developed a method of separating the blended lines such that we can obtain accurate line positions. The best fit to the data is obtained with the assumption that the lines have a Gaussian profile.

RR Lyrae Variables in NGC 5897 by Amelia Wehlau, University of Western Ontario, Helen Sawyer Hogg, David Dunlap Observatory and Nicholas Potts, University of Western Ontario

NGC 5897 is a globular cluster of very low surface brightness. Two-colour photometry by Sandage and Katem yielded a colour-magnitude diagram characteristic of a globular cluster with low metal abundance.

The seven known variables in the cluster have been studied using plates obtained by one of us (H.S.H.) as early as 1939 with the Steward Observatory 36-inch and from 1946 through 1969 with the David Dunlap Observatory 74-inch, in 1970 and 1971 by the University of Western Ontario observers with the new 48-inch there, and by Dr. Christine Coutts of the Dunlap Observatory with the Curtis Schmidt on Cerro Tololo, Chile.

Periods have been obtained for the six RR Lyrae variables. Four of these variables appear to have periods falling between 0.41 and 0.45 day. If these four variables are assumed to be ab-type RR Lyrae stars then the mean period for all the ab-type RR Lyrae variables in the cluster would be 0.45. A tabulation of this average for a number of globular clusters recently published by Castellani, Giannone and Renzini shows only one other cluster with such a low value, NGC 6528, and in that case there is doubt as to whether the variables are members of the cluster.

The result obtained for NGC 5897 may not be significant because of the small number of variables known in the cluster. A continuing program of two-colour photographic photometry of these variables is planned at the University of Western Ontario.

The Spectrum and Light Variations in the Peculiar A Star HD 51418 by A. F. Gulliver, D. A. MacRae, J. R. Percy and J. E. Winzer, David Dunlap Observatory

HD 51418 is a peculiar A star with strong spectral lines of Eu, Sr and Cr. The ratio of the strength of the strongest Eu lines to the strength of Si λ4128 varies between 0.6 and 1.2. The Sr lines also vary in strength, but the Cr lines do not. The brightness of this star also varies, by $0^m.17$ in V, by $0^m.08$ in B, and $0^m.07$ in U, with a period of 5.44 days. This period satisfactorily represents variations in line strength. The brightness variations in V are greater than in any other known peculiar A star.

Radial Velocities of Selected Visual Binaries by C. D. Doucet and G. A. Bakos, University of Waterloo

A determination of the radial velocities of 56 stars was made, using 149 spectrograms, taken at the David Dunlap Observatory with the 74-inch telescope (through the years 1945–1957). Measurement and reduction of these plates were done at the University of Waterloo. The radial velocities are in good agreement with previously published values for these stars in the Wilson Catalogue. The space motions for 44 of these stars were calculated using the radial velocity, proper motion, and parallax. The velocity components were used to obtain the solar motion, resulting in $\pi_\odot = -11.8$, $\Theta_\odot = +10.2$, $Z_\odot = +13.0$, which compare well with the adopted values. The velocity ellipsoid was also determined. Dis-

persions along the ellipsoid axis were $O(\pi) = 33.26$, $O(\Theta) = 21.68$, $O(z) = 17.66$ with directions $l^\pi = 41.^\circ90$, $b^\pi = -10.^\circ98$, $l^\pi = 139.^\circ71$, $b^\pi = -66.^\circ26$, $l^\pi = 317.^\circ93$, $b^\pi = -29.^\circ29$ respectively. The majority of these stars were G and K-type giant stars, randomly distributed over the sky, with intermediate to high galactic latitudes. A plot was made of the velocities in the $\Theta - \pi$ plane. This revealed the apparent metal-rich nature of these G and K-type giants. Finally, several stars were tested for possible variability using an objective statistical test developed by J. F. Heard of Toronto. Three of these stars were assigned positive or questionable variability.

On the Detection of Black Holes by C. Leibovitz and D. P. Hube, University of Alberta

It is shown that in principle the gravitational lens effect may lead to significant light variations when a collapsed object such as a black hole passes between the observer and a normal star. Light curves characteristic of such an event are computed, and the possibility of observing such an event is discussed.

