

**G0.0+0.0**

Sgr A East

**RA:** 17<sup>h</sup>45<sup>m</sup>44<sup>s</sup>**1-GHz flux/Jy:** 100?**Size/arcmin:** 3.5 × 2.5**Dec:** –29°00′**Spectral index:** 0.8?**Type:** S**Radio:** Non-thermal shell, in complex region, interacting with molecular material to the west.**References:**

Ekers *et al.* 1983, A&A, 122, 143. VLA at 1.4 GHz and 5 GHz (both 5'' × 8''),  $S_{1.4\text{ GHz}} = 77\text{ Jy}$ ,  $S_{5.0\text{ GHz}} = 31\text{ Jy}$ .  
 Pedlar *et al.* 1989, ApJ, 342, 769. VLA at 332 MHz (12''), 1.4 GHz (1''.3 × 2''.5) and 5 GHz (1''.3 × 2''.5).  
 Mezger *et al.* 1989, A&A, 209, 337. Nearby molecular material.  
 Ho *et al.* 1991, Natur, 350, 309. VLA of NH<sub>3</sub> emission from surroundings.  
 Anantharamaiah *et al.* 1991, MNRAS, 249, 262. VLA at 330 MHz (17'' × 33'').  
 Serabyn *et al.* 1992, ApJ, 395, 166. Nearby molecular material.  
 Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 88'').  
 Yusef-Zadeh & Mehninger 1995, ApJ, 452, L37. VLA of nearby H<sub>2</sub>O masers.  
 Yusef-Zadeh *et al.* 1999, ApJ, 512, 230. OH maser observations.  
 Coil & Ho 2000, ApJ, 533, 245. NH<sub>3</sub> observations of surroundings.  
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43'' × 24'').  
 Fatuzzo *et al.* 2001, ApJ, 549, 293. Electron–positron lines from the vicinity.  
 Yusef-Zadeh *et al.* 2001, ApJ, 560, 749. Observations of nearby molecular hydrogen.

**G0.3+0.0****RA:** 17<sup>h</sup>46<sup>m</sup>15<sup>s</sup>**1-GHz flux/Jy:** 22**Size/arcmin:** 15 × 8**Dec:** –28°38′**Spectral index:** 0.6**Type:** S

Has been called G0.33+0.04 and G0.4+0.1.

**Radio:** Bilateral shell, near Galactic Centre.**References:**

Kassim & Frail 1996, MNRAS, 283, L51. VLA at 333 MHz (23'' × 42''), plus review of flux densities and other observations.  
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43'' × 24'').

**G0.9+0.1****RA:** 17<sup>h</sup>47<sup>m</sup>21<sup>s</sup>**1-GHz flux/Jy:** 18?**Size/arcmin:** 8**Dec:** –28°09′**Spectral index:** varies**Type:** C**Radio:** Flat spectrum core within steep spectrum shell.**X-ray:** Central core, with non-thermal spectrum.**References:**

Helfand & Becker 1987, ApJ, 314, 203. VLA at 1.4 and 5 GHz, and Einstein observations.  
 Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 91'').  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Mereghetti *et al.* 1998, A&A, 331, L77. X-ray detection.  
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43'' × 24'').  
 Sidoli *et al.* 2000, A&A, 361, 719. BeppoSAX observations.  
 Gaensler *et al.* 2001, ApJ, 556, L107. Chandra observations.

**G1.0–0.1****RA:** 17<sup>h</sup>48<sup>m</sup>30<sup>s</sup>**Dec:** –28°09′**1-GHz flux/Jy:** 15**Spectral index:** 0.6?**Size/arcmin:** 8**Type:** S

Has been called G1.05–0.1 and G1.05–0.15.

**Radio:** Incomplete shell, to the S of Sgr D.**X-ray:** Possibly detected.**References:**Downes *et al.* 1979, A&AS, 35, 1. Review of flux densities.Anantharamaiah *et al.* 1991, MNRAS, 249, 262. VLA at 330 MHz (64'' × 100'' : S=12.3 Jy).

Liszt 1992, ApJS, 82, 495. VLA at 1.6 GHz (13'' × 23'').

Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 91'').

Mehringer *et al.* 1998, ApJ, 493, 274. VLA at 1.6 GHz (15'' × 28'') and 5 GHz, including masers observations.Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43'' × 24'').Sidoli *et al.* 2001, A&A, 372, 651. BeppoSAX possible detection.**G1.4–0.1****RA:** 17<sup>h</sup>49<sup>m</sup>39<sup>s</sup>**Dec:** –27°46′**1-GHz flux/Jy:** 2?**Spectral index:** ?**Size/arcmin:** 10**Type:** S**Radio:** Shell, brightest in E.**References:**

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43'' × 92'' : S=2 Jy).

Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.**G1.9+0.3****RA:** 17<sup>h</sup>48<sup>m</sup>45<sup>s</sup>**Dec:** –27°10′**1-GHz flux/Jy:** 0.6**Spectral index:** 0.7**Size/arcmin:** 1.2**Type:** S**Radio:** Shell, brighter to the N.**References:**

Green &amp; Gull 1984, Natur, 312, 527. VLA at 5 GHz (4''.4 × 2'').

Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 94'').

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.**G3.7–0.2****RA:** 17<sup>h</sup>55<sup>m</sup>26<sup>s</sup>**Dec:** –25°50′**1-GHz flux/Jy:** 2.3**Spectral index:** 0.65**Size/arcmin:** 14 × 11**Type:** S

Has been called G003.8–00.3.

**Radio:** Double arc.**References:**

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43'' × 99'' : S=2.4 Jy).

Gaensler 1998, ApJ, 493, 781. VLA at 1.4 GHz (9'' × 15'' : S=1.7 ± 0.1 Jy).

**G3.8+0.3****RA:** 17<sup>h</sup>52<sup>m</sup>55<sup>s</sup>**Dec:** –25°28′**1-GHz flux/Jy:** 4?**Spectral index:** ?**Size/arcmin:** 18**Type:** S?**Radio:** Incomplete shell.**References:**

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43'' × 100'' : S=3.5 Jy).

**G4.2–3.5****RA:** 18<sup>h</sup>08<sup>m</sup>55<sup>s</sup>**Dec:** –27°03′**1-GHz flux/Jy:** 3.2?**Spectral index:** 0.6?**Size/arcmin:** 28**Type:** S**Radio:** Elongated shell.**References:**Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4'.3).**G4.5+6.8****RA:** 17<sup>h</sup>30<sup>m</sup>42<sup>s</sup>**Dec:** –21°29′**1-GHz flux/Jy:** 19**Spectral index:** 0.64

Kepler, SN1604, 3C358

**Size/arcmin:** 3**Type:** S

This is the remnant of Kepler's SN of AD1604.

**Radio:** Incomplete shell, brighter to the N.**Optical:** Faint filaments.**X-ray:** Shell, brighter to the N.**Distance:** Optical expansion and proper motion indicates about 2.9 kpc, HI observations suggest 3.4 to 6.4 kpc.**References:**

van den Bergh &amp; Kamper 1977, ApJ, 218, 617. Optical proper motions.

Leibowitz &amp; Danziger 1983, MNRAS, 204, 273. Optical spectra.

White &amp; Long 1983, ApJ, 264, 196. Einstein observations.

Matsui *et al.* 1984, ApJ, 287, 295. VLA at 1.4 (2''.5 × 3''.2) and 5 GHz (3''.2 × 4''.8) and Einstein image (5'').Dickel *et al.* 1988, ApJ, 330, 254. VLA at 1.4 (1''.2 × 2''.3) and 5 GHz (0''.6 × 1''.0) at two epochs.Smith *et al.* 1989, ApJ, 347, 925. EXOSAT observations.Hatsukade *et al.* 1990, PASJ, 42, 279. X-ray spectrum.Blair *et al.* 1991, ApJ, 366, 484. Optical imaging and spectroscopy.

Bandiera &amp; van den Bergh 1991, ApJ, 374, 186. Optical changes.

van den Bergh 1991, PASP, 103, 194. Optical imaging.

Predehl &amp; Schmitt 1995, A&amp;A, 293, 889. ROSAT of dust scattered halo.

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

Hughes 1999, ApJ, 527, 298. ROSAT and Einstein image comparison for expansion studies.

Reynoso &amp; Goss 1999, AJ, 118, 926. VLA at 1.4 GHz (23'' × 13'') for HI studies.

Kinugasa &amp; Tsunemi 1999, PASJ, 51, 239. ASCA observations.

Gerardy &amp; Fesen 2001, AJ, 121, 2781. IR spectroscopy and imaging.

**G4.8+6.2****RA:** 17<sup>h</sup>33<sup>m</sup>25<sup>s</sup>**Dec:** –21°34′**1-GHz flux/Jy:** 3**Spectral index:** 0.6**Size/arcmin:** 18**Type:** S

Has been called G4.5+6.2.

**Radio:** Faint shell.**References:**

Bhatnagar 2000, MNRAS, 317, 453. GMRT at 327 MHz (2'.2 × 1'.3: S=5.5 ± 1.2 Jy), and NVSS at 1.4 GHz.

**G5.2–2.6****RA:** 18<sup>h</sup>07<sup>m</sup>30<sup>s</sup>**Dec:** –25°45′**1-GHz flux/Jy:** 2.6?**Spectral index:** 0.6?**Size/arcmin:** 18**Type:** S**Radio:** Poorly resolved shell.**References:**Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4'.3).

**G5.4–1.2**

Milne 56

**RA:** 18<sup>h</sup>02<sup>m</sup>10<sup>s</sup>**1-GHz flux/Jy:** 35?**Size/arcmin:** 35**Dec:** –24°54′**Spectral index:** 0.2?**Type:** C?

Part been called G5.3–1.0. Has been suggested that this is not a SNR.

**Radio:** Incomplete shell, including wide ‘v’ of emission to east with small flat-spectrum source at apex.

**Optical:** Detected.

**X-ray:** Pulsar detected, with faint extension.

**Distance:** HI absorption suggests > 4.3 kpc.

**Point sources:** Pulsar associated with flat spectrum source.

**References:**

Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′:  $S=38$  Jy).

Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).

Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).

Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz (6′.8:  $S=21.9\pm 2.4$  Jy).

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).

Zealey *et al.* 1979, A&AS, 38, 39. Optical detection.

Becker & Helfand 1985, Natur, 313, 115. VLA at 1.4 and 5 GHz. Suggest it is not SNR, see Helfand & Becker 1985, Natur, 313, 118.

Manchester *et al.* 1985, MNRAS, 212, 975. Pulsar detection.

Caswell *et al.* 1987, MNRAS, 225, 329. MOST at 843 MHz (42″ × 110″).

Frail & Kulkarni 1991, Natur, 352, 785. Pulsar and remnant association.

Manchester *et al.* 1991, MNRAS, 253, 7P. Pulsar and remnant association.

Milne *et al.* 1992, MNRAS, 255, 707. Parkes 64-m at 4.75 (4′.5:  $S=30.8\pm 2.1$  Jy) and 8.4 GHz (3′:  $S=24\pm 3$  Jy), including polarization.

Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.0 × 4′.9:  $S=38$  Jy).

Frail *et al.* 1994, AJ, 107, 1120. VLA at 327 MHz (68″ × 73″), plus HI absorption.

Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

Gaensler & Frail 2000, Natur, 406, 158. Pulsar observations, including proper motion.

Kaspi *et al.* 2001, ApJ, 562, L163. X-ray detection of pulsar, and upper limit for remnant.

**G5.9+3.1****RA:** 17<sup>h</sup>47<sup>m</sup>20<sup>s</sup>**1-GHz flux/Jy:** 3.3?**Size/arcmin:** 20**Dec:** –22°16′**Spectral index:** 0.4?**Type:** S

**Radio:** Asymmetric shell.

**References:**

Reich *et al.* 1988, in SNRISM, p293. Effelsberg 100-m at 2.7 GHz (4′.3).

**G6.1+1.2****RA:** 17<sup>h</sup>54<sup>m</sup>55<sup>s</sup>**1-GHz flux/Jy:** 4.0?**Size/arcmin:** 30 × 26**Dec:** –23°05′**Spectral index:** 0.3?**Type:** F

Has been called G6.1+1.15.

**Radio:** Faint, diffuse emission.

**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.

Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).

**G6.4–0.1**

W28

**RA:** 18<sup>h</sup>00<sup>m</sup>30<sup>s</sup>**1-GHz flux/Jy:** 310**Size/arcmin:** 48**Dec:** –23°26′**Spectral index:** varies**Type:** C

Has been called G6.6–0.2.

**Radio:** Several non-thermal sources in a ring, with flat spectrum core.

**Optical:** Filaments.

**X-ray:** Diffuse emission from most of the remnant.

**Point sources:** Young pulsar near edge of remnant.

**Distance:** Uncertain mean optical velocity indicates 3.5–4 kpc.

**References:**

Kundu & Velusamy 1972, A&A, 20, 237. NRAO 140-ft at 10 GHz (3′).

van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.

Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).

Dopita *et al.* 1977, ApJ, 214, 179. Some optical line ratios.

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).

Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.

Andrews *et al.* 1983, ApJ, 266, 684. VLA at 1.4 GHz (8′) 4.9 GHz (3′) and 15 GHz (1′) of central region only, plus Einstein image of central region.

Bohigas *et al.* 1983, RMxAA, 8, 155. Optical spectra.

Odenwald *et al.* 1984, ApJ, 279, 162. Nearby IR source.

Andrews *et al.* 1985, AJ, 90, 310. VLA of central component.

Long *et al.* 1991, ApJ, 373, 567. Einstein and optical observations.

Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.1 × 4′.4;  $S = 660$  Jy).

Kaspi *et al.* 1993, ApJ, 409, L57. Pulsar association.

Frail *et al.* 1993, Natur, 365, 136. VLA at 327 MHz (smoothed to 65′′), plus pulsar association.

Frail *et al.* 1994, ApJ, 424, L111. VLA of associated OH masers.

Esposito *et al.* 1996, ApJ, 461, 820. Possible associated  $\gamma$ -ray emission.

Frail *et al.* 1996, AJ, 111, 1651. OH maser emission.

Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

Claussen *et al.* 1997, ApJ, 489, 143. VLA of OH masers.

Claussen *et al.* 1999, ApJ, 522, 349. High resolution observations of OH masers.

Yusef-Zadeh *et al.* 2000, ApJ, 540, 842. VLA at 327 MHz (2′.6 × 5′.5) and 1.48 GHz (40′′ × 65′′).

Arikawa *et al.* 1999, PASJ, 51, L7. Observations of shocked CO.

Dubner *et al.* 2000, AJ, 120, 1933. VLA at 328 MHz (97′′ × 52′′;  $S = 425 \pm 40$  Jy) and 1415 MHz (88′′ × 48′′;  $S = 246 \pm 20$  Jy), and comparison with other observations.

Reach & Rho 2000, ApJ, 544, 843. ISO observations on interactions with surroundings.

Rowell *et al.* 2000, A&A, 359, 337. Upper limit on high energy  $\gamma$ -rays.

Douvion *et al.* 2001, A&A, 373, 281. ISO observations.

Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.

**G6.4+4.0****RA:** 17<sup>h</sup>45<sup>m</sup>10<sup>s</sup>**1-GHz flux/Jy:** 1.3?**Size/arcmin:** 31**Dec:** –21°22′**Spectral index:** 0.4?**Type:** S

**Radio:** Faint asymmetric shell.

**References:**

Reich *et al.* 1988, in SNRISM, p293. Effelsberg 100-m at 2.7 GHz (4′.3).

**G7.0–0.1****RA:** 18<sup>h</sup>01<sup>m</sup>50<sup>s</sup>**1-GHz flux/Jy:** 2.5?**Size/arcmin:** 15**Dec:** –22°54′**Spectral index:** 0.5?**Type:** S

Has been called G7.06–0.12.

**Radio:** Double rim, brightest in W, confused by bright HII region M20 in SE.

**References:**

Yusef-Zadeh *et al.* 2000, ApJ, 540, 842. VLA at 327 MHz (2′.6 × 5′.5) and 1.48 GHz (40′′ × 65′′).

Dubner *et al.* 2000, AJ, 120, 1933. VLA at 328 MHz (97′′ × 52′′) and 1415 MHz (88′′ × 48′′).

**G7.7–3.7**

1814–24

**RA:** 18<sup>h</sup>17<sup>m</sup>25<sup>s</sup>  
**Dec:** –24°04′**1-GHz flux/Jy:** 11  
**Spectral index:** 0.32**Size/arcmin:** 22  
**Type:** S**Radio:** Shell, with high polarization.**References:**

Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).  
 Milne *et al.* 1986, MNRAS, 223, 487. MOST at 843 MHz (44″ × 108″) and Parkes 64-m at 8.4 GHz (3′ :  $S=4.6\pm 0.5$  Jy), with polarization, plus review of flux densities.  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz (70″ × 35″ :  $S=9.9\pm 0.1$  Jy), including polarization.

**G8.7–5.0****RA:** 18<sup>h</sup>24<sup>m</sup>10<sup>s</sup>  
**Dec:** –23°48′**1-GHz flux/Jy:** 4.4  
**Spectral index:** 0.3**Size/arcmin:** 26  
**Type:** S**Radio:** Asymmetric shell.**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).

**G8.7–0.1**

(W30)

**RA:** 18<sup>h</sup>05<sup>m</sup>30<sup>s</sup>  
**Dec:** –21°26′**1-GHz flux/Jy:** 80  
**Spectral index:** 0.5**Size/arcmin:** 45  
**Type:** S?**Radio:** Clumpy non-thermal shell, with low-frequency turnover.**X-ray:** Northern edge detected.**Point sources:** Pulsar inside western edge.**References:**

Odegard 1986, AJ, 92, 1372. TPT at 57.5 MHz (7′.2 × 9′.7 :  $S=190\pm 50$  Jy).  
 Kassim & Weiler 1990, Natur, 343, 146. VLA at 327 MHz (3′.0 × 3′.7).  
 Kassim & Weiler 1990, ApJ, 360, 184. VLA at 327 MHz (2′.8 × 4′.1 :  $S=129\pm 11$  Jy), and part at 1.4 GHz (0′.9 × 1′.8), plus review of flux densities.  
 Frail *et al.* 1994, AJ, 107, 1120. VLA at 327 MHz (37″ × 55″).  
 Finley & Ögelman 1994, ApJ, 434, L25. ROSAT observations, including pulsar.

**G9.8+0.6****RA:** 18<sup>h</sup>05<sup>m</sup>08<sup>s</sup>  
**Dec:** –20°14′**1-GHz flux/Jy:** 3.9  
**Spectral index:** 0.5**Size/arcmin:** 12  
**Type:** S**Radio:** Asymmetric shell.**References:**

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Caswell 1983, MNRAS, 204, 833. Molonglo at 408 MHz (3′ :  $S=5.8\pm 0.6$  Jy).  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (41″ × 63″ :  $S=3.5\pm 0.4$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G10.0–0.3****RA:** 18<sup>h</sup>08<sup>m</sup>39<sup>s</sup>**Dec:** –20°25′**1-GHz flux/Jy:** 2.9**Spectral index:** 0.8**Size/arcmin:** 8?**Type:** ?

The identification as a SNR has been questioned.

**Radio:** Not well resolved.

**X-ray:** X-ray pulsar, and extended emission from remnant.

**Point sources:** X-ray pulsar associated with soft gamma repeater.

**Distance:** Association with W31 gives 14.5 kpc.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).

Kulkarni & Frail 1993, Natur, 365, 33. VLA at 330 MHz (smoothed to 2′) and 1.49 GHz (40″ × 65″), including association with soft gamma repeater.

Sonobe *et al.* 1994, ApJ, 436, L23. X-ray observations.

Kulkarni *et al.* 1994, Natur, 368, 129. VLA at 1.4 GHz (31″) and 8.4 GHz (5″.5)

Vasishth *et al.* 1995, ApJ, 440, L65. Radio monitoring of core.

Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

Corbel *et al.* 1997, ApJ, 478, 624. CO observations of surroundings.

Frail *et al.* 1997, ApJ, 480, L129. VLA monitoring of changing core.

Kouveliotou *et al.* 1998, Natur, 393, 235. X-ray pulsar detection.

Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

Gaensler *et al.* 2001, ApJ, 559, 963. Questioning of remnant identification.

**G11.2–0.3****RA:** 18<sup>h</sup>11<sup>m</sup>27<sup>s</sup>**Dec:** –19°25′**1-GHz flux/Jy:** 22**Spectral index:** 0.50**Size/arcmin:** 4**Type:** C

Probably associated with the SN of AD386.

**Radio:** Symmetrical clumpy shell, possibly with flatter spectrum core.

**X-ray:** Shell, with hard spectrum centrally brightened region around pulsar.

**Point sources:** Central pulsar.

**Distance:** HI absorption indicates 5 kpc.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Radhakrishnan *et al.* 1972, ApJS, 24, 49. HI absorption.

Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).

Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz (20″ × 25″) and Einstein observations, with review of flux densities.

Becker *et al.* 1985, ApJ, 296, 461. VLA at 1.4 and 5 GHz, plus HI absorption, Einstein observations.

Morsi & Reich 1987, A&AS, 71, 189. Effelsberg 100-m at 32 GHz (26″.5:  $S=4.04 \pm 0.24$  Jy).

Green *et al.* 1988, MNRAS, 231, 735. VLA at 1.4 and 5 GHz.

Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.2 × 4′.1:  $S=39$  Jy).

Reynolds *et al.* 1994, MNRAS, 271, L1. ROSAT image and spectra.

Vasishth *et al.* 1996, ApJ, 456, L59. ASCA observations.

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

Torii *et al.* 1997, ApJ, 489, L145. ASCA detection of pulsar.

Torii *et al.* 1999, ApJ, 523, L69. X-ray timing observations of pulsar.

Kothes & Reich 2001, A&A, 372, 627. Effelsberg 100-m at 4.25, 10.45, 14.9 and 32 GHz (2′.5, 1′.1, 0′.86, 0′.45:  $S=9.6 \pm 0.5, 6.3 \pm 0.4, 5.7 \pm 0.4, 3.8 \pm 0.4$ ).

Kaspi *et al.* 2001, ApJ, 560, 371. Chandra observations.

**G11.4–0.1**

**RA:** 18<sup>h</sup>10<sup>m</sup>47<sup>s</sup>  
**Dec:** –19°05′

**1-GHz flux/Jy:** 6  
**Spectral index:** 0.5

**Size/arcmin:** 8  
**Type:** S?

**Radio:** Incomplete shell, possibly with central core.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=9.4$  Jy) contaminated by sidelobes of a nearby source, and Parkes 64-m at 5 GHz (4′ :  $S=2.8$  Jy).  
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz (6′.8 :  $S=2.0\pm 0.4$  Jy).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.2 × 4′.1 :  $S=18$  Jy).  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (44″ × 63″ :  $S=5.1\pm 0.6$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G12.0–0.1**

**RA:** 18<sup>h</sup>12<sup>m</sup>11<sup>s</sup>  
**Dec:** –18°37′

**1-GHz flux/Jy:** 3.5  
**Spectral index:** 0.7

**Size/arcmin:** 7?  
**Type:** ?

**Radio:** Incomplete shell, defined in E only.

**X-ray:** Detected.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=6.6$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=1.1$  Jy).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.2 × 4′.1).  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (41″ × 61″ :  $S=0.7$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

**G13.3–1.3**

**RA:** 18<sup>h</sup>19<sup>m</sup>20<sup>s</sup>  
**Dec:** –18°00′

**1-GHz flux/Jy:** ?  
**Spectral index:** ?

**Size/arcmin:** 70 × 40  
**Type:** S?

**Radio:** Amorphous emission.

**X-ray:** Elongated emission.

**Optical:** Filaments in S.

**Distance:** Absorption indicates 2–4 kpc.

**References:**

Seward *et al.* 1995, ApJ, 449, 681. ROSAT detection, optical studies and observations of CO.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

**G13.5+0.2**

**RA:** 18<sup>h</sup>14<sup>m</sup>14<sup>s</sup>  
**Dec:** –17°12′

**1-GHz flux/Jy:** 3.5?  
**Spectral index:** 1.0?

**Size/arcmin:** 5 × 4  
**Type:** S

Has been called G13.46+0.16.

**Radio:** Elongated, incomplete shell.

**References:**

Helfand *et al.* 1989, ApJ, 341, 151. VLA at 5 GHz ( $S=0.65\pm 0.05$  Jy) and 1.4 GHz (15″ :  $S=2.67\pm 0.5$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.



**G15.1–1.6**

**RA:** 18<sup>h</sup>24<sup>m</sup>00<sup>s</sup>  
**Dec:** –16°34′

**1-GHz flux/Jy:** 5.5?  
**Spectral index:** 0.8?

**Size/arcmin:** 30 × 24  
**Type:** S

**Radio:** Elongated, incomplete shell.

**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).

**G15.9+0.2**

**RA:** 18<sup>h</sup>18<sup>m</sup>52<sup>s</sup>  
**Dec:** –15°02′

**1-GHz flux/Jy:** 5  
**Spectral index:** 0.6?

**Size/arcmin:** 7 × 5  
**Type:** S?

**Radio:** Incomplete shell, with bright concentration to the E.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=7.7$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=1.9$  Jy).  
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz (6′.8 :  $S=1.1 \pm 0.2$  Jy).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1415 MHz (58″ × 44″).  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 330 MHz (77″ × 61″ :  $S=11.2 \pm 1.0$  Jy), 1.4 GHz (23″ × 14″ :  $S=3.9 \pm 0.1$  Jy) and 4.9 GHz (13″ × 16″).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G16.2–2.7**

**RA:** 18<sup>h</sup>28<sup>m</sup>50<sup>s</sup>  
**Dec:** –16°11′

**1-GHz flux/Jy:** 2  
**Spectral index:** 0.5

**Size/arcmin:** 17  
**Type:** S

**Radio:** Double rim.

**References:**

Trushkin 1999, A&A, 352, L103. Review of radio observations.

**G16.7+0.1**

**RA:** 18<sup>h</sup>20<sup>m</sup>56<sup>s</sup>  
**Dec:** –14°20′

**1-GHz flux/Jy:** 3.0  
**Spectral index:** 0.6

**Size/arcmin:** 4  
**Type:** C

Has been called G16.73+0.08.

**Radio:** Asymmetric shell with flat-spectrum core.

**X-ray:** Detected.

**References:**

Helfand *et al.* 1989, ApJ, 341, 151. VLA at 5 GHz ( $S=0.95$  Jy) and 1.4 GHz (15″ :  $S=2.43$  Jy) and Ooty at 327 MHz ( $S=5.13$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations, including masers.  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

**G16.8–1.1**

**RA:** 18<sup>h</sup>25<sup>m</sup>20<sup>s</sup>  
**Dec:** –14°46′

**1-GHz flux/Jy:** 2?  
**Spectral index:** ?

**Size/arcmin:** 30 × 24?  
**Type:** ?

Has been called G16.85–1.05.

**Radio:** Overlapping thermal and non-thermal emission, parameters uncertain.

**Point sources:** Pulsar within boundary of non-thermal emission.

**References:**

Reich *et al.* 1986, A&A, 155, 185. Effelsberg 100-m at 4.75 GHz (2′.4), plus other observations.

**G17.4–2.3****RA:** 18<sup>h</sup>30<sup>m</sup>55<sup>s</sup>**Dec:** –14°52′**1-GHz flux/Jy:** 4.8?**Spectral index:** 0.8?**Size/arcmin:** 24?**Type:** S**Radio:** Incomplete, poorly defined shell.**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G17.8–2.6****RA:** 18<sup>h</sup>32<sup>m</sup>50<sup>s</sup>**Dec:** –14°39′**1-GHz flux/Jy:** 4.0?**Spectral index:** 0.3?**Size/arcmin:** 24**Type:** S**Radio:** Well defined shell.**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G18.8+0.3****RA:** 18<sup>h</sup>23<sup>m</sup>58<sup>s</sup>**Dec:** –12°23′**1-GHz flux/Jy:** 33**Spectral index:** 0.4**Size/arcmin:** 17 × 11**Type:** S

Kes 67

Has been called G18.9+0.3.

**Radio:** Incomplete shell, in complex region near the HII region W39.**Distance:** HI absorption indicates > 9.5 kpc, and possibly < 19 kpc.**References:**

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz (5′:  $S=17\pm 7$  Jy).  
 Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′:  $S=38$  Jy).  
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.  
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Milne *et al.* 1989, PASAu, 8, 187. Parkes 64-m at 8.4 GHz (3′.0:  $S=12.9\pm 1.0$  Jy), including polarization.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (2′.9 × 3′.5:  $S=55$  Jy).  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz (75″ × 55″:  $S=29.9\pm 0.3$  Jy).  
 Dubner *et al.* 1999, AJ, 118, 930. Parkes 64-m at 1.6 GHz (15″) for HI, VLA at 1.6 GHz (17″ × 12″) for OH, plus CO observations.

**G18.9–1.1****RA:** 18<sup>h</sup>29<sup>m</sup>50<sup>s</sup>**Dec:** –12°58′**1-GHz flux/Jy:** 37**Spectral index:** varies**Size/arcmin:** 33**Type:** C?

Has been called G18.95–1.1 and G18.94–1.04.

**Radio:** Non-thermal, diffuse partially limb-brightened, with central ridge.**X-ray:** Partial shell.**References:**

Fürst *et al.* 1985, Natur, 314, 720. Effelsberg 100-m at 4.75 GHz (2′.4:  $S=23.8$  Jy), plus other flux densities.  
 Odegard 1986, AJ, 92, 1372. TPT at 57.5 MHz (7′.2 × 8′:  $S=82\pm 15$  Jy), plus review of flux densities.  
 Barnes & Turtle 1988, in SNRISM, p347. Molonglo at 408 MHz (2′.9 × 3′.1:  $S=58\pm 9$  Jy) and Parkes 64-m at 5 GHz (4′.4 × 4′.1:  $S=23\pm 6$  Jy).  
 Patnaik *et al.* 1988, Natur, 332, 136. Ooty at 327 MHz (0′.6 × 1′.6).  
 Fürst *et al.* 1989, A&A, 209, 361. Effelsberg 100-m at 4.75 GHz (2′.45:  $S=23.8$  Jy) and VLA at 1.5 and 4.9 GHz (19″ × 14″), and Effelsberg 100-m at 1.4 GHz (9″) for HI.  
 Aschenbach *et al.* 1991, A&A, 246, L32. ROSAT observations.  
 Fürst *et al.* 1997, A&A, 319, 655. ROSAT observations, and Effelsberg 100-m at 10.6 GHz (1′.1).

