that in [NII], [SII], Hα and Ha. This indicates the existence of at least two types of ionization processes occurring in NGC 6888. Current interpretations of the results indicate that the material with the highest [NII]/Hα are associated with dredged-up and wind-contaminated ISM knots (possibly including actual stellar ejecta). Along the N and W outer perimeter of the nebula, the filamentary arcs of [OIII] were found, which seems to be relatively high velocity shocks propagating ahead of the wind. Significant variations in N enrichment resulting from different degrees of wind-contamination of ISM material were found in knots in different regions of [NII]/[SII] ratio maps. This is in agreement with previous studies by Parker.

Specific results that will be presented are 1) Extinction variations across NGC 6888 from Hα/Hβ ratio maps, 2) Ionization and compositional variations from dereddened emission-line ratio maps, and 3) Spatial properties of ejected, photoionized, and shocked material around the WN central star.

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Session 47: Optical Instrumentation, Seeing, Adaptive Optics
Display Session, Exhibit Hall

47.01 An Imaging Tunable Mageto-Optical Filter (ITMOF) for Stable Solar Doppler Observations
H.-S. Lin, J.R. Kuhn (Michigan State University)

The ITMOF is a two-cell magnetic birefringence filter designed to measure the doppler shift of the solar potassium resonance line (770 nm) with respect to a laboratory standard. The gas vapor cells contain isotopically refined potassium and operate at temperatures near 120 C. Hot cell windows are employed in a carefully controlled thermal environment to limit spurious birefringence in the pyrex cell and prevent condensation in the light path. Electro-magnets provide a variable strength and direction longitudinal magnetic field of up to 5KG on each cell. There is no rotating quarter-wave plate or other moving parts. The final image is detected with a CCD camera system.

47.02 A Spectroscopic Survey Telescope Design: Primary Mirror Structure and Support
P.B. Ray, S.V. Krishnamachari (McDonald Observatory/Un. of Texas/Austin)

Astronomers at Pennsylvania State University have initiated the design for a spectroscopic survey telescope utilizing a segmented spherical primary mirror. The University of Texas McDonald Observatory has joined in the effort to produce a workable design for such a telescope, elaborating on and expanding the Pennsylvania ideas. The spherical primary figure requires that a secondary focus assembly be driven at the tracking rate in an altitude normal to the spherical focal surface, while the telescope as a whole, being tilted appropriately at a predetermined azimuthal sphere distance, need only be "set" (and clamped) occasionally about its zenith axis. Another positive feature is that the spherical primary mirror segments are all figure controlled (and redundant) to presenting a potentially simpler manufacturing process than producing off-axis aspheric segments. The overall diameter of the primary is in the 8 to 10 meter range, enough to provide a significant aperture for moderate spectroscopic research, and the radius of curvature considered is 26 meters. The glass segments, here perceived as circular in planform, are supported on a fully triangulated space frame constructed of "invar" and "504" stainless steel. An generative design procedure permits parametric changes in segment diameter and spacing. Such a geometric algorithm is beneficial because the exact dimensions of the struts in the space frame are a function of these two variables and because the complexity of this sort of frame places it beyond the efficient application of ordinary pencil and paper design techniques. Computer assistance in the design was enhanced by the use of the solids modeling program CATIA, for the task of studying various strategies for the space frame layout, and to display and draft graphic details of the structure. The results using standard techniques of finite element analysis show that the expected static performance of both the individual segments and the overall space frame present reasonable goals to be achieved by modern engineering design practice.

The design has been implemented in a full-scale prototype consisting of the central portion of the telescope's primary mirror structure. The prototype is available for thermal stability testing in a typical observatory environment.