

ASTROPHYSICS SEMINAR

Wednesday, 14 January 2004
4:00 – 5:30 PM
Broida Conference Room 3302

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NON-MICROLENSING APPLICATIONS OF MICROLENSING SURVEYS: GALACTIC EXTINCTION

Microensing surveys are massive photometric searches covering tens of square degrees on the sky. As a result, they have many applications that go far beyond their original purpose. I will provide a few examples that highlight the power of microensing surveys. Then I will concentrate on the measurement of Galactic extinction and present a (V-R)-based reddening map of about 43 square degrees toward the Galactic bulge/bar constructed using photometry from the MACHO microensing survey. I will discuss our new method of estimating the reddening that is based on (V-R)-color averages of the entire color-magnitude diagrams. Our (V-R)-colors correlate very well with extinction maps based on other methods and allow us to identify several low-extinction windows. I will argue that a dusty disk obeying a $\text{cosec}|b|$ extinction law well describes gross properties of the extinction toward the bulge/bar fields. I will also show our newest results that firmly establish an anomalous character of the extinction law toward the Galactic bulge. Finally, I will develop a physical model for the dust distribution that is implied by our observations.