**G20.0–0.2****RA:** 18<sup>h</sup>28<sup>m</sup>07<sup>s</sup>**Dec:** –11°35′**1-GHz flux/Jy:** 10**Spectral index:** 0.0**Size/arcmin:** 10**Type:** F**Radio:** Faint, filled-centre, polarized.**Point sources:** OH source 20.1–0.1 is nearby.**References:**

Becker & Helfand 1985, ApJ, 297, L25. VLA at 1.4 and 5 GHz (12").  
 Odegard 1986, AJ, 92, 1372. TPT at 57.5 MHz (7".2 × 8".1;  $S=8.5 \pm 2$  Jy), plus review of flux densities.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

**G21.5–0.9****RA:** 18<sup>h</sup>33<sup>m</sup>33<sup>s</sup>**Dec:** –10°35′**1-GHz flux/Jy:** 6?**Spectral index:** 0.0**Size/arcmin:** 4**Type:** C

Early observations relate to the central core only.

**Radio:** Filled-centre, with high frequency turnover.**X-ray:** Central core, with extended, faint halo.**Distance:** HI absorption indicates 5.5 kpc or more.**References:**

Wilson & Weiler 1976, A&A, 53, 89. WSRT at 5 GHz (6" × 35").  
 Becker & Kundu 1976, ApJ, 204, 427. NRAO interferometer at 2.7 GHz (20" × 5") and 8 GHz (7" × 2"), plus review of flux densities.  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2'.6).  
 Becker & Szymkowiak 1981, ApJ, 248, L23. VLA at 5 GHz (8"), and Einstein observations.  
 Davelaar *et al.* 1986, ApJ, 300, L59. EXOSAT X-ray spectrum, and VLA HI observations.  
 Morsi & Reich 1987, A&AS, 69, 533. Effelsberg 100-m at 32 GHz (26".5;  $S=5.64 \pm 0.29$  Jy).  
 Fürst *et al.* 1988, PASJ, 40, 347. NRO array at 22.3 GHz (4".4 × 7".3).  
 Salter *et al.* 1989, A&A, 225, 167. Observations at 90.7 (29".5;  $S=3.8 \pm 0.4$  Jy) and 141.9 GHz ( $S=2.5 \pm 1.2$  Jy).  
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz ( $S=3.94 \pm 0.70$  Jy), plus review of flux densities.  
 Asaoka & Koyama 1990, PASJ, 42, 625. Ginga X-ray spectrum.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3'.3 × 3'.4;  $S=9$  Jy).  
 Wallace *et al.* 1994, A&A, 286, 565. HI of surroundings.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Slane *et al.* 2000, ApJ, 533, L29. Chandra observations identifying X-ray halo.  
 Warwick *et al.* 2001, A&A, 365, L248. XMM-Newton observations of X-ray halo.  
 Bock *et al.* 2001, ApJ, 561, L203. BIMA at 94 GHz (8".6 × 4".6).  
 Safi-Harb *et al.* 2001, ApJ, 561, 308. Chandra and other X-ray observations.

**G21.8–0.6****RA:** 18<sup>h</sup>32<sup>m</sup>45<sup>s</sup>**Dec:** –10°08′**1-GHz flux/Jy:** 69**Spectral index:** 0.5**Size/arcmin:** 20**Type:** S

Kes 69

**Radio:** Incomplete shell.**X-ray:** Detected.**Distance:** H<sub>2</sub>CO absorption indicates > 6.3 kpc.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3') and Parkes 64-m at 5 GHz (4').  
 Wilson 1972, A&A, 19, 354. H<sub>2</sub>CO absorption.  
 Kundu *et al.* 1974, AJ, 79, 1332. NRAO 140-ft at 5 GHz (6') and 10 GHz (3').  
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz (5';  $S=42.3 \pm 4.6$  Jy).  
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8'.4) and 5 GHz (4'.4).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2'.6).  
 Seward 1990, ApJS, 73, 781. Einstein observations.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3'.3 × 3'.5;  $S=132$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations, including masers.

**G22.7–0.2**

**RA:** 18<sup>h</sup>33<sup>m</sup>15<sup>s</sup>  
**Dec:** –09°13′

**1-GHz flux/Jy:** 33  
**Spectral index:** 0.6

**Size/arcmin:** 26  
**Type:** S?

**Radio:** Non-thermal ring in complex region, overlapping G23.3–0.3.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.3 × 3′.4:  $S=82$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G23.3–0.3**

**RA:** 18<sup>h</sup>34<sup>m</sup>45<sup>s</sup>  
**Dec:** –08°48′

**1-GHz flux/Jy:** 70  
**Spectral index:** 0.5

**Size/arcmin:** 27  
**Type:** S

W41

**Radio:** Incomplete ring, in complex region, overlapping G22.7–0.2.

**Point sources:** Pulsar association suggested.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.3 × 3′.4:  $S=138$  Jy).  
 Gaensler & Johnston 1995, MNRAS, 275, L73. Possible pulsar association.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G23.6+0.3**

**RA:** 18<sup>h</sup>33<sup>m</sup>03<sup>s</sup>  
**Dec:** –08°13′

**1-GHz flux/Jy:** 8?  
**Spectral index:** 0.3

**Size/arcmin:** 10?  
**Type:** ?

**Radio:** Not well resolved, in complex region.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G24.7–0.6**

**RA:** 18<sup>h</sup>38<sup>m</sup>43<sup>s</sup>  
**Dec:** –07°32′

**1-GHz flux/Jy:** 8  
**Spectral index:** 0.5

**Size/arcmin:** 15?  
**Type:** S?

**Radio:** Incomplete shell, defined in SW.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′:  $S=12.3$  Jy) and Parkes 64-m at 5 GHz (4′:  $S=3.6$  Jy).  
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz (6′.8:  $S=2.2 \pm 0.5$  Jy).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (44″ × 56″:  $S=1.9$  Jy).  
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

**G24.7+0.6****RA:** 18<sup>h</sup>34<sup>m</sup>10<sup>s</sup>**Dec:** –07°05′**1-GHz flux/Jy:** 20?**Spectral index:** 0.2?**Size/arcmin:** 30 × 15**Type:** C?**Radio:** Filled-centre, with faint shell, and a compact HII region to the S.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).Reich *et al.* 1984, A&A, 133, L4. Effelsberg 100-m at 2.7 GHz (4.3 :  $S = 19 \pm 3$  Jy) and 4.75 GHz (2′.4 :  $S = 17 \pm 4$  Jy) and NRO 45-m at 10.2 GHz (2′.7 :  $S = 15 \pm 3$  Jy).

Becker &amp; Helfand 1987, ApJ, 316, 660. VLA at 1.4 GHz (12′), and X-ray upper limit.

Biggs &amp; Lyne 1996, MNRAS, 282, 691. Pulsar search.

**G27.4+0.0****RA:** 18<sup>h</sup>41<sup>m</sup>19<sup>s</sup>**Dec:** –04°56′**1-GHz flux/Jy:** 6**Spectral index:** 0.68

4C–04.71

**Size/arcmin:** 4**Type:** S

Early references refer to G27.3–0.1 (Kes 73), a supposed larger remnant.

**Radio:** Incomplete shell.**X-ray:** Diffuse emission, with central low period pulsar.**Point sources:** Central AXP.**Distance:** HI absorption indicates 6 to 7.5 kpc.**References:**

Velusamy &amp; Kundu 1974, A&amp;A, 32, 375. NRAO 300-ft at 2.7 GHz (5′).

Dickel &amp; Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).

Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz (6′.8 :  $S = 2.0 \pm 0.5$  Jy).Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′ :  $S = 4.4$  Jy).Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1415 MHz (60′ × 45′ :  $S = 3.5$  Jy). Revise  $S_{408 \text{ MHz}} = 10.4$  Jy, and  $S_{5 \text{ GHz}} = 1.9 \pm 0.2$  Jy.Kriss *et al.* 1985, ApJ, 288, 703. Einstein observations, plus VLA at 1.4 and 5 GHz (12′).

Sanbonmatsu &amp; Helfand 1992, AJ, 104, 2189. VLA at 1.4 GHz for HI absorption.

Helfand *et al.* 1994, ApJ, 434, 627. ROSAT observations, particularly of central source.Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations, including nearby masers.

Vasisht &amp; Gotthelf 1997, ApJ, 486, L129. ASCA detection of pulsar.

Gotthelf &amp; Vasisht 1997, ApJ, 486, L133. ASCA observations.

Gotthelf *et al.* 1999, ApJ, 522, L49. X-ray timing observations of pulsar.Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.Mereghetti *et al.* 2001, MNRAS, 321, 143. Search for optical/IR counterpart to pulsar.**G27.8+0.6****RA:** 18<sup>h</sup>39<sup>m</sup>50<sup>s</sup>**Dec:** –04°24′**1-GHz flux/Jy:** 30**Spectral index:** varies**Size/arcmin:** 50 × 30**Type:** F**Radio:** Filled-centre, with spectral turnover.**References:**Reich *et al.* 1984, A&A, 133, L4. Effelsberg 100-m at 2.7 GHz (4′.3 :  $S = 23 \pm 2$  Jy), and 4.75 GHz (2′.4 :  $S = 18 \pm 2$  Jy) and NRO 45-m at 10.2 GHz (smoothed to 4′.3 :  $S = 8.5 \pm 2$  Jy).Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

Biggs &amp; Lyne 1996, MNRAS, 282, 691. Pulsar search.

**G28.6–0.1****RA:** 18<sup>h</sup>43<sup>m</sup>55<sup>s</sup>**Dec:** –03°53′**1-GHz flux/Jy:** 3?**Spectral index:** ?**Size/arcmin:** 13 × 9**Type:** S**Radio:** Poorly defined regions of non-thermal emission.**X-ray:** Diffuse shell.**References:**Helfand *et al.* 1989, ApJ, 341, 151. VLA at 1.4 GHz (15′) and 5 GHz (15′).Bamba *et al.* 2001, PASJ, 53, L21. ASCA observations.

**G28.8+1.5****RA:** 18<sup>h</sup>39<sup>m</sup>00<sup>s</sup>**Dec:** –02°55′**1-GHz flux/Jy:** ?**Spectral index:** 0.4?**Size/arcmin:** 100?**Type:** S?**Radio:** Part of rim detected.**X-ray:** Diffuse, Centrally brightened.**References:**

Schwentker 1994, A&amp;A, 286, L47. ROSAT observations.

Song *et al.* 2000, PASJ, 52, 181. ASCA observations.**G29.6+0.1****RA:** 18<sup>h</sup>44<sup>m</sup>52<sup>s</sup>**Dec:** –02°57′**1-GHz flux/Jy:** 1.5?**Spectral index:** 0.5?**Size/arcmin:** 5**Type:** S**Radio:** Diffuse shell.**Point sources:** AXP associated.**References:**Gaensler *et al.* 1999, ApJ, 526, L37. VLA at 5 GHz (13'') and 8 GHz (8'')Vasishth *et al.* 2000, ApJ, 542, L49. X-ray observations of AXP.**G29.7–0.3****RA:** 18<sup>h</sup>46<sup>m</sup>25<sup>s</sup>**Dec:** –02°59′**1-GHz flux/Jy:** 10**Spectral index:** 0.7

Kes 75

**Size/arcmin:** 3**Type:** C**Radio:** Shell with flatter spectrum emission from centre.**X-ray:** Thermal shell and non-thermal core, and central pulsar.**Point sources:** X-ray pulsar.**Distance:** HI absorption indicates > 9 kpc and possibly at 21 kpc.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3') and Parkes 64-m at 5 GHz (4').

Milne &amp; Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8'.4: S=5±20% Jy).

Becker &amp; Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3').

Becker &amp; Kundu 1976, ApJ, 204, 427. NRAO interferometer at 2.7 GHz (20'' × 7'') and 8 GHz (25'' × 8''), plus review of flux densities.

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2'.6).Becker *et al.* 1983, ApJ, 268, L93. VLA at 1.4 GHz (3''), plus Einstein observations.

Becker &amp; Helfand 1984, ApJ, 283, 154. VLA at 5 GHz (2''.6), plus HI.

Morsi &amp; Reich 1987, A&amp;AS, 71, 189. Effelsberg 100-m at 32 GHz (26''.5: S=1.02±0.07 Jy).

Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz of core, plus review of flux densities.

Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3'.4 × 3'.7: S=27.4 Jy).

Biggs &amp; Lyne 1996, MNRAS, 282, 691. Pulsar search.

Blanton &amp; Helfand 1996, ApJ, 470, 961. ASCA observations.

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Gothelf *et al.* 2000, ApJ, 542, L37. X-ray pulsar detection.Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.**G30.7–2.0****RA:** 18<sup>h</sup>54<sup>m</sup>25<sup>s</sup>**Dec:** –02°54′**1-GHz flux/Jy:** 0.5?**Spectral index:** 0.7?**Size/arcmin:** 16**Type:** ?**Radio:** Poorly defined.**References:**Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4'.3).Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G30.7+1.0****RA:** 18<sup>h</sup>44<sup>m</sup>00<sup>s</sup>**Dec:** –01°32′**1-GHz flux/Jy:** 6**Spectral index:** 0.4**Size/arcmin:** 24 × 18**Type:** S?**Radio:** Non-thermal, highly polarized part shell?**Point sources:** Compact source near centre.**References:**Reich *et al.* 1986, A&A, 155, 185. Effelsberg 100-m at 4.75 GHz (2′.4:  $S=3.4\pm 0.4$  Jy), plus other flux densities.Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.6 × 3′.9:  $S=8.6$  Jy).Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.**G31.5–0.6****RA:** 18<sup>h</sup>51<sup>m</sup>10<sup>s</sup>**Dec:** –01°31′**1-GHz flux/Jy:** 2?**Spectral index:** ?**Size/arcmin:** 18?**Type:** S?

Has been called G31.55–0.65.

**Radio:** Distorted shell? near HII region.**Optical:** Diffuse, incomplete shell.**References:**Fürst *et al.* 1987, A&AS, 69, 403. Effelsberg 100-m at 4.75 GHz (2′.4), plus other flux densities.Mavromatakis *et al.* 2001, A&A, 370, 265. Optical observations.**G31.9+0.0****RA:** 18<sup>h</sup>49<sup>m</sup>25<sup>s</sup>**Dec:** –00°55′**1-GHz flux/Jy:** 24**Spectral index:** 0.55**Size/arcmin:** 7 × 5**Type:** S

3C391

**Radio:** Shell, brightest in NW.**X-ray:** Diffuse with central core.**Distance:** HI absorption is seen to the tangent point (8.5 kpc).**References:**Radhakrishnan *et al.* 1972, ApJS, 24, 49. HI absorption.

Becker &amp; Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).

Green *et al.* 1975, A&A, 44, 187. Effelsberg 100-m at 15 GHz (58′:  $S>1.6$ ).

Becker &amp; Kundu 1976, ApJ, 204, 427. NRAO interferometer at 2.7 GHz (20′ × 23′) and 8 GHz (24′ × 9′), plus review of flux densities.

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).Goss *et al.* 1979, A&A, 78, 75. FIRST at 1.4 GHz (54′ × 66′:  $S=20\pm 2$  Jy) and Effelsberg 100-m at 10.7 GHz (77′:  $S=7.5\pm 0.8$  Jy).

Wang &amp; Seward 1984, ApJ, 279, 705. Einstein observations.

Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.4 × 3′.7:  $S=44.8$  Jy).

Reynolds &amp; Moffett 1993, AJ, 105, 2226. VLA at 1.4 GHz (6′), including possible associated CO.

Moffett & Reynolds 1994, ApJ, 425, 668. VLA at 330 MHz (smoothed to 30′:  $S=38.5\pm 0.5$  Jy) 1.46 GHz (6′.7) and 4.85 GHz (6′.2 × 6′.4), including spectral index and polarization studies.Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.

Reach &amp; Rho 1996, A&amp;A, 315, L277. ISO spectroscopy.

Rho &amp; Petre 1996, ApJ, 467, 698. ROSAT observations.

Wilner *et al.* 1998, AJ, 115, 247. CO observations of surroundings.

Reach &amp; Rho 1998, ApJ, 507, L93. ISO observations.

Reach & Rho 1999, ApJ, 511, 836. CO, HCO<sup>+</sup> and CS observations of surroundings.Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

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<b>G32.0–4.9</b>		3C396.1
<b>RA:</b> 19 <sup>h</sup> 06 <sup>m</sup> 00 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 22?	<b>Size/arcmin:</b> 60?
<b>Dec:</b> –03°00′	<b>Spectral index:</b> 0.5?	<b>Type:</b> S?

**Radio:** Possible large shell?

**References:**

Milne & Hill 1969, AuJPh, 22, 211. Parkes 64-m at 635 MHz (31′ :  $S = 25 \pm 30\%$  Jy), 1410 MHz (15′ :  $S = 19 \pm 15\%$  Jy) and 2650 MHz (8′.4 :  $S = 8.6 \pm 30\%$  Jy). Fluxes if size is 60′, plus review of flux densities.  
 Caswell 1970, AuJPh, 23, 105. Revision of low frequency flux densities.  
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo at 111 MHz ( $S = 105 \pm 30$  Jy).

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<b>G32.1–0.9</b>		
<b>RA:</b> 18 <sup>h</sup> 53 <sup>m</sup> 10 <sup>s</sup>	<b>1-GHz flux/Jy:</b> ?	<b>Size/arcmin:</b> 40?
<b>Dec:</b> –01°08′	<b>Spectral index:</b> ?	<b>Type:</b> C?

**Radio:** Possible faint shell, not well defined.

**X-ray:** Diffuse, with clumps.

**References:**

Folgheraiter *et al.* 1997, MNRAS, 292, 365. ROSAT and ASCA observations.

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<b>G32.8–0.1</b>		Kes 78
<b>RA:</b> 18 <sup>h</sup> 51 <sup>m</sup> 25 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 11?	<b>Size/arcmin:</b> 17
<b>Dec:</b> –00°08′	<b>Spectral index:</b> 0.2?	<b>Type:</b> S?

Part has been called G33.1–0.1.

**Radio:** Elongated shell?

**References:**

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft et 2.7 GHz (5′ :  $S = 7.2 \pm 0.5$  Jy).  
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo at 430 MHz ( $S = 19.0 \pm 15.5$  Jy).  
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).  
 Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ :  $S = 12.8$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S = 7.7$  Jy).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.6 × 3′.8 :  $S = 31.3$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA detection of compact OH emission.

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<b>G33.2–0.6</b>		
<b>RA:</b> 18 <sup>h</sup> 53 <sup>m</sup> 50 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 3.5	<b>Size/arcmin:</b> 18
<b>Dec:</b> –00°02′	<b>Spectral index:</b> varies	<b>Type:</b> S

**Radio:** Incomplete shell.

**References:**

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Reich 1982, A&A, 106, 314. Effelsberg 100-m at 2.7 GHz (4′.4 :  $S = 2.6 \pm 0.3$  Jy) and 4.75 GHz (2′.5 :  $S = 1.75 \pm 0.2$  Jy).  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz (68″ × 52″ :  $S = 2.7 \pm 0.3$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.



**G33.6+0.1**

Kes 79, 4C00.70, HC13

**RA:** 18<sup>h</sup>52<sup>m</sup>48<sup>s</sup>**1-GHz flux/Jy:** 22**Size/arcmin:** 10**Dec:** +00°41′**Spectral index:** 0.5**Type:** S

Has been called G33.7+0.0.

**Radio:** Shell, with bright central region, in complex region.**X-ray:** Detected.**Distance:** HI absorption gives about 10 kpc.**References:**

- Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz ( $3' : S = 35.5$  Jy) and Parkes 64-m at 5 GHz ( $4' : S = 7.8$  Jy).  
 Caswell *et al.* 1975, A&A, 45, 239. HI absorption.  
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo  $S_{430}$  MHz =  $69 \pm 33$  Jy.  
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz ( $3' : S = 6.8 \pm 1.5$  Jy).  
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ( $6'.8 : S = 11.4 \pm 1.1$  Jy).  
 Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz ( $1'$ ), plus observations of the nearby point source.  
 van Gorkom *et al.* 1982, MNRAS, 198, 757. WSRT HI absorption to nearby point source, possibly extragalactic.  
 Seaquist & Gilmore 1982, AJ, 87, 378. VLA observations of nearby source, plus Einstein observations.  
 Green 1989, MNRAS, 238, 737. OH absorption.  
 Frail & Clifton 1989, ApJ, 336, 854. VLA at 1.4 GHz ( $1' \times 2'.9$ ), including HI absorption.  
 Velusamy *et al.* 1991, AJ, 102, 676. VLA at 327 MHz ( $1'$ ),  $1.5 (7'' \times 14'')$  and 5 GHz ( $7''$ ), including spectral comparison.  
 Green & Dewdney 1992, MNRAS, 254, 686. Observations of adjacent molecular material.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz ( $3'.6 \times 3'.8 : S = 34.8$  Jy).  
 Seward & Velusamy 1995, ApJ, 439, 715. ROSAT observations.  
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

**G34.7–0.4**

W44, 3C392

**RA:** 18<sup>h</sup>56<sup>m</sup>00<sup>s</sup>**1-GHz flux/Jy:** 230**Size/arcmin:**  $35 \times 27$ **Dec:** +01°22′**Spectral index:** 0.30**Type:** C

Has been called G34.6–0.5.

**Radio:** Distorted shell, brighter to the E, with pulsar and associated nebula.**X-ray:** Centrally concentrated, thermal spectrum, plus pulsar nebula.**Point sources:** Pulsar within the boundary of the remnant.**Distance:** HI absorption indicates 2.5 kpc.**References:**

- Kundu & Velusamy 1972, A&A, 20, 237. NRAO 140-ft at 10.7 GHz ( $3' : S = 105 \pm 7$  Jy).  
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $5' : S = 177 \pm 10$  Jy).  
 Caswell *et al.* 1975, A&A, 45, 239. HI absorption.  
 Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz ( $3' : S = 299$  Jy which is less than the 390 Jy found by Kesteven 1968, AuJPh, 21, 739 with the same telescope).  
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo  $S_{430}$  MHz =  $540 \pm 187$  Jy.  
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz ( $8'.4$ ) and 5 GHz ( $4'.4$ ).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ( $2'.6$ ).  
 Smith *et al.* 1985, MNRAS, 217, 99. Einstein observations.  
 Wolszczan *et al.* 1991, ApJ, 372, L99. Pulsar detection.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz ( $3'.6 \times 3'.8 : S = 469$  Jy).  
 Jones *et al.* 1993, MNRAS, 265, 631. VLA at 1.4 GHz ( $15''$ ), plus X-ray spectra.  
 Rho *et al.* 1994, ApJ, 430, 757. Optical and ROSAT observations.  
 Koo & Heiles 1995, ApJ, 442, 679. HI of surrounding shell.  
 Esposito *et al.* 1996, ApJ, 461, 820. Possible associated  $\gamma$ -ray emission.  
 Harrus *et al.* 1996, ApJ, 464, L161. ASCA observations.  
 Frail *et al.* 1996, ApJ, 464, L165. VLA at 1.5 and 8.4 GHz ( $8''.9 \times 7''.8$ ) of pulsar nebula.  
 Frail *et al.* 1996, AJ, 111, 1651. OH maser emission.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Reach & Rho 1996, A&A, 315, L277. ISO spectroscopy.  
 Harrus *et al.* 1997, ApJ, 488, 781. X-ray observations.  
 Claussen *et al.* 1997, ApJ, 489, 143. VLA of associated OH masers.  
 Giacani *et al.* 1997, AJ, 113, 1379. VLA at 1.4 GHz ( $15''$ ), plus optical images.  
 Seta *et al.* 1998, ApJ, 505, 286. CO observations of surroundings.  
 Cox *et al.* 1999, ApJ, 524, 179. Revision of distance.  
 Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.

**G36.6–0.7**

**RA:** 19<sup>h</sup>00<sup>m</sup>35<sup>s</sup>  
**Dec:** +02°56′

**1-GHz flux/Jy:** ?  
**Spectral index:** ?

**Size/arcmin:** 25?  
**Type:** S?

**Radio:** Polarized arc, possibly part of a larger shell?

**References:**

Fürst *et al.* 1987, A&AS, 69, 403. Effelsberg 100-m at 4.75 GHz (2′.4), plus other flux densities.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.4 × 3′.7:  $S=6.7$  Jy).  
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.

**G36.6+2.6**

**RA:** 18<sup>h</sup>48<sup>m</sup>49<sup>s</sup>  
**Dec:** +04°26′

**1-GHz flux/Jy:** 0.7?  
**Spectral index:** 0.5?

**Size/arcmin:** 17 × 13?  
**Type:** S

**Radio:** Poorly resolved shell.

**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).

**G39.2–0.3**

**RA:** 19<sup>h</sup>04<sup>m</sup>08<sup>s</sup>  
**Dec:** +05°28′

**1-GHz flux/Jy:** 18  
**Spectral index:** 0.6

3C396, HC24, NRAO 593  
**Size/arcmin:** 8 × 6  
**Type:** S

**Radio:** Shell, brightest to the W, with faint ‘tail’ to E.

**X-ray:** Centrally brightened.

**Distance:** HI absorption suggests at least 7.7 kpc.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′).  
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo  $S_{430 \text{ MHz}} = 54 \pm 38$  Jy.  
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′:  $S=4.1 \pm 1.0$  Jy).  
 Caswell *et al.* 1975, A&A, 45, 239. HI absorption.  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1.4 GHz (65″ × 48″).  
 Becker & Helfand 1987, AJ, 94, 1629. VLA at 1.4 GHz (12″:  $S=14$  Jy) and 5 GHz, plus Einstein observations.  
 Patnaik *et al.* 1990, A&A, 232, 467. VLA at 1.5 GHz (25″) and 1.4 GHz (7″.8 × 7″.5) and 5 GHz (25″) including polarization, plus Ooty at 327 MHz (100″ × 31″), including review of flux densities.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.5 × 3′.6:  $S=42.5$  Jy).  
 Anderson & Rudnick 1993, ApJ, 408, 514. VLA at 1.45 and 4.89 GHz for spectral index studies.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.  
 Harrus & Slane 1999, ApJ, 516, 811. ASCA observations.  
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy  $\gamma$ -rays.

**G39.7–2.0****RA:** 19<sup>h</sup>12<sup>m</sup>20<sup>s</sup>**Dec:** +04°55′**1-GHz flux/Jy:** 85?**Spectral index:** 0.7?

W50, SS433

**Size/arcmin:** 120 × 60**Type:** ?

Eastern part has been called G40.0–3.1. Is this a SNR?

**Radio:** Elongated shell, containing SS433, adjacent to the HII region S74.

**Optical:** Faint filaments at the edge of the radio emission.

**X-ray:** Emission from SS433 and two lobes.

**Point sources:** SS433 is the compact source in the centre of the W50.

**Distance:** Distance to SS433 is 5 kpc.

**References:**

van den Bergh 1980, ApJ, 236, L23. Optical in H $\alpha$  and [SII].

Zealey *et al.* 1980, MNRAS, 192, 731. Optical spectra.

van Gorkom *et al.* 1982, MNRAS, 198, 757. WSRT HI absorption to nearby point source (not SS433).

Seaquist & Gilmore 1982, AJ, 87, 378. VLA observations of nearby source.

Watson *et al.* 1983, ApJ, 273, 688. X-ray observations.

Downes *et al.* 1986, MNRAS, 218, 393. Effelsberg 100-m at 4.75 GHz (2′.4 : S = 34 ± 4 Jy), plus previous 1.7 and 2.7 GHz data.

Romney *et al.* 1987, ApJ, 321, 822. VLBI of SS433, including distance.

Elston & Baum 1987, AJ, 94, 1633. Mosaic with VLA at 1.4 GHz (30′′) of fine structure only.

Kawai *et al.* 1989, PASJ, 41, 491. X-ray observations of SS433.

Band 1989, ApJ, 336, 937. Einstein and EXOSAT observations.

Yamauchi *et al.* 1994, PASJ, 46, L109. X-ray spectral observations.

Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

Brinkmann *et al.* 1996, A&A, 312, 306. ROSAT observations.

Kotami *et al.* 1996, PASJ, 48, 619. X-ray line emission from SS433.

Safi-Harb & Ögelman 1997, ApJ, 483, 868. ROSAT observations.

Dubner *et al.* 1998, AJ, 116, 1842. VLA at 328 MHz (64′′ × 60′′ : S = 160 ± 20 Jy), and 1.4 GHz (56′′ × 54′′), plus NRAO 140-ft at 1.4 GHz (21′) for HI observations.

Safi-Harb & Petre 1999, ApJ, 512, 784. X-ray observations.

Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy  $\gamma$ -rays.

**G40.5–0.5****RA:** 19<sup>h</sup>07<sup>m</sup>10<sup>s</sup>**Dec:** +06°31′**1-GHz flux/Jy:** 11**Spectral index:** 0.5**Size/arcmin:** 22**Type:** S

**Radio:** Shell, brightest to the NE.

**References:**

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).

Downes *et al.* 1980, A&A, 92, 47. Effelsberg 100-m at 1.7 GHz (7′.6 : S = 9.3 ± 1.3 Jy), and 2.7 GHz (4′.4 : S = 7.2 ± 0.5 Jy), plus review of flux densities.

Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy  $\gamma$ -rays.

**G41.1–0.3**

3C397

**RA:** 19<sup>h</sup>07<sup>m</sup>34<sup>s</sup>**1-GHz flux/Jy:** 22**Size/arcmin:** 4.5 × 2.5**Dec:** +07°08′**Spectral index:** 0.48**Type:** S**Radio:** 3C397 is two sources: the E is the SNR, the W is a HII region.**X-ray:** Brighter to the E and W, with possible central component.**Distance:** Possible limit of > 7.5 kpc for non-thermal component from HI absorption.**References:**Kundu *et al.* 1974, AJ, 79, 1332. NRAO 140-ft at 10 GHz (3′) and 5 GHz (6′).

Velusamy &amp; Kundu 1974, A&amp;A, 32, 375. NRAO 300-ft at 2.7 GHz (5′ : S = 21.3 ± 1.2 Jy for both components).

Caswell *et al.* 1975, A&A, 45, 239. HI absorption.Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo S<sub>430</sub> MHz = 82 ± 51 Jy, also Algonquin 46-m at 10.6 GHz (3′ : S = 12 ± 2 Jy), and Haystack 36-m at 15.5 GHz (2′.3 : S = 8.5 ± 3.0 Jy).Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : S = 29.8 Jy) and Parkes 64-m at 5 GHz (4′ : S = 8.7 Jy).Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1.4 GHz (58″ × 52″).Becker *et al.* 1985, ApJ, 296, 461. VLA at 1.4 and 5 GHz (8″), plus Einstein observations.

Morsi &amp; Reich 1987, A&amp;AS, 71, 189. Effelsberg 100-m at 32 GHz (smoothed to 30″ : S = 1.10 ± 0.19 Jy).

Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.5 × 3′.6 : S = 46.3 Jy).

Anderson &amp; Rudnick 1993, ApJ, 408, 514. VLA at 1.45 and 4.89 GHz, for spectral index studies.

Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Chen *et al.* 1999, ApJ, 520, 737. ASCA and ROSAT observations.

Dyer &amp; Reynolds 1999, ApJ, 526, 365. VLA at 1.5 GHz (6″.9 × 6″.6) and 4.8 GHz (46″.4 × 5″.6), including polarization and comparison with ROSAT image.

Safi-Harb *et al.* 2000, ApJ, 545, 922. ROSAT, ASCA and other X-ray observations.Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy  $\gamma$ -rays.**G42.8+0.6****RA:** 19<sup>h</sup>07<sup>m</sup>20<sup>s</sup>**1-GHz flux/Jy:** 3?**Size/arcmin:** 24**Dec:** +09°05′**Spectral index:** 0.5?**Type:** S

Has been called G42.8+0.65.

**Radio:** Faint shell.**Point sources:** Near soft gamma repeater, and young pulsar.**References:**Fürst *et al.* 1987, A&AS, 69, 403. Effelsberg 100-m at 4.75 GHz (2′.4 : S = 1.5 ± 0.2 Jy), plus other flux densities.Vasishth *et al.* 1994, ApJ, 431, L35. VLA at 327 MHz (3′.2 × 3′.4).Hurley *et al.* 1996, ApJ, 463, L13. Observations of soft gamma repeater field.

Lorimer &amp; Xilouris 2000, ApJ, 545, 385. Pulsar detection.

Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy  $\gamma$ -rays.

**G43.3–0.2**

W49B

**RA:** 19<sup>h</sup>11<sup>m</sup>08<sup>s</sup>  
**Dec:** +09°06′**1-GHz flux/Jy:** 38  
**Spectral index:** 0.48**Size/arcmin:** 4 × 3  
**Type:** S**Radio:** Shell, brightest to the SE and W, near the HII region W49A.**X-ray:** Filled-centre.**Distance:** HI absorption indicates 12.5 to 14 kpc.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 2.7 GHz (4′).  
 Downes & Wilson 1974, A&A, 34, 133. Effelsberg 100-m at 10.7 GHz (1′.3).  
 Green *et al.* 1975, A&A, 44, 187. Effelsberg 100-m at 15.0 GHz (58″ :  $S=9.0 \pm 0.7$  Jy).  
 Lockhart & Goss 1978, A&A, 67, 355. HI absorption.  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Pye *et al.* 1984, MNRAS, 207, 649. Einstein observations, and VLA at 1.4 and 5 GHz (both 12″).  
 Smith *et al.* 1985, ApJ, 296, 469. EXOSAT spectrum.  
 Morsi & Reich 1987, A&AS, 71, 189. Effelsberg 100-m at 32 GHz (smoothed to 30″ :  $S=6.90 \pm 0.38$  Jy).  
 Moffett & Reynolds 1994, ApJ, 437, 705. VLA at 330 MHz (6″.7 × 7″.7 :  $S=64.4$  Jy), 1.48 GHz (4″.8 × 5″.2 :  $S=31.8$  Jy) and 4.85 GHz (4″.0 × 4″.1), including polarization.  
 Fujimoto *et al.* 1995, PASJ, 47, L31. ASCA observations.  
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Hwang *et al.* 2000, ApJ, 532, 970. ROSAT image and ASCA spectroscopy.  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.  
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy  $\gamma$ -rays.  
 Brogan & Troland 2001, ApJ, 550, 799. VLA at 1.4 GHz (27″ × 24″ and 5″) for HI Zeeman splitting.  
 Lacey *et al.* 2001, ApJ, 559, 954. VLA at 74 MHz (26″ × 23″ :  $S=55.6$  Jy) and 326 MHz (6″.6 × 6″.2 :  $S=56.0$  Jy).

**G43.9+1.6****RA:** 19<sup>h</sup>05<sup>m</sup>50<sup>s</sup>  
**Dec:** +10°30′**1-GHz flux/Jy:** 8.6?  
**Spectral index:** 0.2?**Size/arcmin:** 60?  
**Type:** S?**Radio:** Large, poorly defined faint shell.**Point sources:** Soft gamma repeater nearby.**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).  
 Vasishth *et al.* 1994, ApJ, 431, L35. VLA at 327 MHz (3′.2 × 3′.4).  
 Hurley *et al.* 1996, ApJ, 463, L13. Observations of soft gamma repeater field.

**G45.7–0.4****RA:** 19<sup>h</sup>16<sup>m</sup>25<sup>s</sup>  
**Dec:** +11°09′**1-GHz flux/Jy:** 4.2?  
**Spectral index:** 0.4?**Size/arcmin:** 22  
**Type:** S**Radio:** Shell, brightest to the SE, poorly defined to NW.**References:**

Fürst *et al.* 1987, A&AS, 69, 403. Effelsberg 100-m at 4.75 GHz (2′.4 :  $S=2.6 \pm 0.3$  Jy), plus other flux densities.  
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.

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<b>G46.8–0.3</b>		(HC30)
<b>RA:</b> 19 <sup>h</sup> 18 <sup>m</sup> 10 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 14	<b>Size/arcmin:</b> 17 × 13
<b>Dec:</b> +12°09′	<b>Spectral index:</b> 0.5	<b>Type:</b> S

Has been called G46.6–0.2.

**Radio:** Shell, two bright arcs to NNW and SSE.

**Distance:** HI absorption suggests 6.8–8.8 kpc.

**References:**

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ( $S' : S = 9.8 \pm 0.9$  Jy), and VRO 37-m at 1.7 GHz ( $S = 14.5 \pm 5.5$  Jy).  
 Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz ( $3' : S = 20.3$  Jy) and Parkes 64-m at 5 GHz ( $4' : S = 7.1$  Jy).  
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo  $S_{430}$  MHz =  $46 \pm 21$  Jy.  
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ( $6'.8 : S = 5.9 \pm 0.6$  Jy).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ( $2'.6$ ).  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz ( $58'' \times 53'' : S = 13.3 \pm 0.1$  Jy).

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<b>G49.2–0.7</b>		(W51)
<b>RA:</b> 19 <sup>h</sup> 23 <sup>m</sup> 50 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 160?	<b>Size/arcmin:</b> 30
<b>Dec:</b> +14°06′	<b>Spectral index:</b> 0.3?	<b>Type:</b> S?

**Radio:** In complex region, parameters uncertain.

**X-ray:** Elongated east–west.

**Optical:** Some diffuse emission possibly associated.

**Distance:** HI absorption suggests 4.1 kpc.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Parkes 64-m at 5 GHz ( $4'$ ).  
 Sato 1973, PASJ, 25, 135. HI absorption.  
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $5'$ ),  $S = 51.5 \pm 3.2$  Jy, for the non-thermal component, but probably confused.  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ( $2'.6$ ).  
 Seward 1990, ApJS, 73, 781. Einstein observations.  
 Copetti & Schmidt 1991, MNRAS, 250, 127. CLFST at 151 MHz.  
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz ( $3'.1 \times 3'.5$ ).  
 Subrahmanyan & Goss 1995, MNRAS, 275, 755. VLA at 330 MHz ( $1'.1$ ).  
 Koo *et al.* 1995, ApJ, 447, 211. ROSAT observations.  
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.  
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.  
 Green *et al.* 1997, AJ, 114, 2058. OH masers.  
 Koo & Moon 1997, ApJ, 475, 194. Arecibo ( $3'$ ) and VLA ( $40'' \times 42''$ ) at 1.4 GHz for HI.  
 Koo & Moon 1997, ApJ, 485, 263. NRAO 12-m CO and HCO<sup>+</sup> observations.  
 Mavromatakis *et al.* 2001, A&A, 370, 265. Optical observations.  
 Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.

**G53.6–2.2**

**RA:** 19<sup>h</sup>38<sup>m</sup>50<sup>s</sup>  
**Dec:** +17°14′

**1-GHz flux/Jy:** 8  
**Spectral index:** 0.75

3C400.2, NRAO 611  
**Size/arcmin:** 33 × 28  
**Type:** S

Has been called G53.7–2.2.

**Radio:** Ring of emission, with extension to NW.

**Optical:** Filaments and diffuse emission.

**X-ray:** Centrally brightened, offset to NW.

**Distance:** Mean optical velocity indicates 6.7 kpc, HI absorption indicates 2.3 kpc.

**References:**

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ( $S' : S = 5.3 \pm 0.6$  Jy).  
van den Bergh 1978, ApJS, 38, 119. Optical.  
Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $S' : S = 4.8 \pm 0.3$  Jy).  
Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz ( $3' : S = 11.7$  Jy).  
Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo  $S_{430 \text{ MHz}} = 20 \pm 10$  Jy,  $S_{318 \text{ MHz}} = 20 \pm 3.6$  Jy.  
Goss *et al.* 1975, A&A, 43, 459. WSRT at 610 MHz ( $1' \times 3' : S = 13.2 \pm 1.6$  Jy).  
Sabbadin & d'Odorico 1976, A&A, 49, 119. Optical spectra.  
Rosado 1983, RMxAA, 8, 59. Optical spectra.  
Blair & Long 1988, PASP, 100, 461. Optical imaging and spectroscopy.  
Long *et al.* 1991, ApJ, 373, 567. Einstein and optical observations.  
Winkler *et al.* 1993, ApJ, 405, 608. Optical imaging.  
Dubner *et al.* 1994, AJ, 108, 207. VLA at 327 MHz ( $59''$ ) and 1.49 GHz ( $52''$ ), plus X-rays.  
Saken *et al.* 1995, ApJ, 443, 231. ROSAT observations.  
Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.  
Giacani *et al.* 1998, A&AS, 133, 61. DRAO at 1.4 GHz for HI studies, including distance.  
Yoshita *et al.* 2001, PASJ, 53, 93. ASCA observations, and spectral comparison with ROSAT.

**G54.1+0.3**

**RA:** 19<sup>h</sup>30<sup>m</sup>31<sup>s</sup>  
**Dec:** +18°52′

**1-GHz flux/Jy:** 0.5  
**Spectral index:** 0.1

**Size/arcmin:** 1.5  
**Type:** F?

**Radio:** Filled-centre.

**X-ray:** Centrally concentrated, with extension to NE.

**References:**

Green 1985, MNRAS, 216, 691. 5km at 2.7 GHz ( $7'' \times 20''$ ).  
Reich *et al.* 1985, A&A, 151, L10. Effelsberg 100-m at 4.75 GHz ( $2'.4 : S = 0.37 \pm 0.04$  Jy)  
Velusamy & Becker 1988, AJ, 95, 1162. VLA at 1.4 ( $14'' : S = 0.48 \pm 0.03$  Jy), 1.6 ( $14'' : S = 0.42 \pm 0.03$  Jy) and 5 GHz ( $5'' : S = 0.33 \pm 0.02$  Jy),  
Ooty at 327 MHz ( $S = 0.50 \pm 0.08$  Jy), plus review of flux densities.  
Seward 1989, AJ, 97, 481. Einstein observations.  
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.  
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
Lu *et al.* 2001, A&A, 370, 570. ROSAT and ASCA observations.

**G54.4–0.3**

**RA:** 19<sup>h</sup>33<sup>m</sup>20<sup>s</sup>  
**Dec:** +18°56′

**1-GHz flux/Jy:** 28  
**Spectral index:** 0.5

(HC40)  
**Size/arcmin:** 40  
**Type:** S

Has been called G54.5–0.3.

**Radio:** Shell, in complex region.

**References:**

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $S' : S = 34.4 \pm 5.0$  Jy).  
Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ( $2'.6$ ).  
Caswell 1985, AJ, 90, 1224. DRAO at 1.4 GHz ( $1'.3 \times 2'.6 : S = 18 \pm 4$  Jy).  
Velusamy *et al.* 1986, JApA, 7, 105. WSRT at 609 MHz ( $50'' \times 191''$  smoothed to  $100'' \times 200''$ ).  
Junkes *et al.* 1992, A&AS, 96, 1. Surrounding CO.  
Junkes *et al.* 1992, A&A, 261, 289. Nearby IRAS sources.

**G55.0+0.3**

**RA:** 19<sup>h</sup>32<sup>m</sup>00<sup>s</sup>  
**Dec:** +19°50′

**1-GHz flux/Jy:** 0.5?  
**Spectral index:** 0.5?

**Size/arcmin:** 20 × 15?  
**Type:** S

Has been called G55.2+0.5.

**Radio:** Faint, partial shell.

**Distance:** Association with HI features implies 14 kpc.

**Point sources:** Old pulsar nearby.

**References:**

Mathews *et al.* 1998, ApJ, 493, 312. WSRT at 327 MHz ( $1'.0 \times 2'.9$ :  $S=0.98 \pm 0.15$  Jy), DRAO at 1.4 GHz ( $1'.0 \times 2'.9$ :  $S=0.25 \pm 0.12$  Jy), plus HI observations.

**G55.7+3.4**

**RA:** 19<sup>h</sup>21<sup>m</sup>20<sup>s</sup>  
**Dec:** +21°44′

**1-GHz flux/Jy:** 1.4  
**Spectral index:** 0.6

**Size/arcmin:** 23  
**Type:** S

**Radio:** Incomplete shell.

**Point sources:** Old pulsar within the boundary of the remnant.

**References:**

Goss *et al.* 1977, A&A, 61, 93. WSRT observations at 610 MHz ( $57'' \times 156''$ :  $S=1.9 \pm 0.2$  Jy) and 1415 MHz ( $27'' \times 72''$ :  $S=1.0 \pm 0.1$  Jy).

**G57.2+0.8**

**RA:** 19<sup>h</sup>34<sup>m</sup>59<sup>s</sup>  
**Dec:** +21°57′

**1-GHz flux/Jy:** 1.8?  
**Spectral index:** ?

(4C21.53)  
**Size/arcmin:** 12?  
**Type:** S?

**Radio:** Extended non-thermal arc.

**Point sources:** Near the millisecond pulsar, but not thought to be related.

**References:**

Sieber & Seiradakis 1984, A&A, 130, 257. Effelsberg 100-m at 1.4 GHz ( $8'.8$ :  $1.34 \pm 0.1$ ), 2.7 GHz ( $4'.3$ :  $0.86 \pm 0.1$ ), plus other surveys of the area.

Caswell *et al.* 1985, AJ, 90, 488. DRAO at 1.4 GHz ( $1' \times 3'$ ).

**G59.5+0.1**

**RA:** 19<sup>h</sup>42<sup>m</sup>33<sup>s</sup>  
**Dec:** +23°35′

**1-GHz flux/Jy:** 3?  
**Spectral index:** ?

**Size/arcmin:** 5  
**Type:** S

Has been called G59.6+0.1.

**Radio:** Incomplete shell.

**References:**

Taylor *et al.* 1992, AJ, 103, 931. WSRT at 327 MHz ( $1'.0 \times 2'.5$ :  $S=5.1 \pm 0.2$  Jy), and northern sky survey at 4.9 GHz.

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G59.8+1.2**

**RA:** 19<sup>h</sup>38<sup>m</sup>55<sup>s</sup>  
**Dec:** +24°19′

**1-GHz flux/Jy:** 1.6  
**Spectral index:** 0.5

**Size/arcmin:** 20 × 16?  
**Type:** ?

Has been called G59.7+1.2.

**Radio:** Poorly defined source.

**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.

Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz ( $4'.3$ ).



**G63.7+1.1****RA:** 19<sup>h</sup>47<sup>m</sup>52<sup>s</sup>**Dec:** +27°45′**1-GHz flux/Jy:** 1.8**Spectral index:** 0.3**Size/arcmin:** 8**Type:** F**Radio:** Centrally brightened, with core.**References:**Wallace *et al.* 1997, AJ, 114, 2068. WSRT at 1.4 GHz (14″ × 26″ :  $S = 1.63$  Jy), DRAO at 1.4 GHz (smoothed to 2′), plus review of flux densities and other observations.**G65.1+0.6****RA:** 19<sup>h</sup>54<sup>m</sup>40<sup>s</sup>**Dec:** +28°35′**1-GHz flux/Jy:** 6**Spectral index:** 0.6**Size/arcmin:** 90 × 50**Type:** S**Radio:** Large, faint shell.**Point sources:** Pulsar nearby.**References:**Landecker *et al.* 1990, A&A, 232, 207. DRAO at 408 MHz (3′.5 × 7′.0 :  $S = 9.5 \pm 0.1$  Jy), and 1.4 GHz (1′.0 × 2′.0 :  $S = 5.4 \pm 1.0$  Jy). Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.**G65.3+5.7****RA:** 19<sup>h</sup>33<sup>m</sup>00<sup>s</sup>**Dec:** +31°10′**1-GHz flux/Jy:** 52?**Spectral index:** 0.6?**Size/arcmin:** 310 × 240**Type:** S?

Has been called G65.2+5.7.

**Radio:** Large, faint ring? near S91 and S94.**Optical:** Strong in H $\alpha$ +[NII] and [OIII].**X-ray:** Detected.**Distance:** Mean optical velocity suggests 0.8 kpc.**References:**Gull *et al.* 1977, ApJ, 215, L69. Optical plates.Reich *et al.* 1979, A&A, 72, 270. Effelsberg 100-m observations at 1.42 GHz (smoothed to 11′ :  $S = 42.4 \pm 1.6$  Jy), estimate  $S_{408 \text{ MHz}} = 91 \pm 5$  Jy from previous sky survey.

Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.

Rosado 1981, ApJ, 250, 222. Optical interferometry.

Fesen *et al.* 1983, ApJS, 51, 337. Deep [OIII] imagery.Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.

Seward 1990, ApJS, 73, 781. Einstein observations.

Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.**G65.7+1.2****RA:** 19<sup>h</sup>52<sup>m</sup>10<sup>s</sup>**Dec:** +29°26′**1-GHz flux/Jy:** 5.1**Spectral index:** 0.6**Size/arcmin:** 18**Type:** ?

DA 495

Has mistakenly been called G55.7+1.2.

**Radio:** Filled-centre or thick shell?**References:**Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz (5′ :  $S = 2.8 \pm 0.4$  Jy), and VRO 37-m at 1.7 GHz ( $S = 4.4 \pm 0.5$  Jy), plus review of flux densities.Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo  $S_{430 \text{ MHz}} = 8.7 \pm 4.9$  Jy,  $S_{318 \text{ MHz}} = 9.7 \pm 2.2$  Jy.Landecker & Caswell 1983, AJ, 88, 1810. DRAO at 1.4 GHz (0′.9 × 1′.5 :  $S = 4.4 \pm 0.2$  Jy).Velusamy *et al.* 1989, JApA, 10, 161. Ooty at 327 MHz (36″ × 64″), WSRT at 610 MHz (62″) and VLA at 1.4 GHz (36″ and 12″), including IRAS imaging.

Biggs &amp; Lyne 1996, MNRAS, 282, 691. Pulsar search.

Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G67.7+1.8****RA:** 19<sup>h</sup>54<sup>m</sup>32<sup>s</sup>**Dec:** +31°29′**1-GHz flux/Jy:** 1.4**Spectral index:** 0.3**Size/arcmin:** 9**Type:** S**Radio:** Double arc shell.**Optical:** Filaments in N.**References:**

Taylor *et al.* 1992, AJ, 103, 931. WSRT at 327 MHz ( $1'.9 \times 1'.0$ :  $S=1.9 \pm 0.1$  Jy), and northern sky survey at 4.9 GHz ( $S=0.42 \pm 0.05$  Jy).  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.  
 Mavromatakis *et al.* 2001, A&A, 370, 265. Optical observations.

**G68.6–1.2****RA:** 20<sup>h</sup>08<sup>m</sup>40<sup>s</sup>**Dec:** +30°37′**1-GHz flux/Jy:** 0.7?**Spectral index:** 0.0?**Size/arcmin:** 28 × 25?**Type:** ?**Radio:** Faint, poorly defined source.**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz ( $4'.3$ ).  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G69.0+2.7****RA:** 19<sup>h</sup>53<sup>m</sup>20<sup>s</sup>**Dec:** +32°55′**1-GHz flux/Jy:** 120?**Spectral index:** varies

CTB 80

**Size/arcmin:** 80?**Type:** ?

An association with a SN in AD1408 has been suggested. Has been called G68.8+2.8. Is it a SNR?

**Radio:** Compact core, flat spectrum plateau, and steeper spectrum extensions, with spectral break?**Optical:** Expanding nebulosity near centre, with filaments to the SW and far NE.**X-ray:** Diffuse emission with compact source.**Point sources:** Pulsar at western edge of core.**References:**

Angerhofer *et al.* 1981, A&A, 94, 313. WSRT at 610 MHz ( $56'' \times 103''$ ) 1.4 GHz ( $24'' \times 44''$ ) and 5 GHz ( $7'' \times 13''$ ), plus optical.  
 Becker *et al.* 1982, ApJ, 255, 557. X-ray observations.  
 Sofue *et al.* 1983, PASJ, 35, 437. NRO 45-m at 10.2 GHz ( $2'.7$ ).  
 Velusamy & Kundu 1983, JApA, 3, 253. VLA of compact sources.  
 Blair *et al.* 1984, ApJ, 282, 161. Optical images and spectra.  
 Wang & Seward 1984, ApJ, 285, 607. Einstein observations.  
 Strom *et al.* 1984, A&A, 139, 43. Radio observations of flat spectrum component, VLA 5 GHz ( $1''.7$ ) and 1.4 GHz.  
 Mantovani *et al.* 1985, A&A, 145, 50. Bologna at 408 MHz ( $2'.6 \times 4'.9$ :  $S=67.5 \pm 10.5$  Jy), Effelsberg 100-m at 1.41 ( $9'$ :  $S=62 \pm 9$  Jy), 1.72 ( $7'.6$ :  $S=66 \pm 5$  Jy), 2.7 ( $4'.5$ :  $S=52 \pm 4$  Jy) and 4.75 GHz ( $2'.4$ :  $S=44 \pm 3.3$  Jy), plus review of flux densities.  
 Kulkarni *et al.* 1988, Natur, 331, 50. Pulsar detection.  
 Angelini *et al.* 1988, ApJ, 330, L43. EXOSAT spectra.  
 Fesen *et al.* 1988, Natur, 334, 229. IRAS of surrounding shell.  
 Whitehead *et al.* 1989, MNRAS, 237, 1109. Optical of core.  
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz of core, plus review of flux densities.  
 Hester & Kulkarni 1989, ApJ, 340, 362. Optical imaging and spectroscopy.  
 Koo *et al.* 1990, ApJ, 364, 178. Large, expanding H<sub>i</sub> shell.  
 Greidanus & Strom 1990, A&A, 240, 376. Optical kinematics of core.  
 Koo *et al.* 1993, ApJ, 417, 196. VLA at 1.4 GHz of surrounding H<sub>i</sub> ( $1'$ ), plus IRAS.  
 Safi-Harb *et al.* 1995, ApJ, 439, 722. ROSAT observations.  
 Srinivasan 1997, ApJ, 489, 170.  $\gamma$ -ray observations of pulsar.  
 Mavromatakis *et al.* 2001, A&A, 371, 300. Optical observations.

**G69.7+1.0****RA:** 20<sup>h</sup>02<sup>m</sup>40<sup>s</sup>**Dec:** +32°43′**1-GHz flux/Jy:** 1.6**Spectral index:** 0.8**Size/arcmin:** 16**Type:** S**Radio:** Poorly resolved source.**References:**Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.**G73.9+0.9****RA:** 20<sup>h</sup>14<sup>m</sup>15<sup>s</sup>**Dec:** +36°12′**1-GHz flux/Jy:** 9?**Spectral index:** 0.3?**Size/arcmin:** 22?**Type:** S?**Radio:** Diffuse, centrally brightened to SW.**Optical:** Weak shell.**References:**Reich *et al.* 1986, A&A, 155, 185. Effelsberg 100-m at 4.75 GHz (2′.4:  $S=6.7\pm0.5$  Jy), plus other flux densities.

Chastenay &amp; Pineault 1988, in SNRISM, p297. DRAO at 408 MHz (3′.5 × 5′.9) and 1.4 GHz (1′.0 × 1′.7).

Pineault & Chastenay 1990, MNRAS, 246, 169. DRAO at 408 MHz (3′.4 × 5′.8:  $S=12.7\pm1.2$  Jy) and 1.4 GHz (1′.0 × 1′.7:  $S=7.4\pm1.0$  Jy).Lozinskaya *et al.* 1993, ARep, 37, 240. Optical observations.Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.Pineault *et al.* 1996, AJ, 112, 201. DRAO at 1.4 GHz (smoothed to 2′) for HI.Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G74.0–8.5**

Cygnus Loop

**RA:** 20<sup>h</sup>51<sup>m</sup>00<sup>s</sup>**1-GHz flux/Jy:** 210**Size/arcmin:** 230 × 160**Dec:** +30°40′**Spectral index:** varies**Type:** S**Radio:** Shell, brightest to the NE, with fainter breakout region to S, with spectral variations.**Optical:** Large filamentary loop, brightest to the NE, not well defined to the S or W.**X-ray:** Shell in soft X-rays.**Point sources:** Several compact radio sources within the boundary of the remnant, including CL4, plus X-ray sources in S.**Distance:** Optical proper motion and shock velocity gives 0.44 kpc.**References:**

- Seaquist & Gilmore 1982, AJ, 87, 378. VLA observations of CL4.  
 Green 1984, MNRAS, 211, 433. Most of remnant at 408 MHz (80'' × 160'').  
 Charles *et al.* 1985, ApJ, 295, 456. Einstein observations.  
 Braun & Strom 1986, A&A, 164, 208. IRAS observations.  
 Straka *et al.* 1986, ApJ, 306, 266. Radio and optical comparison of NE. VLA at 1.6 GHz (4'' .7) plus optical.  
 Raymond *et al.* 1988, ApJ, 324, 869. Detailed optical study of filaments.  
 Ballet & Clarke 1989, A&A, 211, 217. [Fex] and [FexIV] spectroscopy.  
 Ballet & Rothenflug 1989, A&A, 218, 277. EXOSAT observations.  
 Green 1990, AJ, 100, 1927. DRAO at 408 MHz (3'.3 × 6'.7) for spectral index study, plus X-ray and optical.  
 Graham *et al.* 1991, AJ, 101, 175. Shocked molecular H outside rim in NE.  
 Shull & Clarke 1991, PASP, 103, 811. Optical spectroscopy of nearside filaments.  
 Blair *et al.* 1991, ApJ, 374, 202. Far UV mapping.  
 Blair *et al.* 1991, ApJ, 379, L33. UV spectroscopy.  
 Greidanus & Strom 1992, A&A, 257, 265. Optical kinematics.  
 Shull & Hippelein 1992, ApJ, 383, 714. Optical kinematics and proper motion.  
 Fesen *et al.* 1992, AJ, 104, 719. H $\alpha$  imagery.  
 Cornett *et al.* 1992, ApJ, 395, L9. UV imagery.  
 Long *et al.* 1992, ApJ, 400, 214. Optical of Balmer dominated filament.  
 Arendt *et al.* 1992, ApJ, 400, 562. IRAS observations.  
 Vancura *et al.* 1993, ApJ, 417, 663. Far UV observations.  
 Hester *et al.* 1994, ApJ, 420, 721. H $\alpha$ , [OIII] and other optical observations of Balmer dominated filaments in NE.  
 Miyata *et al.* 1994, PASJ, 46, L101. X-ray observations of NE.  
 Graham *et al.* 1995, ApJ, 444, 787. X-ray and optical studies of interaction with surroundings.  
 Sauvageot & Decourchelle 1995, A&A, 296, 201. [Fex] and [FexIV] observations.  
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Levenson *et al.* 1996, ApJ, 468, 323. ROSAT and optical observations of W.  
 Decourchelle *et al.* 1997, A&A, 326, 811. ROSAT observations of N.  
 Levenson *et al.* 1997, ApJ, 484, 304. ROSAT observations.  
 Leahy *et al.* 1997, AJ, 114, 2081. DRAO at 1.4 GHz (1' × 2'), including polarisation.  
 Miyata *et al.* 1998, PASJ, 50, 257. ASCA observations.  
 Miyata *et al.* 1998, PASJ, 50, 475. ASCA observations of compact X-ray source in S.  
 Leahy & Roger 1998, ApJ, 505, 784. DRAO at 1.4 GHz (1'.0 × 1'.9) and 408 MHz (3'.4 × 6'.9), for spectral index studies in comparison with other radio observations.  
 Levenson *et al.* 1998, ApJS, 118, 541. Optical images.  
 Roger *et al.* 1999, A&AS, 137, 7. 22 MHz flux density ( $S = 1400 \pm 400$  Jy).  
 Bohigas *et al.* 1999, ApJ, 518, 324. Optical spectroscopy of surroundings.  
 Levenson *et al.* 1999, ApJ, 526, 874. ROSAT images.  
 Blair *et al.* 1999, AJ, 118, 942. HST observations, for distance.  
 Aschenbach & Leahy 1999, A&A, 341, 602. ROSAT image, and comparison with radio.  
 Sauvageot *et al.* 1999, A&A, 351, 669. [Nev] observations.  
 Szentgyorgyi *et al.* 2000, ApJ, 529, 279. [Nev] images.  
 Danforth *et al.* 2000, AJ, 119, 2319. UV, optical and X-ray comparison of selected regions.  
 Sankrit *et al.* 2000, AJ, 120, 1925. HST far-UV spectra on non-radiative shock.  
 Miyata *et al.* 2001, ApJ, 550, 1023. ASCA observations of compact X-ray sources.  
 Miyata & Tsunemi 2001, ApJ, 552, 624. ASCA spectroscopy of regions in N and E.  
 Ghavamian *et al.* 2001, ApJ, 547, 995. Optical spectroscopy.  
 Danforth *et al.* 2001, AJ, 122, 938. Far-UV spectroscopy, H $\alpha$  and other optical observations of NE region.  
 Levenson & Graham 2001, ApJ, 559, 948. HST of SE region.

**G74.9+1.2**

CTB 87

**RA:** 20<sup>h</sup>16<sup>m</sup>02<sup>s</sup>**1-GHz flux/Jy:** 9**Size/arcmin:** 8 × 6**Dec:** +37° 12′**Spectral index:** varies**Type:** F**Radio:** Filled-centre, with high polarization and high frequency turnover.**X-ray:** Centrally brightened.**Distance:** HI absorption indicates 12 kpc.**Point sources:** Extragalactic compact source is nearby.**References:**Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo  $S_{430\text{ MHz}} = 12.2 \pm 9.7$  Jy,  $S_{318\text{ MHz}} = 17.7 \pm 5.0$  Jy.Weiler & Shaver 1978, A&A, 70, 389. WSRT at 610 MHz ( $57'' \times 94'' : S = 9.1 \pm 1.2$  Jy), 1.4 ( $24'' \times 40'' : S = 8.7 \pm 1.2$  Jy) and 5 GHz ( $24'' \times 40'' : S = 5.6 \pm 1.3$  Jy).Geldzahler *et al.* 1980, A&A, 84, 237. Effelsberg 100-m at 2.7 GHz ( $4'.4 : S = 7.6 \pm 0.5$  Jy).

