

A PRELIMINARY REPORT OF A SURVEY OF PLANETARY NEBULAE IN THE SOUTHERN HEMISPHERE

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As you know, the new and most complete catalogue of galactic planetary nebulae, compiled by Perek and Kohoutek, has recently been published. This catalogue will certainly be very useful for astronomers working on planetary nebulae.

However, as has been pointed out by the compilers of the catalogue, the degree of completeness of the discoveries, e.g. in a 20° belt along the Milky Way, is not uniform. This inhomogeneity will affect, of course, all statistical work on planetary nebulae.

Even if we restrict ourselves to the region of the galactic centre only, say, about 30° on both sides of the galactic centre, our knowledge of the number of planetary nebulae over the field is inhomogeneous. This region has been covered by several surveys of planetary nebulae, by Henize using the 10-inch Metcalf refractor, by Abell using the Palomar Schmidt telescope, and by Haro using the Tonantzintla Schmidt telescope. Some regions have been surveyed by Blanco and myself using the Lembang Schmidt telescope. Because of the various methods and telescopes used in these surveys, it is clear that our knowledge of the distribution of planetaries in the region of the galactic centre is not homogeneous.

The situation is even worse outside the region of the galactic centre. Recently Dr Kohoutek, using the Hamburg-Schmidt telescope, had surveyed a region of the Northern Milky Way from $l^{\text{II}}=32^\circ$ up to $l^{\text{II}}=70^\circ$. The limiting magnitude of this survey is red magnitude 17.8. Because of this survey, the distribution of planetaries is not symmetric with respect to the galactic centre, as was pointed out by Perek and Kohoutek in their catalogue.

In view of the above-mentioned inhomogeneity and asymmetry, and in order to extend Kohoutek's survey to the South, I have started, using our Lembang Schmidt telescope, a survey of planetary nebulae. This survey will be done in two steps:

- (1) The central region of the Milky Way from $l^{\text{II}}=40^\circ$ through 0° to $l^{\text{II}}=320^\circ$.
- (2) The Southern Milky Way from $l^{\text{II}}=270^\circ$ to $l^{\text{II}}=320^\circ$.

The width of the survey region will be 10° on both sides of the galactic equator. The reason that I will not go far beyond Carina is because this region falls in our rainy season, during which it is very difficult to obtain plates. I am exposing my plates so that the limiting magnitude of my survey will be comparable to Kohoutek's limiting magnitude.

Osterbrock and O'Dell (eds.), Planetary Nebulae, 36-37. © I.A.U.

I will describe briefly the first results of my survey:

(1) The whole constellation of Scutum was covered by 103a-E survey plates, exposed behind an RG1 filter. The spectra are unwidened. The whole area surveyed is almost 120 square degrees centered at $\alpha = 18^{\text{h}}36^{\text{m}}$, $\delta = -10^{\circ}0$ (1950), which corresponds to $l^{\text{II}} = 23^{\circ}0$, $b^{\text{II}} = -2^{\circ}1$. The total number of previously known planetaries is 39, of which several could not be redetected on my plates, probably caused overlapping, especially in very crowded fields. The catalogue of Perek and Kohoutek will be very useful in re-identifying these missing objects on my plates. The number of newly found planetaries is 14, more than 25 % of all the existing planetaries in this region. All the newly found planetaries in this region, except one, appear stellar on my direct plates.

(2) Furthermore, I have examined a region of 25 square degrees centered at $\alpha = 16^{\text{h}}11^{\text{m}}$, $\delta = -54^{\circ}2$ (1950); or $l^{\text{II}} = 329^{\circ}9$, $b^{\text{II}} = -2^{\circ}8$. The number of known planetaries in this region is 11, while 6 new planetaries were discovered, about 35% of the total number now known. This percentage is lower than that which Kohoutek found in his Hamburg Schmidt survey, but the present survey region may perhaps be exceptional.

I think that the above preliminary result of my survey of planetaries justifies an attempt to survey the southern Milky Way for planetary nebulae. My plate material will of course be very useful for the detection of other interesting objects.

DISCUSSION

Aller: Would you expect to find more planetaries if you used an instrument with larger scale?

Pik Sin The: Yes, especially in the very crowded regions of the Milky Way.

Abell: What is the aperture of your Schmidt telescope?

Pik-Sin The: Its aperture is 70 cm.

Perek: It is pleasant to see that the number of new discoveries is smaller than the number of nebulae already known. It shows that we are approaching completeness with the present telescopes.