sdO Stars in Globular Clusters, J. Glaspey, Observatoire astronomique du mont Mégantic and the Université de Montréal.

Recently obtained spectra at moderate resolution of a blue, UV-bright star in M 22 show absorption lines of He I, He II and H I. The spectral type derived from line ratios is O6, indicating a hotter effective temperature than that implied by the available colour-index. We derive a log $T_{\text{eff}} = 4.58$, a log $g = 4.2$ and a mass of 0.44 $\text{m}_\odot$.

Comparison of this object and several previously known sdO stars with published evolutionary models indicates that cluster sdO stars have very similar masses ($\sim 0.4 \text{m}_\odot$) but have systematically lower surface gravities than field sdOs. The two groups may represent distinctly different evolutionary states.


Nine CTIO 4-m plates are combined to produce a colour-magnitude diagram for several hundred bright stars of this Magellan-type galaxy. The plates were measured with the APM system at Cambridge and analysed with the VAX 11/780 at IOA. One bright red variable $V = 19.35$ was detected and several Cepheids were measured. A distance $\mu_0 = 26.9$ (2.4 Mpc) was obtained from the apparent magnitudes of the three brightest blue stars and the brightest red star. The mean apparent magnitudes of three bright Cepheids match very well this distance. Approximate periods can be estimated from the nine data points.

The Stellar Distribution in Puppis, B.C. Reed, St. Mary’s Univ., Halifax.

$BV$ photographic photometry and objective-prism spectral classifications have been used to study the distribution of stars and interstellar reddening in the direction $(l, b) = (245^\circ, 0^\circ)$ in the constellation Puppis.

Spectrophotometry of a sample of $\sim 3300$ B5 to M5 stars in a 7.75 square degree region to $V \sim 12.5$ reveals that interstellar absorption sets in at $r \sim 400$ pc, and rises steadily to $A_v \sim 1^m.6$ at $r \sim 9$ kpc. The spatial distributions of various spectral groups are consistent in number and structure with those in other Galactic-plane fields; the A2-A5 stars exhibit a density maximum at $r \sim 1.2$ kpc which may be associated with the bridge between the local and Carina spiral features, and the G-K giants appear more populous in this direction than at other Galactic longitudes.

Velocity Dispersion in Giant Extragalactic H II Regions, Robin Arsenault and Jean-René Roy, Département de physique, Université Laval.

We have measured the H$\alpha$ line profiles of 46 extragalactic H II regions with the Canada–France–Hawaii telescope. The line profiles were obtained with the scanning Fabry-Pérot spectrometer built by Roy and Arsenault at Laval University. The profiles have been deconvolved in order to obtain the velocity width in excess of thermal motions. The purpose of this research is to calibrate the relationship between the velocity width of line profiles and the linear diameter of the H II regions and, potentially to establish a relation between the velocity width and the absolute magnitude of the parent galaxy.


New $\lambda 21$ cm aperture-synthesis observations of the H II region, S142, made with the telescope at Penticton (resolution $1' \times 1.2' \times 1.3$ km s$^{-1}$ in velocity) show the radio continuum emission and
several HI features near the ionization boundary of the H II region. The H II region contains a total continuum flux of 13 Jy at λ21 cm and has a peak emission measure of 15400 cm⁻⁶pc. The emission cuts off sharply on the east side of the nebula, but fans out in a larger region of low intensity in the other directions.

An HI feature, overlapping an adjacent dark cloud, closely following the steep edge of the continuum emission, indicates that dissociation of molecular gas near the ionization boundary is taking place. Several other HI features may be linked to the dissociation zone around the H II region. These features contain a total of several thousand $M_\odot$.


The very extended ratio source BG2107+49 lies in the galactic plane and has a cometary “head-tail” structure similar to the extragalactic source 3C129. However, it has a very flat spectral index, unusual for an extended extragalactic source. New observations of this peculiar object have been made in various spectral regimes in an attempt to clarify its nature. These include HI absorption measurements at Westerbork, VLA continuum observations and CCD observations with the C.F.H.T. These data will be presented, demonstrating that the radio source is probably extragalactic.


Fabry-Pérot interferometry at Hα and efficient image-processing techniques have allowed the measurement of nearly 41000 radial velocities across the H II region S142. The mean $V_{LSR}$ is $-35.6 \pm 0.1$ km s⁻¹ and the standard deviation of the velocity distribution is 12.5 km s⁻¹. The observed H-velocity field is interpreted as a systematic expansion of the ionized gas; a velocity gradient in the plane of the sky of 1 km s⁻¹ pc⁻¹ is observed away from the core of the associated molecular cloud. Several features of the morphology and of the observed kinematics of S142 are in close agreement with the predictions of the “champagne” model of Tenorio-Tagle (1979).

*Spectrophotometry of Emission Nebulae in the 5000–6000 A Spectral Region*, C. Pritchett and C. Grillmair, University of Victoria.

High-sensitivity spectrophotometry has been obtained for the planetary nebulae NGC 7027, NGC 6210, and IC 351, and the bipolar nebula AFGL 2688. The observations of NGC 7027 show an emission feature at 5624 Å which we tentatively attribute to the molecule H₂ (for which laboratory spectroscopy has been obtained by Herzberg and collaborators). For the first time, diffuse interstellar bands (at 5780 Å and at 5796 Å) have been found in absorption against the continuum of NGC 7027; their existence may place interesting constraints on the origin of the diffuse interstellar bands.


The physical processes which give rise to the observed radio continuum properties of SNR are modelled from existing theory. Our model utilizes Bell's (1978) formulation of the diffusive shock acceleration mechanism to account for the injection and distribution of relativistic electrons. The observed slope and absolute level (intercept) of the surface brightness – diameter relation is accounted for by the model.