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New small planetary nebulae discovered in the Galactic center direction

Sławomir K. Górny

Copernicus Astronomical Center, Rabiańska 8, 87-100 Toruń,Poland
email: skg@ncac.torun.pl

Abstract. During an ongoing search for small planetary nebulae in the southern hemisphere 24 candidates have been found and spectroscopically observed in a region of 45 square degrees.

Keywords. planetary nebulae: general, Galaxy: center

1. Introduction

We report on an ongoing search for small planetary nebulae (PNe) in the southern hemisphere. It was motivated by the possibility of a statistical bias towards evolved and highly evolved PNe of the known Galactic population after the CD-ROM release of the Edinburgh/AAO/Strasbourg catalogue (Parker *et al.* 2001/2003). Our program was initially designed to balance it by unveiling the sample of younger, compact and dusty PNe expected to be strong infrared emitters (e.g. Górny *et al.* 2001) and as an ultimate goal to help investigate different Galactic PNe populations (see e.g. Górny *et al.* 2004).

To select candidates we use the photometric data and images from the SuperCOSMOS scanned plates of the AAO/UKST H-alpha survey (Parker *et al.* 2005). The other available broad-band visual images taken at different epochs help to discriminate against variable stars that imitate Hα excess sources. Additional criteria have been developed to select promising PNe candidates from recent infrared and near-infrared surveys (Górny, Omont & Schultheis, in preparation).

The selected sources are observed with short exposure times using a low resolution spectrograph at the 1.9 meter telescope of the South African Astronomical Observatory.

Table 1. New planetary nebulae candidates.

PNG	RA Dec 2000	obs. date	PNG	RA Dec 2000	obs. date
005.3+02.5	17 48 12.6 -22 59 38	May 2004	007.6+02.8	17 52 07.8 -20 52 41	May 2004
006.0+05.6 [b]	17 38 25.7 -20 52 18	Jun 2005	007.8+04.3 [b]	17 47 15.5 -19 57 28	Apr 2003
006.1+02.9	17 48 24.8 -22 11 52	Apr 2003	008.1+01.3 [b]	17 58 40.6 -21 12 46	May 2004
006.1+04.1	17 44 10.6 -21 29 21	May 2004	008.4+08.8	17 32 06.0 -17 06 52	Aug 2005
006.2+00.8 [b]	17 56 33.2 -23 11 47	May 2004	008.5+02.4	17 55 42.3 -20 22 59	Aug 2005
006.2+06.9 [b]	17 34 13.7 -20 00 52	Apr 2003	008.6+06.7 [a]	17 40 21.3 -18 05 11	Aug 2005
006.3+01.7 [b]	17 53 28.3 -22 34 23	May 2004	008.8+03.8 [b]	17 51 08.7 -19 25 47	Apr 2003
006.8+05.0 [c]	17 42 25.9 -20 26 38	Apr 2003	008.8+03.9	17 50 47.3 -19 21 04	Aug 2005
007.3+01.7 [b]	17 55 34.7 -21 42 38	May 2004	008.8+06.2	17 42 32.4 -18 09 44	Aug 2005
007.3+03.5 [a]	17 49 26.7 -20 54 31	May 2004	009.3+02.5	17 56 52.2 -19 33 01	Aug 2005
007.4+01.7 [b]	17 55 42.6 -21 40 18	May 2004	009.4+03.9 [a]	17 52 17.8 -18 52 02	Aug 2005
007.4+02.5	17 52 42.7 -21 15 36	May 2004	010.0+03.1	17 56 17.3 -18 42 36	May 2004

Comments: a) first published in Boumis et al. (2003, 2006); b) independently discovered by Parker et al. (2006); c) possibly not PN (Parker, private communication).

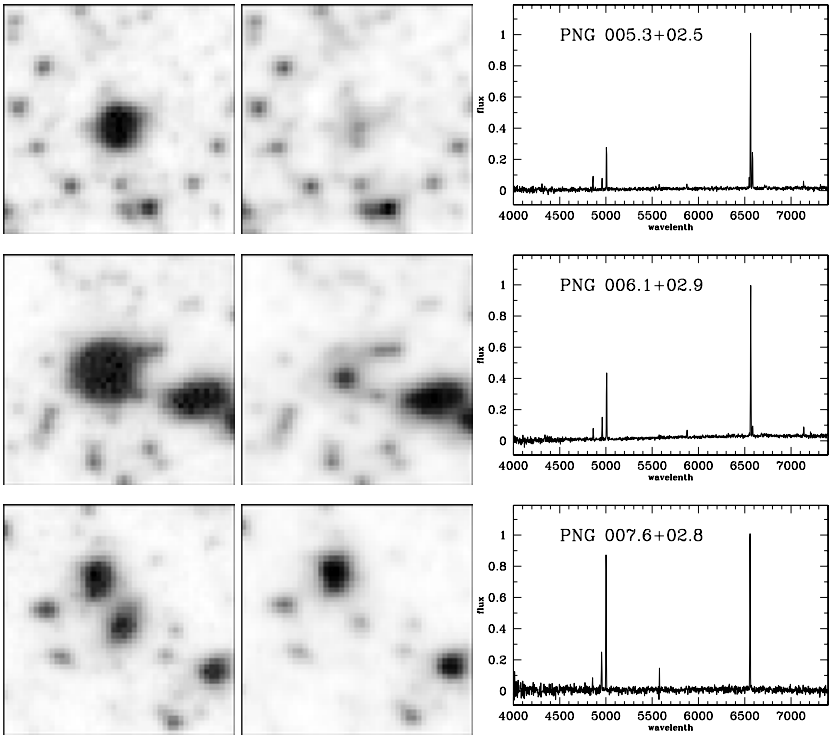

Figure 1. The Hα and R band images ($30'' \times 30''$) and spectra of three small PNe candidates.

2. Results

We present here our results from the best observed field near the Galactic center limited by coordinates: $5° < l < 10°$ and $0° < b < 9°$. The 24 PNe candidates found so far in this region are listed in Table 1.

Nine of our PNe with intermediate diameters have been independently discovered during a recent follow-up program of the AAO/UKST survey (Parker *et al.* 2006). The remaining objects are all small or star-like in appearance. A few examples are shown in Figure 1 presenting their Hα and R band images along with the low-resolution spectra.

Our search in this particular Galactic field is already complete down to about 15th magnitude in Hα but we plan to reach weaker sources and should reveal candidates with E(B-V)=4 located in more dust obscured regions close to the Galactic plane.

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