Wilson 1980, ApJ, 241, L19. Einstein observations.

van Gorkom *et al.* 1982, MNRAS, 198, 757. WSRT HI absorption of nearby compact source.

Seaquist &amp; Gilmore 1982, AJ, 87, 378. VLA observations of nearby source.

Morsi & Reich 1987, A&AS, 69, 533. Effelsberg 100-m at 32 GHz (smoothed to  $40'' : S = 1.47 \pm 0.19$  Jy).Green & Gull 1989, MNRAS, 237, 555. VLA at 1.4 GHz ( $1'.2 \times 1'.4$ ) including HI.Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz, plus review of flux densities.Pineault & Chastenay 1990, MNRAS, 246, 169. DRAO at 408 MHz ( $3'.4 \times 5'.8 : S = 11.6 \pm 0.4$  Jy) and 1.4 GHz ( $1'.0 \times 1'.7 : S = 7.2 \pm 0.3$  Jy).

Asaoka &amp; Koyama 1990, PASJ, 42, 625. Ginga X-ray spectrum.

Wendker *et al.* 1991, A&A, 241, 551. DRAO at 408 MHz ( $3'.5 \times 5'.2 : S = 13.3 \pm 0.8$  Jy) and Effelsberg 100-m at 4.8 GHz ( $S = 7.5 \pm 0.7$  Jy).Wallace *et al.* 1994, A&A, 286, 565. HI of surroundings.Cho *et al.* 1994, AJ, 108, 634. CO of adjacent molecular clouds.Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.

Biggs &amp; Lyne 1996, MNRAS, 282, 691. Pulsar search.

Wallace *et al.* 1997, A&A, 317, 212. DRAO at 408 MHz ( $3'.4 \times 5'.5$ ) and 1.4 GHz ( $1'.0 \times 1'.6$ ) including HI (smoothed to  $2'$ ).Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.**G76.9+1.0****RA:** 20<sup>h</sup>22<sup>m</sup>20<sup>s</sup>**1-GHz flux/Jy:** 2**Size/arcmin:** 12 × 9**Dec:** +38° 43′**Spectral index:** 0.6**Type:** ?**Radio:** Diffuse, non-thermal, with low frequency turnover.**References:**Landecker *et al.* 1993, A&A, 276, 522. VLA at 1.49 GHz ( $14''$ ), 4.86 GHz ( $13'' \times 16''$ ) and 8.55 GHz ( $11'' \times 12''$ ), including polarization and review of flux densities.Landecker *et al.* 1997, A&AS, 123, 199. Miyun at 232-MHz ( $3'.8 \times 5'.4$ ).Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G78.2+2.1**

**RA:** 20<sup>h</sup>20<sup>m</sup>50<sup>s</sup>  
**Dec:** +40°26′

**1-GHz flux/Jy:** 340  
**Spectral index:** 0.5

DR4,  $\gamma$  Cygni SNR  
**Size/arcmin:** 60  
**Type:** S

Has been called G78.1+1.8.

**Radio:** In complex region (early catalogues refer to other proposed remnants in this region).

**Optical:** Faint filaments, spectra indicate a SNR superposed on a HII region.

**X-ray:** Weak emission from the SE of the remnant.

**Point sources:**  $\gamma$ -ray and X-ray point source in remnant.

**References:**

Higgs *et al.* 1977, AJ, 82, 718. DRAO at 1.4 GHz ( $2' \times 3' : S=270 \pm 40$  Jy) plus some 10 GHz ( $4'$ ) survey data, reveals true extent of remnant.  
d'Odorico & Sabbadin 1977, A&AS, 28, 439. Optical spectra.  
van den Bergh 1978, ApJS, 38, 119. Optical.  
Landecker *et al.* 1980, A&AS, 39, 133. DRAO HI observations ( $2' \times 3'.1$ ).  
Higgs *et al.* 1983, AJ, 88, 97. CO of surroundings.  
Bohigas *et al.* 1983, RMxAA, 8, 155. Optical spectra, find thermal only.  
Braun & Strom 1986, A&AS, 63, 345. WSRT HI observations.  
Fukui & Tatematsu 1988, in SNRISM, p261. CO observations of the vicinity ( $2'.7$ ).  
Green 1989, MNRAS, 238, 737. OH observations.  
Pineault & Chastenay 1990, MNRAS, 246, 169. DRAO at 408 MHz ( $3'.4 \times 5'.8 : S=480 \pm 60$  Jy) and 1.4 GHz ( $1'.0 \times 1'.7 : S=270 \pm 40$  Jy).  
Wendker *et al.* 1991, A&A, 241, 551. DRAO at 408 MHz ( $3'.5 \times 5'.2 : S=540 \pm 40$  Jy) and Effelsberg 100-m at 4.8 GHz ( $S=150 \pm 15$  Jy).  
Esposito *et al.* 1996, ApJ, 461, 820. Associated  $\gamma$ -ray emission.  
Brazier *et al.* 1996, MNRAS, 281, 1033.  $\gamma$ -ray and X-ray point source.  
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
Zhang *et al.* 1997, A&A, 324, 641. Multi-frequency radio comparison.  
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.  
Lozinskaya *et al.* 2000, A&A, 26, 77. H $\alpha$  and X-ray observations.  
Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.

**G82.2+5.3**

**RA:** 20<sup>h</sup>19<sup>m</sup>00<sup>s</sup>  
**Dec:** +45°30′

**1-GHz flux/Jy:** 120?  
**Spectral index:** 0.5?

W63  
**Size/arcmin:** 95  $\times$  65  
**Type:** S

**Radio:** Shell in the Cygnus X complex.

**Optical:** In complex region, but spectra indicate SNR filaments.

**X-ray:** Detected.

**References:**

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $5' : S=59.0 \pm 3.5$  Jy).  
Sabbadin 1976, A&A, 51, 159. Optical spectra.  
Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ( $6'.8$ ). Incomplete mapping.  
Rosado & González 1981, RMxAA, 5, 93. Optical spectra.  
Seward 1990, ApJS, 73, 781. Einstein observations.  
Higgs *et al.* 1991, JRASC, 85, 24. DRAO at 408 MHz ( $3'.4 \times 5'.0 : S=165 \pm 21$  Jy), plus review of flux densities.  
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G84.2–0.8**

**RA:** 20<sup>h</sup>53<sup>m</sup>20<sup>s</sup>  
**Dec:** +43°27′

**1-GHz flux/Jy:** 11  
**Spectral index:** 0.5

**Size/arcmin:** 20  $\times$  16  
**Type:** S

**Radio:** Elongated shell, with a filament aligned with the major axis.

**References:**

Matthews *et al.* 1977, A&A, 55, 1. WSRT at 610 MHz ( $56'' \times 81'' : S=12.4 \pm 1.5$  Jy) and Effelsberg 100-m at 2.7 GHz ( $4'.4 : S=6.8 \pm 1.3$  Jy).  
Matthews & Shaver 1980, A&A, 87, 255. WSRT at 1415 MHz ( $23'' \times 32''$ ), and Effelsberg 100-m at 2.7 GHz ( $4'.4 : S=5.6 \pm 0.5$  Jy).  
Feldt & Green 1993, A&A, 274, 421. DRAO at 1.4 GHz ( $1' \times 1'.5$ ), including HI, plus CO observations.  
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G84.9+0.5**

**RA:** 20<sup>h</sup>50<sup>m</sup>30<sup>s</sup>  
**Dec:** +44°53′

**1-GHz flux/Jy:** 0.8  
**Spectral index:** 0.4

**Size/arcmin:** 6  
**Type:** S

**Radio:** Incomplete shell.

**References:**

Taylor *et al.* 1992, AJ, 103, 931. WSRT at 327 MHz ( $1'.4 \times 1'.0$ :  $S = 1.2 \pm 0.1$  Jy), and northern sky survey at 4.9 GHz ( $S = 0.40 \pm 0.01$  Jy). Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G85.4+0.7**

**RA:** 20<sup>h</sup>50<sup>m</sup>40<sup>s</sup>  
**Dec:** +45°22′

**1-GHz flux/Jy:** ?  
**Spectral index:** 0.5?

**Size/arcmin:** 24  
**Type:** S

**Radio:** Faint, incomplete shell, within larger thermal shell.

**X-ray:** Detected.

**References:**

Kothes *et al.* 2001, A&A, 376, 641. DRAO at 408 MHz ( $4'.4 \times 2'.8$ :  $S < 0.45$  Jy) and 1.4 GHz ( $1'.1 \times 0'.8$ ), plus H<sub>I</sub>, X-ray and optical data.

**G85.9–0.6**

**RA:** 20<sup>h</sup>58<sup>m</sup>40<sup>s</sup>  
**Dec:** +44°53′

**1-GHz flux/Jy:** ?  
**Spectral index:** 0.5?

**Size/arcmin:** 24  
**Type:** S

**Radio:** Faint, incomplete shell.

**X-ray:** Detected.

**References:**

Kothes *et al.* 2001, A&A, 376, 641. DRAO at 408 MHz ( $4'.4 \times 2'.8$ :  $S < 0.9$  Jy) and 1.4 GHz ( $1'.1 \times 0'.8$ ), plus H<sub>I</sub>, X-ray and optical data.

**G89.0+4.7**

**RA:** 20<sup>h</sup>45<sup>m</sup>00<sup>s</sup>  
**Dec:** +50°35′

**1-GHz flux/Jy:** 220  
**Spectral index:** 0.40

**Size/arcmin:** 120 × 90  
**Type:** S

HB21

**Radio:** Distorted shell (4C50.52, an extragalactic double, is within the boundary of the remnant).

**Optical:** Filaments possibly associated.

**X-ray:** Centrally brightened.

**Distance:** Various associations suggest 0.8 kpc.

**References:**

Hirabayashi & Takahashi 1972, PASJ, 24, 231. 30-m dish at 4.2 GHz ( $11'$ :  $S = 160 \pm 40$  Jy). Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ( $5'$ :  $S = 148 \pm 16$  Jy), plus optical filaments. Hill 1974, MNRAS, 169, 59. Half-Mile Telescope at 1.4 GHz ( $3' \times 3'.9$ ). Haslam *et al.* 1975, A&A, 39, 453. Effelsberg 100-m at 2.7 GHz ( $4'.4$ ). Fukui & Tatematsu 1988, in SNRISM, p261. CO observations of the vicinity ( $2'.7$ ). Tatematsu *et al.* 1990, A&A, 237, 189. DRAO at 408 MHz ( $3'.5 \times 4'.5$ ) and 1.4 GHz ( $1'.0 \times 1'.3$ ), including H<sub>I</sub>, plus CO observations of adjacent molecular cloud. Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search. Leahy & Aschenbach 1996, A&A, 315, 260. ROSAT observations. Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search. Koo *et al.* 2001, ApJ, 552, 175. NRAO 12-m and other CO observations ( $27''$  and  $45''$ ) of eastern part.

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<b>G93.3+6.9</b>		DA 530, 4C(T)55.38.1
<b>RA:</b> 20 <sup>h</sup> 52 <sup>m</sup> 25 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 9	<b>Size/arcmin:</b> 27 × 20
<b>Dec:</b> +55°21′	<b>Spectral index:</b> 0.54	<b>Type:</b> S

Has been called G93.2+6.7.

**Radio:** Shell, with two bright limbs, highly polarized.

**Distance:** HI observations suggest 2.5 kpc.

**References:**

Roger & Costain 1976, A&A, 51, 151. DRAO at 1.42 GHz ( $2' \times 2'.4$ :  $S=6.9$  Jy).

Haslam *et al.* 1980, A&A, 92, 57. Effelsberg 100-m at 1.72 GHz ( $7'.6$ :  $S=6.47 \pm 0.52$  Jy) and 2.7 GHz ( $4'.4$ :  $S=5.64 \pm 0.64$  Jy), plus review of flux densities.

Lalitha *et al.* 1984, A&A, 131, 196. Effelsberg 100-m at 4.75 GHz (smoothed to  $3'$ :  $S=4.01 \pm 0.57$  Jy).

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

Landecker *et al.* 1999, ApJ, 527, 866. DRAO at 408 MHz ( $3'.5 \times 4'.3$ ) and 1.4 GHz ( $1'.0 \times 1'.2$ ), including polarisation and HI.

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<b>G93.7–0.2</b>		CTB 104A, DA 551
<b>RA:</b> 21 <sup>h</sup> 29 <sup>m</sup> 20 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 65	<b>Size/arcmin:</b> 80
<b>Dec:</b> +50°50′	<b>Spectral index:</b> 0.3	<b>Type:</b> S

Has been called G93.6–0.2 and G93.7–0.3.

**Radio:** Faint shell with possible a steep spectrum core.

**References:**

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $5'$ :  $S=18.4 \pm 1.0$  Jy).

Mantovani *et al.* 1982, A&A, 105, 176. Effelsberg 100-m at 1.7 GHz ( $7'.6$ :  $S=53.5 \pm 5.0$  Jy), plus review of flux densities.

Landecker *et al.* 1985, AJ, 90, 1082. DRAO at 1.4 GHz (smoothed to  $2'$ :  $S=58 \pm 6$  Jy).

Mantovani *et al.* 1991, A&A, 247, 545. Effelsberg 100-m at 4.75 GHz (smoothed to  $3'$ :  $S=33.5 \pm 4.0$  Jy), including polarization, plus review of flux densities.

Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

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<b>G94.0+1.0</b>		3C434.1
<b>RA:</b> 21 <sup>h</sup> 24 <sup>m</sup> 50 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 15	<b>Size/arcmin:</b> 30 × 25
<b>Dec:</b> +51°53′	<b>Spectral index:</b> 0.44	<b>Type:</b> S

**Radio:** Incomplete shell, in complex region.

**References:**

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ( $5'$ :  $S=6.1 \pm 0.8$  Jy), and VRO 37-m at 1.7 GHz ( $S=11 \pm 3$  Jy).

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $5'$ :  $S=5.8 \pm 0.4$  Jy). Also NRAO 140-ft at 5 GHz ( $6'$ ).

Mantovani *et al.* 1982, A&A, 105, 176. Effelsberg 100-m at 1.7 GHz ( $7'.6$ :  $S=12.0 \pm 1.3$  Jy), plus review of flux densities.

Goss *et al.* 1984, A&A, 138, 469. WSRT at 610 MHz (smoothed to  $100''$ :  $S=16 \pm 1.7$  Jy) and Effelsberg 100-m at 4.75 GHz ( $2'.4$ :  $S=7.2 \pm 0.5$  Jy).

Landecker *et al.* 1985, AJ, 90, 1082. DRAO at 1.4 GHz (smoothed to  $2'$ :  $S=16 \pm 3$  Jy).

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

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<b>G106.3+2.7</b>		
<b>RA:</b> 22 <sup>h</sup> 27 <sup>m</sup> 30 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 6	<b>Size/arcmin:</b> 60 × 24
<b>Dec:</b> +60°50′	<b>Spectral index:</b> 0.6	<b>Type:</b> ?

Incorporates the proposed smaller remnant G106.6+2.9.

**Radio:** Faint extended source, which brighter ‘head’ to NE.

**Point sources:** Pulsar in ‘head’.

**References:**

Pineault & Joncas 2000, AJ, 120, 3218. DRAO at 408 MHz ( $3'.9 \times 3'.5$ :  $S=10.5 \pm 0.3$  Jy) and 1.4 GHz ( $1'.2 \times 1'.0$ :  $S=4.9 \pm 0.6$  Jy), plus HI.

Halpern *et al.* 2001, ApJ, 547, 323. X-ray and radio observations of the ‘head’.

Halpern *et al.* 2001, ApJ, 552, L125. Pulsar detection.

Kothes *et al.* 2001, ApJ, 560, 236. DRAO at 1.4 GHz, including HI, plus CO and other observations.



**G109.1–1.0**

CTB 109

**RA:** 23<sup>h</sup>01<sup>m</sup>35<sup>s</sup>**1-GHz flux/Jy:** 20**Size/arcmin:** 28**Dec:** +58°53′**Spectral index:** 0.50**Type:** S**Radio:** Semicircular shell, with the Molecular cloud S152 is to the immediate W.**X-ray:** Incomplete shell, with pulsar at W edge.**Point sources:** Long period X-ray pulsar.**References:**

- Hughes *et al.* 1981, ApJ, 246, L127. WSRT at 610 MHz ( $1' : S = 40 \pm 5$  Jy) shows bad CLEAN artefacts.  
 Blair & Kirshner 1981, Natur, 291, 132. Optical spectra.  
 Downes 1983, MNRAS, 203, 695. Effelsberg 100-m at 2.7 GHz ( $4'.4 : S = 13.0 \pm 1.5$  Jy).  
 Sofue *et al.* 1983, PASJ, 35, 447. NRO 45-m at 10.2 GHz ( $2'.7$ ).  
 Hughes *et al.* 1984, ApJ, 283, 147. WSRT at 610 MHz ( $20'' : S = 26 \pm 3$  Jy) 1.4 GHz ( $10''$ ), DRAO at 1.4 GHz ( $1' \times 1'.2 : S = 16.8 \pm 2$  Jy) and Algonquin 46-m at 6.5 GHz ( $4'.5 : S = 6.7 \pm 1$  Jy).  
 Braun & Strom 1986, A&AS, 63, 345. WSRT H<sub>i</sub> observations.  
 Tatematsu *et al.* 1987, PASJ, 39, 755. NRO 45-m at 10 GHz ( $2'.7$ ), plus polarization.  
 Tatematsu *et al.* 1987, A&A, 184, 279. CO observations of the surroundings ( $2'.7$ ).  
 Hanson *et al.* 1988, A&A, 195, 114. EXOSAT of pulsar.  
 Morini *et al.* 1988, ApJ, 333, 777. EXOSAT observations.  
 Koyama *et al.* 1989, PASJ, 41, 461. X-ray observations of pulsar.  
 Coe *et al.* 1989, MNRAS, 238, 649. IRAS observations of surroundings.  
 Green 1989, MNRAS, 238, 737. OH observations.  
 Tatematsu *et al.* 1990, ApJ, 351, 157. CO of surroundings, plus X-ray observations.  
 Davies & Coe 1991, MNRAS, 249, 313. Optical and IR observations near pulsar.  
 Hurford & Fesen 1995, MNRAS, 277, 549. ROSAT imaging.  
 Rho & Petre 1997, ApJ, 484, 828. ROSAT observations.  
 Parmar *et al.* 1998, A&A, 330, 175. X-ray observations.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.  
 Patel *et al.* 2001, ApJ, 563, L45. Chandra observations of pulsar.

**G111.7–2.1**

Cassiopeia A, 3C461

**RA:** 23<sup>h</sup>23<sup>m</sup>26<sup>s</sup>**1-GHz flux/Jy:** 2720**Size/arcmin:** 5**Dec:** +58°48′**Spectral index:** 0.77**Type:** S

Presumably the remnant of a late 17th century SN.

**Radio:** Bright shell with compact knots and extended plateau of emission.

**Optical:** Fast knots and quasi-stationary flocculi, with many filaments at large radii, and NE ‘jet’.

**X-ray:** Incomplete shell, with hard spectral component, and compact central source.

**Distance:** Optical expansion, plus proper motions indicate 3.4 kpc.

**References:**

- Woan & Duffett-Smith 1990, MNRAS, 243, 87. Structure at 81.5 MHz.  
 Rees 1990, MNRAS, 243, 637. Flux density decrease at 38 MHz.  
 Anderson *et al.* 1991, ApJ, 373, 146. VLA at 1.4 and 5 GHz (1".3) for spectral variations.  
 Hook *et al.* 1992, A&A, 255, 285. Flux density decrease at 81.5 MHz.  
 Woan & Duffett-Smith 1993, MNRAS, 260, 693. Deep pulsar search.  
 Guame *et al.* 1994, ApJ, 425, 127. NH<sub>3</sub> absorption and CO observations.  
 Reed *et al.* 1995, ApJ, 440, 706. Optical spectra, for 3-d structure.  
 Anderson *et al.* 1995, ApJ, 441, 300. VLA at 1.4 GHz and 4.8 GHz (both 1".3), for polarization studies.  
 Anderson & Rudnick 1995, ApJ, 441, 307. VLA at 1.4 GHz and 4.8 GHz, for proper motion studies.  
 The *et al.* 1995, ApJ, 444, 244.  $\gamma$ -ray observations.  
 Predehl & Schmitt 1995, A&A, 293, 889. ROSAT of dust scattered halo.  
 Liszt & Lucas 1995, A&A, 294, 811. NRAO 12-m observations of molecular emission and absorption.  
 Lawrence *et al.* 1995, AJ, 109, 2635. Optical imaging spectroscopy.  
 Kassim *et al.* 1995, ApJ, 455, L59. VLA at 74 (25") and 332 MHz (6"), including spectral index comparisons.  
 Anderson & Rudnick 1996, ApJ, 456, 234. VLA for spectral index comparisons.  
 Agafanov 1996, A&A, 306, 578. Flux density decrease at 102 MHz.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Vink *et al.* 1996, A&A, 307, L41. ASCA spectrum.  
 Lagage *et al.* 1996, A&A, 315, L273. ISO observations.  
 Keohane *et al.* 1996, ApJ, 466, 309. Radio and X-ray comparison.  
 Hurford & Fesen 1996, ApJ, 469, 246. Optical spectroscopy and reddening studies.  
 Fesen & Gunderson 1996, ApJ, 470, 967. Optical observations of NE ‘jet’.  
 Schwarz *et al.* 1997, A&AS, 123, 43. WSRT at 1.4 GHz (30") for H $\alpha$  absorption.  
 Reynoso *et al.* 1997, A&A, 317, 203. VLA at 1.4 GHz (11"  $\times$  14") for H $\alpha$  absorption.  
 Dupraz *et al.* 1997, A&A, 324, 683.  $\gamma$ -ray line detection.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.  
 Vink *et al.* 1998, A&A, 339, 201. Comparison of ROSAT and Einstein images for expansion studies.  
 Keohane *et al.* 1998, ApJ, 503, L175. Deep ROSAT image, and comparison with radio.  
 Koralesky *et al.* 1998, ApJ, 505, L27. Comparison of ROSAT and Einstein images for expansion studies.  
 Wright *et al.* 1999, ApJ, 518, 284. BIMA at 83 GHz (6".5  $\times$  6".2) at 28 GHz, for comparison with other radio images for spectral index studies.  
 Arendt *et al.* 1999, ApJ, 521, 234. ISO observations.  
 O’Sullivan & Green 1999, MNRAS, 303, 575. Flux density changes at 13.5, 15.5 and 16.5 GHz.  
 Agüeros & Green 1999, MNRAS, 305, 957. CLFST at 151 MHz for bulk expansion studies.  
 Mason *et al.* 1999, AJ, 118, 2908. Flux density at 32 GHz ( $S = 194 \pm 5$  Jy).  
 Vink *et al.* 1999, A&A, 344, 289. X-ray line and continuum observations.  
 Liszt & Lucas 1999, A&A, 347, 258. NRAO 12-m at 86 GHz (72" :  $S = 101 \pm 3.3$  Jy) and 140 GHz (44" :  $S = 69.6 \pm 6.3$  Jy), plus CO observations.  
 Douvion *et al.* 1999, A&A, 352, L111. ISO observations.  
 Hughes *et al.* 2000, ApJ, 528, L109. Chandra observations.  
 Reichart & Stephens 2000, ApJ, 537, 904. Flux density changes at 1405 MHz.  
 Hwang *et al.* 2000, ApJ, 537, L119. Chandra imaging, including lines.  
 McLaughlin *et al.* 2001, ApJ, 547, L41. Radio upper limit for central source.  
 Chakrabarty *et al.* 2001, ApJ, 548, 800. Chandra observations, including central compact source.  
 Ryan *et al.* 2001, ApJ, 548, 811. Optical limits in compact central source.  
 Gotthelf *et al.* 2001, ApJ, 552, L39. Chandra observations, showing outer shock.  
 Kaplan *et al.* 2001, ApJ, 558, 270. Search for near-IR counterpart to central source.  
 Vink *et al.* 2001, ApJ, 560, L79. BeppoSAX X-ray line observations.  
 Fesen 2001, ApJS, 133, 161. Optical imaging and spectroscopy.  
 Bleeker *et al.* 2001, A&A, 365, L225. XMM-Newton observations.  
 Maccarone *et al.* 2001, A&A, 368, 267. BeppoSAX observations.  
 Douvion *et al.* 2001, A&A, 369, 589. ISO observations.  
 Aharonian *et al.* 2001, A&A, 370, 112. High energy  $\gamma$ -ray emission detection.  
 Gerardy & Fesen 2001, AJ, 121, 2781. IR spectroscopy and imaging.  
 Thorstensen *et al.* 2001, AJ, 122, 297. Optical expansion studies.  
 Hwang *et al.* 2001, ApJ, 560, L175. Chandra observations of Doppler shifted lines.  
 Fesen *et al.* 2001, AJ, 122, 2644. HST observations.

**G114.3+0.3****RA:** 23<sup>h</sup>37<sup>m</sup>00<sup>s</sup>**Dec:** +61°55′**1-GHz flux/Jy:** 6?**Spectral index:** 0.3?**Size/arcmin:** 90 × 55**Type:** S**Radio:** Shell, with HII region S165 within the boundary of the remnant.**Distance:** Possible association with HI features suggests 3.0–3.8 kpc.**Point sources:** Pulsar near centre of remnant.**References:**

Reich & Braunsfurth 1981, A&A, 99, 17. Effelsberg 100-m at 2.7 GHz ( $4'.4: S=3.6$  Jy) and  $S_{1.4\text{ GHz}}=4.4$  Jy from 1.4 GHz survey data, plus HI from Maryland-Green Bank survey.  
 Kulkarni *et al.* 1993, Natur, 362, 135. Pulsar association.  
 Fürst *et al.* 1993, A&A, 276, 470. Pulsar association.  
 Becker *et al.* 1996, A&A, 306, 464. ROSAT of pulsar.  
 Fesen *et al.* 1997, AJ, 113, 767. Optical observations.

**G116.5+1.1****RA:** 23<sup>h</sup>53<sup>m</sup>40<sup>s</sup>**Dec:** +63°15′**1-GHz flux/Jy:** 11?**Spectral index:** 0.8?**Size/arcmin:** 80 × 60**Type:** S**Radio:** Distinct shell, with high polarization.**Distance:** Possible association with HI features suggests 3.6–5.2 kpc.**References:**

Reich & Braunsfurth 1981, A&A, 99, 17. Effelsberg 100-m at 2.7 GHz ( $4'.4: S=4.7\pm 0.4$  Jy) and  $S_{1.4\text{ GHz}}=8.0\pm 0.8$  Jy from 1.4 GHz survey data, plus HI from Maryland-Green Bank survey.  
 Fesen *et al.* 1997, AJ, 113, 767. Optical observations.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G116.9+0.2****RA:** 23<sup>h</sup>59<sup>m</sup>10<sup>s</sup>**Dec:** +62°26′**1-GHz flux/Jy:** 9?**Spectral index:** 0.5?**Size/arcmin:** 34**Type:** S

CTB 1

Has been called G117.3+0.1 and G116.9+0.1.

**Radio:** Incomplete shell.**Optical:** Filaments on sky survey.**X-ray:** Centrally brightened, with NE ‘breakout’.**Point sources:** Pulsar to NE.**Distance:** Possible association with HI features suggests 2.8–4.0 kpc, mean optical velocity suggests 2.7 kpc.**References:**

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ( $5': S=3.9\pm 1.0$  Jy), and VRO 37-m at 1.7 GHz ( $S=5.5\pm 2.0$  Jy), plus review of flux densities.  
 van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.  
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $5': S=4.2\pm 0.2$  Jy).  
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ( $6'.8: S=3.0\pm 0.3$  Jy).  
 Dickel & Willis 1980, A&A, 85, 55. WSRT at 610 MHz ( $56''\times 64''$ ) and 1.4 GHz ( $22''\times 25''$ ).  
 Reich & Braunsfurth 1981, A&A, 99, 17. Effelsberg 100-m at 2.7 GHz ( $4'.4: S=4.8\pm 0.4$  Jy) and  $S_{1.4\text{ GHz}}=7.8\pm 0.8$  Jy from 1.4 GHz survey data, plus HI from Maryland-Green Bank survey.  
 Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.  
 Landecker *et al.* 1982, AJ, 87, 1379. DRAO at 1.42 GHz and HI ( $2'\times 2'.3: S=8.3\pm 0.5$  Jy), plus review of flux densities.  
 Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.  
 Hailey & Craig 1994, ApJ, 434, 635. Optical spectroscopy.  
 Hailey & Craig 1995, ApJ, 455, L151. ROSAT of nearby pulsar.  
 Fesen *et al.* 1997, AJ, 113, 767. Optical observations.  
 Craig *et al.* 1997, ApJ, 488, 307. ROSAT observations.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

**G119.5+10.2**

CTA 1

**RA:** 00<sup>h</sup>06<sup>m</sup>40<sup>s</sup>**1-GHz flux/Jy:** 36**Size/arcmin:** 90?**Dec:** +72°45′**Spectral index:** 0.6**Type:** S

Has been called G119.5+10.3.

**Radio:** Incomplete shell, with ‘breakout’ to NW.

**Optical:** Faint diffuse nebulosities.

**X-ray:** Centrally brightened.

**Point sources:** Compact, central X-/γ-ray source.

**References:**

- Sieber *et al.* 1979, A&A, 74, 361. Effelsberg 100-m at 2.7 GHz ( $4'.4: S=23.6\pm 2.8$  Jy).  
 Sieber *et al.* 1981, A&A, 103, 393. Effelsberg 100-m at 2.7 GHz and 1.7 GHz ( $7'.6: S=31.6\pm 2.5$  Jy), and 6C at 151 MHz ( $4': S=62.6\pm 6$  Jy).  
 Fesen *et al.* 1981, ApJ, 247, 148. Optical, including spectra.  
 Fesen *et al.* 1983, ApJS, 51, 337. Deep [OIII] imagery.  
 Seward 1990, ApJS, 73, 781. Einstein observations.  
 Simonetti 1992, ApJ, 386, 170. VLA observations of background sources for rotation measure studies.  
 Pineault *et al.* 1993, AJ, 105, 1060. DRAO at 1.4 GHz ( $1': S=34\pm 4$  Jy), plus HI and IRAS.  
 Seward *et al.* 1995, ApJ, 453, 284. ROSAT observations.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Slane *et al.* 1997, ApJ, 485, 221. ASCA and ROSAT observations.  
 Pineault *et al.* 1997, A&A, 324, 1152. DRAO at 408 MHz ( $3'.5$ ) and 1.4 GHz ( $1'.0$ ).  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.  
 Brazier *et al.* 1998, MNRAS, 295, 819. Studies of central, compact γ-ray source.  
 Mavromatakis *et al.* 2000, A&A, 353, 371. Optical imagery.  
 Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.

