

Abstract

A revised catalogue of 274 Galactic supernova remnants (SNRs) is presented, based in the literature published up to the end 2008. This includes 43 more objects than in the previous published version of the catalogue from 2004.

1 Introduction

This catalogue of Galactic supernova remnants (SNRs) is an updated version of those published in detail in Green (1984, 1988) and in summary form in Green (1991), Stephenson & Green (2002) and Green (2004). Since 1995 detailed versions of the catalogue have also been presented on the World-Wide-Web, at:

<http://www.mrao.cam.ac.uk/surveys/snrs/>

Table 1: the summary data for the first 35 SNRs in the catalogue.

<i>l</i>	<i>b</i>	RA (J2000)	Dec	size	type	Flux at spectral	other	
(h m s)	(° ' ")	1 GHz/ly		/arcmin		index	name(s)	
0.0	+0.0	17 45 44	-29 00	3.5 × 2.5	S	100?	0.8?	Sgr A East
0.3	+0.0	17 46 15	-28 38	15 × 8	S	22	0.6	
0.9	+0.1	17 47 21	-28 09	8	C	18?	varies	
1.0	-0.1	17 48 30	-28 09	8	S	15	0.6?	
1.4	-0.1	17 49 39	-27 46	10	S	2?	?	
1.9	+0.3	17 48 45	-27 10	1.5	S	0.6	0.6	
3.7	-0.2	17 55 26	-25 50	14 × 11	S	2.3	0.65	
3.8	+0.3	17 52 55	-25 28	18	S?	3?	0.6	
4.2	-3.3	18 08 55	-27 03	28	S	3.2?	0.6?	
4.5	+6.3	17 30 42	-21 29	3	S	19	0.64	Kepler, SN1604, 3C358
4.8	+6.2	17 33 25	-21 34	18	S	3	0.6	
5.2	-2.6	18 07 30	-25 45	18	S	2.6?	0.6?	
5.4	-1.2	18 02 10	-24 54	35	C?	35?	0.2?	Milne 56
5.5	+0.3	17 57 04	-24 00	15 × 12	S	5.5	0.7	
5.9	+3.1	17 47 20	-22 16	20	S	3.3?	0.4?	
6.1	+0.5	17 57 29	-23 25	18 × 12	S	4.5	0.9	
6.1	+1.2	17 54 55	-23 05	30 × 26	F	4.0?	0.3?	
6.4	-0.1	18 00 30	-23 26	48	C	310	varies	W28
6.4	+4.0	17 45 10	-21 22	31	S	1.3?	0.4?	
6.5	-0.4	18 02 11	-23 34	18	S	2?	0.6	
7.0	-1.1	18 01 50	-22 54	15	S	2.5?	0.5?	
7.2	+0.2	18 01 07	-22 38	12	S	2.8	0.6	
7.7	-3.7	18 17 25	-24 04	22	S	11	0.32	1814-24
8.3	-0.0	18 04 34	-21 49	5 × 4	S	1.2	0.6	
8.7	-5.0	18 24 10	-23 48	26	S	4.4	0.3	
8.7	-0.1	18 05 30	-21 26	45	S?	8?	0.5	(W30)
8.9	+0.4	18 03 58	-21 03	24	S	9	0.6	
9.7	-0.0	18 07 22	-20 35	15 × 11	S	3.7	0.6	
9.8	+0.6	18 05 08	-20 14	12	S	3.9	0.5	
9.9	-0.8	18 10 41	-20 43	12	S	6.7	0.4	
10.5	-0.0	18 09 08	-19 47	6	S	0.9	0.6	
11.0	-0.0	18 10 04	-19 25	11 × 9	S	1.3	0.6	
11.1	-1.0	18 14 03	-19 46	18 × 12	S	5.8	0.6	
11.1	-0.7	18 12 46	-19 38	11 × 7	S	1.0	0.7	
11.1	+0.1	18 09 47	-19 12	12 × 10	S	2.3	0.4	

2 The Catalogue

This, the 2009 March version of the catalogue, contains 274 SNRs (which is 43 more than in the last published version from 2004). The detailed version of the catalogue contains over a thousand references, and is based on research in the published literature up to the end of 2008.

For each remnant in the catalogue the following parameters are given.

- **Galactic Coordinates;**
- **Right Ascension and Declination;**
- **Angular Size;**
- **Type,** i.e. 'S' or 'F' if the remnant shows a 'shell' or 'filled-centre' structure, or 'C' for a 'composite' structure, or 'S?', 'F?' or 'C?' if there is some uncertainty, or '?' in several cases where an object is conventionally regarded as an SNR even though its nature is poorly known or not well-understood;
- **Flux Density** of the remnant at 1 GHz, in jansky;
- **Spectral Index** of the integrated radio emission from the remnant;
- **Other Names.**

A summary of the data available for the first 35 remnants in the catalogue is shown in Table 1.

