

G0.0+0.0

RA: 17^h45^m44^s
Dec: –29°00′

1-GHz flux/Jy: 100?
Spectral index: 0.8?

Sgr A East
Size/arcmin: 3.5 × 2.5
Type: S

Radio: Non-thermal shell, in complex region, interacting with molecular material to the west.

X-ray: Diffuse emission, centrally peaked.

Point sources: Compact X-ray source.

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, Nature, 350, 309. VLA of NH₃ 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 & Mehringer 1995, ApJ, 452, L37. VLA of nearby H₂O masers.
 Yusef-Zadeh *et al.* 1999, ApJ, 512, 230. OH maser observations.
 Coil & Ho 2000, ApJ, 533, 245. NH₃ observations of surroundings.
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (24'' × 43'').
 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.
 Maeda *et al.* 2002, ApJ, 570, 671. Chandra observations.
 Sakano *et al.* 2003, AN, 324 (No S1), 197. XMM observations.
 Roy & Rao 2004, MNRAS, 349, L25. GMRT at 620 MHz (6'.6 × 11'.4).
 Sakano *et al.* 2004, MNRAS, 350, 129. XMM observations.
 Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz (1'' × 2''2).
 Park *et al.* 2005, ApJ, 631, 964. Chandra observations.
 Aharonian *et al.* 2006, ApJ, 636, 777. γ -ray detection.
 Koyama *et al.* 2007, PASJ, 59, S237. Suzaku observations.
 Lee *et al.* 2008, ApJ, 674, 247. Molecular H₂ observations of surroundings.
 Sjouwerman & Pihlström 2008, ApJ, 681, 1287. VLA at 1.7 GHz of OH masers.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G0.3+0.0

RA: 17^h46^m15^s
Dec: –28°38′

1-GHz flux/Jy: 22
Spectral index: 0.6

Size/arcmin: 15 × 8
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 (30'').
 Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz (30'').

G0.9+0.1

RA: 17^h47^m21^s
Dec: –28°09′

1-GHz flux/Jy: 18?
Spectral index: varies

Size/arcmin: 8
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.
 Porquet *et al.* 2003, A&A, 401, 197. XMM observations.
 Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz (8''6 × 11''3).
 Aharonian *et al.* 2005, A&A, 432, L25. γ -ray detection.
 Dubner *et al.* 2008, A&A, 487, 1033. ATCA and VLA at 1.4 GHz (1''2 × 2''5 : S = 8.3 ± 0.7 Jy), 5 GHz (1''6 × 2''5) and 8.3 GHz (0''8 × 1''5).

G1.0–0.1

RA: 17^h48^m30^s
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'').
 Mehninger *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.
 Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz (30'').
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G1.4–0.1

RA: 17^h49^m39^s
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.
 Bhatnagar 2002, MNRAS, 332, 1. GMRT at 327 MHz (2''7 × 2''4 : S = 4.2 ± 0.5).
 Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz (8''2 × 12''2).
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G1.9+0.3

RA: 17^h48^m45^s
Dec: –27°10′

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

Size/arcmin: 1.5
Type: S

Radio: Shell, brighter to the N, brightening.

X-ray: Shell, with bright limbs to E and W.

References:

Green & Gull 1984, *Nature*, 312, 527. VLA at 5 GHz ($4''.4 \times 2''$).
 Gray 1994, *MNRAS*, 270, 835. MOST at 843 MHz ($43'' \times 94''$).
 Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m OH observations.
 Yusef-Zadeh *et al.* 2004, *ApJS*, 155, 421. VLA at 1.4 GHz ($8''.3 \times 12''$).
 Nord *et al.* 2004, *AJ*, 128, 1646. VLA at 330 MHz ($7'' \times 12''$).
 Green 2004, *BASI*, 32, 335. VLA at 1.5 GHz ($7''.2 \times 9''.4$).
 Reynolds *et al.* 2008, *ApJ*, 680, L41. Chandra observations.
 Green *et al.* 2008, *MNRAS*, 387, L54. VLA at 4.86 GHz ($4'' \times 10''$), for expansion studies.
 Murphy *et al.* 2008, *MNRAS*, 389, L23. MOST at 843 MHz for flux increase.

G3.7–0.2

RA: 17^h55^m26^s
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 ($43'' \times 99''$; $S=2.4$ Jy).
 Gaensler 1998, *ApJ*, 493, 781. VLA at 1.4 GHz ($9'' \times 15''$; $S=1.7 \pm 0.1$ Jy).
 Yusef-Zadeh *et al.* 2004, *ApJS*, 155, 421. VLA at 1.4 GHz ($8''.4 \times 11''.4$).

G3.8+0.3

RA: 17^h52^m55^s
Dec: –25°28′

1-GHz flux/Jy: 3?
Spectral index: 0.6

Size/arcmin: 18
Type: S?

Radio: Incomplete shell.

References:

Gray 1994, *MNRAS*, 270, 847. MOST at 843 MHz ($43'' \times 100''$; $S=3.5$ Jy).
 Bhatnagar 2002, *MNRAS*, 332, 1. GMRT at 327 MHz ($27'' \times 17''$; $S=6.0 \pm 0.4$).

G4.2–3.5

RA: 18^h08^m55^s
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

Kepler, SN1604, 3C358

RA: 17^h30^m42^s
Dec: –21°29′**1-GHz flux/Jy:** 19
Spectral index: 0.64**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 & Kamper 1977, ApJ, 218, 617. Optical proper motions.
Leibowitz & Danziger 1983, MNRAS, 204, 273. Optical spectra.
White & 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 & van den Bergh 1991, ApJ, 374, 186. Optical changes.
van den Bergh 1991, PASP, 103, 194. Optical imaging.
Predehl & Schmitt 1995, A&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 & Goss 1999, AJ, 118, 926. VLA at 1.4 GHz (23'' × 13'') for HI studies.
Kinugasa & Tsunemi 1999, PASJ, 51, 239. ASCA observations.
Gerardy & Fesen 2001, AJ, 121, 2781. IR spectroscopy and imaging.
DeLaney *et al.* 2002, ApJ, 580, 914. VLA at 1.3 to 1.5 GHz and 5 GHz (7''2) for spectral index studies.
Morgan *et al.* 2003, ApJ, 597, L33. Sub-mm dust observations.
Sollerman *et al.* 2003, A&A, 407, 249. Optical spectroscopy.
Cassam-Chenaï *et al.* 2004, A&A, 414, 545. XMM observations.
Bamba *et al.* 2005, ApJ, 621, 793. Chandra observations of rim.
Riesgo & López 2005, RMxAA, 41, 57. Optical observations of filament (previously classified as PN, H 2-12).
Blair *et al.* 2007, ApJ, 662, 998. Spitzer IR observations.
Reynolds *et al.* 2007, ApJ, 668, L135. Chandra observations.
Sankrit *et al.* 2008, AJ, 135, 538. HST observations.
Aharonian *et al.* 2008, A&A, 488, 219. γ -ray upper limit.
Enomoto *et al.* 2008, ApJ, 683, 383. γ -ray upper limit.
Katsuda *et al.* 2008, ApJ, 689, 225. Chandra proper motion studies.
Vink *et al.* 2008, ApJ, 689, 231. Chandra proper motion studies.

G4.8+6.2**RA:** 17^h33^m25^s
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^h07^m30^s
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

RA: 18^h02^m10^s
Dec: –24°54′

1-GHz flux/Jy: 35?
Spectral index: 0.2?

Milne 56
Size/arcmin: 35
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 nearby, in 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±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, Nature, 313, 115. VLA at 1.4 and 5 GHz.
 Helfand & Becker 1985, Nature, 313, 118. Suggesting it is not a SNR.
 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, Nature, 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±2.1 Jy) and 8.4 GHz (3′ : S=24±3 Jy), including polarisation.
 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, Nature, 406, 158. Pulsar observations, including proper motion.
 Kaspi *et al.* 2001, ApJ, 562, L163. X-ray detection of pulsar, and upper limit for remnant.
 Reich 2002, in NSPS, p1. Effelsberg 100-m at 10.6 GHz, including polarisation.
 Blazek *et al.* 2006, ApJ, 652, 1523. Proper motion study of pulsar.
 Zeiger *et al.* 2008, ApJ, 674, 271. Proper motion study of pulsar.

G5.5+0.3

RA: 17^h57^m04^s
Dec: –24°00′

1-GHz flux/Jy: 5.5
Spectral index: 0.7

Size/arcmin: 15 × 12
Type: S

Has been called G5.55+0.32.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : S=14.3±0.3 Jy), plus other observations.

G5.9+3.1

RA: 17^h47^m20^s
Dec: –22°16′

1-GHz flux/Jy: 3.3?
Spectral index: 0.4?

Size/arcmin: 20
Type: S

Radio: Asymmetric shell.

References:

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

G6.1+0.5**RA:** 17^h57^m29^s
Dec: –23°25′**1-GHz flux/Jy:** 4.5
Spectral index: 0.9**Size/arcmin:** 18 × 12
Type: S

Has been called G6.10+0.53.

Radio: Partial shell.**References:**Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″: $S = 13.4 \pm 0.2$ Jy), plus other observations.

G6.1+1.2**RA:** 17^h54^m55^s
Dec: –23°05′**1-GHz flux/Jy:** 4.0?
Spectral index: 0.3?**Size/arcmin:** 30 × 26
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^h00^m30^s**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: Diffuse emission.

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

Point sources: Young pulsar near edge of remnant, but not thought to be related.