**G120.1+1.4**

**RA:** 00<sup>h</sup>25<sup>m</sup>18<sup>s</sup>  
**Dec:** +64°09′

**1-GHz flux/Jy:** 56  
**Spectral index:** 0.61

Tycho, 3C10, SN1572

**Size/arcmin:** 8  
**Type:** S

This is the remnant of the Tycho's SN of AD1572.

**Radio:** Shell, brightest to the NE.

**Optical:** Faint filaments/knots to the NNW, NE and E.

**X-ray:** Shell, coincident with the radio shell, brighter to the NE.

**Point sources:** Faint radio source near centre of the remnant, thought to be extragalactic.

**Distance:** HI absorption gives 2–5 kpc, optical proper motion and shock velocity gives 2.4 kpc.

**References:**

- Duin & Strom 1975, A&A, 39, 33. WSRT at 610 MHz ( $57'' \times 64''$ ) and 5 GHz ( $7'' \times 8''$ ).  
 Klein *et al.* 1979, A&A, 76, 120. Effelsberg 100-m at 10.7 GHz ( $1'.2 : S = 13.1 \pm 0.8$  Jy), plus review of flux densities.  
 Strom *et al.* 1982, MNRAS, 200, 473. WSRT at 1415 MHz ( $27'' \times 31''$ ) from 1971 and 1979, for expansion.  
 Dickel *et al.* 1982, ApJ, 257, 145. Comparison of Radio, X-ray and Optical.  
 Reid *et al.* 1982, ApJ, 261, 485. Einstein observations.  
 Seward *et al.* 1983, ApJ, 266, 287. Einstein observations.  
 Tan & Gull 1985, MNRAS, 216, 949. 5km at 2.7 GHz ( $4''$ ) from 1980 and 1983, and One-Mile Telescope at 1.4 GHz ( $23''$ ) from 1965 and 1980, for expansion.  
 Albinson *et al.* 1986, MNRAS, 219, 427. HI observations.  
 Green & Gull 1987, MNRAS, 224, 1055. VLA HI absorption observations towards central radio source.  
 Smith *et al.* 1988, ApJ, 325, 288. EXOSAT spectrum and image (smoothed to  $13''$ ).  
 Dickel *et al.* 1991, AJ, 101, 2151. VLA at 1.4 and 5 GHz ( $1''.5$ ).  
 Wood *et al.* 1992, AJ, 103, 1338. VLA at 5 GHz ( $1''.5$ ) polarization studies.  
 Fink *et al.* 1994, A&A, 283, 635. X-ray spectra.  
 Vancura *et al.* 1995, ApJ, 441, 680. X-ray spectra and ROSAT image.  
 Predehl & Schmitt 1995, A&A, 293, 889. ROSAT of dust scattered halo.  
 Schwarz *et al.* 1995, A&A, 299, 193. WSRT and Effelsberg 100-m at 1.4 GHz ( $50''$ ), and VLA at 1.4 GHz ( $13''$ ), for neutral hydrogen studies.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Hwang & Gotthelf 1997, ApJ, 475, 665. ASCA observations.  
 Reynoso *et al.* 1997, ApJ, 491, 816. VLA at 1.4 GHz ( $1''.4 \times 1''.5$ ) from 1984 and 1994 for expansion studies.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.  
 Reynoso *et al.* 1999, AJ, 117, 1827. VLA at 1.4 GHz ( $13''$ ), for HI studies.  
 Katz-Stone *et al.* 2000, ApJ, 529, 453. VLA at 333 MHz and 1.4 GHz ( $9''.5 \times 7''.7$ ), for spectral index studies.  
 Ghavamian *et al.* 2000, ApJ, 535, 266. Optical observations of shock precursors.  
 Hughes 2000, ApJ, 545, L53. ROSAT X-ray expansion.  
 Decourchelle *et al.* 2001, A&A, 365, L218. XMM-Newton observations.  
 Ghavamian *et al.* 2001, ApJ, 547, 995. Optical spectroscopy.  
 Douvion *et al.* 2001, A&A, 373, 281. ISO observations.  
 Aharonian *et al.* 2001, A&A, 373, 292. Upper limit on high energy  $\gamma$ -rays.

**G126.2+1.6**

**RA:** 01<sup>h</sup>22<sup>m</sup>00<sup>s</sup>  
**Dec:** +64°15′

**1-GHz flux/Jy:** 7  
**Spectral index:** varies

**Size/arcmin:** 70  
**Type:** S?

**Radio:** Poorly defined shell.

**Optical:** Filaments detected.

**References:**

- Reich *et al.* 1979, A&A, 78, L13. Effelsberg 100-m at 1.4 GHz ( $9' : S = 6.8 \pm 0.7$  Jy) and 2.7 GHz ( $4'.4 : S = 3.9 \pm 0.4$  Jy).  
 Blair *et al.* 1980, ApJ, 242, 592. Optical detection and spectra.  
 Rosado 1982, RMxAA, 5, 127. Optical spectra.  
 Fesen *et al.* 1983, ApJS, 51, 337. Deep [OIII] imagery.  
 Fürst *et al.* 1984, A&A, 133, 11. Effelsberg 100-m at 2.7 GHz ( $4'.4$ ) and 4.8 GHz ( $2'.6$ ).  
 Joncas *et al.* 1989, A&A, 219, 303. DRAO at 408 MHz ( $3'.5 \times 3'.9 : S = 12 \pm 2.5$  Jy) and part at 1.4 GHz ( $1'.1 \times 1'.0$ ), plus review of flux densities.  
 Xilouris *et al.* 1993, A&A, 270, 393. Optical imaging.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

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<b>G127.1+0.5</b>		<b>R5</b>
<b>RA:</b> 01 <sup>h</sup> 28 <sup>m</sup> 20 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 13	<b>Size/arcmin:</b> 45
<b>Dec:</b> +63°10′	<b>Spectral index:</b> 0.6	<b>Type:</b> S

Has been called G127.3+0.7.

**Radio:** Distinct shell, with bright central source.

**Point sources:** Flat radio spectrum (extragalactic) source at centre of remnant.

**Optical:** Detected.

**Distance:** 1.2–1.3 kpc if associated with NGC559.

**References:**

Caswell 1977, MNRAS, 181, 789. Half-Mile Telescope at 1.42 GHz ( $3'.5 \times 3'.9$ ), plus other observations of central source.  
 Salter *et al.* 1978, A&A, 66, 77. Effelsberg 100-m at 2.7 GHz ( $4'.4$ ), plus 5 and 8.7 GHz of the central source.  
 Pauls 1977, A&A, 59, L13. Effelsberg 100-m at 1.4 GHz ( $9' : S = 8 \pm 1$  Jy).  
 Reich *et al.* 1979, A&A, 78, L13. Effelsberg 100-m at 1.4 GHz ( $9' : S = 10.8 \pm 1.3$  Jy).  
 Pauls *et al.* 1982, A&A, 112, 120. WSRT at 610 MHz ( $56'' \times 62''$ ) and H<sub>I</sub> absorption to the point source with the VLA.  
 Geldzahler & Shaffer 1982, ApJ, 260, L69. Observations of central source.  
 Fürst *et al.* 1984, A&A, 133, 11. Effelsberg 100-m at 2.7 GHz ( $4'.4$ ) and 4.8 GHz ( $2'.6$ ).  
 Goss & van Gorkom 1984, JApA, 5, 425. WSRT H<sub>I</sub> absorption of central source.  
 Joncas *et al.* 1989, A&A, 219, 303. DRAO at 408 MHz ( $3'.5 \times 3'.9 : S = 17.9 \pm 2.0$  Jy) and 1.4 GHz ( $1'.13 \times 1'.0 : S = 10.1 \pm 0.8$  Jy), plus review of flux densities.  
 Xilouris *et al.* 1993, A&A, 270, 393. Optical imaging.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

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<b>G130.7+3.1</b>		<b>3C58, SN1181</b>
<b>RA:</b> 02 <sup>h</sup> 05 <sup>m</sup> 41 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 33	<b>Size/arcmin:</b> 9 × 5
<b>Dec:</b> +64°49′	<b>Spectral index:</b> 0.10	<b>Type:</b> F

This is the remnant of the SN of AD1181.

**Radio:** Filled-centre, highly polarized, with high frequency turnover.

**Optical:** Faint filaments.

**X-ray:** Centrally brightened with power-law spectrum.

**Point sources:** Compact source in X-rays.

**Distance:** H<sub>I</sub> absorption indicates 3.2 kpc.

**References:**

Green *et al.* 1975, A&A, 44, 187. Effelsberg 100-m at 15.0 GHz ( $58'' : S = 26.7 \pm 0.5$  Jy).  
 Wilson & Weiler 1976, A&A, 49, 357. WSRT at 610 MHz ( $58'' \times 64''$ ), 1.4 GHz ( $24'' \times 27''$ ) and 5 GHz ( $7'' \times 8''$ ).  
 van den Bergh 1978, ApJ, 220, L9. Optical observations.  
 Becker *et al.* 1982, ApJ, 255, 557. X-ray observations.  
 Green & Gull 1982, Natur, 299, 606. H<sub>I</sub> absorption distance.  
 Fesen 1983, ApJ, 270, L53. Optical spectra.  
 Reynolds & Aller 1985, AJ, 90, 2312. VLA at 1.4 GHz ( $2'$ ), for limits of shell.  
 Davelaar *et al.* 1986, ApJ, 300, L59. EXOSAT spectrum.  
 Green 1986, MNRAS, 218, 533. CLFST at 151 MHz ( $1'.2 \times 1'.3 : S = 36 \pm 4$  Jy), 5km at 2.7 GHz ( $4''$ ), plus Einstein observations for limit on shell.  
 Green 1987, MNRAS, 225, 11P. Flux density increase at 408 MHz.  
 Morsi & Reich 1987, A&AS, 69, 533. Effelsberg 100-m at 32 GHz ( $26''.5 : S = 24.2 \pm 1.4$  Jy).  
 Reynolds & Aller 1988, ApJ, 327, 845. VLA at 1.4 ( $2''.4$ ) and 4.9 GHz ( $2''.5$ ).  
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz ( $90'' : S = 15.0 \pm 2.0$  Jy), plus review of flux densities.  
 Asaoka & Koyama 1990, PASJ, 42, 625. Ginga X-ray spectrum.  
 Green & Scheuer 1992, MNRAS, 258, 833. IRAS upper limits.  
 Roberts *et al.* 1993, A&A, 274, 427. H<sub>I</sub> absorption.  
 Wallace *et al.* 1994, A&A, 286, 565. H<sub>I</sub> of surroundings.  
 Helfand *et al.* 1995, ApJ, 453, 741. ROSAT observations.  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.  
 Torii *et al.* 2000, PASJ, 52, 875. ASCA observations.  
 Bietenholz *et al.* 2001, ApJ, 560, 772. VLA at 74 MHz ( $26'' : S = 33.6$  Jy) and 327 MHz ( $8''.2 : S = 33.9$  Jy), for spectral index studies, and comparison with earlier observations for expansion studies.  
 Bocchino *et al.* 2001, A&A, 369, 1078. XMM-Newton observations.

**G132.7+1.3**

HB3

**RA:** 02<sup>h</sup>17<sup>m</sup>40<sup>s</sup>**1-GHz flux/Jy:** 45**Size/arcmin:** 80**Dec:** +62°45′**Spectral index:** 0.6**Type:** S

Has been called G132.4+2.2.

**Radio:** Faint shell, adjacent to W3/4/5 complex.

**Optical:** Complete, filamentary shell, shock excited spectra.

**X-ray:** Partial shell.

**Point sources:** Pulsar nearby.

**Distance:** Interaction with surroundings suggests 2.2 kpc.

**References:**

van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ( $S' : S = 33.8 \pm 7.0$  Jy).

d'Odorico & Sabbadin 1977, A&AS, 28, 439. Optical spectra.

Read 1981, MNRAS, 194, 863. 6C at 151 MHz (4'.4) and Half-Mile Telescope at 1.4 GHz (2') showing H<sub>I</sub> shell.

Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.

Fesen & Gull 1983, PASP, 95, 196. Optical image.

Leahy *et al.* 1985, ApJ, 294, 183. Einstein observations.

Landecker *et al.* 1987, AJ, 94, 111. DRAO at 408 MHz ( $3'.5 \times 4' : S = 75 \pm 15$  Jy), plus review of flux densities.

Routledge *et al.* 1991, A&A, 247, 529. DRAO at 1.4 GHz ( $1'.0 \times 1'.1$ ) for H<sub>I</sub>, plus CO observations.

Fesen *et al.* 1995, AJ, 110, 2876. Optical imaging and spectroscopy, DRAO at 408 MHz ( $3'.5 \times 4'$ ) and 1.4 GHz ( $1'.0 \times 1'.1$ ).

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

Koralesky *et al.* 1998, AJ, 116, 1323. VLA detection of compact OH emission.

**G156.2+5.7****RA:** 04<sup>h</sup>58<sup>m</sup>40<sup>s</sup>**1-GHz flux/Jy:** 5**Size/arcmin:** 110**Dec:** +51°50′**Spectral index:** 0.5**Type:** S

**Radio:** Faint shell.

**X-ray:** Faint shell.

**References:**

Pfeffermann *et al.* 1991, A&A, 246, L28. ROSAT detection.

Reich *et al.* 1992, A&A, 256, 214. Effelsberg 100-m at 1.4 ( $9' : S = 4.2 \pm 1.0$  Jy) and 2.7 GHz ( $4'.3 : S = 3.0 \pm 1.0$  Jy), plus H<sub>I</sub> and IRAS.

Yamauchi *et al.* 1993, PASJ, 45, 795. Hard X-ray observations.

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

Yamauchi *et al.* 1999, PASJ, 51, 13. ASCA observations of some regions.

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<b>G160.9+2.6</b>			HB9
<b>RA:</b> 05 <sup>h</sup> 01 <sup>m</sup> 00 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 110	<b>Size/arcmin:</b> 140 × 120	
<b>Dec:</b> +46° 40′	<b>Spectral index:</b> 0.6	<b>Type:</b> S	

Has been called G160.5+2.8 and G160.4+2.8.

**Radio:** Large, filamentary shell.

**Optical:** Incomplete shell.

**X-ray:** Centrally brightened.

**Point sources:** Pulsar within boundary of the remnant, plus several nearby compact radio sources.

**Distance:** Various observations suggests less than 4 kpc.

**References:**

d’Odorico & Sabbadin 1977, A&AS, 28, 439. Optical spectra.

Damashek *et al.* 1978, ApJ, 225, L31. Pulsar.

Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.

Dwarakanath *et al.* 1982, JApA, 3, 207. Radio observations at 34.5 MHz ( $26' \times 40' : S=750 \pm 150$  Jy), plus review of flux densities.

van Gorkom *et al.* 1982, MNRAS, 198, 757. WSRT H $\alpha$  absorption to nearby point source.

Sequist & Gilmore 1982, AJ, 87, 378. VLA observations of nearby source.

Leahy 1988, ApJ, 322, 917. Einstein observations.

Leahy & Roger, 1991, AJ, 101, 1033. DRAO at 408 MHz ( $3'.5 \times 4'.8$ ) and 1.4 GHz ( $1'.0 \times 1'.4$ ), including H $\alpha$  and discussion of distance.

Yamauchi & Koyama 1993, PASJ, 45, 545. Hard X-ray observations.

Leahy & Aschenbach 1995, A&A, 293, 853. ROSAT observations.

Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

Leahy *et al.* 1998, A&A, 339, 601. Miyun at 232 MHz ( $3'.8 \times 5'.2$ ), CLFST at 151 MHz ( $4'.2 \times 5'.8$ ) and Effelsberg 100-m at 4.7 GHz ( $2'.5$ ) for spectral index studies.

Roger *et al.* 1999, A&AS, 137, 7. 22 MHz flux density ( $S=1130 \pm 340$  Jy).

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<b>G166.0+4.3</b>			VRO 42.05.01
<b>RA:</b> 05 <sup>h</sup> 26 <sup>m</sup> 30 <sup>s</sup>	<b>1-GHz flux/Jy:</b> ??	<b>Size/arcmin:</b> 55 × 35	
<b>Dec:</b> +42° 56′	<b>Spectral index:</b> 0.4?	<b>Type:</b> S	

**Radio:** Two arcs of strikingly different radii.

**Optical:** Nearly complete ring.

**X-ray:** Predominantly in SW.

**Distance:** H $\alpha$  indicates 4.5 kpc.

**References:**

van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ( $5' : S=5.2 \pm 1.0$  Jy).

Lozinskaya 1979, AuJPh, 32, 113. H $\alpha$  interferometry.

Landecker *et al.* 1982, ApJ, 261, L41. DRAO at 1.4 GHz ( $1'.0 \times 1'.4$ ), plus review of flux densities.

Fesen *et al.* 1983, ApJS, 51, 337. Deep [OIII] imagery.

Pineault *et al.* 1985, A&A, 151, 52. VLA at 1.4 GHz ( $16'' \times 20''$ ) of part of remnant, and optical.

Pineault *et al.* 1987, ApJ, 315, 580. DRAO and VLA combined at 1.4 GHz ( $20''$ ).

Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.

Braun & Strom 1986, A&AS, 63, 345. WSRT H $\alpha$  Observations.

Landecker *et al.* 1989, MNRAS, 237, 277. DRAO at 1.4 GHz ( $1'.0 \times 1'.4$ ), including H $\alpha$ .

Burrows & Guo 1994, ApJ, 421, L19. ROSAT images and spectra.

Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

Guo & Burrows 1997, ApJ, 480, L51. ASCA observations.

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.



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<b>G166.2+2.5</b>			OA 184
<b>RA:</b> 05 <sup>h</sup> 19 <sup>m</sup> 00 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 11	<b>Size/arcmin:</b> 90 × 70	
<b>Dec:</b> +41°55′	<b>Spectral index:</b> 0.5	<b>Type:</b> S	

**Radio:** Large, faint shell.

**Optical:** Nearly complete ring.

**Distance:** HI indicates  $8 \pm 2$  kpc.

**References:**

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ( $5′ : S = 6.0 \pm 2.2$  Jy).

Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo 111 MHz.

Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.

Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.

Routledge *et al.* 1986, MNRAS, 221, 809. DRAO at 1.4 GHz ( $1′ \times 1′.4 : S = 9.0 \pm 0.5$  Jy) including HI, plus review of flux densities.

Kim *et al.* 1988, AJ, 96, 704. VLA of background sources for magnetic field structure of the remnant.

Leahy & Marshall 1988, MNRAS, 235, 805. IRAS observations.

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

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<b>G179.0+2.6</b>			
<b>RA:</b> 05 <sup>h</sup> 53 <sup>m</sup> 40 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 7	<b>Size/arcmin:</b> 70	
<b>Dec:</b> +31°05′	<b>Spectral index:</b> 0.4	<b>Type:</b> S?	

**Radio:** Thick shell, with background extragalactic sources near centre.

**References:**

Fürst & Reich 1986, A&A, 154, 303. Effelsberg 100-m at 1.4 ( $9′.4$ ), 2.7 ( $4′.3$ ) and 4.75 GHz ( $2′.4$ ).

Fürst *et al.* 1989, A&A, 223, 66. Observations of central, extragalactic source.

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

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<b>G180.0–1.7</b>			S147
<b>RA:</b> 05 <sup>h</sup> 39 <sup>m</sup> 00 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 65	<b>Size/arcmin:</b> 180	
<b>Dec:</b> +27°50′	<b>Spectral index:</b> varies	<b>Type:</b> S	

**Radio:** Large faint shell, with spectral break.

**Optical:** Wispy ring.

**X-ray:** Possible detection.

**Point sources:** Pulsar within boundary.

**References:**

van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.

Sofue *et al.* 1980, PASJ, 32, 1. Effelsberg 100-m at 5 GHz ( $2′.6$ ) of parts.

Kundu *et al.* 1980, A&A, 92, 225. Effelsberg 100-m at 2.7 GHz ( $5′.5 : S = 34.9 \pm 4$  Jy) and 1.6 GHz ( $10′ : S = 60.2 \pm 6$  Jy).

Angerhofer & Kundu 1981, AJ, 86, 1003. Arecibo at 430 MHz ( $9′ : S = 97 \pm 20$  Jy).

Fürst *et al.* 1982, A&A, 115, 428. Observations of compact radio sources near the remnant.

Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.

Fürst & Reich 1986, A&A, 163, 185. Effelsberg 100-m at 1.4, 2.7 and 4.7/5.0 GHz ( $9′.4, 4′.3$  and  $2′.4/2′.6$ ).

Sauvageot *et al.* 1990, A&A, 227, 183. EXOSAT possible detection.

Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

Anderson *et al.* 1996, ApJ, 468, L55. Pulsar detection.

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<b>G182.4+4.3</b>			
<b>RA:</b> 06 <sup>h</sup> 08 <sup>m</sup> 10 <sup>s</sup>	<b>1-GHz flux/Jy:</b> 1.2	<b>Size/arcmin:</b> 50	
<b>Dec:</b> +29°00′	<b>Spectral index:</b> 0.4	<b>Type:</b> S	

**Radio:** Incomplete shell.

**References:**

Kothes *et al.* 1998, A&A, 331, 661. Effelsberg 100-m at 1.4, 2.7, 4.9 and 10.5 GHz ( $9′.4 : S = 0.36 \pm 0.08$  Jy,  $4′.4 : S = 0.25 \pm 0.04$  Jy,  $2′.5 : S = 0.20 \pm 0.02$  Jy and  $1′.2 : S = 0.15 \pm 0.03$  Jy), plus X-ray upper limit.

**G184.6–5.8**

Crab Nebula, 3C144, SN1054

**RA:** 05<sup>h</sup>34<sup>m</sup>31<sup>s</sup>**1-GHz flux/Jy:** 1040**Size/arcmin:** 7 × 5**Dec:** +22°01′**Spectral index:** 0.30**Type:** F

This is the remnant of the SN of AD1054.

**Radio:** Filled-centre, central pulsar, with faint ‘jet’ (or tube) extending from the N edge.

**Optical:** Strongly polarized filaments, diffuse synchrotron emission, with ‘jet’ faintly visible.

**X-ray:** Central ‘torus’ around the pulsar.

**Point sources:** Pulsar powering the remnant.

**Distance:** Proper motions and radial velocities give 2 kpc.

**References:**

- Velusamy 1984, *Natur*, 308, 251. VLA at 1.4 GHz, radio detection of ‘jet’.
- Harnden & Seward 1984, *ApJ*, 283, 279. X-ray observations.
- Velusamy 1985, *MNRAS*, 212, 359. VLA at 1.4 GHz (15”).
- Aller & Reynolds 1985, *ApJ*, 293, L73. Flux density decrease.
- Fesen & Gull 1986, *ApJ*, 306, 259. Deep [OIII] imagery of ‘jet’.
- Marcelin *et al.* 1990, *A&A*, 228, 471. Optical of ‘jet’.
- Fesen & Blair 1990, *ApJ*, 351, L45. Optical identification of dust in filaments.
- Hester *et al.* 1990, *ApJ*, 357, 539. Optical and IR images.
- Graham *et al.* 1990, *ApJ*, 352, 172. IR spectroscopy and imaging.
- Hickson & van den Bergh 1990, *ApJ*, 365, 224. Optical polarization.
- Bietenholz & Kronberg 1990, *ApJ*, 357, L13. VLA at 1.4 GHz (1” .8).
- MacAlpine & Uomoto 1991, *AJ*, 102, 218. Photometry.
- Michel *et al.* 1991, *ApJ*, 368, 463. Optical photometry.
- Bietenholz *et al.* 1991, *ApJ*, 373, L59. VLA at multiple epochs for expansion studies.
- Véron-Cetty & Woltjer 1991, *A&A*, 251, L31. Limits on optical variations.
- Hennessy *et al.* 1992, *ApJ*, 395, L13. UV imagery.
- Fesen *et al.* 1992, *ApJ*, 399, 599. Optical studies of ‘dark bays’.
- Blair *et al.* 1992, *ApJ*, 399, 611. Far UV observations.
- Bietenholz & Kronberg 1992, *ApJ*, 393, 206. VLA at 1.5 and 5 GHz (1” .8) and 1.5 and 14 GHz (6” .5) for spectral studies.
- Strom & Greidanus 1992, *Natur*, 358, 654. IRAS observations.
- Fesen & Staker 1993, *MNRAS*, 263, 69. [OIII] imaging of ‘jet’, and proper motion studies.
- Kassim *et al.* 1993, *AJ*, 106, 2218. VLA at 74 MHz (20”).
- Véron-Cetty & Woltjer 1993, *A&A*, 270, 370. Continuum and [OIII] photometry.
- Nolan *et al.* 1993, *ApJ*, 409, 697.  $\gamma$ -ray observations.
- Strong *et al.* 1993, *A&AS*, 97, 133.  $\gamma$ -ray observations
- Murdin 1994, *MNRAS*, 269, 89. Deep H $\alpha$  plates and spectroscopy of halo.
- Wallace *et al.* 1994, *A&A*, 286, 565. H $\alpha$  of surroundings.
- MacAlpine *et al.* 1994, *ApJ*, 432, L131. Prominent optical knots.
- Rudy *et al.* 1994, *ApJ*, 426, 646. IR spectroscopy.
- Tanimori *et al.* 1994, *ApJ*, 429, L61.  $\gamma$ -rays from pulsar.
- Predehl & Schmitt 1995, *A&A*, 293, 889. ROSAT of dust scattered halo.
- Lawrence *et al.* 1995, *AJ*, 109, 2635. Optical imaging spectroscopy.
- Frail *et al.* 1995, *ApJ*, 454, L129. VLA at 333 MHz (20”) for limits on shell.
- MacAlpine *et al.* 1996, *ApJ*, 463, 650. Optical spectroscopy of N and S rich filaments.
- Nasuti *et al.* 1996, *A&A*, 314, 849. Spectrophotometry of pulsar.
- Bietenholz *et al.* 1997, *ApJ*, 490, 291. Comparison of VLA observations at 74 MHz, 327 MHz, 1.5 GHz and 5 GHz for spectral index studies.
- Blair *et al.* 1997, *ApJS*, 109, 473. HST imaging.
- van der Meulen *et al.* 1998, *A&A*, 330, 321.  $\gamma$ -ray observations.
- Tanimori *et al.* 1998, *ApJ*, 492, L33.  $\gamma$ -ray observations.
- Nugent 1998, *PASP*, 110, 831. Optical expansion.
- Hillas *et al.* 1998, *ApJ*, 503, 744.  $\gamma$ -ray spectrum.
- Sankrit *et al.* 1998, *ApJ*, 504, 344. HST images.
- Wallace *et al.* 1999, *ApJS*, 124, 181. DRAO at 1.4 GHz (1’ .0 × 2’ .8), plus Effelsberg 100-m, for H $\alpha$  studies.
- Greiveldinger & Aschenbach 1999, *ApJ*, 510, 305. X-ray variability of torus.
- Weisskopf *et al.* 2000, *ApJ*, 536, L81. Chandra observations.
- Sollerman *et al.* 2000, *ApJ*, 537, 861. HST observations.
- Aharonian *et al.* 2000, *ApJ*, 539, 317. High energy  $\gamma$ -ray observations.
- Carramiñana *et al.* 2000, *ApJ*, 542, 974. Optical spectra of pulsar.
- Oser *et al.* 2001, *ApJ*, 547, 949.  $\gamma$ -ray observations.
- Willingale *et al.* 2001, *A&A*, 365, L212. XMM-Newton observations.
- Douvion *et al.* 2001, *A&A*, 373, 281. ISO observations.
- Bietenholz *et al.* 2001, *ApJ*, 560, 254. Multi-epoch VLA observations, showing variations near the pulsar.

**G189.1+3.0**

IC443, 3C157

**RA:** 06<sup>h</sup>17<sup>m</sup>00<sup>s</sup>**1-GHz flux/Jy:** 160**Size/arcmin:** 45**Dec:** +22°34′**Spectral index:** 0.36**Type:** C**Radio:** Limb-brightened to NE, with faint extension to the E.**Optical:** Brightest to the NE, with faint filaments outside the NE boundary.**X-ray:** Shell, brightest to the NE, with nebula and compact source.**Point sources:** Compact X-ray source in S.**Distance:** Mean optical velocity suggests 0.7–1.5 kpc, association with S249 gives 1.5–2 kpc.**References:**

- Duin & van der Laan 1975, A&A, 40, 111. WSRT at 610 MHz ( $1' \times 2'.5$ ), 1415 MHz ( $24'' \times 63''$ ), and part at 5 GHz ( $12'' \times 31''$ ).  
 Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.  
 Fesen 1984, ApJ, 281, 658. Optical of filament to far NE.  
 Erickson & Mahoney 1985, ApJ, 290, 596. TPT at 4 frequencies between 31 and 74 MHz ( $13' \times 11'$  to  $5'.4 \times 4'.7$ ), plus review of flux densities.  
 Braun & Strom 1986, A&A, 164, 193. WSRT at 327 MHz ( $72'' \times 185''$ ) and 1.4 GHz ( $17'' \times 43''$ ), plus H $\alpha$  and IRAS.  
 Green 1986, MNRAS, 221, 473. CLFST at 151 MHz ( $1'.2 \times 3'.1$ ) and Half-Mile Telescope at 1.4 GHz ( $2'.1 \times 5'.4$ ).  
 Mufson *et al.* 1986, AJ, 92, 1349. Radio, IR, optical, UV and X-ray comparison, including VLA at 1.6 GHz ( $3''.8 \times 3''.3$  and  $40''$ ).  
 Brown *et al.* 1988, ApJ, 334, 852. [Fex] optical imaging.  
 Dickel *et al.* 1989, AJ, 98, 1363. VLA at 1.4 GHz ( $1''.1 \times 1''.2$ ) of NE.  
 Petre *et al.* 1988, ApJ, 335, 215. Einstein and other X-ray observations.  
 Burton *et al.* 1990, ApJ, 355, 197. IR observations of shocked O $_2$ .  
 Sauvageot *et al.* 1990, A&A, 232, 203. [Fex] and [FexIV] imaging.  
 Moorhouse *et al.* 1991, MNRAS, 253, 662. Observations of shocked molecular H $_2$ .  
 Wood *et al.* 1991, AJ, 102, 224. VLA at 5 GHz ( $3''.6 \times 3''.8$ ) of northeast, including polarization.  
 Teske 1991, ApJ, 383, 233. [Fex] and [FexIV] imaging.  
 Wang & Scoville 1992, ApJ, 386, 158. Observations of shocked molecular species.  
 Wang *et al.* 1992, PASJ, 44, 303. Ginga X-ray observations.  
 Turner *et al.* 1992, ApJ, 399, 114. Observations of shocked molecular species.  
 Dickman *et al.* 1992, ApJ, 400, 203. Observations of shocked molecular species.  
 Inoue *et al.* 1993, PASJ, 45, 539. Observations of shocked molecular H $_2$ .  
 van Dishoeck *et al.* 1993, A&A, 279, 541. Observations of shocked molecular species.  
 Asaoka & Aschenbach 1994, A&A, 284, 573. X-ray, including possible overlapping remnant.  
 Tauber *et al.* 1994, ApJ, 421, 570. Observations of shocked molecular species.  
 Richter *et al.* 1995, ApJ, 454, 277. Observations of shocked molecular H $_2$ .  
 Esposito *et al.* 1996, ApJ, 461, 820. Associated  $\gamma$ -ray emission.  
 Frail *et al.* 1996, AJ, 111, 1651. OH maser emission.  
 Keohane *et al.* 1997, ApJ, 484, 350. ASCA observations.  
 Claussen *et al.* 1997, ApJ, 489, 143. VLA of associated OH masers.  
 Claussen *et al.* 1997, ApJ, 522, 349. High resolution observations of OH masers.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.  
 Seta *et al.* 1998, ApJ, 505, 286. CO observations of surroundings.  
 Oliva *et al.* 1999, A&A, 341, L75. ISO observations.  
 Cesarsky *et al.* 1999, A&A, 348, 945. ISO observations of shocked molecular H $_2$ .  
 Bocchino & Bykov 2000, A&A, 362, L29. BeppoSAX observations.  
 Rho *et al.* 2001, ApJ, 547, 885. ISAO and 2Mass IR spectroscopy and imaging.  
 Olbert *et al.* 2001, ApJ, 554, L205. Chandra of compact X-ray source and surrounding nebula.  
 Bocchino & Bykov 2001, A&A, 376, 248. XMM-Newton of compact X-ray source and surrounding nebula.  
 Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.

