



*Physics & Astronomy Colloquium*  
*Fall 2021*



**Tuesday, Nov 9<sup>th</sup> at 3:30 pm**

Location: Science 234

**Dr. Brad Barlow**

Physics, High Point University

**A Search for Variable Hot Subdwarf Stars and  
Their Significance to Astrophysics**

The enigmatic hot subdwarf stars represent one of the least-understood stages of stellar evolution. Theory shows they likely formed from red giants that lost their outer hydrogen envelopes due to Roche lobe overflow and common envelope interactions with a nearby companion. Observations seem to support this idea as the large majority of hot subdwarfs are, in fact, in binaries. Many hot subdwarfs show photometric variations, and detailed studies of their light curves help constrain stellar parameters through asteroseismological analyses or binary light curve modeling. We have utilized a novel method for identifying new variable hot subdwarf stars using data from the Gaia spacecraft and have been collecting follow-up photometry of these candidate variables using NASA's TESS spacecraft for several years. This work has led to discoveries of systems that might shed further light on how substellar objects affect stellar evolution, whether planets can survive the red giant stage of their host stars, and how many Type 1a supernovae progenitor binaries exist in our Galaxy. In this talk, I will present a general overview of hot subdwarf stars, review their broader significance to astronomy, present the details of our novel variable selection method, and discuss the results of our ongoing photometric survey.