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Final Technical Report
NAG5-8728

Date: November 7, 2001

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NASA Grant No: NAG5-8728

Title: *Characterizing Nearby Stars: Age and Activity*

STScI Project No: J0205

Performance Pd: 08/01/99-07/31/01

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The funds in this grant were used to support costs for observing and data analysis over the past two years. During this time I have been obtaining low-resolution (R~2,000) spectra for about 5,000 solar-type stars (late-F and G dwarfs) that are within 60 parsecs of the Sun. The sample was defined with results from the Hipparcos mission, and the spectra were obtained at Kitt Peak National Observatory, using the Coude Feed telescope, and at Cerro Tololo Interamerican Observatory, using their 1.5 m telescopes for stars below -40 declination.

Nearly all the observed spectra have been reduced and analyzed. What is determined is R-prime, an index of the chromospheric emission in the cores of the Ca II H and K lines relative to the nearby continuum, and normalized for the color of the star. Chromospheric emission arises from magnetic activity on the star, and that is turn is driven by rotation. Solar-type stars spin down as they age, and so they get weaker in their chromospheric emission as well. Thus this R-prime index can be used to estimate the ages of stars.

A few stars remain to be observed at Kitt Peak, and follow-up high-resolution spectra are being obtained of the most active stars seen, but the majority of the starting sample have been completed. The spectra obtained are also being analyzed to yield an index of overall metallicity for each star, and this will be used to study Galactic evolution questions. These metallicities will form the first large dataset of high and consistent quality.

Initial results from this work have been used to define targets for a SIRTF Legacy program, for stars to study for planetary transits, and for SETI efforts. Because of the large number of stars involved, most of the data will be made available on the web, although some specific papers about the results are in preparation. The web database is being constructed.