**G192.8–1.1**

PKS 0607+17

**RA:** 06<sup>h</sup>09<sup>m</sup>20<sup>s</sup>**1-GHz flux/Jy:** 20?**Size/arcmin:** 78**Dec:** +17°20′**Spectral index:** 0.6?**Type:** S

Has been called G193.3–1.5. Has been regarded as part of the Origem Loop, a supposed larger remnant.

**Radio:** In complex region.**Optical:** Encompasses S261 and S254–258.**References:**

- Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz ( $9' : S = 13 \pm 15\%$  Jy).  
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo at 318 MHz ( $15' : S = 74 \pm 32$  Jy), and  $S_{610 \text{ MHz}} = 40$  Jy.  
 Caswell 1985, AJ, 90, 1076. DRAO at 1.4 GHz ( $1' \times 3'.3 : S = 18 \pm 3$  Jy).  
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.  
 Welsh *et al.* 2001, A&A, 372, 516. Far-UV spectroscopy.

**G205.5+0.5****RA:** 06<sup>h</sup>39<sup>m</sup>00<sup>s</sup>**Dec:** +06°30′**1-GHz flux/Jy:** 160**Spectral index:** 0.5

Monoceros Nebula

**Size/arcmin:** 220**Type:** S**Radio:** In complex region, parts may be HII regions.**Optical:** Large ring, near Rosette nebula.**X-ray:** Possibly detected.**Distance:** Mean optical velocity suggests 0.8 kpc, low frequency radio absorption suggests 1.6 kpc.**References:**

Milne &amp; Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (9′).

Velusamy &amp; Kundu 1974, A&amp;A, 32, 375. NRAO 300-ft at 2.7 GHz (5′), part only.

Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo at 111 MHz (1′:  $S=462 \pm 180$  Jy) and  $S_{610\text{ MHz}}=245$  Jy.Davies *et al.* 1978, A&AS, 31, 271. Deep optical plates.

Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.

Graham *et al.* 1982, A&A, 109, 145. Effelsberg 100-m at 2.7 GHz (4′.4:  $S=97.6 \pm 12.5$  Jy), plus review of flux densities.Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.Leahy *et al.* 1986, MNRAS, 220, 501. Einstein observations.

Odegard 1986, ApJ, 301, 813. TPT at 20.6, 25.6 and 30.9 MHz (24′, 19′ and 16′).

Esposito *et al.* 1996, ApJ, 461, 820. Possible associated  $\gamma$ -ray emission.

Biggs &amp; Lyne 1996, MNRAS, 282, 691. Pulsar search.

Oliver *et al.* 1996, A&A, 315, 578. CO observations of some of surroundings.Jaffe *et al.* 1997, ApJ, 484, L129.  $\gamma$ -ray detection.**G206.9+2.3****RA:** 06<sup>h</sup>48<sup>m</sup>40<sup>s</sup>**Dec:** +06°26′**1-GHz flux/Jy:** 6**Spectral index:** 0.5

PKS 0646+06

**Size/arcmin:** 60 × 40**Type:** S?**Radio:** Diffuse source near the Monoceros Nebula.**Optical:** Filaments detected.**X-ray:** Possibly detected.**References:**

Davies &amp; Meaburn 1978, A&amp;A, 69, 443. Optical.

Nousek *et al.* 1981, ApJ, 248, 152. HEAO-1 X-ray limit.Graham *et al.* 1982, A&A, 109, 145. Effelsberg 100-m at 2.7 GHz (4′.4:  $S=4.1 \pm 0.6$  Jy), plus review of flux densities.

Rosado 1982, RMxAA, 5, 127. Optical.

Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.Leahy *et al.* 1986, MNRAS, 220, 501. Einstein observations.

Odegard 1986, ApJ, 301, 813. TPT at 20.6, 25.6 and 30.9 MHz (24′, 19′ and 16′).

Biggs &amp; Lyne 1996, MNRAS, 282, 691. Pulsar search.

**G260.4–3.4****RA:** 08<sup>h</sup>22<sup>m</sup>10<sup>s</sup>**Dec:** –43°00′**1-GHz flux/Jy:** 130**Spectral index:** 0.5

Puppis A, MSH 08–44

**Size/arcmin:** 60 × 50**Type:** S

This remnant overlaps the Vela SNR (G263.9–3.3).

**Radio:** Angular shell, brightest to the E, poorly defined to the W.

**Optical:** Nebulosity and wisps.

**X-ray:** Brightest to the E.

**Point sources:** Central source, a possible pulsar in X-rays.

**Distance:** Association with HI gives  $2.2 \pm 0.3$  kpc; OH absorption/emission in vicinity implies 0.5 to 1.9 kpc.

**References:**

- Green 1971, AuPh, 24, 773. Molonglo at 408 MHz ( $3' : S = 198 \pm 20$  Jy).  
 Goudis & Meaburn 1978, A&A, 62, 283. H $\alpha$ +NII optical image.  
 Winkler *et al.* 1981, ApJ, 245, 574. X-ray spectroscopy of O lines.  
 Winkler *et al.* 1981, ApJ, 245, L27. X-ray spectrum.  
 Petre *et al.* 1982, ApJ, 258, 22. Einstein observations.  
 Milne *et al.* 1983, MNRAS, 204, 237. FIRST at 1415 MHz (50"), large scale emission missing.  
 Teske & Petre 1987, ApJ, 318, 370. Coronal optical line emission.  
 Dubner & Arnal 1988, A&AS, 75, 363. HI and CO observations of surroundings.  
 Arendt *et al.* 1990, ApJ, 350, 266. MOST at 843 MHz (44" × 65"), with large scale emission added, plus IR, optical and X-ray observations.  
 Dubner *et al.* 1991, AJ, 101, 1466. VLA at 327 MHz (43" × 73") and 1.5 GHz (43" × 77").  
 Arendt *et al.* 1991, ApJ, 368, 474. IR observations.  
 Milne *et al.* 1993, MNRAS, 261, 366. Parkes 64-m at 4.75 (4'.5 : S = 59 ± 5 Jy) and 8.4 GHz (3' : S = 38 ± 4 Jy), plus polarization.  
 Berthiaume *et al.* 1994, ApJ, 425, 132. X-ray spectroscopy.  
 Sutherland & Dopita 1995, ApJ, 439, 365. Spectrophotometry.  
 Reynoso *et al.* 1995, AJ, 110, 318. VLA at 1.4 GHz (90") including neutral hydrogen.  
 Blair *et al.* 1995, ApJ, 454, L35. Far UV spectroscopy.  
 Petre *et al.* 1996, ApJ, 465, L43. ROSAT of central source.  
 Bock *et al.* 1998, AJ, 116, 1886. MOST at 843 MHz (43" × 60").  
 Pavlov *et al.* 1999, ApJ, 511, L45. Possible pulsation detection from central X-ray source.  
 Zavlin *et al.* 1999, ApJ, 525, 959. X-ray observations of central source.  
 Bocchino *et al.* 2000, A&A, 359, 316. Optical studies of selected filaments in N.  
 Woermann *et al.* 2000, MNRAS, 317, 421. OH observations.  
 Gaensler *et al.* 2000, ApJ, 537, L35. Radio limit for nebula around possible pulsar.

**G261.9+5.5****RA:** 09<sup>h</sup>04<sup>m</sup>20<sup>s</sup>**Dec:** –38°42′**1-GHz flux/Jy:** 10?**Spectral index:** 0.4?**Size/arcmin:** 40 × 30**Type:** S

**Radio:** Faint shell with little limb brightening.

**References:**

- Hill 1967, AuJPh, 20, 297. Parkes 64-m at 2650 MHz (7'.5 : S = 7 Jy) also  $S_{1410 \text{ MHz}} = 8$  Jy,  $S_{81.5 \text{ MHz}} = 25$  Jy.  
 Colomb & Dubner 1980, A&A, 82, 244. Argentine 30-m dish at 1.4 GHz, for HI possibly associated with remnant.  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44" × 71").  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G263.9–3.3**

Vela (XYZ)

**RA:** 08<sup>h</sup>34<sup>m</sup>00<sup>s</sup>**1-GHz flux/Jy:** 1750**Size/arcmin:** 255**Dec:** –45°50′**Spectral index:** varies**Type:** C

This refers to the whole Vela XYZ complex, of which X has at times been classified as a separate (filled-centre) remnant. This remnant is overlapped by G260.4–3.4 and G266.2–1.2.

**Radio:** Large shell, with flatter spectrum component (Vela X).

**Optical:** Filaments.

**X-ray:** Patchy shell, with extensions, central nebula and pulsar.

**Point sources:** Pulsar within Vela X, with one-sided ‘jet’.

**Distance:** Vela pulsar parallax gives 0.3 kpc, optical spectra and HI studies suggest 0.25 kpc.

**References:**

- Milne 1968, *AuPh*, 21, 201. Parkes 64-m at various frequencies, including 408 MHz (48′ :  $S=2300 \pm 300$  Jy), 635 MHz (31′ :  $S=2360 \pm 300$  Jy), 1410 MHz (14′ :  $S=1640 \pm 300$  Jy) and 2650 MHz (7′.5 :  $S=1400 \pm 250$  Jy), plus discussion of the distance.
- van den Bergh *et al.* 1973, *ApJS*, 26, 19. Optical.
- Dopita *et al.* 1977, *ApJ*, 214, 179. Optical spectroscopy.
- Hearn *et al.* 1980, *ApJ*, 235, L67. X-ray map.
- Milne 1980, *A&A*, 81, 293. Maps of Vela X with Parkes 64-m at 1.66, 2.7 and 5 GHz (12′, 8′.4 and 4′.4).
- Weiler & Panagia 1980, *A&A*, 90, 269. Clarify notation of this region and review previous observations.
- Kahn *et al.* 1985, *ApJ*, 299, 821. Einstein observations.
- Harnden *et al.* 1985, *ApJ*, 299, 828. Einstein observations of Vela X and pulsar.
- Biggami & Caraveo 1988, *ApJ*, 325, L5. Pulsar proper motion from optical observations.
- Dwarakanath 1991, *JApA*, 12, 199. Gauribidanur ‘T’ array at 34.5 MHz (26′ × 84′ :  $S=1800$  Jy for Vela X and  $S=3900$  Jy for Vela YZ), plus review of flux densities.
- Bietenholz *et al.* 1991, *ApJ*, 376, L41. VLA at 5 GHz in vicinity of pulsar.
- Raymond *et al.* 1991, *ApJ*, 383, 226. UV spectroscopy.
- Willmore *et al.* 1992, *MNRAS*, 254, 139. Hard X-ray observations.
- Dubner *et al.* 1992, *A&AS*, 96, 505. Argentine 30-m at 1.4 GHz (30′) of surrounding HI.
- Oberlack *et al.* 1994, *ApJS*, 92, 433.  $\gamma$ -ray observations.
- Bocchino *et al.* 1994, *ApJ*, 437, 209. ROSAT observations of NE.
- Aschenbach *et al.* 1995, *Natur*, 373, 587. ROSAT of X-ray extensions.
- Strom *et al.* 1995, *Natur*, 373, 590. Radio of X-ray extensions.
- Markwardt & Ögelman 1995, *Natur*, 375, 40. X-ray jet from pulsar.
- Jenkins & Wallerstein 1995, *ApJ*, 440, 227. Optical absorption of associated neutral carbon cloud.
- Milne 1995, *MNRAS*, 277, 1435. Parkes 64-m at 8.4 GHz (3′), including polarization, of Vela X.
- Duncan *et al.* 1996, *MNRAS*, 280, 252. Parkes 64-m at 2.4 GHz (8′.9).
- Danks & Sembach 1995, *AJ*, 109, 2627. Optical spectroscopy of background stars.
- de Jager *et al.* 1996, *ApJ*, 460, 729.  $\gamma$ -ray detection.
- Blair *et al.* 1995, *AJ*, 110, 312. UV spectroscopy.
- Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43″ × 62″) of part.
- Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m and ATCA OH observations.
- Frail *et al.* 1997, *ApJ*, 475, 224. VLA at 330 MHz (1′ × 1′.8) and comparison with ROSAT observations of Vela X.
- Markwardt & Ögelman 1997, *ApJ*, 480, L13. ASCA observations of pulsar ‘jet’.
- Raymond *et al.* 1997, *ApJ*, 482, 881. UV spectroscopy.
- Yoshikoshi *et al.* 1997, *ApJ*, 487, L65.  $\gamma$ -ray observations of pulsar.
- Jenkins *et al.* 1998, *ApJ*, 492, L147. UV absorption to background star.
- Dubner *et al.* 1998, *AJ*, 116, 813. Parkes 64-m at 1.4 GHz (15′) for HI studies.
- Bock *et al.* 1998, *AJ*, 116, 1886. MOST at 843 MHz (43″ × 60″).
- Cha *et al.* 1999, *ApJ*, 515, L25. Optical spectra, for distance.
- Lu & Aschenbach 2000, *A&A*, 362, 1083. ROSAT spatially resolved spectroscopy.
- Chadwick *et al.* 2000, *ApJ*, 537, 414. Limit on high energy  $\gamma$ -rays from pulsar.
- Sankrit *et al.* 2001, *ApJ*, 549, 416. Far-UV observations of selected region.
- Pavlov *et al.* 2001, *ApJ*, 554, L189. Chandra two-epoch observations of pulsar nebula.
- Helfand *et al.* 2001, *ApJ*, 556, 380. Chandra observations of pulsar and its nebula.
- Miyata *et al.* 2001, *ApJ*, 559, L45. Chandra of X-ray extension.
- Alvarez *et al.* 2001, *A&A*, 372, 636. Radio spectral index studies.
- Caraveo *et al.* 2001, *ApJ*, 561, 930. HST parallax observations of pulsar.

**G266.2–1.2****RA:** 08<sup>h</sup>52<sup>m</sup>00<sup>s</sup>**Dec:** –46°20′**1-GHz flux/Jy:** 50?**Spectral index:** 0.3?**Size/arcmin:** 120**Type:** S

This remnant overlaps the Vela SNR (G263.9–3.3).

**Radio:** Incomplete shell, confused by the Vela SNR.

**Optical:** Possible nebulosity associated.

**X-ray:** Non-thermal shell, confused by the Vela SNR, with central source.

**Point sources:** Central X-ray source.

**Distance:** X-ray data suggest an upper limit of 1 kpc.

**References:**

Aschenbach 1998, *Natur*, 396, 141. ROSAT identification.

Iyudin *et al.* 1998, *Natur*, 396, 142.  $\gamma$ -ray observations.

Combi *et al.* 1999, *ApJ*, 519, L177. Radio observations.

Duncan & Green 2000, *A&A*, 364, 732. Parkes 64-m at 1.4 GHz (14′.0), and comparison with other observations.

Redman *et al.* 2000, *ApJ*, 543, L153. Optical of nearby nebulosity.

Slane *et al.* 2001, *ApJ*, 548, 814. ASCA observations.

Mereghetti *et al.* 2001, *ApJ*, 548, L213. BeppoSAX observations of central sources.

Tsunemi *et al.* 2000, *PASJ*, 52, 887. ASCA spectral observations.

Pavlov *et al.* 2001, *ApJ*, 559, L131. Chandra of central X-ray source.

**G272.2–3.2****RA:** 09<sup>h</sup>06<sup>m</sup>50<sup>s</sup>**Dec:** –52°02′**1-GHz flux/Jy:** 0.4**Spectral index:** 0.6**Size/arcmin:** 15?**Type:** S?

**Radio:** Diffuse shell.

**X-ray:** Centrally brightened.

**Optical:** Detected.

**References:**

Greiner *et al.* 1994, *A&A*, 286, L35. ROSAT observations, plus optical.

Duncan *et al.* 1997, *MNRAS*, 289, 97. Parkes 64-m at 1.4 GHz (18′ :  $S=0.38 \pm 0.09$  Jy) 2.4 GHz (10′.6 :  $S=0.25 \pm 0.04$  Jy) and 4.8 GHz (5′.7 :  $S=0.17 \pm 0.02$  Jy), MOST at 843 MHz (45″ × 70″ :  $S=0.45 \pm 0.10$  Jy), and ATCA at 2.4 GHz (37″ × 52″), plus ROSAT observations.

Harrus *et al.* 2001, *ApJ*, 552, 614. ASCA and ROSAT observations, plus review of earlier observations.

**G279.0+1.1****RA:** 09<sup>h</sup>57<sup>m</sup>40<sup>s</sup>**Dec:** –53°15′**1-GHz flux/Jy:** 30?**Spectral index:** 0.6?**Size/arcmin:** 95**Type:** S

**Radio:** Faint, incomplete shell.

**Point sources:** Pulsar nearby.

**References:**

Woermann & Jonas 1988, *MNRAS*, 234, 971. Hartesbeesthoek 26-m at 1.6 (30′ :  $S=25.2 \pm 4$  Jy) and 2.3 GHz (20′ :  $S=20.7 \pm 3$  Jy).

Duncan *et al.* 1995, *MNRAS*, 277, 319. Parkes 64-m at 1.4 (18′ :  $S=28 \pm 3$  Jy) and 2.4 GHz (11′ :  $S=20 \pm 2$  Jy), including polarization.

Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43″ × 53″) of part.

Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m OH observations.

**G284.3–1.8**

**RA:** 10<sup>h</sup>18<sup>m</sup>15<sup>s</sup>  
**Dec:** –59°00′

**1-GHz flux/Jy:** 11?  
**Spectral index:** 0.3?

**MSH 10–53**  
**Size/arcmin:** 24?  
**Type:** S

Has been called G284.2–1.8.

**Radio:** Incomplete, poorly defined shell.

**Point sources:** Pulsar nearby.

**References:**

Ruiz & May 1986, ApJ, 309, 667. CO and optical observations.

Milne *et al.* 1989, PASAu, 8, 187. MOST at 843 MHz (43″ × 50″) and Parkes 64-m at 8.4 GHz (3′ :  $S=5.4 \pm 0.8$  Jy) including polarization, plus earlier flux densities.

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.

Camilo *et al.* 2001, ApJ, 557, L51. Observations of nearby pulsar.

**G286.5–1.2**

**RA:** 10<sup>h</sup>35<sup>m</sup>40<sup>s</sup>  
**Dec:** –59°42′

**1-GHz flux/Jy:** 1.4?  
**Spectral index:** ?

**Size/arcmin:** 26 × 6  
**Type:** S?

**Radio:** Double, elongated arc.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ :  $S=1.6$  Jy).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G289.7–0.3**

**RA:** 11<sup>h</sup>01<sup>m</sup>15<sup>s</sup>  
**Dec:** –60°18′

**1-GHz flux/Jy:** 6.2  
**Spectral index:** 0.2?

**Size/arcmin:** 18 × 14  
**Type:** S

**Radio:** Incomplete shell.

**Point sources:** Compact radio source near centre.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ :  $S=6.4 \pm 0.5$  Jy), plus Parkes 64-m at 4.5 GHz ( $S=7.5 \pm 2.5$  Jy) and 8.55 GHz ( $S=3.6 \pm 0.9$  Jy).

**G290.1–0.8**

**RA:** 11<sup>h</sup>03<sup>m</sup>05<sup>s</sup>  
**Dec:** –60°56′

**1-GHz flux/Jy:** 42  
**Spectral index:** 0.4

**MSH 11–61A**  
**Size/arcmin:** 19 × 14  
**Type:** S

**Radio:** Elongated, clumpy shell.

**Optical:** Filaments detected.

**X-ray:** Detected.

**Point sources:** Pulsar nearby.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 :  $S=20.2$  Jy).

Elliot & Malin 1979, MNRAS, 186, 45P. Optical image and spectra.

Kirshner & Winkler 1979, ApJ, 227, 853. Optical.

Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 50″).

Milne *et al.* 1989, PASAu, 8, 187. MOST at 843 MHz (43″ × 49″ :  $S=45 \pm 11$  Jy), and Parkes 64-m at 8.4 GHz (3′ :  $S=19.5 \pm 1.0$  Jy), including polarization.

Seward 1990, ApJS, 73, 781. Einstein observations.

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ :  $S=43$  Jy).

Rosado *et al.* 1996, A&A, 315, 243. Optical kinematics.

Kaspi *et al.* 1997, ApJ, 485, 820. Pulsar detection.

Gothelf & Kaspi 1998, ApJ, 497, L29. ASCA observations of pulsar.



**G291.0–0.1**

(MSH 11–62)

**RA:** 11<sup>h</sup>11<sup>m</sup>54<sup>s</sup>**1-GHz flux/Jy:** 16**Size/arcmin:** 15 × 13**Dec:** –60°38′**Spectral index:** 0.29**Type:** C**Radio:** Centrally brightened core, with surrounding arcs.**X-ray:** Centrally brightened.**Point sources:** Central compact X-ray source.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Roger *et al.* 1986, MNRAS, 219, 815. MOST at 843 MHz (43″ × 50″ :  $S = 17.2 \pm 1.0$  Jy), and Parkes 64-m at 5 and 8.4 GHz (4′.6 and 3′ :  $S = 10.4 \pm 0.4$  Jy and  $9′.1 \pm 0.2$ ), with polarization.

Wilson 1986, ApJ, 302, 718. Einstein observations.

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ :  $S = 12.7$  Jy).Harrus *et al.* 1998, ApJ, 499, 273. ASCA observations.**G292.0+1.8**

MSH 11–54

**RA:** 11<sup>h</sup>24<sup>m</sup>36<sup>s</sup>**1-GHz flux/Jy:** 15**Size/arcmin:** 12 × 8**Dec:** –59°16′**Spectral index:** 0.4**Type:** C**Radio:** Centrally brightened source surrounded by a plateau of faint emission.**Optical:** Oxygen rich.**X-ray:** Ring of emission, with diffuse central nebula and compact source.**Point sources:** Compact X-ray source.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Goss *et al.* 1979, MNRAS, 188, 357. Optical spectra.Lockhart *et al.* 1977, MNRAS, 179, 147. Fleurs at 1415 MHz (50″ :  $S = 13.0$  Jy).Clark *et al.* 1980, MNRAS, 193, 129. X-ray spectrum.Tuohy *et al.* 1982, ApJ, 260, L65. Einstein observations.

Dopita &amp; Tuohy 1984, ApJ, 282, 135. Optical spectra.

Braun *et al.* 1986, A&A, 162, 259. MOST at 843 MHz (0′.8) and IRAS.

Hughes &amp; Singh 1994, ApJ, 422, 126. EXOSAT spectrum.

Sutherland &amp; Dopita 1995, ApJ, 439, 365. Spectrophotometry.

Hughes *et al.* 2001, ApJ, 559, L153. Chandra observations, including central nebula.**G292.2–0.5****RA:** 11<sup>h</sup>19<sup>m</sup>20<sup>s</sup>**1-GHz flux/Jy:** 7?**Size/arcmin:** 20 × 15**Dec:** –61°28′**Spectral index:** 0.6?**Type:** S**Radio:** Shell.**X-ray:** Detected.**Point sources:** Central, young pulsar.**References:**Crawford *et al.* 2001, ApJ, 554, 152. ATCA at 1.4 GHz (29″ × 25″ :  $S = 5.6 \times 0.3$  Jy) and 2.5 GHz (21″ × 20″).Pivovarov *et al.* 2001, ApJ, 554, 161. ROSAT and ASCA observations.**G293.8+0.6****RA:** 11<sup>h</sup>35<sup>m</sup>00<sup>s</sup>**1-GHz flux/Jy:** 5?**Size/arcmin:** 20**Dec:** –60°54′**Spectral index:** 0.6?**Type:** C**Radio:** Central source, with faint extended plateau.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S = 9.0$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S = 2.1$  Jy).

Kesteven &amp; Caswell 1987, A&amp;A, 183, 118. MOST at 843 MHz (44″ × 51″).

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ :  $S = 2.6$  Jy).

**G294.1–0.0****RA:** 11<sup>h</sup>36<sup>m</sup>10<sup>s</sup>**Dec:** –61°38′**1-GHz flux/Jy:** >2?**Spectral index:** ?**Size/arcmin:** 40**Type:** S**Radio:** Faint shell.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 49″ : S &gt; 2).

**G296.1–0.5****RA:** 11<sup>h</sup>51<sup>m</sup>10<sup>s</sup>**Dec:** –62°34′**1-GHz flux/Jy:** 8?**Spectral index:** 0.6?**Size/arcmin:** 37 × 25**Type:** S

Incorporates the previously catalogued remnant G296.1–0.7. Has been called G296.05–0.50.

**Radio:** Irregular shell, with nearby HII regions.**Optical:** Detected.**X-ray:** Detected.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 6.9 Jy) and Parkes 64-m at 5 GHz (4′ : S > 0.74) poor 5-GHz map (of G296.1–0.7).Longmore *et al.* 1977, MNRAS, 181, 541. Optical spectra.

van den Bergh 1978, ApJS, 38, 119. Optical.

Markert *et al.* 1981, ApJ, 248, L17. Einstein observations.

Caswell &amp; Barnes 1983, ApJ, 271, L55. Molonglo at 408 MHz (3′ : S = 12.4 Jy).

Biglami *et al.* 1986, ApJ, 302, 606. EXOSAT and Einstein observations.

Hwang &amp; Markert 1994, ApJ, 431, 819. ROSAT observations.

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S &gt; 2.4).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.**G296.5+10.0****RA:** 12<sup>h</sup>09<sup>m</sup>40<sup>s</sup>**Dec:** –52°25′**1-GHz flux/Jy:** 48**Spectral index:** 0.5

PKS 1209–51/52

**Size/arcmin:** 90 × 65**Type:** S

Has been called G296.5+9.7.

**Radio:** Shell with two bright limbs.**Optical:** Detected.**X-ray:** Incomplete shell, with central pulsar.**Point sources:** Central pulsar.**References:**

Irvine &amp; Irvine 1974, ApJ, 192, L111. Optical.

Danziger &amp; Dennefeld 1976, PASP, 88, 44. Optical spectra.

Dickel &amp; Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).

Tuohy *et al.* 1979, ApJ, 230, L27. X-ray detection with HEAO-1 A2 experiment.

Ruiz 1983, AJ, 88, 1210. Optical spectra.

Dubner *et al.* 1986, AJ, 91, 343. Argentine 30-m dish at 1.4 GHz (34′), plus HI.Kellelt *et al.* 1987, MNRAS, 225, 199. EXOSAT of the west of the remnant, including the compact source.

Kesteven &amp; Caswell 1987, A&amp;A, 183, 118. MOST at 843 MHz (44″ × 56″).

Matsui *et al.* 1988, ApJ, 329, 838. Einstein observations, including compact source.Roger *et al.* 1988, ApJ, 332, 940. MOST at 843 MHz (44″ × 56″).Biglami *et al.* 1992, ApJ, 389, L67. Optical in vicinity of X-ray source.

Milne &amp; Haynes 1994, MNRAS, 270, 106. Parkes 64-m at 2.4 GHz (8′.3 : S = 33 ± 3 Jy), 4.8 GHz (4′.5 : S = 23.3 ± 3 Jy) and 8.4 GHz (3′.0 : 18.8 ± 3), including polarization and review of flux densities.

Mereghetti *et al.* 1996, ApJ, 464, 842. Radio, optical and X-ray observations of central source.Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.Vasisht *et al.* 1997, ApJ, 476, L43. ASCA observations of neutron star.Zavlin *et al.* 1998, A&A, 331, 821. ROSAT and ASCA observations of neutron star.Giacani *et al.* 2000, AJ, 119, 281. ATCA at 1.4 GHz (2′.7 × 4′.0) for HI studies.Zavlin *et al.* 2000, ApJ, 540, L25. Chandra observations of central pulsar.

**G296.8–0.3**

1156–62

**RA:** 11<sup>h</sup>58<sup>m</sup>30<sup>s</sup>  
**Dec:** –62°35′**1-GHz flux/Jy:** 9  
**Spectral index:** 0.6**Size/arcmin:** 20 × 14  
**Type:** S**Radio:** Shell, brighter to the NW.**Distance:** HI absorption gives  $9.6 \pm 0.6$  kpc.**X-ray:** Detected.**References:**

Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ :  $S=15.0$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=3.2$  Jy).  
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).  
 Hwang & Markert 1994, ApJ, 431, 819. ROSAT observations.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ :  $S=9.2$  Jy).  
 Gaensler *et al.* 1998, MNRAS, 296, 813. ATCA at 1.3 GHz (22″ × 24″ :  $S=7.0 \pm 0.3$  Jy), including polarisation and HI observations, plus review of flux densities.