Distance: HI observations suggest 1.9 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 observations.
 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, Nature, 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 γ -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.
 Arikawa *et al.* 1999, PASJ, 51, L7. Observations of shocked CO.
 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'' : S = 425 ± 40 Jy) and 1415 MHz (88'' × 48'' : S = 246 ± 20 Jy), and comparison with other observations.
 Reach & Rho 2000, ApJ, 544, 843. ISO observations of interactions with surroundings.
 Rowell *et al.* 2000, A&A, 359, 337. Upper limit on high energy γ -rays.
 Douvion *et al.* 2001, A&A, 373, 281. ISO observations.
 Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.
 Velázquez *et al.* 2002, AJ, 124, 2145. Parkes 64-m at 1.4 GHz (15') for HI.
 Rho & Borkowski 2002, ApJ, 575, 201. ROSAT and ASCA observations.
 Claussen *et al.* 2002, ApJ, 580, 909. Observations of nearby source.
 Yusef-Zadeh *et al.* 2003, ApJ, 583, 267. OH observations.
 Caswell 2004, MNRAS, 349, 99. ATCA at 1.7 GHz of associated OH masers.
 Mavromatakis *et al.* 2004, A&A, 426, 567. Optical observations.
 Reach *et al.* 2005, ApJ, 618, 297. Molecular lines and near IR observations.
 Hoffman *et al.* 2005, ApJ, 620, 257. OH maser observations.
 Kawasaki *et al.* 2005, ApJ, 631, 935. ASCA observations.
 Neufeld *et al.* 2007, ApJ, 664, 890. Spitzer IR observations.
 Aharonian *et al.* 2008, A&A, 481, 401. γ -ray observations.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G6.4+4.0**RA:** 17^h45^m10^s**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).

G6.5–0.4

RA: 18^h02^m11^s
Dec: –23°34′

1-GHz flux/Jy: 27
Spectral index: 0.6

Size/arcmin: 18
Type: S

Has been called G6.51–0.48, and part has been called G6.67–0.42.

Radio: Shell.

References:

Yusef-Zadeh *et al.* 2000, ApJ, 540, 842. VLA at 330 MHz (2′.6 × 5′.5) and 1.4 GHz (0′.7 × 1′.1).
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=60.8 \pm 0.4$ Jy), plus other observations.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.

G7.0–0.1

RA: 18^h01^m50^s
Dec: –22°54′

1-GHz flux/Jy: 2.5?
Spectral index: 0.5?

Size/arcmin: 15
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″).

G7.2+0.2

RA: 18^h01^m07^s
Dec: –22°38′

1-GHz flux/Jy: 2.8
Spectral index: 0.6

Size/arcmin: 12
Type: S

Has been called G7.20+0.20.

Radio: Partial shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=5.2 \pm 0.2$ Jy), plus other observations.

G7.7–3.7

RA: 18^h17^m25^s
Dec: –24°04′

1-GHz flux/Jy: 11
Spectral index: 0.32

1814–24
Size/arcmin: 22
Type: S

Radio: Shell, with high polarisation.

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 polarisation, 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 polarisation.

G8.3–0.0

RA: 18^h04^m34^s
Dec: –21°49′

1-GHz flux/Jy: 1.2
Spectral index: 0.6

Size/arcmin: 5 × 4
Type: S

Has been called G8.31–0.09.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=2.3 \pm 0.1$ Jy), plus other observations.
 Higashi *et al.* 2008, ApJ, 683, 957. γ -ray detection.

G8.7–5.0**RA:** 18^h24^m10^s**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****RA:** 18^h05^m30^s**Dec:** –21°26′**1-GHz flux/Jy:** 80**Spectral index:** 0.5**Size/arcmin:** 45**Type:** S?

(W30)

Has been called G8.6–0.1.

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 ± 50 Jy).

Kassim & Weiler 1990, Nature, 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 ± 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.

Aharonian *et al.* 2005, Science, 307, 1938. γ -ray detection.Aharonian *et al.* 2006, ApJ, 636, 777. γ -ray observations.Landi *et al.* 2006, ApJ, 651, 190. X-ray observations.Briskin *et al.* 2006, ApJ, 652, 554. Pulsar proper motion.**G8.9+0.4****RA:** 18^h03^m58^s**Dec:** –21°03′**1-GHz flux/Jy:** 9**Spectral index:** 0.6**Size/arcmin:** 24**Type:** S

Has been called G8.90+0.40.

Radio: Shell.**References:**Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : S=18.2 ± 0.5 Jy), plus other observations.**G9.7–0.0****RA:** 18^h07^m22^s**Dec:** –20°35′**1-GHz flux/Jy:** 3.7**Spectral index:** 0.6**Size/arcmin:** 15 × 11**Type:** S

Has been called G9.7–0.1 and G9.70–0.06.

Radio: Shell.**References:**Frail *et al.* 1994, AJ, 107, 1120. VLA at 327 MHz.Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : S=6.5 ± 0.2 Jy), plus other observations.

G9.8+0.6

RA: 18^h05^m08^s
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).
 Frail *et al.* 1994, AJ, 107, 1120. VLA at 327 MHz.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G9.9–0.8

RA: 18^h10^m41^s
Dec: –20°43′

1-GHz flux/Jy: 6.7
Spectral index: 0.4

Size/arcmin: 12
Type: S

Has been called G9.95–0.81.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=11.0 \pm 0.3$ Jy), plus other observations.

G10.5–0.0

RA: 18^h09^m08^s
Dec: –19°47′

1-GHz flux/Jy: 0.9
Spectral index: 0.6

Size/arcmin: 6
Type: S

Has been called G10.59–0.04.

Radio: Partial shell.

X-ray: Detected.

References:

Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA observations.
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=1.4 \pm 0.1$ Jy), plus other observations.

G11.0–0.0

RA: 18^h10^m04^s
Dec: –19°25′

1-GHz flux/Jy: 1.3
Spectral index: 0.6

Size/arcmin: 11 × 9
Type: S

Has been called G11.0+0.0 and G11.03–0.05.

Radio: Partial shell.

X-ray: Diffuse emission.

References:

Bamba *et al.* 2003, ApJ, 589, 253. ASCA observations.
 Brogan *et al.* 2004, AJ, 127, 355. VLA at 330 MHz (25″), 1.5 GHz (25″), and 74 MHz.
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=3.1 \pm 0.2$ Jy), plus other observations.

G11.1–1.0

RA: 18^h14^m03^s
Dec: –19°46′

1-GHz flux/Jy: 5.8
Spectral index: 0.6

Size/arcmin: 18 × 12
Type: S

Has been called G11.2–1.1 and G11.17–1.04.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=11.0 \pm 0.3$ Jy), plus other observations.

G11.1–0.7

RA: 18^h12^m46^s
Dec: –19°38′

1-GHz flux/Jy: 1.0
Spectral index: 0.7

Size/arcmin: 11 × 7
Type: S

Has been called G11.15–0.71.

Radio: Partial shell.

References:

Brogan *et al.* 2004, AJ, 127, 355. VLA at 330 MHz (25''), 1.5 GHz (25''), and 74 MHz.
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42'': $S=2.3\pm 0.1$ Jy), plus other observations.

G11.1+0.1

RA: 18^h09^m47^s
Dec: –19°12′

1-GHz flux/Jy: 2.3
Spectral index: 0.4

Size/arcmin: 12 × 10
Type: S

Has been called G11.18+0.11.

Radio: Shell.

References:

Brogan *et al.* 2004, AJ, 127, 355. VLA at 330 MHz (25''), 1.5 GHz (25''), and 74 MHz.
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42'': $S=3.5\pm 0.2$ Jy), plus other observations.

G11.2–0.3

RA: 18^h11^m27^s
Dec: –19°25′

1-GHz flux/Jy: 22
Spectral index: 0.6

Size/arcmin: 4
Type: C

Probably associated with the SN of AD386.

Radio: Symmetrical clumpy shell, with flatter spectrum core.

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

Point sources: Central pulsar.

Distance: HI absorption indicates 4.4 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.
 Vasisht *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.
 Tam *et al.* 2002, ApJ, 572, 202. VLA at 1.4/1.5 GHz (2''6 × 1''8: $S=16.6\pm 0.9$ Jy) and 5 GHz (2''1 × 1''5: $S=8.4\pm 0.9$ Jy) for spectral studies.
 Reich 2002, in NSPS, p1. Effelsberg 100-m at 14.7 GHz.
 Tam & Roberts 2003, ApJ, 598, L27. Multi-epoch VLA observations at 1.4/1.5 GHz and 5 GHz, for expansion studies.
 Roberts *et al.* 2003, ApJ, 588, 992. Chandra observations.
 Brogan *et al.* 2004, AJ, 127, 355. VLA at 330 MHz (25''), 1.5 GHz (25''), and 74 MHz.
 Bock & Gaensler 2005, ApJ, 626, 343. BIMA at 88.6 GHz (18'').
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Kaplan & Moon 2006, ApJ, 644, 1056. IR upper limit for pulsar.
 Koo *et al.* 2007, ApJ, 657, 308. IR observations.
 Dean *et al.* 2008, MNRAS, 384, L29. Integral observations of pulsar and nebula.

G11.4–0.1

RA: 18^h10^m47^s
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.
 Brogan *et al.* 2004, AJ, 127, 355. VLA at 330 MHz (25″), 1.5 GHz (25″), and 74 MHz.

G11.8–0.2

RA: 18^h12^m25^s
Dec: –18°44′

1-GHz flux/Jy: 0.7
Spectral index: 0.3

Size/arcmin: 4
Type: S

Has been called G11.89–0.21.

