39.05

Teaching Materials: Stellar Atmospheres/Radiative Transfer
S.L. Hawley (Michigan State Univ.), T.R. Ayres (CASA: Univ. of Colorado)

We will present a selection of modern teaching materials for courses in Stellar Atmospheres and Radiative Transfer that have been collected from a wide variety of sources. We will provide brief synopses of each book, or set of of notes, and endeavor to compare and contrast the different presentations of the material. One of the newer additions to the literature is "Radiative Transfer in Stellar Atmospheres," lecture notes from R.J. Rutten based on courses taught at Utrecht University. In addition, I. Hubeny and D. Mihalas presently are writing a new edition of Mihalas' famous "Stellar Atmospheres." Other books we are aware of range from the planning stages to near completion. We will emphasize the diversity of styles and presentation techniques, but will try to make clear the central themes around which any successful Stellar Atmospheres/Radiative Transfer course must be built.

Tuesday

Session 40: The Environment of Stars: From Protostars to the Main Sequence
Display Session, 9:30am-6:30pm
96/06/11, Great Hall

40.01

Toward Determining the Galactic Distribution of Protostars
M. Cushing and D. Clemens (Boston University)

The goal of this Senior Distinction Thesis project at Boston University is to construct a three dimensional map of the distribution of protostars in the first quadrant of our galaxy. We will begin with a preselected group of protostars, obtain radial velocities for each protostar, and then use the galactic rotation curve to determine the distance to each protostar. These distances, along with the galactic latitude and longitude of the protostars, will allow us to construct a map of the distribution of protostars in the first quadrant. This map will be an important starting point for determining the luminosities of each protostar and the protostellar luminosity function.

The first step is to select a group of protostars. We have begun a NASA-funded project to catalog all the protostars in our galaxy. Our group is in the process of analyzing some five thousand candidates to ascertain which are true protostars.

The next step is to obtain the radial velocity of each protostar. Through SIMBAD, we have discovered that many of the protostar candidates have well established radial velocities. The remaining radial velocities will be obtained via radio observations of CO and CS gas associated with the protostars.

Galactocentric distances for the protostars will be established using the rotation curve of Clemens (1985). Resolution of the near/far distance ambiguity will be based on association with dense gas, as performed for galactic HII regions by Clemens et al. (1988).

40.02

New Views of Holoea - A YSO in Transition
E. Magnier, L.B.F.M. Waters, P. Groote (U. Amsterdam, Astronomical Institute), Yi-Jehng Kuan (Academia Sinica, Taiwan), Eduardo Martin (Instituto de Astrofísica de Canarias)

We are continuing to study the observational characteristics of Holoea. This young stellar object, associated with IRAS 05327+3404, appears to be undergoing the quick transition from embedded (Class I) to exposed (Class II) T Tauri star. We have obtained new observations of this source, particularly pertaining to the outflow and the characteristics of the dust. We will present some of our new observations and discuss some of the implications. Comparisons of visible and near-IR (JHK) images show a morphology which changes significantly with wavelength. Our low-resolution optical spectra show the presence of extended red emission (ERE) in the tail-like reflection nebula. We will also present images in the CO(2-1) line made with the JCMT. Observations of Holoea tell us about the characteristics of the very small class of objects in this short transitional stage.

40.03

Young Stars in the Cr232 Region of the Carina Nebula
D. VanOrsw (STScI), R.J. Dufour (Rice U.), D.G. Currie (UMD), I.J. Hester (ASU), D.K. Walter (SCSU)

We present information about the stellar population in the line-of-sight to the Collinder 232 cluster located in the Great Carina Nebula. This region was observed serendipitously with the WFPC2 of the Hubble Space Telescope during a program (GO-6042) of spectroscopy of the outer condensations of Eta Carinae. Paired exposures were taken through each of the three wide-band filters: F336W, F439W, and F555W. These were combined to remove cosmic rays, hot pixels, etc. and mosaiced to produce deep UBV images of this region which reach a limiting magnitude of V ~ 25 at ~0.1\'' spatial resolution. Images were also acquired using several interference filters isolating prominent nebular emission lines.

The stellar population characteristics are discussed from color-magnitude (CMD) and color-color (CCD) diagrams for the stars over an 160'' wide L-shaped field covering the NE part of the brightest stars in Cr 232 located some 3' north of Eta Carinae. Using the diagrams, we discuss the fraction of stars that might be members of the cluster, the magnitude and variation of reddening for the cluster stars, and estimate a distance for the cluster. These results are compared to CMD's for the rich nearby clusters Trumpler 14 (for which Cr 232 may just be an extension of) and Trumpler 16.

Finally, other aspects of star-formation evident in this field are discussed based on the emission-line images. Of particular note are several stellar [NI]-emitting knots located in many of the small dark globules previously reported by Dufour et al. (1996 BAAS, 27, 114) from those data.

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40.04

Spectral Classification of T Tauri stars in the Orion Nebula Cluster
C.M. Hamilton, R.C. DeCoste (Connecticut College), A.J. Ferro (Steward Observatory, University of Arizona)

The use of low resolution optical spectra in determining spectral and luminosity classes of T Tauri stars in the Orion Nebula Cluster is investigated. The most accurate means of locating stars on H-R diagrams typically uses multicolor photometry to determine apparent magnitudes (e.g. V mag) and colors (e.g. B-V). However, colors can be significantly affected by interstellar and circumstellar reddening. Hence, observed colors cannot be relied on to derive effective temperatures for T Tauri stars which are frequently embedded in circumstellar disks. In the case of unknown reddening effects, the more accurate, however less precise method for determining effective temperatures and luminosities of T Tauri stars is to classify their optical spectra, a method often used for stars subject to intrinsic reddening effects. We present low resolution spectra of a well-defined sample of T Tauri stars selected from the magnitude-limited CCD survey of variable stars.