**G298.5–0.3****RA:** 12<sup>h</sup>12<sup>m</sup>40<sup>s</sup>  
**Dec:** –62°52′**1-GHz flux/Jy:** 5?  
**Spectral index:** 0.4?**Size/arcmin:** 5?  
**Type:** ?**Radio:** Not well resolved, may be part of a larger ring?**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Hwang & Markert 1994, ApJ, 431, 819. ROSAT upper limit.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ :  $S=1.8$  Jy).

**G298.6–0.0****RA:** 12<sup>h</sup>13<sup>m</sup>41<sup>s</sup>  
**Dec:** –62°37′**1-GHz flux/Jy:** 5?  
**Spectral index:** 0.3**Size/arcmin:** 12 × 9  
**Type:** S

Has been called G298.6–0.1.

**Radio:** Incomplete shell, in complex region.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 50″).  
 Hwang & Markert 1994, ApJ, 431, 819. ROSAT upper limit.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ :  $S=7.4$  Jy).

**G299.2–2.9****RA:** 12<sup>h</sup>15<sup>m</sup>13<sup>s</sup>  
**Dec:** –65°30′**1-GHz flux/Jy:** 0.5?  
**Spectral index:** ?**Size/arcmin:** 18 × 11  
**Type:** S**Radio:** Faint source.**X-ray:** Centrally brightened.**Optical:** Filaments in W.**References:**

Busser *et al.* 1996, A&A, 310, L1. ROSAT detection, plus optical studies.  
 Slane *et al.* 1996, ApJ, 465, 840. Einstein, IRAS and radio observations.  
 Bai & Wang 2000, ApJ, 539, 760. ASCA observations.

**G299.6–0.5****RA:** 12<sup>h</sup>21<sup>m</sup>45<sup>s</sup>  
**Dec:** –63°09′**1-GHz flux/Jy:** 1.0?  
**Spectral index:** ?**Size/arcmin:** 13  
**Type:** S**Radio:** Faint shell, brightest to E.**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ :  $S=1.1$  Jy).

**G301.4–1.0****RA:** 12<sup>h</sup>37<sup>m</sup>55<sup>s</sup>**Dec:** –63°49′**1-GHz flux/Jy:** 2.1?**Spectral index:** ?**Size/arcmin:** 37 × 23**Type:** S**Radio:** Faint, incomplete shell, with possible extension to southwest.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=2.3 Jy).

**G302.3+0.7****RA:** 12<sup>h</sup>45<sup>m</sup>55<sup>s</sup>**Dec:** –62°08′**1-GHz flux/Jy:** 5?**Spectral index:** 0.4?**Size/arcmin:** 17**Type:** S**Radio:** Distorted shell, in complex region, with possibly associated filament.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=7.5 Jy) and Parkes 64-m at 5 GHz (4′ : S=3.0 Jy).

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 49″ : S=3.2 Jy).

Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.**G304.6+0.1****RA:** 13<sup>h</sup>05<sup>m</sup>59<sup>s</sup>**Dec:** –62°42′**1-GHz flux/Jy:** 14**Spectral index:** 0.5

Kes 17

**Size/arcmin:** 8**Type:** S**Radio:** Incomplete shell.**Distance:** Possible limit of > 9.7 kpc from HI absorption.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Milne &amp; Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 : S=6.9 Jy).

Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=18 Jy).

Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.**G308.1–0.7****RA:** 13<sup>h</sup>37<sup>m</sup>37<sup>s</sup>**Dec:** –63°04′**1-GHz flux/Jy:** 1.2?**Spectral index:** ?**Size/arcmin:** 13**Type:** S**Radio:** Faint shell.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=1.3 Jy).

**G308.8–0.1****RA:** 13<sup>h</sup>42<sup>m</sup>30<sup>s</sup>**Dec:** –62°23′**1-GHz flux/Jy:** 15?**Spectral index:** 0.4?**Size/arcmin:** 30 × 20?**Type:** C?

Incorporates previous catalogued remnant G308.7+0.0.

**Radio:** Bright ridge in north, and arc to south.**Point sources:** Pulsar near centre of remnant.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=16.7 Jy) and Parkes 64-m at 5 GHz (4′ : S=7.0 Jy).

Milne &amp; Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 : S=6.5 Jy).

Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz (50″).

Wilson 1986, ApJ, 302, 718. Lack of detection with Einstein.

Caswell *et al.* 1992, ApJ, 399, L151. MOST at 843 MHz (43″ × 49″).Kaspi *et al.* 1992, ApJ, 399, L155. Pulsar observations.Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G309.2–0.6**

**RA:** 13<sup>h</sup>46<sup>m</sup>31<sup>s</sup>  
**Dec:** –62°54′

**1-GHz flux/Jy:** 7?  
**Spectral index:** 0.4?

**Size/arcmin:** 15 × 12  
**Type:** S

Has been called G309.2–0.7.

**Radio:** Distorted shell.

**X-ray:** Extended emission, with central source.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=10.0$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=3.9$  Jy).  
 Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz (1′.5).  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 50″).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ :  $S=6$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Gaensler *et al.* 1998, MNRAS, 299, 812. ATCA at 1.3 GHz (24″ × 23″ :  $S=5.2 \pm 0.2$  Jy).  
 Rakowski *et al.* 2001, ApJ, 548, 258. ASCA and ROSAT observations.

**G309.8+0.0**

**RA:** 13<sup>h</sup>50<sup>m</sup>30<sup>s</sup>  
**Dec:** –62°05′

**1-GHz flux/Jy:** 17  
**Spectral index:** 0.5

**Size/arcmin:** 25 × 19  
**Type:** S

**Radio:** Distorted shell.

**Point sources:** Steep radio spectrum source near the centre of the remnant.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=26.4$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=7.4$  Jy).  
 Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz (1′).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ :  $S > 8.8$ ).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G310.6–0.3**

**RA:** 13<sup>h</sup>58<sup>m</sup>00<sup>s</sup>  
**Dec:** –62°09′

**1-GHz flux/Jy:** 5?  
**Spectral index:** ?

**Size/arcmin:** 8  
**Type:** S  
 Kes 20B

**Radio:** Asymmetric shell.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ :  $S=5.4$  Jy).

**G310.8–0.4**

**RA:** 14<sup>h</sup>00<sup>m</sup>00<sup>s</sup>  
**Dec:** –62°17′

**1-GHz flux/Jy:** 6?  
**Spectral index:** ?

**Size/arcmin:** 12  
**Type:** S  
 Kes 20A

**Radio:** Arc in E, in complex region.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ :  $S=6.9$  Jy).

**G311.5–0.3**

**RA:** 14<sup>h</sup>05<sup>m</sup>38<sup>s</sup>  
**Dec:** –61°58′

**1-GHz flux/Jy:** 3?  
**Spectral index:** 0.5

**Size/arcmin:** 5  
**Type:** S

**Radio:** Shell, not well resolved.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Caswell & Barnes 1985, MNRAS, 216, 753. Molonglo at 408 MHz (3′).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ :  $S=2.9$  Jy).

**G312.4–0.4****RA:** 14<sup>h</sup>13<sup>m</sup>00<sup>s</sup>**Dec:** –61°44′**1-GHz flux/Jy:** 45**Spectral index:** 0.36**Size/arcmin:** 38**Type:** S**Radio:** Irregular, incomplete shell.**Point sources:** Nearby  $\gamma$ -ray sources.**References:**Caswell & Barnes 1985, MNRAS, 216, 753. Molonglo at 408 MHz ( $3' : S = 56$  Jy).Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ( $43'' \times 49'' : S > 19$ ), plus Parkes 64-m at 4.5 GHz ( $S = 30 \pm 2$  Jy) and 8.55 GHz ( $S = 17 \pm 4$  Jy).Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.Case & Bhattacharya 1998, ApJ, 521, 246. Nearby  $\gamma$ -ray sources.Roberts *et al.* 1999, ApJ, 515, 712. MOST at 843 MHz ( $43'' \times 49''$ ).**G315.4–2.3****RA:** 14<sup>h</sup>43<sup>m</sup>00<sup>s</sup>**Dec:** –62°30′**1-GHz flux/Jy:** 49**Spectral index:** 0.6**RCW 86, MSH 14–63****Size/arcmin:** 42**Type:** S

Possibly the remnant of the SN of AD185?

**Radio:** Shell, brightest to the SW.**Optical:** Bright, radiative filaments, with some faint Balmer dominated filaments.**X-ray:** Partial shell and bright patch.**Distance:** Possible association with OB stars suggests 2.5 kpc.**References:**van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz ( $3' : S = 86$  Jy) and Parkes 64-m at 5 GHz ( $4' : S = 18.2$  Jy).Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz ( $8' .4$ ) and 5 GHz ( $4' .4$ ).

Winkler 1978, ApJ, 221, 220. X-ray detection.

Leibowitz &amp; Danziger 1983, MNRAS, 204, 273. Optical spectra.

Pisarski *et al.* 1984, ApJ, 277, 710. Einstein observationsNugent *et al.* 1984, ApJ, 284, 612. X-ray spectrum.Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz ( $44'' \times 50''$ ).

Long &amp; Blair 1990, ApJ, 358, L13. Balmer dominated optical filaments.

Greidanus &amp; Strom 1990, A&amp;A, 240, 385. IRAS observations.

Kaastra *et al.* 1992, A&A, 264, 654. Ginga X-ray spectra.

Strom 1994, MNRAS, 268, L5. Historical association

Chin &amp; Huang 1994, Natur, 371, 398. Questioning of historical association.

Schaefer 1995, AJ, 110, 1793. Questioning of historical association.

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ( $43'' \times 48'' : S > 22$ ).Rosado *et al.* 1996, A&A, 315, 243. Optical kinematics.Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Smith *et al.* 1997, AJ, 114, 2664. Observations of Balmer dominated filaments.Vink *et al.* 1997, A&A, 328, 628. ASCA spectroscopy.Bocchino *et al.* 2000, A&A, 360, 671. ASCA observations of N and SW.Ghavamanian *et al.* 2001, ApJ, 547, 995. Optical spectroscopy.Dickel *et al.* 2001, ApJ, 546, 447. ATCA at 1.34 GHz ( $8''$ ), including polarisation.Bamba *et al.* 2000, PASJ, 52, 1157. ASCA observations.Bokowski *et al.* 2001, ApJ, 550, 334. ASCA observations.**G315.4–0.3****RA:** 14<sup>h</sup>35<sup>m</sup>55<sup>s</sup>**Dec:** –60°36′**1-GHz flux/Jy:** 8**Spectral index:** 0.4**Size/arcmin:** 24  $\times$  13**Type:** ?**Radio:** Irregular non-thermal emission, with HII region superposed in E.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz ( $3' : S = 15.9$  Jy) and Parkes 64-m at 5 GHz ( $4' : S = 4.9$  Jy).Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz ( $50'' : S = 6.25$  Jy), re-assessment of earlier flux densities.Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ( $43'' \times 49'' : S = 3.1$  Jy).Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

**G315.9–0.0****RA:** 14<sup>h</sup>38<sup>m</sup>25<sup>s</sup>**Dec:** –60°11′**1-GHz flux/Jy:** 0.8?**Spectral index:** ?**Size/arcmin:** 25 × 14**Type:** S

Has been called G315.8–0.0.

**Radio:** Faint, distorted shell, with steep-spectrum ‘jet’?**References:**Kesteven *et al.* 1987, AuJPh, 40, 855. MOST at 843 MHz (44″ × 50″).

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S=0.9 Jy).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.**G316.3–0.0**

(MSH 14–57)

**RA:** 14<sup>h</sup>41<sup>m</sup>30<sup>s</sup>**Dec:** –60°00′**1-GHz flux/Jy:** 20?**Spectral index:** 0.4**Size/arcmin:** 29 × 14**Type:** S**Radio:** Distorted shell, with possible ‘blowout’.**X-ray:** Detected.**Distance:** HI absorption data suggests > 7.2 kpc.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.

Milne &amp; Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 : S=16.7 Jy).

Kesteven &amp; Caswell 1987, A&amp;A, 183, 118. MOST at 843 MHz (44″ × 51″).

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S=20 Jy).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.**G317.3–0.2****RA:** 14<sup>h</sup>49<sup>m</sup>40<sup>s</sup>**Dec:** –59°46′**1-GHz flux/Jy:** 4.7?**Spectral index:** ?**Size/arcmin:** 11**Type:** S**Radio:** Incomplete shell.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S=5.2 Jy).

**G318.2+0.1****RA:** 14<sup>h</sup>54<sup>m</sup>50<sup>s</sup>**Dec:** –59°04′**1-GHz flux/Jy:** >3.9?**Spectral index:** ?**Size/arcmin:** 40 × 35**Type:** S**Radio:** Faint shell, with central HII region.**X-ray:** Sources within remnant.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S &gt; 4.3).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Bocchino *et al.* 2001, A&A, 367, 629. BeppoSAX and ROSAT observations.

**G318.9+0.4****RA:** 14<sup>h</sup>58<sup>m</sup>30<sup>s</sup>**Dec:** –58°29′**1-GHz flux/Jy:** 4?**Spectral index:** 0.2?**Size/arcmin:** 30 × 14**Type:** C

May not be a SNR?

**Radio:** Complex arcs, with off-centre core.**References:**Whiteoak 1990, *Natur*, 347, 157. MOST at 843 MHz (43'' × 51'').Whiteoak 1993, *ApJ*, 415, 701. MOST at 843 MHz (43'' × 51'' :  $S=4.8\pm 0.6$  Jy), Parkes 64-m at 4.5 GHz (4'.7 :  $S=3.7\pm 0.2$  Jy) and 8.4 GHz (2'.8 :  $S=3.0\pm 0.4$  Jy) including polarization, and ATCA at 1.4 GHz and 4.8 GHz (11'' × 13'') of core.Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43'' × 50'' :  $S=4.8$  Jy).Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m OH observations.**G320.4–1.2****RA:** 15<sup>h</sup>14<sup>m</sup>30<sup>s</sup>**Dec:** –59°08′**1-GHz flux/Jy:** 60?**Spectral index:** 0.4

MSH 15–52, RCW 89

**Size/arcmin:** 35**Type:** C

Has been suggested as the remnant of the SN of AD185?

**Radio:** Ragged shell.**Optical:** RCW 89 is the H $\alpha$  emitting region to the NW.**X-ray:** Partial shell, central nebula and pulsar and possible ‘jet’.**Point sources:** Radio and X-ray pulsar, plus IR compact source.**Distance:** HI absorption indicates 5.2 kpc.**References:**Caswell *et al.* 1975, *A&A*, 45, 239. Parkes HI absorption.Dickel & Milne 1976, *AuJPh*, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8'.4) and 5 GHz (4'.4).Dopita *et al.* 1977, *ApJ*, 214, 179. Optical spectra.Caswell *et al.* 1981, *MNRAS*, 195, 89. FIRST at 1415 MHz (50'').Seward & Harnden 1982, *ApJ*, 256, L45. X-ray of pulsar.Manchester *et al.* 1982, *ApJ*, 262, L31. Radio of pulsar.Seward *et al.* 1983, *ApJ*, 267, 698. X-ray, Optical and IR.van den Bergh & Kamper, 1984, *ApJ*, 280, L51. Optical expansion.Seward *et al.* 1984, *ApJ*, 281, 650. X-ray observations of pulsar and nebulosity.Lortet *et al.* 1987, *A&A*, 180, 65. Optical observations.Trussoni *et al.* 1990, *A&A*, 234, 403. EXOSAT observations.Asaoka & Koyama 1990, *PASJ*, 42, 625. Ginga X-ray spectrum.Arendt 1991, *AJ*, 101, 2160. IRAS observations, including compact source.Milne *et al.* 1993, *MNRAS*, 264, 853. Parkes 64-m at 4.8 GHz (4'.5 :  $S=37\pm 7$  Jy) and 8.4 GHz (3'.0 :  $S=24\pm 4$  Jy), including polarization and review of flux densities.Strom 1994, *MNRAS*, 268, L5. Historical association.Chin & Huang 1994, *Natur*, 371, 398. Questioning of historical association.Matz *et al.* 1994, *ApJ*, 434, 288. X-ray observations of pulsar.Schaefer 1995, *AJ*, 110, 1793. Questioning of historical association.Du Plessis *et al.* 1995, *ApJ*, 453, 746. Hartesbeesthoek 26-m at 2.3, 5 and 8.5 GHz ( $S=42, 35.6, 14.5$  Jy).Greiveldinger *et al.* 1995, *ApJ*, 454, 855. ROSAT observations.Trassoni *et al.* 1996, *A&A*, 306, 581. ROSAT observations.Tamura *et al.* 1996, *PASJ*, 48, L33. ASCA observations.Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43'' × 50'' :  $S=62$  Jy).Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m OH observations.Marsden *et al.* 1997, *ApJ*, 491, L39. X-ray spectroscopy.Brazier & Becker 1997, *MNRAS*, 284, 335. ROSAT observations.Gaensler *et al.* 1999, *MNRAS*, 305, 724. ATCA at 1.4 GHz (24'' × 21''), plus HI observations, and 5.3 GHz (15'' × 10'').Sako *et al.* 2000, *ApJ*, 537, 422. Possible high energy  $\gamma$ -ray detection of pulsar.**G320.6–1.6****RA:** 15<sup>h</sup>17<sup>m</sup>50<sup>s</sup>**Dec:** –59°16′**1-GHz flux/Jy:** ?**Spectral index:** ?**Size/arcmin:** 60 × 30**Type:** S**Radio:** Faint shell, overlapping G320.4–1.2 in W.**References:**Milne *et al.* 1993, *MNRAS*, 264, 853. Parkes 64-m at 4.8 GHz (4'.5) and 8.4 GHz (3'.0), including polarization.Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43'' × 50'' :  $S > 9.3$ ).



**G321.9–1.1****RA:** 15<sup>h</sup>23<sup>m</sup>45<sup>s</sup>**Dec:** –58°13′**1-GHz flux/Jy:** >3.4?**Spectral index:** ?**Size/arcmin:** 28**Type:** S**Radio:** Faint shell.**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 51″ :  $S > 3.8$ ).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G321.9–0.3****RA:** 15<sup>h</sup>20<sup>m</sup>40<sup>s</sup>**Dec:** –57°34′**1-GHz flux/Jy:** 13**Spectral index:** 0.3**Size/arcmin:** 31 × 23**Type:** S**Radio:** Shell brighter to the W, with Cir X-1 to N.**Point sources:** Compact, probably thermal source at S edge.**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S = 18.3$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S = 7.8$  Jy).  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 52″).  
 Stewart *et al.* 1993, MNRAS, 261, 593. ATCA at 1.5 GHz (21″).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 51″ :  $S > 8.3$ ).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G322.5–0.1****RA:** 15<sup>h</sup>23<sup>m</sup>23<sup>s</sup>**Dec:** –57°06′**1-GHz flux/Jy:** 1.5**Spectral index:** 0.4**Size/arcmin:** 15**Type:** C**Radio:** Shell with central extended source.**Point sources:** PN Pe 2-8 within boundary.**References:**

Whiteoak 1992, MNRAS, 256, 121. MOST at 843 MHz (43″ × 51″ :  $S = 2.0 \pm 0.3$  Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 51″ :  $S = 1.7$  Jy), plus Parks 64-m at 4.5 GHz ( $= 0.89 \pm 0.13$ ).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G323.5+0.1****RA:** 15<sup>h</sup>28<sup>m</sup>42<sup>s</sup>**Dec:** –56°21′**1-GHz flux/Jy:** 3?**Spectral index:** 0.4?**Size/arcmin:** 13**Type:** S**Radio:** Distorted shell, confused with thermal emission.**Point sources:** Compact, probably thermal source near centre.**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S = 4.2$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S = 1.5$  Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 52″ :  $S = 4.2$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G326.3–1.8**

**RA:** 15<sup>h</sup>53<sup>m</sup>00<sup>s</sup>  
**Dec:** –56°10′

**1-GHz flux/Jy:** 145  
**Spectral index:** varies

MSH 15–56

**Size/arcmin:** 38  
**Type:** C

Has been called G326.2–1.7.

**Radio:** Shell, with elongated, flat-spectrum core.

**Optical:** Emission around the shell.

**X-ray:** Shell, with central extended emission.

**References:**

Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′ : S = 180 Jy).  
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.  
 Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz (0′.8 : S > 95) and Parkes 64-m at 14.7 GHz (2′.2 : S = 69 ± 8 Jy).  
 van den Bergh 1979, ApJ, 227, 497. Optical observations.  
 Zealey *et al.* 1979, A&AS, 38, 39. Optical observations.  
 Dennefeld 1980, PASP, 92, 603. Optical spectra.  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 53″).  
 Milne *et al.* 1989, PASAu, 8, 187. MOST at 843 MHz (43″ × 52″ : S = 153 ± 40 Jy), and Parkes 64-m at 8.4 GHz (3′ : S = 68 ± 5 Jy), including polarization.  
 Seward 1990, ApJS, 73, 781. Einstein observations.  
 Kassim *et al.* 1993, ApJ, 419, 733. ROSAT image.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 52″ : S > 130).  
 Rosado *et al.* 1996, A&A, 315, 243. Optical kinematics.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Dickel *et al.* 2000, ApJ, 543, 840. ATCA at 1.34 GHz (8″.5 × 6″.4 : S > 60 Jy), 4.80 GHz (3″.8 : S = 25 Jy for core only) and 8.64 GHz (3″.2 : S = 15 Jy for core only).

**G327.1–1.1**

**RA:** 15<sup>h</sup>54<sup>m</sup>25<sup>s</sup>  
**Dec:** –55°09′

**1-GHz flux/Jy:** 7?  
**Spectral index:** ?

**Size/arcmin:** 18  
**Type:** C

**Radio:** Shell, with off-centre core.

**X-ray:** Diffuse, with core.

**References:**

Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8′.4 : S = 10 ± 15% Jy).  
 Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 10.6 Jy) and Parkes 64-m at 5 GHz (4′ : S = 4.3 Jy).  
 Lamb & Markert 1981, ApJ, 244, 94. Einstein observations.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 52″ : S = 7.6 Jy).  
 Seward *et al.* 1996, ApJ, 471, 887. ROSAT observations.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Sun *et al.* 1999, ApJ, 511, 274. ASCA and ROSAT observations.

**G327.4+0.4**

**RA:** 15<sup>h</sup>48<sup>m</sup>20<sup>s</sup>  
**Dec:** –53°49′

**1-GHz flux/Jy:** 30?  
**Spectral index:** 0.6

Kes 27

**Size/arcmin:** 21  
**Type:** S

Has been called G327.3+0.4 and G327.3+0.5.

**Radio:** Incomplete, multi-arc shell, brightest to the SE.

**X-ray:** Diffuse, best defined to E.

**Distance:** HI absorption indicates 4.3 to 5.4 kpc.

**References:**

Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : S = 58 Jy) and Parkes 64-m at 5 GHz (4′ : S = 12.4 Jy).  
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).  
 Lamb & Markert 1981, ApJ, 244, 94. Einstein observations.  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 55″).  
 Milne *et al.* 1989, PASAu, 8, 187. MOST at 843 MHz (43″ × 53″ : S = 32.2 ± 6 Jy), and Parkes 64-m at 8.4 GHz (3′ : S = 9.4 ± 0.8 Jy), including polarization.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 53″ : S = 25 Jy).  
 Seward *et al.* 1996, ApJ, 471, 887. ROSAT observations.  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.  
 McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

**G327.4+1.0****RA:** 15<sup>h</sup>46<sup>m</sup>48<sup>s</sup>**Dec:** –53°20′**1-GHz flux/Jy:** 1.9?**Spectral index:** ?**Size/arcmin:** 14**Type:** S**Radio:** Asymmetric shell.**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43'' × 54'' :  $S=2.1$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parkes 64-m at 1.4 GHz (2'.0 × 1'.8), plus HI.

**G327.6+14.6****RA:** 15<sup>h</sup>02<sup>m</sup>50<sup>s</sup>**Dec:** –41°56′**1-GHz flux/Jy:** 19**Spectral index:** 0.6

SN1006, PKS 1459–41

**Size/arcmin:** 30**Type:** S

This is the remnant of the SN of AD1006.

**Radio:** Shell, with two bright arcs.**Optical:** Filaments to the NW, with broad H $\alpha$  component.**X-ray:** Thermal shell, with non-thermal limb-brightened arcs.**Point sources:** The background Schweizer–Middleditch star is near the middle of the remnant.**Distance:** Optical spectra and proper motion indicate 1.7–3.1 kpc, modelling spectra gives  $1.8 \pm 0.3$  kpc.**References:**

van den Bergh 1976, ApJ, 208, L17. Optical.  
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8'.4) and 5 GHz (4'.4).  
 Becker *et al.* 1980, ApJ, 240, L33. X-ray spectroscopy.  
 Schweizer & Middleditch 1980, ApJ, 241, 1039. Possible stellar remnant.  
 Pye *et al.* 1981, MNRAS, 194, 569. Einstein observations.  
 Caswell *et al.* 1983, MNRAS, 204, 921. FIRST at 1415 MHz (77'').  
 Reynolds & Gilmore 1986, AJ, 92, 1138. VLA at 1.37 and 1.67 GHz (16'' × 20'').  
 Kirshner *et al.* 1987, ApJ, 315, L135. Broad H $\alpha$  optical component.  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44'' × 66'').  
 Fesen *et al.* 1988, ApJ, 327, 164. UV absorption spectra of the Schweizer–Middleditch star.  
 Roger *et al.* 1988, ApJ, 332, 940. MOST at 843 MHz (44'' × 66'' :  $S=17.5 \pm 1.5$  Jy).  
 Long *et al.* 1988, ApJ, 333, 749. Optical proper motion for distance.  
 Jones & Pye 1989, MNRAS, 238, 567. EXOSAT observations.  
 Leahy *et al.* 1991, ApJ, 374, 218. HEAO-1 X-ray spectra.  
 Wu *et al.* 1993, ApJ, 416, 247. UV spectra.  
 Ozaki *et al.* 1994, PASJ, 46, 367. X-ray observations.  
 Reynolds & Gilmore 1993, AJ, 106, 272. VLA at 1.37 and 1.67 GHz (24''), including polarization.  
 Moffett *et al.* 1993, AJ, 106, 1566. VLA at 1.37 and 1.67 GHz (10'' × 14''), for proper motion studies.  
 Raymond *et al.* 1995, ApJ, 454, L31. Far UV spectroscopy.  
 Koyama *et al.* 1995, Natur, 378, 255. ASCA observations.  
 Willingale *et al.* 1996, MNRAS, 278, 749. ROSAT observations.  
 Blair *et al.* 1996, ApJ, 468, 871. Optical absorption studies.  
 Laming *et al.* 1996, ApJ, 472, 267. Modelling of optical spectra, including distance.  
 Wu *et al.* 1997, ApJ, 477, L53. Far UV absorption spectra of the Schweizer–Middleditch star.  
 Winkler & Long 1997, ApJ, 486, L137. UV absorption spectra of background quasar.  
 Winkler & Long 1997, ApJ, 491, 829. ROSAT and optical images.  
 Tanimori *et al.* 1998, ApJ, 497, L25.  $\gamma$ -ray detection.  
 Vink *et al.* 2000, A&A, 354, 931. X-ray spectroscopy.  
 Burleigh *et al.* 2000, A&A, 356, 585. Optical spectroscopy of the Schweizer–Middleditch star.  
 Allen *et al.* 2001, ApJ, 558, 739. ASCA, ROSAT and other X-ray observations.

**G328.4+0.2**

(MSH 15–57)

**RA:** 15<sup>h</sup>55<sup>m</sup>30<sup>s</sup>**1-GHz flux/Jy:** 15**Size/arcmin:** 5**Dec:** –53°17′**Spectral index:** 0.12**Type:** F**Radio:** Amorphous emission, with central bar.**X-ray:** Detected at high energies.**Distance:** HI absorption indicates at least 17.4 ± 0.9 kpc.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz (50″).

Wilson 1986, ApJ, 302, 718. Lack of detection with Einstein.

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 54″ : S = 15 Jy).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Gaensler *et al.* 2000, ApJ, 542, 380. ATCA at 1.4 GHz (19″.5 × 16″.5 : S = 14.3 ± 0.1 Jy) and 4.5 GHz (2″.0 × 1″.5 : S = 12.5 ± 0.2 Jy).Hughes *et al.* 2000, ApJ, 542, 386. ASCA observations.McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.**G329.7+0.4****RA:** 16<sup>h</sup>01<sup>m</sup>20<sup>s</sup>**1-GHz flux/Jy:** >34?**Size/arcmin:** 40 × 33**Dec:** –52°18′**Spectral index:** ?**Type:** S**Radio:** Diffuse shell, in complex region.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 53″ : S &gt; 38).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.**G330.0+15.0**

Lupus Loop

**RA:** 15<sup>h</sup>10<sup>m</sup>00<sup>s</sup>**1-GHz flux/Jy:** 350?**Size/arcmin:** 180?**Dec:** –40°00′**Spectral index:** 0.5?**Type:** S**Radio:** Low surface brightness loop with HI shell.**X-ray:** Detected.**References:**

Milne 1971, AuJPh, 24, 757. Parkes 64-m at 408 MHz (48′), 635 MHz (31′) and 1410 MHz (15′).

Milne &amp; Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8′.4 : S = 120 ± 30% Jy).

Toor 1980, A&amp;A, 85, 184. X-ray image and spectrum.

Colomb &amp; Dubner 1982, A&amp;A, 112, 141. Argentine 30-m dish at 1.42 GHz (30′), HI observations.

Leahy *et al.* 1991, ApJ, 374, 218. HEAO-1 X-ray spectra.Ozaki *et al.* 1994, PASJ, 46, 367. X-ray observations.**G330.2+1.0****RA:** 16<sup>h</sup>01<sup>m</sup>06<sup>s</sup>**1-GHz flux/Jy:** 5?**Size/arcmin:** 11**Dec:** –51°34′**Spectral index:** 0.3**Type:** S?**Radio:** Clumpy non-thermal emission, possibly a distorted shell.**Distance:** HI absorption indicates at least 4.9 kpc.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 8.6 Jy) and Parkes 64-m at 5 GHz (4′ : S = 4.0 Jy).Caswell *et al.* 1983, MNRAS, 204, 915. FIRST at 1415 MHz (52″ × 47″), and MOST at 843 MHz (43″ × 55″).