Radio: Shell.

X-ray: Detected.

References:

Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA observations.
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=0.9 \pm 0.1$ Jy), plus other observations.

G12.0–0.1

RA: 18^h12^m11^s
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.

G12.2+0.3

RA: 18^h11^m17^s
Dec: –18°10′

1-GHz flux/Jy: 0.8
Spectral index: 0.7

Size/arcmin: 6 × 5
Type: S

Has been called G12.26+0.30.

Radio: Partial shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=1.5 \pm 0.1$ Jy), plus other observations.

G12.5+0.2

RA: 18^h12^m14^s
Dec: –17°55′

1-GHz flux/Jy: 0.6
Spectral index: 0.4

Size/arcmin: 6 × 5
Type: C?

Has been called G12.58+0.22.

Radio: Diffuse, central brightened.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=0.8 \pm 0.1$ Jy), plus other observations.

G12.7–0.0

RA: 18^h13^m19^s
Dec: –17°54′

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

Size/arcmin: 6
Type: S

Has been called G12.72–0.00.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=2.0 \pm 0.1$ Jy), plus other observations.

G12.8–0.0

RA: 18^h13^m37^s
Dec: –17°49′

1-GHz flux/Jy: 0.8
Spectral index: 0.5

Size/arcmin: 3
Type: C?

Has been called G12.82–0.02 and G12.83–0.02.

Radio: Shell.

X-ray: Diffuse, with central source.

References:

Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA observations.
 Brogan *et al.* 2005, ApJ, 629, L105. VLA at 330 MHz (19″ × 32″), plus other observations.
 Ubertini *et al.* 2005, ApJ, 629, L109. X-ray, γ -ray and other observations.
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″ : $S=1.2 \pm 0.1$ Jy), plus other observations.
 Aharonian *et al.* 2006, ApJ, 636, 777. γ -ray detection.
 Albert *et al.* 2006, ApJ, 637, L41. γ -ray observations.
 Landi *et al.* 2006, ApJ, 651, 190. X-ray observations.
 Funk *et al.* 2007, A&A, 470, 249. XMM observations, CO observations of surroundings.
 Helfand *et al.* 2007, ApJ, 665, 1297. Chandra observations.

G13.3–1.3

RA: 18^h19^m20^s
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^h14^m14^s
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.

G14.1–0.1

RA: 18^h15^m52^s
Dec: –16°34′

1-GHz flux/Jy: 0.5
Spectral index: 0.6

Size/arcmin: 6 × 5
Type: S

Has been called G14.18–0.12.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S=0.9\pm 0.1$ Jy), plus other observations.

G14.3+0.1

RA: 18^h15^m58^s
Dec: –16°27′

1-GHz flux/Jy: 0.6
Spectral index: 0.4

Size/arcmin: 5 × 4
Type: S

Has been called G14.30+0.14.

Radio: Partial shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S=1.2\pm 0.1$ Jy), plus other observations.

G15.1–1.6

RA: 18^h24^m00^s
Dec: –16°34′

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

Size/arcmin: 30 × 24
Type: S

Radio: Elongated, incomplete shell.

Optical: Diffuse 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 ($4'/3$).
 Boumis *et al.* 2008, A&A, 481, 705. Optical detection.

G15.4+0.1

RA: 18^h18^m02^s
Dec: –15°27′

1-GHz flux/Jy: 5.6
Spectral index: 0.6

Size/arcmin: 15 × 14
Type: S

Has been called G15.42+0.18.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S=10.9\pm 0.3$ Jy), plus other observations.

G15.9+0.2

RA: 18^h18^m52^s
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.

X-ray: Shell, brighter to S and 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 ($6′.8 : S = 1.1 ± 0.2$ 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 ($77″ × 61″ : S = 11.2 ± 1.0$ Jy), 1.4 GHz ($23″ × 14″ : S = 3.9 ± 0.1$ Jy) and 4.9 GHz ($13″ × 16″$).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Reynolds *et al.* 2006, ApJ, 652, L45. Chandra observations.

G16.0–0.5

RA: 18^h21^m56^s
Dec: –15°14′

1-GHz flux/Jy: 2.7
Spectral index: 0.6

Size/arcmin: 15 × 10
Type: S

Has been called G16.05–0.57.

Radio: Shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42″ : S = 4.9 ± 0.2$ Jy), plus other observations.

G16.2–2.7

RA: 18^h29^m40^s
Dec: –16°08′

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.

G16.4–0.5

RA: 18^h22^m38^s
Dec: –14°55′

1-GHz flux/Jy: 4.6
Spectral index: 0.7

Size/arcmin: 13
Type: S

Has been called G16.41–0.55.

Radio: Partial shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42″ : S = 10.0 ± 0.3$ Jy), plus other observations.

G16.7+0.1**RA:** 18^h20^m56^s**1-GHz flux/Jy:** 3.0**Size/arcmin:** 4**Dec:** –14°20′**Spectral index:** 0.6**Type:** C

Has been called G16.73+0.08.

Radio: Asymmetric shell with flat-spectrum core.**X-ray:** Non-thermal core.**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.
 Reynoso & Mangum 2000, ApJ, 545, 874. CO observations of surroundings.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Helfand *et al.* 2003, ApJ, 592, 941. XMM observations.
 Bock & Gaensler 2005, ApJ, 626, 343. BIMA at 88.6 GHz ($19'' \times 25''$).
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G16.8–1.1**RA:** 18^h25^m20^s**1-GHz flux/Jy:** 2?**Size/arcmin:** 30 × 24?**Dec:** –14°46′**Spectral index:** ?**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.

G17.0–0.0**RA:** 18^h21^m57^s**1-GHz flux/Jy:** 0.5**Size/arcmin:** 5**Dec:** –14°08′**Spectral index:** 0.5**Type:** S

Has been called G17.02–0.04.

Radio: Shell.**References:**

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S=0.7 \pm 0.1$ Jy), plus other observations.

G17.4–2.3**RA:** 18^h30^m55^s**1-GHz flux/Jy:** 4.8?**Size/arcmin:** 24?**Dec:** –14°52′**Spectral index:** 0.8?**Type:** S**Radio:** Incomplete, poorly defined shell.**Optical:** Filaments to SE, and 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).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Boumis *et al.* 2002, A&A, 385, 1042. Optical observations.

G17.4–0.1**RA:** 18^h23^m08^s**Dec:** –13°46′**1-GHz flux/Jy:** 0.4**Spectral index:** 0.7**Size/arcmin:** 6**Type:** S

Has been called G17.48–0.12.

Radio: Partial shell.**References:**Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″: $S=0.9\pm 0.1$ Jy), plus other observations.**G17.8–2.6****RA:** 18^h32^m50^s**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.**G18.1–0.1****RA:** 18^h24^m34^s**Dec:** –13°11′**1-GHz flux/Jy:** 4.6**Spectral index:** 0.5**Size/arcmin:** 8**Type:** S

Has been called G18.1–0.2 and G18.16–0.16.

Radio: Shell.**X-ray:** Detected.**References:**

Odegard 1986, AJ, 92, 1372. TPT at 57.5 MHz (8′).

Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA observations.Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″: $S=7.6\pm 0.1$ Jy), plus other observations.**G18.6–0.2****RA:** 18^h25^m55^s**Dec:** –12°50′**1-GHz flux/Jy:** 1.4**Spectral index:** 0.4**Size/arcmin:** 6**Type:** S

Has been called G18.62–0.28.

Radio: Partial shell.**References:**Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42″: $S=1.9\pm 0.1$ Jy), plus other observations.

G18.8+0.3

Kes 67

RA: 18^h23^m58^s
Dec: –12°23′

1-GHz flux/Jy: 33
Spectral index: 0.4

Size/arcmin: 17 × 11
Type: S

Has been called G18.9+0.3.

Radio: Incomplete shell, in complex region near the HII region W39.

Distance: Association with molecular cloud and HI absorption suggests 12 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, PASA, 8, 187. Parkes 64-m at 8.4 GHz ($3'.0 : S = 12.9 \pm 1.0$ Jy), including polarisation.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($2'.9 \times 3'.5 : S = 55$ Jy).
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz ($75'' \times 55'' : S = 29.9 \pm 0.3$ Jy).
 Dubner *et al.* 1999, AJ, 118, 930. Parkes 64-m at 1.6 GHz ($15''$) for HI, VLA at 1.6 GHz ($17'' \times 12''$) for OH, plus CO observations.
 Dubner *et al.* 2004, A&A, 426, 201. CO observations of environment.
 Tian *et al.* 2007, A&A, 474, 541. VGPS at 1.4 GHz ($1'$) including HI, plus CO of surroundings.

G18.9–1.1

RA: 18^h29^m50^s
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.

Distance: Various observations suggest 2 kpc.

References:

Fürst *et al.* 1985, Nature, 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 ($7'.2 \times 8' : S = 82 \pm 15$ Jy), plus review of flux densities.
 Barnes & Turtle 1988, in SNRISM, p347. Molonglo at 408 MHz ($2'.9 \times 3'.1 : S = 58 \pm 9$ Jy) and Parkes 64-m at 5 GHz ($4'.4 \times 4'.1 : S = 23 \pm 6$ Jy).
 Patnaik *et al.* 1988, Nature, 332, 136. Ooty at 327 MHz ($0'.6 \times 1'.6$).
 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 ($19'' \times 14''$), 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 ($1'.1$).
 Reich 2002, in NSPS, p1. Effelsberg 100-m at 10.6 GHz, including polarisation.
 Harrus *et al.* 2004, ApJ, 603, 152. ROSAT and ASCA observations.

