle interferometry. She was an Investigation Team member on NASA's DART mission and is a member of the Ground-based Observations working group for ESA's Hera mission. She also manages the Quad-camera, Wave-front-sensing, Six-wavelength-channel Speckle Interferometer (QWSSI) instrument on LDT.