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 55″ : S = 4.7 Jy).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

**G332.0+0.2**

**RA:** 16<sup>h</sup>13<sup>m</sup>17<sup>s</sup>  
**Dec:** –50°53′

**1-GHz flux/Jy:** 8?  
**Spectral index:** 0.5

**Size/arcmin:** 12  
**Type:** S

**Radio:** Incomplete shell.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 57″).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 55″ : S=8.9 Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

**G332.4–0.4**

**RA:** 16<sup>h</sup>17<sup>m</sup>33<sup>s</sup>  
**Dec:** –51°02′

**1-GHz flux/Jy:** 28  
**Spectral index:** 0.5

**RCW 103**  
**Size/arcmin:** 10  
**Type:** S

**Radio:** Shell, brightest to the S.

**Optical:** Filaments correspond well to the radio shell.

**X-ray:** Detected, with point source near centre.

**Point sources:** Central, variable X-ray source, and nearby pulsar.

**Distance:** HI absorption indicates 3.3 kpc.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.  
 Tuohy & Garmire 1980, ApJ, 239, L107. Einstein detection of X-ray point source.  
 Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz (50″).  
 Lamb & Markert 1981, ApJ, 244, 94. Einstein observations.  
 Ruiz 1983, AJ, 88, 1210. Optical spectra.  
 Tuohy *et al.* 1983, ApJ, 268, 778. X-ray observations.  
 Leibowitz & Danziger 1983, MNRAS, 204, 273. Optical spectra.  
 Nugent *et al.* 1984, ApJ, 284, 612. X-ray spectrum (and Einstein image from Tuohy, private communication).  
 Meaburn & Allen 1986, MNRAS, 222, 593. Optical spectra.  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 57″).  
 Oliva *et al.* 1990, A&A, 240, 453. IR spectroscopy.  
 Dickel *et al.* 1996, AJ, 111, 340. ATCA at 1.36 (8″) and 2.37 GHz (4″.5″), including polarization.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 55″ : S=34 Jy).  
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.  
 Gotthelf *et al.* 1997, ApJ, 487, L175. ASCA observations of compact X-ray source.  
 Torii *et al.* 1998, ApJ, 494, L207. ASCA detection of nearby pulsar.  
 Kaspi *et al.* 1998, ApJ, 503, L161. Pulsar observations.  
 Gotthelf *et al.* 1999, ApJ, 514, L107. X-ray variability of central source.  
 Oliva *et al.* 1999, A&A, 343, 943. ISO spectroscopy.  
 Torii *et al.* 2000, ApJ, 534, L71. X-ray timing on pulsar, including glitch.

**G332.4+0.1**

**RA:** 16<sup>h</sup>15<sup>m</sup>17<sup>s</sup>  
**Dec:** –50°42′

**1-GHz flux/Jy:** 26  
**Spectral index:** 0.5

**MSH 16–51, Kes 32**  
**Size/arcmin:** 15  
**Type:** S

Has been called G332.4+0.2.

**Radio:** Distorted shell, with thermal jet and plume adjacent.

**Point sources:** Pulsar nearby.

**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Roger *et al.* 1985, Natur, 316, 44. MOST at 843 MHz (44″ × 57″).  
 Caraveo 1993, ApJ, 415, L111. Nearby pulsar.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 56″ : S=29 Jy).  
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.  
 Brinkmann *et al.* 1999, A&A, 346, 599. ROSAT image of remnant and nearby pulsar.

**G335.2+0.1****RA:** 16<sup>h</sup>27<sup>m</sup>45<sup>s</sup>**Dec:** –48°47′**1-GHz flux/Jy:** 16**Spectral index:** 0.5**Size/arcmin:** 21**Type:** S**Radio:** Well defined shell.**Point sources:** Old pulsar within remnant boundary.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=27.1$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=8.6$  Jy).Kaspi *et al.* 1996, AJ, 111, 2028. Pulsar observations.Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 57″ :  $S=16$  Jy).Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.**G336.7+0.5****RA:** 16<sup>h</sup>32<sup>m</sup>11<sup>s</sup>**Dec:** –47°19′**1-GHz flux/Jy:** 6**Spectral index:** 0.5**Size/arcmin:** 14 × 10**Type:** S**Radio:** Irregular shell.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Kesteven &amp; Caswell 1987, A&amp;A, 183, 118. MOST at 843 MHz (44″ × 60″).

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 58″ :  $S=6.1$  Jy).Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.**G337.0–0.1****RA:** 16<sup>h</sup>35<sup>m</sup>57<sup>s</sup>**Dec:** –47°36′**1-GHz flux/Jy:** 1.5**Spectral index:** 0.6?**Size/arcmin:** 1.5**Type:** S

(CTB 33)

This entry refers to a small (1′.5) SNR, not the larger previously catalogued G337.0–0.1.

**Radio:** Shell, in a complex region.**Distance:** Association with CTB 33 gives 11 kpc.**Point sources:** Associated with a soft gamma repeater.**References:**

Shaver &amp; Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 58″ :  $S=21$  Jy).Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.Sarma *et al.* 1997, ApJ, 483, 335. ATCA at 1.4 GHz (12″) including HI, and 8.9 GHz (13″ × 15″) for recombination lines, clarifying extent of the remnant.Woods *et al.* 1999, ApJ, 519, L139. Soft gamma repeater observations.Hurley *et al.* 2000, ApJ, 528, L21. ASCA observations of soft gamma repeater.Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.**G337.2–0.7****RA:** 16<sup>h</sup>39<sup>m</sup>28<sup>s</sup>**Dec:** –47°51′**1-GHz flux/Jy:** 2?**Spectral index:** 0.7**Size/arcmin:** 6**Type:** S**Radio:** Shell, not well resolved.**X-ray:** Extended emission.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=3.8$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=0.70$  Jy).Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 58″ :  $S=2.0$  Jy).Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Rakowski *et al.* 2001, ApJ, 548, 258. ASCA and ROSAT observations.

**G337.3+1.0**

Kes 40

**RA:** 16<sup>h</sup>32<sup>m</sup>39<sup>s</sup>**1-GHz flux/Jy:** 16**Size/arcmin:** 15 × 12**Dec:** –46°36′**Spectral index:** 0.55**Type:** S**Radio:** Nearly complete shell.**References:**

Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ :  $S=24.6$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=7.2$  Jy).  
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).  
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 61″).  
 Milne *et al.* 1989, PASAu, 8, 187. MOST at 843 MHz (43″ × 59″ :  $S=14.8 \pm 3.0$  Jy), and Parkes 64-m at 8.4 GHz (3′ :  $S=5.1 \pm 0.6$  Jy), including polarization.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ :  $S=20$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G337.8–0.1**

Kes 41

**RA:** 16<sup>h</sup>39<sup>m</sup>01<sup>s</sup>**1-GHz flux/Jy:** 18**Size/arcmin:** 9 × 6**Dec:** –46°59′**Spectral index:** 0.5**Type:** S**Radio:** Distorted shell.**Distance:** HI absorption suggests > 9.3 kpc.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ :  $S=18$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA detection of compact OH emission.

**G338.1+0.4****RA:** 16<sup>h</sup>37<sup>m</sup>59<sup>s</sup>**1-GHz flux/Jy:** 4?**Size/arcmin:** 15?**Dec:** –46°24′**Spectral index:** 0.4**Type:** S**Radio:** Arc in NE, merging with thermal emission in S.**Optical:** Detected.**X-ray:** Detected.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Zealey *et al.* 1979, A&AS, 38, 39. Optical detection.  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ :  $S=3.8$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

**G338.3–0.0****RA:** 16<sup>h</sup>41<sup>m</sup>00<sup>s</sup>**1-GHz flux/Jy:** 7?**Size/arcmin:** 8**Dec:** –46°34′**Spectral index:** ?**Type:** S**Radio:** Irregular shell, in complex region.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ :  $S=7.4$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G338.5+0.1****RA:** 16<sup>h</sup>41<sup>m</sup>09<sup>s</sup>**Dec:** –46° 19′**1-GHz flux/Jy:** 12?**Spectral index:** ?**Size/arcmin:** 9**Type:** ?**Radio:** Circle of non-thermal emission in complex region, not well defined.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ : S = 13 Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G340.4+0.4****RA:** 16<sup>h</sup>46<sup>m</sup>31<sup>s</sup>**Dec:** –44° 39′**1-GHz flux/Jy:** 5**Spectral index:** 0.4**Size/arcmin:** 10 × 7**Type:** S**Radio:** Distorted shell, elongated east–west.**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 8.2 Jy) and Parkes 64-m at 5 GHz (4′ : S = 2.9 Jy).  
 Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″).  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 330 MHz (75″ × 48″ : S = 9.8 ± 0.9 Jy) and 1.4 GHz (27″ × 9″ : S = 3.6 ± 0.1 Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 61″ : S = 5.9 Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G340.6+0.3****RA:** 16<sup>h</sup>47<sup>m</sup>41<sup>s</sup>**Dec:** –44° 34′**1-GHz flux/Jy:** 5?**Spectral index:** 0.4?**Size/arcmin:** 6**Type:** S**Radio:** Incomplete shell.**Optical:** Possible associated filaments.**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 7.0 Jy) and Parkes 64-m at 5 GHz (4′ : S = 2.8 Jy).  
 Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″).  
 Zealey *et al.* 1979, A&AS, 38, 39. Optical.  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 330 MHz (75″ × 48″ : S = 9.2 ± 0.9 Jy) and 1.4 GHz (27″ × 9″ : S = 5.8 ± 0.1 Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 61″ : S = 4.5 Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

**G341.2+0.9****RA:** 16<sup>h</sup>47<sup>m</sup>35<sup>s</sup>**Dec:** –43° 47′**1-GHz flux/Jy:** 1.5?**Spectral index:** 0.6?**Size/arcmin:** 16 × 22**Type:** C**Radio:** Incomplete shell, with extension to SW.**Point sources:** Pulsar in W, with wind nebula.**References:**

Frail *et al.* 1994, ApJ, 437, 781. VLA at 330 MHz (54″ × 116″ : S = 3.0 ± 0.1 Jy) and 1.4 GHz (21″ × 25″ : S = 12.5 ± 0.05 Jy).  
 Giacani *et al.* 2001, AJ, 121, 3133. VLA at 1.4 and 4.9 GHz (25″) of pulsar wind nebula.



**G341.9–0.3**

**RA:** 16<sup>h</sup>55<sup>m</sup>01<sup>s</sup>  
**Dec:** –44°01′

**1-GHz flux/Jy:** 2.5  
**Spectral index:** 0.5

**Size/arcmin:** 7  
**Type:** S

**Radio:** Incomplete shell, brightest to NE.

**References:**

Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ :  $S = 7.4$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S = 1.7$  Jy), see Caswell & Clark 1975, AuJPA, 37, 57 for the maps.  
 Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″), revision of previous flux densities.  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz (35″ × 11″ :  $S = 2.2 \pm 0.1$  Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 62″ :  $S = 2.7$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

**G342.0–0.2**

**RA:** 16<sup>h</sup>54<sup>m</sup>50<sup>s</sup>  
**Dec:** –43°53′

**1-GHz flux/Jy:** 3.5?  
**Spectral index:** 0.4?

**Size/arcmin:** 12 × 9  
**Type:** S

**Radio:** Distorted shell.

**References:**

Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″), estimate  $S_{408 \text{ MHz}} = 5$  Jy,  $S_{5 \text{ GHz}} = 2$  Jy from previous maps.  
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz (35″ × 11″).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 62″ :  $S = 3.5$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

**G342.1+0.9**

**RA:** 16<sup>h</sup>50<sup>m</sup>43<sup>s</sup>  
**Dec:** –43°04′

**1-GHz flux/Jy:** 0.5?  
**Spectral index:** ?

**Size/arcmin:** 10 × 9  
**Type:** S

**Radio:** Incomplete shell.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 63″ :  $S = 0.6$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G343.0–6.0**

**RA:** 17<sup>h</sup>25<sup>m</sup>00<sup>s</sup>  
**Dec:** –46°30′

**1-GHz flux/Jy:** ?  
**Spectral index:** ?

**Size/arcmin:** 250  
**Type:** S

**Radio:** Faint, poorly defined.

**Optical:** Filamentary shell.

**References:**

Walker & Zealey 2001, MNRAS, 325, 287. Optical observations, and review of earlier observations.

**G343.1–2.3**

**RA:** 17<sup>h</sup>08<sup>m</sup>00<sup>s</sup>  
**Dec:** –44°16′

**1-GHz flux/Jy:** 8?  
**Spectral index:** 0.5?

**Size/arcmin:** 32?  
**Type:** C?

**Radio:** Incomplete shell?

**Point sources:** Pulsar near edge, with wind nebula.

**References:**

McAdam *et al.* 1993, Natur, 361, 516. MOST at 843 MHz (smoothed to 2′).  
 Frail *et al.* 1994, ApJ, 437, 781. VLA at 330 MHz (56″ × 111″ :  $S = 10.6$  Jy) and 1.4 GHz (22″ × 27″) near pulsar.  
 Becker *et al.* 1995, A&A, 298, 528. ROSAT of pulsar, and limit for remnant.  
 Giacani *et al.* 2001, AJ, 121, 3133. VLA at 1.4, 4.9 and 8.5 GHz (25″) of pulsar wind nebula.

**G343.1–0.7**

**RA:** 17<sup>h</sup>00<sup>m</sup>25<sup>s</sup>  
**Dec:** –43°14′

**1-GHz flux/Jy:** 7.8  
**Spectral index:** 0.55

**Size/arcmin:** 27 × 21  
**Type:** S

**Radio:** Shell, with smaller thermal shell adjacent.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 63″ :  $S=8.5 \pm 0.6$ ), plus Parkes 64-m at 4.5 GHz ( $S=3.9 \pm 0.6$  Jy) and 8.55 GHz ( $S=2.4 \pm 0.5$  Jy)  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

**G344.7–0.1**

**RA:** 17<sup>h</sup>03<sup>m</sup>51<sup>s</sup>  
**Dec:** –41°42′

**1-GHz flux/Jy:** 2.5?  
**Spectral index:** 0.5

**Size/arcmin:** 10  
**Type:** C?

**Radio:** Aysmmetric shell, with possible core.

**X-ray:** Detected.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=4.7$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=1.3$  Jy).  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (30″ × 43″ :  $S=1.7 \pm 0.1$  Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 65″ :  $S=2.5$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

**G345.7–0.2**

**RA:** 17<sup>h</sup>07<sup>m</sup>20<sup>s</sup>  
**Dec:** –40°53′

**1-GHz flux/Jy:** 0.6?  
**Spectral index:** ?

**Size/arcmin:** 6  
**Type:** S

**Radio:** Poorly defined diffuse shell.

**Point sources:** Old pulsar nearby.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 66″ :  $S=0.7$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G346.6–0.2**

**RA:** 17<sup>h</sup>10<sup>m</sup>19<sup>s</sup>  
**Dec:** –40°11′

**1-GHz flux/Jy:** 8?  
**Spectral index:** 0.5?

**Size/arcmin:** 8  
**Type:** S

**Radio:** Irregular shell.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=14.9$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=4.3$  Jy).  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (31″ × 43″ :  $S=8.1 \pm 0.9$  Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 67″ :  $S=8.7$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA detection of compact OH emission.

**G347.3–0.5****RA:** 17<sup>h</sup>13<sup>m</sup>50<sup>s</sup>**Dec:** –39°45′**1-GHz flux/Jy:** ?**Spectral index:** ?**Size/arcmin:** 65 × 55**Type:** S?**Radio:** Faint emission.**X-ray:** Non-thermal, limb-brightened to W, with central source.**Distance:** Association with molecular clouds, and HII region, suggests 6 kpc.**References:**Koyama *et al.* 1997, PASJ, 49, L7. ASCA of NW.Slane *et al.* 1999, ApJ, 525, 357. ASCA and other observations.Muraishi *et al.* 2000, A&A, 354, L57. High energy  $\gamma$ -ray detection.Butt *et al.* 2001, ApJ, 562, L167. Associated  $\gamma$ -ray emission.**G348.5–0.0****RA:** 17<sup>h</sup>15<sup>m</sup>26<sup>s</sup>**Dec:** –38°28′**1-GHz flux/Jy:** 10?**Spectral index:** 0.4?**Size/arcmin:** 10?**Type:** S?**Radio:** Arc, overlapping G348.5+0.1.**References:**Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz (46'' × 53''), 1.4 GHz (18'' × 33'') and part at 5 GHz (2''.5 × 3''.9).

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43'' × 69'' : S = 10.2 Jy).

Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.**G348.5+0.1****RA:** 17<sup>h</sup>14<sup>m</sup>06<sup>s</sup>**Dec:** –38°32′**1-GHz flux/Jy:** 72**Spectral index:** 0.3**Size/arcmin:** 15**Type:** S

CTB 37A

**Radio:** Shell, poorly define to S and W, overlapping G348.5–0.0 in E.**Distance:** HI absorption indicates 10.2 ± 3.5 kpc.**References:**Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3' : S = 97 Jy).

Milne &amp; Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4'.4 : S = 43 Jy).

Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz (0'.8 : S > 50) and Parkes 64-m at 14.7 GHz (2'.2 : S = 18 ± 5 Jy).

Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz (20'' × 45'').

Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz (46'' × 53''), 1.4 GHz (18'' × 33'') and part at 5 GHz (2''.5 × 3''.9).

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43'' × 69'' : S = 71 Jy).

Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.**G348.7+0.3****RA:** 17<sup>h</sup>13<sup>m</sup>55<sup>s</sup>**Dec:** –38°11′**1-GHz flux/Jy:** 26**Spectral index:** 0.3**Size/arcmin:** 17?**Type:** S

CTB 37B

**Radio:** Incomplete shell with faint eastern extensions.**Distance:** HI absorption indicates 10.2 ± 3.5 kpc.**References:**Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3' : S = 34 Jy).

Milne &amp; Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4'.4 : S = 32 Jy).

Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz (0'.8 : S > 20) and Parkes 64-m at 14.7 GHz (2'.2 : S = 8 ± 3 Jy).

Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz (20'' × 45'').

Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz (46'' × 53'').

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43'' × 69'' : S = 33 Jy).

Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

**G349.2–0.1**

**RA:** 17<sup>h</sup>17<sup>m</sup>15<sup>s</sup>  
**Dec:** –38°04′

**1-GHz flux/Jy:** 1.4?  
**Spectral index:** ?

**Size/arcmin:** 9 × 6  
**Type:** S

**Radio:** Elongated shell, adjacent to bright HII region.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 70″ : S=1.6 Jy).  
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

**G349.7+0.2**

**RA:** 17<sup>h</sup>17<sup>m</sup>59<sup>s</sup>  
**Dec:** –37°26′

**1-GHz flux/Jy:** 20  
**Spectral index:** 0.5

**Size/arcmin:** 2.5 × 2  
**Type:** S

**Radio:** Incomplete clumpy shell, with enhancement to the S.

**Distance:** HI absorption indicates  $18.3 \pm 4.6$  kpc, association with CO features gives 23 kpc.

**References:**

Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).  
 Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : S=31.0 Jy) and Parkes 64-m at 5 GHz (4′ : S=9.1 Jy), no maps.  
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.  
 Shaver *et al.* 1985, Natur, 313, 113. VLA at 1.4 GHz (3″.4 × 14″.5).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 71″ : S=22 Jy).  
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.  
 Reynoso & Mungum 2001, AJ, 121, 347. CO observations of the vicinity.  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.  
 Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.

**G350.0–2.0**

**RA:** 17<sup>h</sup>27<sup>m</sup>50<sup>s</sup>  
**Dec:** –38°32′

**1-GHz flux/Jy:** 26  
**Spectral index:** 0.4

**Size/arcmin:** 45  
**Type:** S

Incorporates the previously catalogued G350.0–1.8 in the NW.

**Radio:** Shell, brightest in NW.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=49.5 Jy) and Parkes 64-m at 5 GHz (4′ : S=13.6 Jy).  
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4).  
 Gaensler 1998, ApJ, 493, 781. VLA and Parkes 64-m at 1.4 GHz (18″ × 21″ : S=22.3 ± 0.3 Jy), clarifying extent of remnant.

**G351.2+0.1**

**RA:** 17<sup>h</sup>22<sup>m</sup>27<sup>s</sup>  
**Dec:** –36°11′

**1-GHz flux/Jy:** 5?  
**Spectral index:** 0.4

**Size/arcmin:** 7  
**Type:** C?

Has been called G351.3+0.2.

**Radio:** Distorted shell, with possible flat-spectrum core.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=8.1 Jy) and Parkes 64-m at 5 GHz (4′ : S=3.1 Jy).  
 Caswell *et al.* 1984, PASAu, 5, 227. MOST at 843 MHz (43″ × 77″).  
 Becker & Helfand 1988, AJ, 95, 883. VLA at 5 GHz (15″), and at 15 GHz of core.  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (32″ × 36″ : S=4.8 ± 0.2 Jy).  
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 73″ : S=5.5 Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G351.7+0.8****RA:** 17<sup>h</sup>21<sup>m</sup>00<sup>s</sup>**Dec:** –35°27′**1-GHz flux/Jy:** 10?**Spectral index:** ?**Size/arcmin:** 18 × 14**Type:** S**Radio:** Elongated shell, adjacent to bright HII region.**Point sources:** Pulsar nearby.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 74″ : S = 11 Jy).

**G351.9–0.9****RA:** 17<sup>h</sup>28<sup>m</sup>52<sup>s</sup>**Dec:** –36°16′**1-GHz flux/Jy:** 1.8?**Spectral index:** ?**Size/arcmin:** 12 × 9**Type:** S**Radio:** Asymmetric shell.**References:**

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 73″ : S = 2.0 Jy).

**G352.7–0.1****RA:** 17<sup>h</sup>27<sup>m</sup>40<sup>s</sup>**Dec:** –35°07′**1-GHz flux/Jy:** 4**Spectral index:** 0.6**Size/arcmin:** 8 × 6**Type:** S**Radio:** Distorted shell.**X-ray:** Detected.**References:**Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 9.6 Jy) and Parkes 64-m at 5 GHz (4′ : S = 2.3 Jy).Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (1′.1).Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (34″ : S = 3.4 ± 0.4 Jy).

Whiteoak &amp; Green 1996, A&amp;AS, 118, 329. MOST at 843 MHz (43″ × 75″ : S = 4.4 Jy).

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Kinugasa *et al.* 1998, PASJ, 50, 249. ASCA observations.Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.**G353.9–2.0****RA:** 17<sup>h</sup>38<sup>m</sup>55<sup>s</sup>**Dec:** –35°11′**1-GHz flux/Jy:** 1?**Spectral index:** 0.5?**Size/arcmin:** 13**Type:** S**Radio:** Shell, with central double source.**References:**

Green 2001, MNRAS, 326, 283. VLA at 327 MHz (3′.0 × 2′.7) and 1.4 GHz (42″ × 36″), plus 8.4 GHz (8″.4 × 6″.1) of central source only.

**G354.1+0.1****RA:** 17<sup>h</sup>30<sup>m</sup>28<sup>s</sup>**Dec:** –33°46′**1-GHz flux/Jy:** ?**Spectral index:** varies?**Size/arcmin:** 15 × 3?**Type:** C?

Is this a SNR?

**Radio:** Elongated N–S.**Point sources:** Pulsar at S tip.**References:**Frail *et al.* 1994, ApJ, 437, 781. VLA at 330 MHz (47″ × 99″) and 1.4 GHz (8″.8 × 21″).

**G354.8–0.8**

**RA:** 17<sup>h</sup>36<sup>m</sup>00<sup>s</sup>  
**Dec:** –33°42′

**1-GHz flux/Jy:** 2.8?  
**Spectral index:** ?

**Size/arcmin:** 19  
**Type:** S

**Radio:** Distorted shell.

**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 78″ :  $S=3.1$  Jy).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.  
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

**G355.6–0.0**

**RA:** 17<sup>h</sup>35<sup>m</sup>16<sup>s</sup>  
**Dec:** –32°38′

**1-GHz flux/Jy:** 3?  
**Spectral index:** ?

**Size/arcmin:** 8 × 6  
**Type:** S

**Radio:** Well defined shell.

**X-ray:** Detected.

**References:**

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 80″ :  $S=2.6$  Jy).  
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

**G355.9–2.5**

**RA:** 17<sup>h</sup>45<sup>m</sup>53<sup>s</sup>  
**Dec:** –33°43′

**1-GHz flux/Jy:** 8  
**Spectral index:** 0.5

**Size/arcmin:** 13  
**Type:** S

**Radio:** Distorted shell, brightest to SE.

**References:**

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ :  $S=12.3$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=3.4$  Jy).  
 Caswell *et al.* 1984, PASAu, 5, 227. MOST at 843 MHz (43″ × 77″).  
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (32″ × 34″ :  $S=5.0 \pm 0.3$  Jy).  
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 77″).  
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

**G356.2+4.5**

**RA:** 17<sup>h</sup>19<sup>m</sup>00<sup>s</sup>  
**Dec:** –29°40′

**1-GHz flux/Jy:** 4  
**Spectral index:** 0.7

**Size/arcmin:** 25  
**Type:** S

**Radio:** Faint shell.

**References:**

Bhatnagar 2000, MNRAS, 317, 453. GMRT at 327 MHz (3′ × 1′.5 :  $S=8.1 \pm 1.7$  Jy), and NVSS at 1.4 GHz.

**G356.3–0.3**

**RA:** 17<sup>h</sup>37<sup>m</sup>56<sup>s</sup>  
**Dec:** –32°16′

**1-GHz flux/Jy:** 3?  
**Spectral index:** ?

**Size/arcmin:** 11 × 7  
**Type:** S

**Radio:** Elongated shell, brighter in N.

**References:**

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 81″ :  $S=2.6$  Jy).

**G356.3–1.5**

**RA:** 17<sup>h</sup>42<sup>m</sup>35<sup>s</sup>  
**Dec:** –32°52′

**1-GHz flux/Jy:** 3?  
**Spectral index:** ?

**Size/arcmin:** 20 × 15  
**Type:** S

**Radio:** Double arc.

**References:**

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 79″ :  $S=2.8$  Jy).

**G357.7–0.1**

**RA:** 17<sup>h</sup>40<sup>m</sup>29<sup>s</sup>  
**Dec:** –30°58′

**1-GHz flux/Jy:** 37  
**Spectral index:** 0.4

**MSH 17–39**  
**Size/arcmin:** 8 × 3?  
**Type:** ?

Has been suggested that this is not a SNR.

**Radio:** Multiple arcs and filaments.

**Point sources:** Peripheral compact source (possibly a compact HII region).

**References:**

Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ :  $S=54.2$  Jy) and Parkes 64-m at 5 GHz (4′ :  $S=18.5$  Jy).  
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 :  $S=14.6$  Jy).  
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).  
 Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz (50″).  
 Weiler & Panagia 1980, A&A, 90, 269. Effelsberg 100-m at 9 GHz (1′.5) (private communication from Baker).  
 Shaver *et al.* 1985, Natur, 313, 113. VLA at 1.4 GHz (3″.8 × 10″.9) and 5 GHz (12″ × 26″).  
 Becker & Helfand 1985, Natur, 313, 115. VLA at 1.4 GHz and 5 GHz, suggest it is not a SNR, see Helfand & Becker 1985 Natur, 313, 118.  
 Shaver *et al.* 1985, A&A, 147, L23. Observations of peripheral compact source.  
 Caswell *et al.* 1989, PASAu, 8, 184. MOST at 843 MHz (43″ × 83″).  
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 84″).  
 Stewart *et al.* 1994, ApJ, 432, L39. ATCA at 4.79 and 5.84 GHz (12″ × 22″) and Effelsberg 100-m at 10.6 GHz (1′), including polarization.  
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.  
 Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.  
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43″ × 24″).  
 Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.

**G357.7+0.3**

**RA:** 17<sup>h</sup>38<sup>m</sup>35<sup>s</sup>  
**Dec:** –30°44′

**1-GHz flux/Jy:** 10  
**Spectral index:** 0.4?

**Size/arcmin:** 24  
**Type:** S

**Radio:** Non-thermal shell in complex region.

**References:**

Reich & Fürst 1984, A&AS, 57, 165. Effelsberg 100-m at 2.7 GHz (4′.3 :  $S=7 \pm 1.5$  Jy),  $S_{5\text{ GHz}} = 5.5 \pm 1.5$  Jy from surveys.  
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 84″).  
 Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.

**G358.0+3.8**

**RA:** 17<sup>h</sup>26<sup>m</sup>00<sup>s</sup>  
**Dec:** –28°36′

**1-GHz flux/Jy:** 1.5?  
**Spectral index:** ?

**Size/arcmin:** 38  
**Type:** S

**Radio:** Faint shell.

**References:**

Bhatnagar 2000, MNRAS, 317, 453. GMRT at 327 MHz (2′.2 × 1′.3 :  $S=2.5 \pm 1.3$  Jy), and NVSS at 1.4 GHz.

**G359.0–0.9****RA:** 17<sup>h</sup>46<sup>m</sup>50<sup>s</sup>**Dec:** –30° 16′**1-GHz flux/Jy:** 23**Spectral index:** 0.5**Size/arcmin:** 23**Type:** S**Radio:** Incomplete shell.**X-ray:** Partial shell.**References:**

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.  
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).  
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 86″).  
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43″ × 24″).  
 Bamba *et al.* 2000, PASJ, 52, 259. ASCA observations.

**G359.1–0.5****RA:** 17<sup>h</sup>45<sup>m</sup>30<sup>s</sup>**Dec:** –29° 57′**1-GHz flux/Jy:** 14**Spectral index:** 0.4?**Size/arcmin:** 24**Type:** S**Radio:** Non-thermal shell in complex region, crossed by the ‘snake’.**X-ray:** Centrally brightened.**Point sources:** Several compact radio sources near centre, OH masers around edge.**References:**

Downes *et al.* 1979, A&AS, 35, 1. From observations by Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6:  $S=13$  Jy).  
 Reich & Fürst 1984, A&AS, 57, 165. Effelsberg 100-m at 2.7 GHz (4′.3:  $S=10\pm 1.5$  Jy) and 4.8 GHz (2′.4:  $S=8.1\pm 0.5$  Jy).  
 Uchida *et al.* 1992, ApJ, 398, 128. VLA at 1.5 GHz (11″ × 10″), and observations of nearby molecular material.  
 Uchida *et al.* 1992, AJ, 104, 1533. VLA at 1.4 GHz.  
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 85″).  
 Yusef-Zadeh *et al.* 1995, Sci, 270, 1801. VLA at 1.4 GHz (33″ × 31″), and 1.7 GHz for OH survey.  
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43″ × 24″).  
 Bamba *et al.* 2000, PASJ, 52, 259. ASCA observations.

**G359.1+0.9****RA:** 17<sup>h</sup>39<sup>m</sup>36<sup>s</sup>**Dec:** –29° 11′**1-GHz flux/Jy:** 5?**Spectral index:** ?**Size/arcmin:** 12 × 11**Type:** S**Radio:** Shell, brightest in E.**References:**

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 88″:  $S=4.3$  Jy).