

Faint extended structures near galaxies: preliminary results from the Wise Observatory

Noah Brosch¹, Aleksandr Mosenkov² and R. Michael Rich³

¹Wise Observatory, Tel Aviv University and Dept. of Physics and Astronomy, Tel Aviv University, Tel Aviv 69978, Israel
email: noah@wise.tau.ac.il

²Ghent University, Belgium; St. Petersburg State University and Central Astronomical Observatory, Russian Academy of Sciences, Russia³ Dept. of Physics and Astronomy, UCLA

Abstract. We present the first results from a survey of deep imaging of edge-on galaxies, with the goal of testing the growth-by-accretion of galaxies proposed by Λ CDM. The data were obtained with a new telescope at the Wise Observatory. Our images show previously unreported extensions of the disk, tidal distortions, and streams at the level of 27-28 mag arcsec⁻².

Keywords. Galaxies, halos, interactions

In Λ CDM galaxies form by accreting dwarf-galaxy sized units of dark and baryonic matter. It is important to confront this prediction with observations; among the most powerful approach is the observation of the accretion history of galaxies. We have initiated a program of deep imaging for a sample of 180 edge-on disk galaxies (EODGs) selected from the Revised Catalog of Edge-on Galaxies (Karachentsev *et al.* 2003) with angular size > 2 arcmin and visibility ($\delta > -30^\circ$). We use a new 0.7-m prime-focus telescope at the Wise Observatory (The Jay Baum Rich telescope; JBRT, Brosch *et al.* 2015), as well as an identical facility near Frazier Park, CA (see Rich *et al.* these proceedings). The JBRT camera is at prime focus behind a 2-element Ross corrector, imaging a $\sim 1^\circ$ field at f/3.2 onto a PL-16801 (FLI) 4096² CCD with 9 μ m pixels, at 0.84 arcsec pixel⁻¹. To reach the required LSB levels we co-add 20 – 100+ dithered images, each exposed for 300 sec through a luminance (wide R) filter [250 nm bandpass, center at 560 nm, flat transmission profile at 95% over the entire bandpass].

The images are debiased, dark-subtracted, flat-fielded with twilight sky flats, astrometrically registered, sky-subtracted and co-added, while rejecting outlier pixels, using *THELI* (Schirmer 2013). Further processing is done using *DECA* (Mosenkov 2014). This includes masking of unrelated objects (stars, field galaxies, artifacts), re-estimation of the sky background in the region of interest, and photometric calibration using unsaturated stars with R-band magnitudes. The galaxy image is then cropped and aligned with the major axis horizontal, and a model fit to the galaxy's surface brightness profile. Our preliminary very deep images of EODGs reach $\mu \geq 28$ mag arcsec⁻². Imaging the entire EODG sample will be used to test Λ CDM.

References

- Brosch, N., Kaspi, S., Niv, S. & Manulis, I. 2015 *Ap&SS*, 359, 49
Karachentsev, I. D., *et al.* 2003 arXiv:astro-ph/0305566
Mosenkov, A. 2014 *Astrophys. Bull.* 69 [1], 99
Schirmer, M. 2013 *ApJS* 209, 21