

Louisiana State University
Department of Physics and Astronomy
Baton Rouge, Louisiana 70803-4001

[S0002-7537(93)04131-9]

This report covers the interval 1 July 1999 - 30 June 2000.

1. PERSONNEL

Drs. G. C. Clayton, J. S. Drilling, J. Frank, A. U. Landolt, and J. E. Tohline made up the permanent teaching faculty in the Department of Physics and Astronomy's astronomy/astrophysics group. Dr. Mark Slovak joined the group as an instructor in the department. Dr. A. K. Uomoto, The Johns Hopkins University, and Landolt continued working on the latter's CCD faint standard star project. Drs. Tracy Smith and Wentao Wu were postdoctoral fellows working in Clayton's group.

Graduate Students for the year were Eric Barnes, Patrick Motl, Karly Pitman, Kenneth Taylor, and Lynne Valencic. Cazes and Cohl received their Ph.D. degrees.

Undergraduate students included Yara Beshara and Chris Dolese.

Saied Andalib, John Cazes, Howard Cohl, and Paul Fisher received their Ph.D.'s under Tohline's direction. Karl Misselt completed his Ph.D. working under Clayton's direction.

2. RESEARCH

Clayton along with Y. Beshara and O. DeMarco continued his investigations of R Coronae Borealis (RCB) stars. He obtained UV HST/STIS spectra, as well as K-band spectra at Steward Observatory and imaging at CTIO. These data are being used in studies of the evolution of RCB stars and the mechanism of their dust formation.

Clayton also studied the UV extinction properties along 30 sightlines using data from the IUE archive that have never been previously examined. These distant sightlines were selected to investigate the distribution and physical conditions of gas located in low density regions of the Galactic disk and halo. The sightlines have average densities among the lowest known. A subsample of these sightlines has extinction curves with weak bumps and very steep FUV extinction reminiscent of the Magellanic Clouds.

Clayton, Gordon, Valencic, and Misselt continued investigations of starburst galaxies through new observations and modeling. The new observations included IR spectra obtained at the Kitt Peak and Steward Observatories. Misselt finished his Ph.D. thesis, where he improved a radiative transfer code for galaxies with dust to include IR emission. Smith, Gordon and Clayton are studying the dust characteristics in a large sample of galaxies in the Hubble Deep Field.

Drilling continued with the following projects: a search for protoplanetary nebulae (with M. Parthasarathy of the Indian Institute of Astrophysics), classification of hot subdwarfs from the Edinburgh-Cape survey (with D. Kilkenny, D. O'Donoghue, and R. Stobie of the South African Astro-

nomical Observatory), studies of blue stragglers in open clusters (with S.M. Andrievsky and D. Schoenberner of the Astrophysikalisches Institut Potsdam), and studies of extremely metal-poor giants (with T. Beers of Michigan State University).

Projects completed during the reporting period included the chapter on normal stars in *Astrophysical Quantities* (J.S. Drilling and A.U. Landolt), the article on blue stars at high galactic latitude in the encyclopedia of *Astronomy and Astrophysics* (J.S. Drilling), the classification of helium-rich hot subdwarfs (C.S. Jeffery *et al.* 1999, Third Conference on Faint Blue Stars, 421), sorting out the nomenclature on faint blue star research (K.S. de Boer *et al.* 1999, Third Conference on Faint Blue Stars, 515) classification of hot subdwarfs (J.S. Drilling *et al.* 2000, Reunion of the Kth Group), low-resolution spectroscopy of hot post-AGB candidates (M. Parthasarathy *et al.* 2000, *Astronomy and Astrophysics Suppl.* 145, 269), and blue stragglers in NGC 6475 (S.M. Andrievsky *et al.* 2000, *Astronomy and Astrophysics* 356, 517). Colloquia were given at the South African Astronomical Observatory, the Armagh Observatory, and the Bamberg Observatory.

Landolt continued to gather photometric data at the Cerro Tololo Inter-American Observatory as he worked on the development of more extensive and accurate fainter UBVR standard star sequences. These broadband sequences are centered at the celestial equator, around the sky, in a band several degrees wide. The effort has been extended to additional sequences around the sky and centered at declination -50 degrees.

Landolt continued his years-long program of monitoring the photometric behavior of hydrogen-deficient stars, of RCrB stars, of FU Ori stars, of Preston's metal-poor blue stars, and of various novae and supernovae as time permitted.

3. MISCELLANEOUS

Several of the faculty in the Department of Physics and Astronomy remained active in public outreach at the public/university observatory which was built on the south edge of Baton Rouge. Information about the observatory and its operations may be found on the web at <http://www.phys.lsu.edu/observatory>.

Landolt continued as Secretary of the American Astronomical Society, as Secretary of the U.S. National Committee for the I.A.U., and on the Board of Governors of the American Institute of Physics. He continued to participate in the AAS Shapley Visiting Professor Program. Tohline continued to serve on the American Institute of Physics' Advisory Committee on Computation in Science and Engineering. He also served on the AAS's Publications Board.

Arlo U. Landolt