Selected Model Stellar Atmospheres by Ernst J. Mausser and Robert J. Doyle, University of Waterloo

Over the past two years, a general computer program for model stellar atmospheres has been developed at the University of Waterloo. The program computes flux-constant models for stars with effective temperatures in the range 7000–20,000 °K and for surface gravities in the range 10–10^8 cm/sec^2. Models computed have compositions that vary from pure hydrogen to pure helium and include models with solar abundances. In integrating the equation of hydrostatic equilibrium, the formation of H_2, H_2^+ and H^- is considered. The opacity sources are HI, H_2^+, H^-, HeI, HeII, electron scattering and Rayleigh scattering by HI. The models which are discussed include an F giant, F dwarf, A dwarf, B dwarf, and two helium white dwarfs. Comparison of two models with nearly the same effective temperature ($T_{\text{eff}} \sim 17{,}000$ °K), one a dwarf and the other a white dwarf model, shows that radiation pressure can be ignored for the white dwarf. In an F giant model ($T_{\text{eff}} = 7000$ °K, $\log g = 1$), $dPg/d\tau$ becomes slightly negative at optical depth 2 at 5000 Å, indicating possible large scale mass motion. All of the models computed have flux constancy better than 1%. Convective flux has been ignored.

Intensity Measurements and Transition Probabilities for the C_2 Swan Band System by L. Danylewych and R. W. Nicholls, York University

The rotational line intensity, partial band intensity and peak band intensity methods have been used (some in conjunction with computer-generated synthetic spectra) to interpret photoelectric intensity measurements on the astrophysically important C_2 Swan Band system, excited in controlled conditions in the laboratory.

All measurements lead to a consistent (within 10%) expression for the variation of the electronic transition moment with internuclear separation of

$$R_e(r) = C(1.00 - 0.52r) \quad 1.120 < r < 1.488\text{A}$$

Critical assessment of recent published oscillator strength measurements on the (0, 0) band

suggest that C is 13.02×10^{-18} cm e.s.u. ($\pm 30\%$). A table of absolute band strengths, oscillator strengths and Einstein A coefficient has thus been calculated.

Oscillator Strength Measurements on the (0, 0) *Band of the NO Gamma System From Dispersion Measurements by V. Hasson, A. J. D. Farmer and R. W. Nicholls, York University*

Absolute oscillator strength measurements have been made on the (0, 0) band of the NO Gamma system from dispersion measurements. A Mach-Zehnder interferometer was used in conjunction with a high dispersion spectrograph to investigate the change of refractive index in selected optical windows of the band. The method is more sensitive than the "hook" technique of Rozhdestvenskii (*Ann. Phys.* (*4*), **39**, 307, 1912) and is well suited to molecular intensity measurements.

Accretion onto a Rapidly Rotating Magnetic White Dwarf as a Possible Model for Cen XR-3 by W. Y. Chau, R. N. Henriksen and P. A. Feldman, Queen's University

The remarkable observational features of the pulsed blackbody X-Ray source Cen XR-3 can be explained in terms of accretion onto a rapidly rotating, magnetic white dwarf. The observed period is interpreted as the free nutation period, and the $\sim 10^7$ K blackbody X-ray spectrum is generated by shocked material accreting onto a small region on the surface of the white dwarf through the combined funnelling effect of rotation and the magnetic field. The *decrease* in period by $\sim$1 percent over a time span of 3 months is taken to be the secular behaviour of a rapidly rotating object evolving along the Jacobi sequence where it has the peculiar property of speeding up while losing its angular momentum. Other short-time-scale features (spin variations and flare-ups) that occur in a time of about 1 hour are just interpreted as results of fluctuations in the accretion process and/or the relative orientations of the mass, rotation and magnetic axes.

2700 MHz Observations and Comments for the Flare of October 24, 1969 by Arthur E. Covington, Astrophysics Branch, National Research Council, Ottawa

Observations of the impulsive flare of October 24, 1969 by H. Zirin, Gail Pruss and Joan Vorpohl (*Solar Physics*, **19**, p. 463, 1971) with accompanying observations of X.U.V. emissions from satellites and four microwave radio emissions from the Sagamore Hill Observatory, Hamilton, from 1415 to 8800 MHz are most detailed. These are an excellent example of the development of two types of radio spectra within the same flaring volume. The inclusion of small intensity variations observed at ARO and DRAO at 2700 MHz provides a clarification of burst profiles and an extension of the spectrum of the first burst from the high frequencies to the lower frequency with subsequent modifications to the theoretical implications.

HeI Triplet Spectrum in the Nebular Stage of Nova Delphini 1967 by A. Sanyal, David Dunlap Observatory

Complex Roots in the Secular Spectrum of Stars by M. L. Aizenman, Université de Montréal

Giant Impulses from NP0532 by J. F. R. Gower and E. Argyle, Dominion Radio Astrophysical Observatory, Penticton