Abstracts of Presented Papers

Session 5

05.13
The Strong, Spatially Extensive Magnetic Fields of the dm flare Star AD Leo
S. H. Saar and J. L. Linsky (JILA, Univ. of Colo. and NBS)

A high resolution infrared spectrum of the dm3.5e flare star AD Leo, obtained with the Kitt Peak 4 meter Fourier Transform Spectrometer, clearly shows the presence of widespread photospheric magnetic fields of large absolute strength. Several absorption lines in the 4400–4600 cm\(^{-1}\) (2.27–2.17 μ) region exhibit distinct, resolved Zeeman splitting proportional to their respective Landé g values. The inferred field strength is nearly 4 kilogauss. The relative weakness of central components in several lines influenced by the "anomalous" Zeeman effect indicates that most of the star's surface is covered by these magnetically active areas. This represents the first positive detection of photospheric magnetic fields on a dm star. Simultaneous Hα observations exhibit no evidence of unusually strong flare-like emission; our observations thus represent AD Leo's "guescent" magnetic flux level. We discuss the implications of these results for the atmospheric structure of flare stars and for stellar activity in general.

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Session 13

13.12
Crab pulsar: statistical studies of giant radio pulses in the three pulse components.
Friedman, J.F., (University of Puerto Rico and University of Oklahoma), Borkiakoff, V. (NAIC)

A statistical study of giant pulses was done at 430 MHz with the Arecibo radiotelescope using a 80 microsec time resolution. All three pulse components (presumed, main pulse and interpulse) are included in the study with a total sample of 600,000 pulses.

Session 43

43.16
Optical and Infrared Studies of Galaxy Clusters with Cooling Accretion Flows
W. Romanishin (Arizona State University)

What is the final fate of the gas that x-ray observations indicate is accreting onto the brightest cluster members in some galaxy clusters? Are the accretion rates inferred from the x-ray models accurate? We explore several ways that optical and infrared observations can help answer these questions. To search for star formation in the accretion flow gas, new V-K colors are presented for 8 brightest cluster members in x-ray clusters with a range of accretion flow rates, and published optical data for other clusters is analyzed. Except for A 426 (Perseus), color data does not provide evidence for star formation in any accreting cluster. Using H-K colors, we search for evidence that the accreting gas is fueling a non-thermal nuclear source. Again with the exception of A 426, no evidence of this is found. Two other consequences of star formation in accretion flows, changes in galaxy absolute magnitude and changes in M/L ratio, are discussed. No definite evidence for either of these effects is found. Thus, only in A 426 do we find evidence for the "final" fate of the accreting gas. However, if the accreting gas in other clusters