G19.1+0.2

RA: 18^h24^m56^s
Dec: –12°07′

1-GHz flux/Jy: 10
Spectral index: 0.5

Size/arcmin: 27
Type: S

Has been called G19.15+0.27.

Radio: Partial shell.

References:

Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S = 17.4 \pm 0.4$ Jy), plus other observations.

G20.0–0.2**RA:** 18^h28^m07^s**Dec:** –11°35′**1-GHz flux/Jy:** 10**Spectral index:** 0.0**Size/arcmin:** 10**Type:** F**Radio:** Faint, filled-centre, polarised.**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' : S=8.5 ± 2 Jy), plus review of flux densities.

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

G20.4+0.1**RA:** 18^h27^m51^s**Dec:** –11°00′**1-GHz flux/Jy:** 3.1**Spectral index:** 0.4**Size/arcmin:** 8**Type:** S

Has been called G20.47+0.16.

Radio: Shell.**References:**Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42'' : S=4.2 ± 0.1 Jy), plus other observations.**G21.0–0.4****RA:** 18^h31^m12^s**Dec:** –10°47′**1-GHz flux/Jy:** 1.1**Spectral index:** 0.6**Size/arcmin:** 9 × 7**Type:** S

Has been called G21.04–0.47.

Radio: Shell.**References:**Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz (42'' : S=2.3 ± 0.2 Jy), plus other observations.

G21.5–0.9

RA: 18^h33^m33^s
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.

Point sources: Central pulsar.

Distance: HI absorption indicates 4.6 kpc.

References:

Wilson & Weiler 1976, A&A, 53, 89. WSRT at 5 GHz ($6'' \times 35''$).
 Becker & Kundu 1976, ApJ, 204, 427. NRAO interferometer at 2.7 GHz ($20'' \times 5''$) and 8 GHz ($7'' \times 2''$), 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 ($4''4 \times 7''3$).
 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 ($3'3 \times 3'4$: $S=9$ Jy).
 Wallace *et al.* 1994, A&A, 286, 565. HI of surroundings.
 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 observations of X-ray halo.
 Bock *et al.* 2001, ApJ, 561, L203. BIMA at 94 GHz ($8''6 \times 4''6$).
 Safi-Harb *et al.* 2001, ApJ, 561, 308. Chandra and other X-ray observations.
 Reich 2002, in NSPS, p1. Effelsberg 100-m at 22 GHz ($8''$) and 32 GHz, including polarisation.
 La Palombara & Mereghetti 2002, A&A, 383, 916. XMM upper limit on pulsations.
 Bocchino *et al.* 2005, A&A, 442, 539. XMM and Chandra observations.
 Gupta *et al.* 2005, Current Science, 89, 853. Pulsar discovery.
 Camilo *et al.* 2006, ApJ, 637, 456. Pulsar discovery.
 Bietenholz & Bartel 2008, MNRAS, 386, 1411. VLA at 4.75 GHz ($0''53 \times 0''82$) for expansion studies.
 Tian & Leahy 2008, MNRAS, 391, L54. VGPS at 1.4 GHz ($1'$) including HI.

G21.5–0.1

RA: 18^h30^m50^s
Dec: –10°09′

1-GHz flux/Jy: 0.4
Spectral index: 0.5

Size/arcmin: 5
Type: S

Has been called G21.56–0.10.

Radio: Partial shell.

X-ray: Detected.

References:

Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA observations.
 Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42''$: $S=0.5 \pm 0.1$ Jy), plus other observations.

G21.8–0.6

Kes 69

RA: 18^h32^m45^s**1-GHz flux/Jy:** 69**Size/arcmin:** 20**Dec:** –10°08′**Spectral index:** 0.5**Type:** S**Radio:** Incomplete shell.**X-ray:** Detected.**Distance:** HI absorption indicates 5.5 to 7.4 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. H₂CO absorption.
 Kundu *et al.* 1974, AJ, 79, 132. NRAO 140-ft at 5 GHz (6′) and 10 GHz (3′).
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft et 2.7 GHz (5′: S=42.3±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.
 Yusef-Zadeh *et al.* 2003, ApJ, 585, 319. X-ray observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Hewitt *et al.* 2008, ApJ, 683, 189.GBT at 1.6 and 1.7 GHz for OH masers.
 Wood *et al.* 2008, AJ, 135, 2358. VLA at 4.8 GHz, including polarisation.
 Tian & Leahy 2008, MNRAS, 391, L54. VGPS at 1.4 GHz (1′) including HI.

G22.7–0.2**RA:** 18^h33^m15^s**1-GHz flux/Jy:** 33**Size/arcmin:** 26**Dec:** –09°13′**Spectral index:** 0.6**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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.

G23.3–0.3

W41

RA: 18^h34^m45^s**1-GHz flux/Jy:** 70**Size/arcmin:** 27**Dec:** –08°48′**Spectral index:** 0.5**Type:** S**Radio:** Distorted ring, in complex region, overlapping G22.7–0.2.**X-ray:** Possible extended emission, with compact sources.**Point sources:** Pulsar association suggested.**Distance:** HI and CO observations indicate 4.2 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).
 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.
 Aharonian *et al.* 2005, Science, 307, 1938. γ -ray detection.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.
 Aharonian *et al.* 2006, ApJ, 636, 777. γ -ray observations.
 Albert *et al.* 2006, ApJ, 643, L53. γ -ray observations.
 Landi *et al.* 2006, ApJ, 651, 190. X-ray observations.
 Tian *et al.* 2007, ApJ, 657, L25. VGPS at 1.4 GHz (1′) including HI, plus XMM observations.
 Leahy & Tian 2008, AJ, 135, 167. VGPS at 1.4 GHz (1′) including HI, plus CO observations.

G23.6+0.3

RA: 18^h33^m03^s
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^h38^m43^s
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^h34^m10^s
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 & 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 & Helfand 1987, ApJ, 316, 660. VLA at 1.4 GHz (12″), and X-ray upper limit.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

G27.4+0.0

RA: 18^h41^m19^s
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 suggests 7.5 to 9.8 kpc.

References:

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz (5′).
 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 : $S=2.0 \pm 0.5$ 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 & 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 & Gotthelf 1997, ApJ, 486, L129. ASCA detection of pulsar.
 Gotthelf & 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.
 Kuiper *et al.* 2004, ApJ, 613, 1173. X-ray observations of pulsar.
 Tian & Leany 2008, ApJ, 677, 292. VGPS at 1.4 GHz (1′) including HI.

G27.8+0.6

RA: 18^h39^m50^s
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 & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.

G28.6–0.1

RA: 18^h43^m55^s
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, with thermal and non-thermal emission.

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.
 Ueno *et al.* 2003, ApJ, 588, 338. Chandra observations.

G28.8+1.5**RA:** 18^h39^m00^s**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&A, 286, L47. ROSAT observations.

Song *et al.* 2000, PASJ, 52, 181. ASCA observations.Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.**G29.6+0.1****RA:** 18^h44^m52^s**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′)Vasisht *et al.* 2000, ApJ, 542, L49. X-ray observations of AXP.**G29.7–0.3****RA:** 18^h46^m25^s**Dec:** –02°59′**1-GHz flux/Jy:** 10**Spectral index:** 0.7

Kes 75

Size/arcmin: 3**Type:** C

Has erroneously been called G29.6+0.1.

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 possibly < 7.5 kpc.**References:**

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

Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8.4 : S = 5 ± 20% Jy).

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

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

Morsi & Reich 1987, A&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 & Lyne 1996, MNRAS, 282, 691. Pulsar search.

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

Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Gotthelf *et al.* 2000, ApJ, 542, L37. X-ray pulsar detection.Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.Mereghetti *et al.* 2002, ApJ, 574, 873. BeppoSAX observations of pulsar.Helfand *et al.* 2003, ApJ, 582, 783. Chandra observations.

Bock & Gaensler 2005, ApJ, 626, 343. BIMA at 88.6 GHz (10′ × 13′).

Morton *et al.* 2007, ApJ, 667, 219. Spitzer and Chandra observations.McBride *et al.* 2008, A&A, 477, 249. γ -ray and Chandra observations.

Leahy & Tian 2008, A&A, 480, L25. VGPS at 1.4 GHz (1′) including HI.

Kumar & Safi-Harb 2008, ApJ, 678, L43. Chandra observations.

Ng *et al.* 2008, ApJ, 686, 508. Chandra observations.Gavriil *et al.* 2008, Science, 319, 1802. X-ray observations of pulsar.

G30.7–2.0**RA:** 18^h54^m25^s**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^h44^m00^s**Dec:** –01°32′**1-GHz flux/Jy:** 6**Spectral index:** 0.4**Size/arcmin:** 24 × 18**Type:** S?**Radio:** Non-thermal, highly polarised 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^h51^m10^s**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

3C391

RA: 18^h49^m25^s
Dec: –00°55′**1-GHz flux/Jy:** 24
Spectral index: 0.49**Size/arcmin:** 7 × 5
Type: S**Radio:** Shell, brightest in NW, with low frequency turnover.**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 & 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 & 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 & 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 & 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 polarisation studies.
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Reach & Rho 1996, A&A, 315, L277. ISO spectroscopy.
 Rho & Petre 1996, ApJ, 467, 698. ROSAT observations.
 Wilner *et al.* 1998, AJ, 115, 247. CO observations of surroundings.
 Reach & Rho 1998, ApJ, 507, L93. ISO observations.
 Reach & Rho 1999, ApJ, 511, 836. CO, HCO⁺ and CS observations of surroundings.
 Reach & Rho 2000, ApJ, 544, 843. ISO observations of interactions with surroundings.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Chen & Slane 2001, ApJ, 563, 202. ASCA observations.
 Reach *et al.* 2002, ApJ, 564, 302. Observations of shocked molecular species.
 Chen *et al.* 2004, ApJ, 616, 885. Chandra observations.
 Brogan *et al.* 2005, AJ, 130, 148. VLA at 74 MHz, 330 MHz and 1.5 GHz (70″).
 Kawasaki *et al.* 2005, ApJ, 631, 935. ASCA observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Neufeld *et al.* 2007, ApJ, 664, 890. Spitzer IR observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G32.0–4.9

3C396.1

RA: 19^h06^m00^s
Dec: –03°00′**1-GHz flux/Jy:** 22?
Spectral index: 0.5?**Size/arcmin:** 60?
Type: 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).

