

Invited talk title: Dust Extinction with Gaia BP/RP Spectra

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**Abstract:** The three-dimensional distribution of dust in the Milky Way is richly structured on many scales. Until the mid-2010s, this structure could only be mapped in two dimensions, as a function of angular position on the sky. Most two-dimensional maps of dust column density are based on the intensity of far-infrared dust thermal emission, which is insensitive to the distance to the dust. Large surveys of Milky Way stars have dramatically changed this picture, allowing us to map the distribution of dust in 3D. Each star serves as a probe of the integrated dust column density along a particular line of sight, out to the distance of the star. By combining information from hundreds of millions of stars, we are able to reveal the complex 3D distribution of dust in our Galaxy. In this talk, I will discuss recent developments in 3D dust mapping enabled by Gaia, a space telescope that is collecting stellar astrometry and spectrophotometry at an unprecedented scale. Gaia not only enables more precise maps of dust density throughout the Milky Way, but also allows us to trace variation in the wavelength-dependence of dust extinction throughout the Galaxy, which is - as of yet - poorly understood. Better knowledge of extinction-curve variation may give insight into the dust grain-size distribution and composition, as well as its dependence on environment.