SPECTROSCOPY OF EXTRAGALACTIC PLANETARY NEBULAE IN THE ULTRAVIOLET

T.R. Gull, S.P. Maran, T.P. Stecher
Laboratory for Astronomy and Solar Physics, NASA-Goddard Space Flight Center, Greenbelt, Maryland 20771, USA

L.H. Aller
Department of Astronomy, University of California, Los Angeles, California 90024, USA

Three high-excitation planetary nebulae in the Magellanic Clouds were successfully observed with the International Ultraviolet Explorer. Emission lines as well as nebular and stellar continua were detected. Fluxes in the lines 1550 C IV, 1640 He II, 1663 O III, and 1909 C III were measured in spectra of LMC P40, SMC N2, and SMC N5 obtained with the IUE short wavelength spectrograph; 2422 Ne IV was measured in P40 with the long wavelength spectrograph. The data were analyzed together with groundbased observations by Aller in order to derive ionization models and the nebular abundances of He, C, N, O, S, Ar. The C abundances are as large as those typically found in galactic planetaries, although the interstellar media of the Clouds are notably deficient in C. Thus, the C was synthesized in the progenitor stars and presumably was lifted to the stellar envelopes by convection prior to the ejection of the nebulae. Other planetary nebulae in the Clouds, as well as the planetary nebula in the Fornax galaxy, may be observable with IUE.

DISCOVERY OF A LARGE HIGH-EXCITATION PLANETARY NEBULA

J.N. Heckathorn
Computer Sciences Corporation

R.A. Fesen, T.R. Gull
NASA Goddard Space Flight Center

The discovery of a new planetary nebula from (O III) interference filter imagery is reported. The nebula, PN 136 + 5°1, is 15' in diameter and asymmetric in appearance. Spectrophotometry of the central regions indicate it is of excitation class between 8 and 10. A single bright condensation within the nebula exhibits emission lines of much lower ionization with (S II) λλ 6717, 6731 line intensities indicating an

https://doi.org/10.1017/S007418090009447X Published online by Cambridge University Press

electron density of about 350 ± 150 cm^{-3}. Seeing limited (O III) imagery of this planetary nebula is also presented. (This article is appearing in Astron. Astrophys. in the near future).

BIPOLAR NEBULAE AND TYPE I PLANETARY NEBULAE

N. Calvet
Centro de Investigación de Astronomía, Mérida, Venezuela

M. Peimbert
Instituto de Astronomía, Universidad Nacional Autónoma de México

It is suggested that the bipolar nature of PN of Type I can be explained in terms of their relatively massive progenitors ($M_i \geq 2.4\ M_\odot$), that had to lose an appreciable fraction of their mass and angular momentum during their planetary nebula stage. The following objects are discussed in relation with this suggestion: NGC 6302, NGC 2346, NGC 2440, CRL 618, Mz-3 and M2-9. It is found that CRL 618 is overabundant in N/O by a factor of 5-10 compared with the Orion Nebula.

WIND-BLANKETED STELLAR ATMOSPHERES

D.C. Abbott, D.G. Hummer
Joint Institute for Laboratory Astrophysics

Radiation scattered by a stellar wind back into the photosphere alters the temperature-depth relation and thus the stellar flux distribution. The fraction of the radiation returned to the star at every wavelength has been calculated using stellar wind models accounting for approximately 10 000 lines. Model stellar atmospheres containing hydrogen and helium, both with and without the assumption of LTE, have been computed allowing for the reflected radiation. For realistic wind and stellar parameters relevant to central stars of planetary nebulae, we obtain a 25% increase in the surface temperature and in the optical brightness temperature, and a 2 order-of-magnitude increase in the flux in the He II continuum.