G32.1–0.9**RA:** 18^h53^m10^s
Dec: –01°08′**1-GHz flux/Jy:** ?
Spectral index: ?**Size/arcmin:** 40?
Type: 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.

G32.4+0.1**RA:** 18^h50^m05^s**Dec:** –00°25′**1-GHz flux/Jy:** 0.25?**Spectral index:** ?**Size/arcmin:** 6**Type:** S

Has been called G32.45+0.1.

Radio: Shell.**X-ray:** Shell.**Distance:** X-ray absorption suggests 17 kpc.**References:**Yamaguchi *et al.* 2004, PASJ, 56, 1059. XMM and other observations.Ueno *et al.* 2005, in XRRC, E4.18. XMM observations.**G32.8–0.1****RA:** 18^h51^m25^s**Dec:** –00°08′**1-GHz flux/Jy:** 11?**Spectral index:** 0.2?

Kes 78

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

Part has been called G33.1–0.1.

Radio: Elongated shell?**References:**Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($S' : S = 7.2 \pm 0.5$ 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 ($3'6 \times 3'8 : S = 31.3$ 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.**G33.2–0.6****RA:** 18^h53^m50^s**Dec:** –00°02′**1-GHz flux/Jy:** 3.5**Spectral index:** varies**Size/arcmin:** 18**Type:** 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 ($68'' \times 52'' : S = 2.7 \pm 0.3$ Jy).Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G33.6+0.1

Kes 79, 4C00.70, HC13

RA: 18^h52^m48^s**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:** Multiple shells and filaments.**Point sources:** Central X-ray pulsar.**Distance:** HI absorption gives about 7.8 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 $S_{430 \text{ MHz}} = 69 \pm 33$ 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.
 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.
 Tsunemi & Enoguchi 2002, PASJ, 54, 735. ASCA observations.
 Seward *et al.* 2003, ApJ, 584, 414. Chandra observations.
 Stanimirović 2003, ApJ, 592, 953. Arecibo OH absorption.
 Sun *et al.* 2004, ApJ, 605, 742. Chandra observations.
 Gotthelf *et al.* 2005, ApJ, 627, 390. XMM pulsar detection.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.
 Halpern *et al.* 2007, ApJ, 665, 1304. X-ray pulsar timing observations.

G34.7–0.4**RA:** 18^h56^m00^s**Dec:** +01°22′**1-GHz flux/Jy:** 230**Spectral index:** 0.37

W44, 3C392

Size/arcmin: 35 × 27**Type:** C

Has been called G34.6–0.5.

Radio: Distorted shell, brighter to the E, with pulsar and associated nebula.**Optical:** Diffuse emission.**X-ray:** Centrally concentrated, thermal spectrum, plus pulsar wind nebula.**Point sources:** Pulsar within the boundary of the remnant.**Distance:** HI absorption indicates 2.8 kpc.**References:**

- Kundu & Velusamy 1972, A&A, 20, 237. NRAO 140-ft at 10.7 GHz (3′ : S = 105 ± 7 Jy).
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz (5′ : S = 177 ± 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).
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo S₄₃₀ MHz = 540 ± 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 × 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 γ -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 × 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.
 Reach & Rho 2000, ApJ, 544, 843. ISO observations of interactions with surroundings.
 Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.
 Petre *et al.* 2002, ApJ, 579, 404. Chandra observations of pulsar and wind nebula.
 Mavromatakis *et al.* 2003, A&A, 405, 591. Optical observations.
 Shelton *et al.* 2004, ApJ, 611, 906. Chandra observations of part.
 Reach *et al.* 2005, ApJ, 618, 297. Molecular line and near-IR observations.
 Hoffman *et al.* 2005, ApJ, 627, 803. Observations of OH masers.
 Kawasaki *et al.* 2005, ApJ, 631, 935. ASCA observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Neufeld *et al.* 2007, ApJ, 664, 890. Spitzer IR observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.
 Castelletti *et al.* 2007, A&A, 471, 537. VLA at 74 MHz (36′′ × 39′′ : S = 634 ± 70 Jy) and 324 MHz (13′′ : S = 411 ± 50 Jy).

G36.6–0.7**RA:** 19^h00^m35^s**Dec:** +02°56′**1-GHz flux/Jy:** ?**Spectral index:** ?**Size/arcmin:** 25?**Type:** S?**Radio:** polarised 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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G36.6+2.6**RA:** 18^h48^m49^s**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^h04^m08^s**Dec:** +05°28′**1-GHz flux/Jy:** 18**Spectral index:** 0.6

3C396, HC24, NRAO 593

Size/arcmin: 8 × 6**Type:** C**Radio:** Shell, brighter to W, with faint ‘tail’ to E.**X-ray:** Diffuse, brighter to W, with central core.**Point sources:** Central X-ray source.**Distance:** HI absorption suggests > 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 polarisation, 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.

Harris & Slane 1999, ApJ, 516, 811. ASCA observations.

Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.Olbert *et al.* 2003, ApJ, 592, L45. Chandra observations.Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.Scaife *et al.* 2007, MNRAS, 377, L69. 33 GHz observations.

G39.7–2.0

RA: 19^h12^m20^s
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: HI absorption indicates 6.0 ± 0.5 kpc.

References:

- van den Bergh 1980, ApJ, 236, L23. Optical in H α 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 ($2.4: S = 34 \pm 4$ 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 ($64'' \times 60'' : S = 160 \pm 20$ Jy), and 1.4 GHz ($56'' \times 54''$), 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 γ -rays.
 Brinkmann *et al.* 2007, A&A, 463, 611. XMM observations of E lobe.
 Boumis *et al.* 2007, MNRAS, 381, 308. Optical observations.
 Lockman *et al.* 2007, MNRAS, 381, 881. HI observations.

G40.5–0.5

RA: 19^h07^m10^s
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 ($7.6: S = 9.3 \pm 1.3$ Jy), and 2.7 GHz ($4.4: S = 7.2 \pm 0.5$ Jy), plus review of flux densities.
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.
 Yang *et al.* 2006, ChJAA, 6, 210. CO observations of surroundings.
 Abdo *et al.* 2007, ApJ, 664, L91. γ -ray observations.

G41.1–0.3

3C397

RA: 19^h07^m34^s**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 central component.**Distance:** Possible limit of > 7.5 kpc for non-thermal component from HI absorption.**References:**Kundu *et al.* 1974, AJ, 79, 132. NRAO 140-ft at 10 GHz (3′) and 5 GHz (6′).Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz (5′: $S=21.3 \pm 1.2$ Jy for both components).Caswell *et al.* 1975, A&A, 45, 239. HI absorption.Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430\text{ MHz}} = 82 \pm 51$ Jy, also Algonquin 46-m at 10.6 GHz (3′: $S=12 \pm 2$ Jy), and Haystack 36-m at 15.5 GHz (2′3: $S=8.5 \pm 3.0$ 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 & Reich 1987, A&AS, 71, 189. Effelsberg 100-m at 32 GHz (smoothed to 30″: $S=1.10 \pm 0.19$ Jy).Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′5 × 3′6: $S=46.3$ Jy).

Anderson & 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 & Reynolds 1999, ApJ, 526, 365. VLA at 1.5 GHz (6′9 × 6′6) and 4.8 GHz (46′4 × 5′6), including polarisation 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 γ -rays.Safi-Harb *et al.* 2005, ApJ, 618, 321. Chandra observations.Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.**G42.8+0.6****RA:** 19^h07^m20^s**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: $S=1.5 \pm 0.2$ Jy), plus other flux densities.Vasisht *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 & Xilouris 2000, ApJ, 545, 385. Pulsar detection.

Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.Kaplan *et al.* 2002, ApJ, 566, 378. VLA at 333 MHz (50″), and other observations of the region.

G43.3–0.2

W49B

RA: 19^h11^m08^s**1-GHz flux/Jy:** 38**Size/arcmin:** 4 × 3**Dec:** +09°06′**Spectral index:** 0.48**Type:** S**Radio:** Shell, brightest to the SE and W, near the HII region W49A.**X-ray:** Centrally brightened, elongated E–W.**Distance:** HI absorption indicates 10 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 polarisation.
 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 γ -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).
 Kaplan *et al.* 2002, ApJ, 566, 378. VLA at 333 MHz (50″), and other observations of the region.
 Kawasaki *et al.* 2005, ApJ, 631, 935. ASCA observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Miceli *et al.* 2006, A&A, 453, 567. XMM observations.
 Keohane *et al.* 2007, ApJ, 654, 938. IR and Chandra observations.

