CHEMICAL ABUNDANCE BEHAVIOR OF TYPE I PLANETARY NEBULAE

J.L. Jiménez O.
Universidad Nacional "Andrés Bello", Chile
and
M. Faúndez-Abans[1]
Depto. de Física, Universidad de Santiago de Chile

In this work 13 planetary nebulae have been classified as Type I according to Peimbert's criteria (Peimbert 1978, IAU Symposium 76, 215). These objects have been added to a previous sample (Maciel & Faúndez-Abans 1985, A&A, 149, 365) and diagrams of O/H versus N/H, S/H, Ne/H, and Ar/H, as well as N/H versus S/H, Ne/H, and Ar/H have been drawn. All of them exhibit a tendency for linear correlation; moreover, the behavior of O and N versus Ar and S are very similar, with approximately the same slope. When the excitation class parameter was included in the diagrams, no clear tendency can be discerned, for any class.

[1] On leave from CNPq/Laboratório Nacional de Astrofísica, Brazil.

H_2 V = 1–0 (S1) IMAGES OF SOUTHERN PLANETARY NEBULAE

J.A. López[1], M. Roth[2], and M. Tapia[1]

We have searched for molecular hydrogen in a sample of Southern planetary nebulae. The images in the light of H_2 with subtracted continuum of Mz-1, Mz-3 and IC 4406 are presented. The spatial distribution of molecular hydrogen is discussed and analyzed in terms of the physical characteristics of these objects and compared with CCD images obtained in a number of low-excitation lines.

The infrared images reported here were obtained with the NICMOS 3 array in the IR-Camera at the duPont telescope of Las Campanas Observatory.

[1] Instituto de Astronomía, Universidad Nacional Autónoma de México.
[2] Las Campanas Observatory, Carnegie Institution of Washington, Chile.

EPISODIC SYMMETRIC JETS IN THE PLANETARY NEBULA FG 1

J.A. López[1], M. Roth[2], and M. Tapia[1]

Deep CCD imaging and long-slit spectroscopy have been obtained for the elliptical planetary nebula Fg-1 (He 2–66). We report the discovery of a symmetric jet-like structure, consisting of two opposed strings of ionized knots, highly reminiscent of Herbig-Haro objects. The strings are bent in opposite directions and span 2 arcmin to either side of the PN. The main body of Fg-1 is found to consist of an orthogonal system of elliptical structures. The spectra from the opposite innermost knots intersected by the slit show expanding velocities and line ratios typical of collisionaly excited gas. The knots that make up the strings are remarkably equidistant with respect to the nucleus. These knots are interpreted as multiple ansae that have been formed and blown away in episodic events by symmetric collimated flows, probably produced by a precessing source.

[1] Instituto de Astronomía, Universidad Nacional Autónoma de México.
[2] Las Campanas Observatory, Carnegie Institution of Washington, Chile.

TIME EVOLUTION OF GALACTIC ABUNDANCE GRADIENTS

Walter J. Maciel
Instituto Astronômico e Geofísico, USP, Brazil
and
Joachim Köppen
Institut für Theoretische
Physik und Sternwarte, Germany

Galactic abundance gradients can be determined from H II regions, planetary nebulae, and stars of different ages and populations. Although most determinations are similar (~ -0.07 dex/kpc) for ratios such as O/H and S/H in young objects, there are several indications that older systems present flatter gradients.

This is particularly true for disk planetary nebulae, which comprise Peimbert's types I, II, and III. There are presently compelling evidences from their space distribution, kinematics, and chemical composition, in the sense that planetary nebulae form a true population (or age) sequence. As a consequence, the abundances derived from these objects are extremely important to the study of the time evolution of the gradients, even though their corresponding distances are still poorly known.