



PHYSICS AND ASTRONOMY COLLOQUIUM

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“A calibration of the stellar-mass fundamental plane at $\langle z \rangle = 0.5$ using the micro-lensing induced flux ratio anomalies of macro-lensed quasars”

Abstract

We measure the stellar mass surface densities of early type galaxies by observing the micro-lensing of macro-lensed quasars caused by individual stars, including stellar remnants, brown dwarfs and red dwarfs too faint to produce photometric or spectroscopic signatures.

Instead of observing multiple micro-lensing events in a single system, we combine single epoch X-ray snapshots of ten quadruple systems, and compare the measured relative magnifications for the images with those computed from macro-models. We use these to normalize a stellar mass fundamental plane constructed using a Salpeter IMF with a low mass cutoff of 0.1 solar masses and treat the zeropoint of the surface mass density as a free parameter. Our method measures the GRAININESS of the gravitational potential produced by individual stars, in contrast to methods that decompose a smooth total gravitational potential into two smooth components, one stellar and one dark. We find the median likelihood value for the normalization factor F by which the Salpeter stellar masses must be multiplied is 1.23, with a one sigma confidence range, dominated by small number statistics, of $0.77 < F < 2.10$.

Wednesday, March 25, 2015

3:30 p.m.

Bob Wright Centre

Room A104