G43.9+1.6**RA:** 19^h05^m50^s**1-GHz flux/Jy:** 8.6?**Size/arcmin:** 60?**Dec:** +10°30′**Spectral index:** 0.2?**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).
 Vasisht *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.
 Kaplan *et al.* 2002, ApJ, 566, 378. VLA at 333 MHz (50″), and other observations of the region.

G45.7–0.4**RA:** 19^h16^m25^s**1-GHz flux/Jy:** 4.2?**Size/arcmin:** 22**Dec:** +11°09′**Spectral index:** 0.4?**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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G46.8–0.3		(HC30)
RA: 19 ^h 18 ^m 10 ^s	1-GHz flux/Jy: 14	Size/arcmin: 17 × 13
Dec: +12°09′	Spectral index: 0.5	Type: 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 ($5'$: $S=9.8\pm 0.9$ 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 $S_{430\text{ MHz}}=46\pm 21$ Jy.
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ($6'8$: $S=5.9\pm 0.6$ Jy).
 Sato 1979, ApL, 20, 43. HI observations.
 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).

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

Radio: In complex region, parameters uncertain.

X-ray: Elongated east–west.

Optical: Some diffuse emission possibly associated.

Distance: Association with CO gives 6 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⁺ observations.
 Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.
 Mavromatakis *et al.* 2001, A&A, 370, 265. Optical observations.
 Koo *et al.* 2002, AJ, 123, 1629. ASCA observations.
 Koo *et al.* 2005, ApJ, 633, 946. Chandra observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.
 Kang & Koo 2007, ApJS, 173, 85. SGPS of high velocity HI.

G53.6–2.2

RA: 19^h38^m50^s
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: Association with HI gives 2.8 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 observations.
 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.
 Ambrocio-Cruz *et al.* 2006, RMxAA, 42, 241. Optical imaging and spectroscopy.

G54.1+0.3

RA: 19^h30^m31^s
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 extensions and diffuse emission.

Point sources: Central pulsar.

Distance: HI absorption suggests 4.5–9 kpc, association with CO suggest 8.2 kpc.

References:

- Green 1985, MNRAS, 216, 691. Radio 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.
 Lu *et al.* 2002, ApJ, 568, L49. Chandra observations.
 Camilo *et al.* 2002, ApJ, 574, L71. Pulsar detection.
 Kaplan & Moon 2006, ApJ, 644, 1056. IR upper limit for pulsar.
 Leahy *et al.* 2008, AJ, 136, 1477. VGPS at 1.4 GHz ($1'$) including HI.
 Koo *et al.* 2008, ApJ, 673, L147. IR observations of surroundings.

G54.4–0.3

(HC40)

RA: 19^h33^m20^s**1-GHz flux/Jy:** 28**Size/arcmin:** 40**Dec:** +18°56′**Spectral index:** 0.5**Type:** S

Has been called G54.5–0.3.

Radio: Shell, in complex region.**Optical:** Faint filaments.**References:**

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5'$: $S=34.4\pm 5.0$ 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.
 Boumis *et al.* 2005, A&A, 443, 175. Optical observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Kang & Koo 2007, ApJS, 173, 85. SGPS of high velocity HI.

G55.0+0.3**RA:** 19^h32^m00^s**1-GHz flux/Jy:** 0.5?**Size/arcmin:** 20 × 15?**Dec:** +19°50′**Spectral index:** 0.5?**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:**

Matthews *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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G55.7+3.4**RA:** 19^h21^m20^s**1-GHz flux/Jy:** 1.4**Size/arcmin:** 23**Dec:** +21°44′**Spectral index:** 0.6**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

(4C21.53)

RA: 19^h34^m59^s**1-GHz flux/Jy:** 1.8?**Size/arcmin:** 12?**Dec:** +21°57′**Spectral index:** ?**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 ± 0.1), 2.7 GHz ($4'3$: 0.86 ± 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^h42^m33^s
Dec: +23°35′

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

Size/arcmin: 15
Type: S

Has been called G59.6+0.1.

Radio: Incomplete shell.

Optical: Diffuse 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.
 Gök *et al.* 2008, Ap&SS, 318, 207. Optical observations.

G59.8+1.2

RA: 19^h38^m55^s
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.

Optical: Faint diffuse emission and filaments.

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).
 Boumis *et al.* 2005, A&A, 443, 175. Optical observations.

G63.7+1.1

RA: 19^h47^m52^s
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 ($14'' \times 26''$: $S=1.63$ Jy), DRAO at 1.4 GHz (smoothed to 2'), plus review of flux densities and other observations.

G65.1+0.6

RA: 19^h54^m40^s
Dec: +28°35′

1-GHz flux/Jy: 5.5
Spectral index: 0.61

Size/arcmin: 90 × 50
Type: S

Radio: Large, faint shell.

Point sources: Old pulsar nearby.

Distance: Possible association with HI suggests 9 kpc.

References:

Landecker *et al.* 1990, A&A, 232, 207. DRAO at 408 MHz ($3'.5 \times 7'.0$: $S=9.5 \pm 0.1$ Jy), and 1.4 GHz ($1'.0 \times 2'.0$: $S=5.4 \pm 1.0$ Jy).
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Tian & Leahy 2006, A&A, 455, 1053. CGPS at 408 MHz ($2'.8 \times 5'.9$: $S=8.6 \pm 0.8$ Jy) and 1.4 GHz ($0'.8 \times 1'.7$: $S=4.9 \pm 0.5$ Jy) including HI.
 Kothés *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=9.1 \pm 1.0$ Jy) and 1420 MHz ($\sim 1'$: $S=3.9 \pm 0.5$ Jy), including review of flux densities.

G65.3+5.7**RA:** 19^h33^m00^s**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:** Filamentary ring.**X-ray:** Diffuse, centrally brightened.**Distance:** Optical proper motions and velocities indicates 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.Mavromatakis *et al.* 2002, A&A, 388, 355. Optical observations.Boumis *et al.* 2004, A&A, 424, 583. Optical observations.Shelton *et al.* 2004, ApJ, 615, 275. ROSAT observations.Kaplan *et al.* 2006, ApJS, 163, 344. X-ray upper limit on compact sources.**G65.7+1.2****RA:** 19^h52^m10^s**Dec:** +29°26′**1-GHz flux/Jy:** 5.1**Spectral index:** varies

DA 495

Size/arcmin: 22**Type:** F

Has mistakenly been called G55.7+1.2.

Radio: Centrally brightened with thick shell?**X-ray:** Detected.**Point sources:** Compact X-ray source near centre.**Distance:** HI polarisation observations suggest 1.5 kpc.**References:**Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ($S' : S = 2.8 \pm 0.4$ 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 ($0'9 \times 1'5 : S = 4.4 \pm 0.2$ Jy).Velusamy *et al.* 1989, JApA, 10, 161. Ooty at 327 MHz ($36'' \times 64''$), WSRT at 610 MHz ($62''$) and VLA at 1.4 GHz ($36''$ and $12''$), including IRAS imaging.

Biggs & 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.Kothés *et al.* 2004, ApJ, 607, 855. HI polarisation absorption.Arzoumanian *et al.* 2004, ApJ, 610, L101. ROSAT and ASCA observations of compact source.Kothés *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 6.5 \pm 0.6$ Jy) and 1420 MHz ($\sim 1' : S = 4.0 \pm 0.2$ Jy), including polarisation and review of flux densities.Arzoumanian *et al.* 2008, ApJ, 687, 505. Chandra observations.Kothés *et al.* 2008, ApJ, 687, 516. CGPS at 408 MHz ($2'9 \times 6'0 : S = 6.5 \pm 0.5$ Jy) and 1.4 GHz ($0'82 \times 1'75 : S = 4.0 \pm 0.2$ Jy), Effelsberg 100-m at 4.85 GHz ($2'45 : S = 1.6 \pm 0.1$ Jy) and 10.55 GHz (smoothed to $2'45 : S = 1.1 \pm 0.1$ Jy), plus review of flux densities.

G67.7+1.8**RA:** 19^h54^m32^s**Dec:** +31°29′**1-GHz flux/Jy:** 1.0**Spectral index:** 0.5**Size/arcmin:** 15 × 12**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.Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=1.1 \pm 0.1$ Jy) and 1420 MHz ($\sim 1'$: $S=0.68 \pm 0.04$ Jy), including polarisation and review of flux densities.Gök *et al.* 2008, Ap&SS, 318, 207. Optical observations.**G68.6–1.2****RA:** 20^h08^m40^s**Dec:** +30°37′**1-GHz flux/Jy:** 0.7?**Spectral index:** 0.0?**Size/arcmin:** 23**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.Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 1420 MHz ($\sim 1'$: $S=0.57 \pm 0.08$ Jy), including review of flux densities

G69.0+2.7

CTB 80

RA: 19^h53^m20^s**1-GHz flux/Jy:** 120?**Size/arcmin:** 80?**Dec:** +32°55′**Spectral index:** varies**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 (2.6×4.9 : $S = 67.5 \pm 10.5$ 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, Nature, 331, 50. Pulsar detection.
 Angelini *et al.* 1988, ApJ, 330, L43. EXOSAT spectra.
 Fesen *et al.* 1988, Nature, 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 HI 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 HI (1'), plus IRAS.
 Safi-Harb *et al.* 1995, ApJ, 439, 722. ROSAT observations.
 Srinivasan 1997, ApJ, 489, 170. γ -ray observations of pulsar.
 Mavromatakis *et al.* 2001, A&A, 371, 300. Optical observations.
 Butler *et al.* 2002, A&A, 395, 845. HST detection of pulsar.
 Migliazzo *et al.* 2002, ApJ, 567, L141. Pulsar proper motion study.
 Castelletti *et al.* 2003, AJ, 126, 2114. GMRT at 240 and 618 MHz ($26'' \times 17''$ and $10'' \times 6''$) and VLA at 324 and 1380 MHz ($73'' \times 63''$ and $93'' \times 78''$).
 Moon *et al.* 2004, ApJ, 610, L33. Chandra and HST observations of core.
 Li *et al.* 2005, ApJ, 628, 931. Chandra observations of pulsar and surroundings.
 Golden *et al.* 2005, ApJ, 635, L153. High resolution radio observations of pulsar and surroundings.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S = 72 \pm 7$ Jy) and 1420 MHz ($\sim 1'$: $S = 56 \pm 5$ Jy), including polarisation and review of flux densities.
 Kang & Koo 2007, ApJS, 173, 85. SGPS of high velocity HI.
 Albert *et al.* 2007, ApJ, 669, 1143. γ -ray observations.
 Zeiger *et al.* 2008, ApJ, 674, 271. Proper motion of pulsar.