The more detailed version of the catalogue on the web also contains the following information.

- Notes if other Galactic coordinates have been used to label it, if the SNR is thought to be the remnant of a historical SN, or if the nature of the source as an SNR has been questioned.
- Short descriptions of the observed structure of the remnant at radio, X-ray and optical wavelengths.
- Notes on distance determinations, and any point sources or pulsars in or near the object.
- References to observations are given for each remnant, complete with journal, volume, page, and a short description of what information each paper contains. These references are *not* complete, but cover representative and recent observations of the remnant, up to the end of 2008.

An example of the webpage for the SNR G1.9+0.3 is shown in Fig.1.

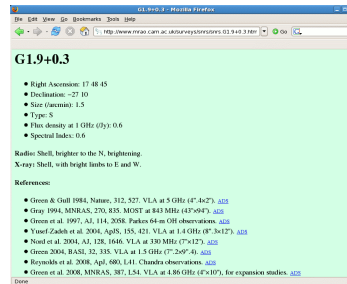


Figure 1: A screen shot of the detailed web-based catalogue entry for G1.9+0.3. Note that links to the ADS are provided with all the references.

The detailed version of the catalogue contains notes both on those objects no longer thought to be SNRs, and on many possible and probable remnants.

3 Revisions

Since the 2004 version of the catalogue was published, two objects have been removed from the catalogue, and 45 have been added.

G166.2+2.5 (=OA 184) and G84.9+0.5 have been shown to be HII regions (see Foster et al. 2006, 2007).

The majority of the newly added SNRs were identified from the deep, multi-frequency radio and infra-red survey of the region $4^{\circ}5 < l < 22^{\circ}0$, $|b| < 1^{\circ}25$ by Brogan et al. (2006).

4 Discussion

There are 16 Galactic SNRs that are either not detected at radio wavelengths, or are poorly defined by current radio observations, so that their flux density at 1 GHz cannot be determined with any confidence: i.e. 94% have a flux density at 1 GHz included in the catalogue. Of the catalogued remnants, $\approx 40\%$ are detected in X-rays, and $\approx 20\%$ in the optical. At both of these wavebands Galactic absorption hampers the detection of distant remnants.

In the current version of the catalogue, 78% of remnants are classed as shell (or possible

shell), 12% are composite (or possible composite), and 4% are filled-centre (or possible filled-centre) remnants. The type of the remaining remnants is not clear from current observations, or else they are objects which are conventionally regarded as SNRs although they do not fit well into any of the conventional types.

Although several Galactic SNRs have been identified at other than radio wavelengths, in practice the dominant selection effects are those that are applicable at radio wavelengths. Simplistically, two selection effects apply to the identification of Galactic SNRs due to the difficulty in identifying (i) faint remnants and (ii) small angular size remnants (see Green 1991, 2004, 2005 for more detailed discussions).

Due to these selection effects, care has to be taken in using the catalogue for statistical studies. For example, Fig. 2 shows the distribution of both (a) *all* SNRs, and (b) the brighter ones (with $\Sigma_1 \text{ GHz} \geq 10^{-20} \text{ W m}^{-2} \text{ Hz}^{-1} \text{ sr}^{-1}$). This shows that relatively many more remnants are seen in the 2nd and 3rd Galactic quadrants and away from $b = 0^{\circ}$, when looking at the whole catalogue rather than the brighter remnants. This is expected, as the Galactic background is fainter in the anticentre and away from $b = 0^{\circ}$, and hence it is easier to identify faint SNRs here.

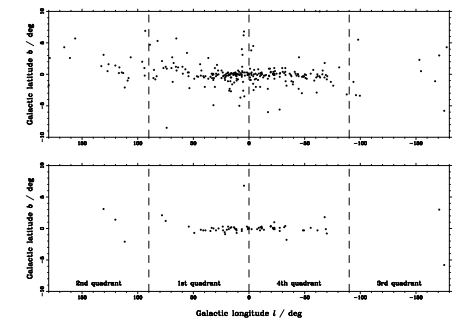


Figure 2: Galactic distribution of (top) all Galactic SNR and (bottom) those SNRs with a surface brightness at 1 GHz greater than $10^{-20} \text{ W m}^{-2} \text{ Hz}^{-1} \text{ sr}^{-1}$. (Note that the latitude and longitude axes are not on the same scale.)

Acknowledgements

I am grateful to colleagues for comments on previous versions of the Galactic SNR catalogue. This research has made use of NASA's Astrophysics Data System Bibliographic Services.

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