

KPNO/CWRU Burrell Schmidt telescope. The individual CCD frames have an unvignetted, circular field of view of $\sim 1^\circ$ diameter; generous overlap between the 41 CCD frames allows them to be matched to one another with a high degree of accuracy. The distinctive features of our dataset are: (1) the wide angular extent of the image makes accurate determination of the "sky" background possible; and (2) the relatively high angular resolution ($2''$) enables identification and removal of bright foreground stars. By measuring the total magnitude of M31, we are able to calibrate the I -band Tully-Fisher relation for spiral galaxies in the Coma supercluster, and thereby estimate the value of the Hubble constant (H_0).

48.08

Optical, Far-Infrared and X-ray Properties of the FIR quiescent Sc Galaxy NGC 247

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We present a multi-wavelength study of the large Sc galaxy, NGC 247 in the Sculptor group. Optical (B, I and $H\alpha$) CCD, Far-Infrared (FIR) (IRAS 60 and $100\mu\text{m}$), and X-ray (ROSAT PSPC, 0.2-2.4keV) images are combined to investigate local and global emission properties. NGC 247 is unique since it has the lowest L_{FIR} , and FIR/B ratio of the large ($D_{25B} > 8'$) Sc's observed by IRAS. It may be considered the best example of a FIR quiescent galaxy, although its 60/100 μm colour (dust temperature) is not abnormal for an Sc. There are 4-5 X-ray sources ($L_X \sim 5E37-3E38 \text{ erg s}^{-1}$) located in the disk of the galaxy. These sources are not coincident with the regions of 60 μm emission, consistent with the interpretation that the X-ray sources are old population binary systems. Constraints are put on X-ray diffuse emission and source variability.

48.09

Cleaning up the Sculptor Dwarf Spheroidal Galaxy Color-Magnitude Diagram

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A proper motion cleaned color-magnitude diagram of the probable member stars of the Sculptor dwarf spheroidal galaxy, a companion to the Milky Way, is presented. This survey presents membership and photometry of 1400 stars in the central region of Sculptor. To determine the proper motions, 26 plates from four different telescopes were used, with the observations spanning 53 years. This survey includes 134 known variable stars (van Agt, 1978) as well as many newly-discovered variables. These results are the first step in a project to determine the absolute proper motions of three nearby dwarf spheroidal galaxies. This research has been partially supported by the National Science Foundation.

48.10

Stellar Populations and Abundances in Sculptor and Fornax

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We present Washington photometry of the dwarf spheroidal galaxies Fornax and Sculptor and new methods for obtaining reddening, metallicity, age, and distance modulus. Our method is based on simultaneous isochrone fits in three independent colours, and on the analysis of metallicity distribution functions of cool stars.

For Sculptor, we find a reddening of $E_{B-V,0} = 0.045 \pm 0.008 \text{ mag}$ and a distance modulus of $19.15 \pm 0.05 \text{ mag}$. We get the best fits for isochrones on the assumption of two main populations, one with an age of $17.3 \pm 0.7 \text{ Gyr}$ and a second population with an age of $15.0 \pm 1.4 \text{ Gyr}$. The metallicity distribution shows three abundance populations at $[\text{Fe}/\text{H}] = -1.64 \pm 0.06 \text{ dex}$, at $-2.1 \pm 0.1 \text{ dex}$, and at $-2.5 \pm 0.5 \text{ dex}$. The first population encompasses $\approx 90\%$ of all red giants in our field, while $\approx 10\%$ of the red giants belong to the subpopulations.

The weighted means we compute for the four main vital statistics of the Fornax field are (1) a reddening of $E_{(B-V),0} = 0.045 \pm 0.015 \text{ mag}$, (2) a distance modulus of $DM = 20.26 \pm 0.17 \text{ mag}$, (3) abundance of $[\text{Fe}/\text{H}] = -1.32 \pm 0.11 \text{ dex}$, and (4) an age of $t = 13.0 \pm 1.6 \text{ Gyr}$. The GC#3 population fits an age of $13.8 \pm 1.1 \text{ Gyr}$, and $[\text{Fe}/\text{H}] = -1.87 \pm 0.11 \text{ dex}$. The metallicity distribution function is in general agreement with these isochrone results, but also reveals a more metal rich subpopulation of stars in the Fornax field. There is evidence of an intermediate age population in the colour magnitude diagrams that is fit by an isochrone of 3 Gyr and an abundance of -1.3 dex . The metallicity of the few stars so identified does not seem metal rich.

48.11

Optical Surface Photometry of M81 Dwarf Galaxies

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We present optical surface photometry of four dwarf irregular galaxies in the M81 group: UGC4483, UGC5423, UGC6451, UGC6456. The data were collected at the Capilla Peak Observatory, New Mexico, with the RCA 512x320 CCD in March, 1993. We intend to combine the photometry observations with HI synthesis observations in an effort to better understand the dynamics of each galaxy.

48.12

Exploring the Center of the Giant Virgo Cluster Spiral Galaxy M100 with the HST Planetary Camera 2

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The inner disk and nucleus of the Virgo Cluster giant Sc spiral galaxy M100 were observed with the Wide Field Planetary Camera 2 on the *Hubble Space Telescope* as an Early Release Observation. The Planetary Camera 2 CCD obtained images of the center of the galaxy in the F435W, F555W, and F702W filters with a resolution of about 0.05 arcsec, corresponding to a linear scale of 4(D/15 Mpc) pc. These now familiar images might initially be mistaken for a full-field view of an Sc galaxy due to the presence of many stellar and semi-stellar objects and a pronounced two-arm spiral dust pattern. A closer examination reveals three major structural zones in the center of M100: (1) The outer nuclear disk contains a nearly complete ring of young, luminous stars and star clusters as well as the dominant 2-arm dark lane spiral pattern. (2) In the inner quarter of the disk, luminous semi-stellar objects are rarer and the organized dust pattern breaks up into a complex of smaller filaments. (3) A distinct nucleus and probably small nuclear bulge are located at the center of the galaxy, and are also associated with a possible fainter radial dust lane pattern. We will present an initial exploration of the properties of these major structural components as well as a brief discussion of the relationship between the nuclear region and larger scale structure of this galaxy.