G69.7+1.0**RA:** 20^h02^m40^s**1-GHz flux/Jy:** 2.0**Size/arcmin:** 16 \times 14**Dec:** +32°43′**Spectral index:** 0.7**Type:** S

Radio: Poorly resolved source.

X-ray: Detected.

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.
 Yoshita *et al.* 2000, PASJ, 52, 867. ROSAT and ASCA observations.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S = 3.2 \pm 0.4$ Jy) and 1420 MHz ($\sim 1'$: $S = 1.5 \pm 0.1$ Jy), including review of flux densities.

G73.9+0.9**RA:** 20^h14^m15^s**Dec:** +36°12′**1-GHz flux/Jy:** 9**Spectral index:** 0.23**Size/arcmin:** 27**Type:** S?**Radio:** Diffuse, centrally brightened to SW.**Optical:** Faint shell.**References:**Reich *et al.* 1986, A&A, 155, 185. Effelsberg 100-m at 4.75 GHz (2′.4 : S = 6.7 ± 0.5 Jy), plus other flux densities.

Chastenay & 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 ± 1.2 Jy) and 1.4 GHz (1′.0 × 1′.7 : S = 7.4 ± 1.0 Jy).

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.

Mavromatakis 2003, A&A, 398, 153. Optical observations.

Kotthes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz (~ 3′ : S = 10.0 ± 1.7 Jy) and 1420 MHz (~ 1′ : S = 7.6 ± 0.6 Jy), including polarisation and review of flux densities.

G74.0–8.5

Cygnus Loop

RA: 20^h51^m00^s**1-GHz flux/Jy:** 210**Size/arcmin:** 230 × 160**Dec:** +30°40′**Spectral index:** varies**Type:** S

Has been suggested that this is two overlapping remnants.

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:

- 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.
 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 α 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.
 Hester *et al.* 1994, ApJ, 420, 721. H α , [OIII] and other optical observations of Balmer dominated filaments in NE.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 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 α and other optical observations of NE region.
 Levenson & Graham 2001, ApJ, 559, 948. HST of SE region.
 Uyaniker *et al.* 2002, A&A, 389, L61. Effelsberg 100-m at 2.7 GHz (4′3) including polarisation, and comparison with ROSAT data.
 Leahy 2002, AJ, 123, 2689. DRAO at 1.4 GHz (4′ × 2′) for H α .
 Patnaude *et al.* 2002, AJ, 124, 2118. Optical and ROSAT observations of region in SW.
 Blair *et al.* 2002, ApJS, 140, 367. UV spectroscopy.
 Welsh *et al.* 2002, A&A, 391, 705. Optical absorption to background stars.
 Sankrit & Blair 2002, ApJ, 565, 297. UV observations of NE filament.
 Levenson *et al.* 2002, ApJ, 576, 798. Chandra observations of W edge.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz (14′5 : $S = 184 \pm 18$ Jy).
 Leahy 2004, MNRAS, 351, 385. Chandra observations of SW.
 Uyaniker *et al.* 2004, A&A, 426, 909. Effelsberg 100-m at 2.7 GHz (4′3), with comparison with other data for spectral index studies.
 Blair *et al.* 2005, AJ, 129, 2268. HST of outer filaments.
 Leahy 2005, AJ, 130, 165. DRAO at 1.4 GHz of SE.
 Levenson & Graham 2005, ApJ, 622, 366. Chandra observations of know in SE.
 Sun *et al.* 2006, A&A, 447, 937. Urumqi 25-m at 4.8 GHz (9′5 : $S = 90 \pm 9$ Jy), with comparisons with other data for spectral index studies.
 Kaplan *et al.* 2006, ApJS, 163, 344. X-ray upper limit on compact sources.
 Seon *et al.* 2006, ApJ, 644, L175. Far UV observations.
 Sankrit *et al.* 2007, AJ, 133, 1383. UV observations of part.
 Tsunemi *et al.* 2007, ApJ, 671, 1717. XMM observations of NE to SW.
 Miyata *et al.* 2007, PASJ, 59, S163. Suzaku observations of NE.
 Nemes *et al.* 2008, ApJ, 675, 1293. XMM observations of NE.
 Katsuda *et al.* 2008, ApJ, 680, 1198. Chandra observations of NE.
 Uchida *et al.* 2008, ApJ, 688, 1102. XMM observations.

G74.9+1.2

RA: 20^h16^m02^s
Dec: +37°12'

1-GHz flux/Jy: 9
Spectral index: varies

CTB 87
Size/arcmin: 8 × 6
Type: F

Radio: Filled-centre, with high polarisation and high frequency turnover.

X-ray: Centrally brightened.

Distance: HI absorption indicates 12 kpc, optical extinction gives 6.1 kpc.

Point sources: Extragalactic compact source is nearby.

References:

Dickel & DeNoyer 1975, *AJ*, 80, 437. Arecibo S_{430} MHz = 12.2 ± 9.7 Jy, S_{318} MHz = 17.7 ± 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 & 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 & 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 & 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.
 Kothes *et al.* 2003, *ApJ*, 588, 852. CGPS at 1.4 GHz ($1'.6 \times 1'$) including HI, plus CO observations.
 Kothes *et al.* 2006, *A&A*, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=11.9 \pm 0.9$ Jy) and 1420 MHz ($\sim 1'$: $S=7.1 \pm 1.1$ Jy), including polarisation and review of flux densities.

G76.9+1.0

RA: 20^h22^m20^s
Dec: +38°43'

1-GHz flux/Jy: 1.2
Spectral index: 0.60

Size/arcmin: 9
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 polarisation 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.
 Kothes *et al.* 2006, *A&A*, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=2.3 \pm 0.2$ Jy) and 1420 MHz ($\sim 1'$: $S=1.35 \pm 0.07$ Jy), including polarisation and review of flux densities.

G78.2+2.1

RA: 20^h20^m50^s
Dec: +40°26′

1-GHz flux/Jy: 320
Spectral index: 0.51

DR4, γ 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: γ -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 observations.
Landecker *et al.* 1980, A&AS, 39, 133. DRAO HI observations ($2' \times 3'$).
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 γ -ray emission.
Brazier *et al.* 1996, MNRAS, 281, 1033. γ -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.
Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.
Uchiyama *et al.* 2002, ApJ, 571, 866. ASCA observations.
Mavromatakis 2003, A&A, 408, 237. Optical observations.
Bykov 2004, A&A, 427, L21. Hard X-ray observations.
Becker *et al.* 2004, ApJ, 615, 897. Chandra and other observations of compact source.
Weisskopf *et al.* 2006, ApJ, 652, 387. Chandra and other observations of compact source.
Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S=500 \pm 35$ Jy) and 1420 MHz ($\sim 1' : S=226 \pm 19$ Jy), including review of flux densities.
Kang & Koo 2007, ApJS, 173, 85. SGPS of high velocity HI.
Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.
Ladouceur & Pineault 2008, A&A, 490, 197. CGPS at 408 MHz ($2'9 \times 4'5$) and 1.4 GHz ($0'8 \times 1'5$).

G82.2+5.3

RA: 20^h19^m00^s
Dec: +45°30′

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

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

Has been called G82.5+5.3.

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.
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14'5 : S=82.5 \pm 5.5$ Jy).
Uyaniker *et al.* 2003, ApJ, 585, 785. CGPS at 1.4 GHz ($1'$) including polarisation, of part.
Mavromatakis *et al.* 2004, A&A, 415, 1051. ROSAT, ASCA and optical observations.
Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S=144 \pm 12$ Jy) and 1420 MHz ($\sim 1' : S=93 \pm 5$ Jy), including review of flux densities.

G83.0–0.3

RA: 20^h46^m55^s
Dec: +42°52'

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

Size/arcmin: 9 × 7
Type: S

Radio: Incomplete shell.

References:

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=1.2\pm 0.3$ Jy) and 1420 MHz ($\sim 1'$: $S=0.8\pm 0.1$ Jy, including polarisation and review of flux densities.

G84.2–0.8

RA: 20^h53^m20^s
Dec: +43°27'

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

Size/arcmin: 20 × 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.

Uyaniker *et al.* 2003, ApJ, 585, 785. CGPS at 1.4 GHz ($1'$) including polarisation.

Kaplan *et al.* 2004, ApJS, 153, 269. Chandra limits for any compact source.

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=14.5\pm 0.5$ Jy) and 1420 MHz ($\sim 1'$: $S=7.2\pm 0.8$ Jy), including review of flux densities.

