

9:30 a.m.

Stellar Occultations in the Gaia Era: Ground-based Support for NASA's Small Body Missions

Anne Verbiscer, University of Virginia

Since 2016, the European Space Agency's (ESA) Gaia Space Observatory has measured the positions, distances, and motion of stars with unprecedented precision. These astrometric data have enabled observation campaigns using portable ground-based telescopes to capture stellar occultations by small solar system bodies. Prior to the Gaia mission, large uncertainties in the stellar positions made such campaigns impractical for small bodies, resulting in predictions that spanned 100s if not 1000s of kilometers in the cross-track direction. Thanks to ESA's Gaia mission, several large campaigns have successfully provided shape and astrometric information for NASA small body mission targets. I will review occultation campaigns that supported NASA's New Horizons flyby of small Kuiper belt object (486958) Arrokoth in 2019 as well as the 2027-2033 encounters of Trojan asteroids by the Lucy spacecraft.

11:00 a.m.

So, I've Taken an Image with a Telescope – How Do I Measure the Expansion of the Universe?

Erik Peterson, Duke University

Astronomers use light to study individual astrophysical objects like stars, planets, and nebulae as well as the state of the universe across distant and numerous galaxies. Most use images from telescopes with varying characteristics to cover light emitted across the complete electromagnetic spectrum – using different instruments to study radio waves, optical light observable by our own eyes, and gamma rays. In this talk, I describe how we go from taking images with telescopes all the way to making grand statements about the expansion of the universe, specifically with supernovae from my thesis project called DEHVILS.

2:00 p.m.

The whole sky every second: Hardware to Science with the Argus Optical Array

Hank Corbett, UNC-Chapel Hill

Multiplexed wide-field telescopes are a unique new tool for exploring the night sky on the fastest timescales. In this talk, I will give an overview of the history of many-telescope systems, the science they have done, and the questions they will answer next. The Argus Optical Array is an upcoming 900-telescope survey instrument with a light collecting area equivalent to a 5-meter mirror and a field of view encompassing the entire sky at once. Argus will capture a continuous 55,000 megapixel movie of the night sky to depths comparable to the deepest active sky surveys, enabling second-by-second studies of objects ranging from distant asteroids in our own solar system, to flaring stars, to distant cosmic explosions. Argus is currently under development at the University of North Carolina, and the 38-telescope Argus Pathfinder was recently deployed to the Pisgah Astronomical Research Institute in Rosman, NC.

3:30 p.m.

Earth to Sky Park - Small Park, Big Dreams - and a big scope, too!

Kyle Lanning, Mayland Community College

This talk gives an overview of how Earth to Sky Park came to be what it is today and what we wish to become in the future. From beginnings as a mica mine, to a landfill that produced 12 years' worth of off-the-grid methane for local artists, to a dark sky park with an incredible 34" telescope, and finally to one of two places on the planet that have both an IDA certified Dark Sky Observatory and a planetarium on the same campus!