G85.4+0.7

RA: 20^h50^m40^s
Dec: +45°22'

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

Size/arcmin: 24?
Type: S

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

X-ray: Centrally brightened.

Distance: HI observations suggest 3.5 kpc.

References:

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

Jackson *et al.* 2008, ApJ, 674, 936. XMM and HI observations.

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=2.9\pm 0.5$ Jy) and 1420 MHz ($\sim 1'$: $S=2.3\pm 0.2$ Jy), including review of flux densities.

G85.9–0.6

RA: 20^h58^m40^s
Dec: +44°53'

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

Size/arcmin: 24
Type: S

Radio: Faint, incomplete shell.

X-ray: Centrally brightened.

Distance: HI observations suggest 4.8 kpc.

References:

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

Jackson *et al.* 2008, ApJ, 674, 936. XMM and HI observations.

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$: $S=3.0\pm 1.3$ Jy) and 1420 MHz ($\sim 1'$: $S=2.2\pm 0.8$ Jy), including review of flux densities.

G89.0+4.7

HB21

RA: 20^h45^m00^s
Dec: +50°35′

1-GHz flux/Jy: 220
Spectral index: 0.38

Size/arcmin: 120 × 90
Type: S

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

Optical: Filaments and patches.

X-ray: Centrally brightened.

Distance: Various associations imply 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′ × 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 × 4′5) and 1.4 GHz (1′0 × 1′3), including HI, 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.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz (14′5 : $S=228 \pm 5$ Jy).
 Uyaniker *et al.* 2003, ApJ, 585, 785. CGPS at 1.4 GHz (1′) including polarisation.
 Byun *et al.* 2006, ApJ, 637, 283. CO observations of surroundings.
 Kang & Koo 2007, ApJS, 173, 85. SGPS of high velocity HI.
 Lazendic & Slane 2006, ApJ, 647, 350. X-ray observations.
 Leahy 2006, ApJ, 647, 1125. CGPS at 408 MHz (2′8 × 3′7) and 1.4 GHz (0′8 × 1′1).
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3′ : S=259 \pm 19$ Jy) and 1420 MHz ($\sim 1′ : S=183 \pm 9$ Jy), including polarisation and review of flux densities.
 Mavromatakis *et al.* 2007, A&A, 461, 991. Optical observations.

G93.3+6.9

DA 530, 4C(T)55.38.1

RA: 20^h52^m25^s
Dec: +55°21′

1-GHz flux/Jy: 9
Spectral index: 0.45

Size/arcmin: 27 × 20
Type: C?

Has been called G93.2+6.7.

Radio: Shell, with two bright limbs, highly polarised.

X-ray: Compact central source.

Distance: HI observations suggest 2.2 kpc.

References:

- Roger & Costain 1976, A&A, 51, 151. DRAO at 1.42 GHz (2′ × 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 × 4′3) and 1.4 GHz (1′0 × 1′2), including polarisation and HI.
 Foster & Routledge 2003, ApJ, 598, 1005. HI for distance.
 Kaplan *et al.* 2004, ApJS, 153, 269. Chandra limits for any compact source.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3′ : S=10.5 \pm 0.7$ Jy) and 1420 MHz, including review of flux densities.
 Jiang *et al.* 2007, ApJ, 670, 1142. Chandra observations.
 Bocchino *et al.* 2008, AdSpR, 41, 407. XMM observations.

G93.7–0.2

RA: 21^h29^m20^s
Dec: +50°50′

1-GHz flux/Jy: 65
Spectral index: 0.65

CTB 104A, DA 551

Size/arcmin: 80
Type: S

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

Radio: Distorted, faint shell.

Distance: Association with HI features suggests 1.5 kpc.

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 polarisation, 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.
 Uyaniker *et al.* 2002, ApJ, 565, 1022. CGPS 1.4 GHz ($54″ \times 49″$), including HI, and 408 MHz ($3′7 \times 2′8$).
 Uyaniker *et al.* 2003, ApJ, 585, 785. CGPS at 1.4 GHz ($1′$) including polarisation.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3′ : S = 67 \pm 6$ Jy) and 1420 MHz ($\sim 1′ : S = 35 \pm 4$ Jy), including polarisation and review of flux densities.

G94.0+1.0

RA: 21^h24^m50^s
Dec: +51°53′

1-GHz flux/Jy: 13
Spectral index: 0.48

3C434.1

Size/arcmin: 30 × 25
Type: S

Radio: Incomplete shell, containing HI shell.

Distance: Association with stellar wind bubble implies 5.2 kpc.

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.
 Uyaniker *et al.* 2003, ApJ, 585, 785. CGPS at 1.4 GHz ($1′$) including polarisation.
 Foster *et al.* 2004, A&A, 417, 79. DRAO at 1.4 GHz, including HI.
 Foster 2005, A&A, 441, 1043. CGPS at 408 MHz ($2′8 \times 3′6$) and 1.4 GHz ($0′8 \times 1′0$) for spectral index studies, plus other observations.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3′ : S = 20 \pm 2$ Jy) and 1420 MHz ($\sim 1′ : S = 11.3 \pm 1.0$ Jy), including review of flux densities.

G96.0+2.0

RA: 21^h30^m30^s
Dec: +53°59′

1-GHz flux/Jy: 0.3
Spectral index: 0.5

Size/arcmin: 26
Type: S

Radio: Faint, arc in S, poorly defined in N.

Distance: Association for HI indicates 4 kpc.

References:

Kothes *et al.* 2005, A&A, 444, 871. CGPS at 408 MHz ($2′8 \times 3′5$) and 1.4 GHz ($50″ \times 61″$) including HI.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3′ : S = 0.42 \pm 0.06$ Jy) and 1420 MHz ($\sim 1′ : S = 0.24 \pm 0.02$ Jy), including review of flux densities.

G106.3+2.7

RA: 22^h27^m30^s
Dec: +60°50′

1-GHz flux/Jy: 6
Spectral index: 0.6

Size/arcmin: 60 × 24
Type: C?

Incorporates the pulsar wind nebula G106.6+2.9 (the ‘Boomerang’).

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

X-ray: Pulsar and wind nebula.

Point sources: Pulsar.

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. CGPS at 1.4 GHz, including HI, plus CO and other observations.
 Kothes *et al.* 2004, ApJ, 607, 855. HI polarisation absorption.
 Ng & Romani 2004, ApJ, 601, 479. Chandra detection of pulsar wind nebula.
 Kothes *et al.* 2006, ApJ, 638, 225. Effelsberg 100-m at 4.85 (2'4), 8.35 (1'4), 10.5 (1'2) and 32 GHz (0'45) of pulsar wind nebula, including polarisation.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 8.6 \pm 1.0$ Jy) and 1420 MHz ($\sim 1' : S = 4.8 \pm 0.5$ Jy), including polarisation and review of flux densities.
 Abdo *et al.* 2007, ApJ, 664, L91. γ -ray observations.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.

G108.2–0.6

RA: 22^h53^m40^s
Dec: +58°50′

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

Size/arcmin: 70 × 54
Type: S

Radio: Faint shell.

Distance: Possible associated HI structures suggest 3.2 kpc.

References:

Tian *et al.* 2007, A&A, 465, 907. DRAO at 408 MHz ($2'8 \times 3'3 : S = 11.5 \pm 1.2$ Jy) and 1.4 GHz ($1'0 \times 1'2 : S = 6.6 \pm 0.7$ Jy) including HI.

G109.1–1.0

CTB 109

RA: 23^h01^m35^s**1-GHz flux/Jy:** 22**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:** Semicircular shell, with pulsar at W edge.**Point sources:** Long period X-ray pulsar.**Distance:** Association with HII regions implies 3 kpc.**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, Nature, 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 HI observations.
 Tatematsu *et al.* 1987, PASJ, 39, 755. NRO 45-m at 10 GHz ($2'.7$), plus polarisation.
 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.
 Kothes *et al.* 2002, ApJ, 576, 169. CGPS at 1.4 GHz ($68'' \times 59''$), including HI, plus CO observations.
 Sasaki *et al.* 2004, ApJ, 617, 322. XMM observations.
 Sasaki *et al.* 2006, ApJ, 642, L149. CO observations of surroundings.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 26 \pm 3$ Jy) and 1420 MHz ($\sim 1' : S = 17.4 \pm 1.2$ Jy), including polarisation and review of flux densities.

G111.7–2.1

Cassiopeia A, 3C461

RA: 23^h23^m26^s**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:

- Anderson *et al.* 1991, ApJ, 373, 146. VLA at 1.4 and 5 GHz (1[′]3) for spectral variations.
 Anderson *et al.* 1995, ApJ, 441, 300. VLA at 1.4 GHz and 4.8 GHz (both 1[′]3), for polarisation studies.
 Anderson & Rudnick 1995, ApJ, 441, 307. VLA at 1.4 GHz and 4.8 GHz, for proper motion studies.
 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.
 Schwarz *et al.* 1997, A&AS, 123, 43. WSRT at 1.4 GHz (30[′]) for H I absorption.
 Reynoso *et al.* 1997, A&A, 317, 203. VLA at 1.4 GHz (11[′] × 14[′]) for H I absorption.
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 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).
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 Chakrabarty *et al.* 2001, ApJ, 548, 800. Chandra observations, including central compact source.
 Gotthelf *et al.* 2001, ApJ, 552, L39. Chandra observations, showing outer shock.
 Fesen 2001, ApJS, 133, 161. Optical imaging and spectroscopy.
 Bleeker *et al.* 2001, A&A, 365, L225. XMM observations.
 Maccarone *et al.* 2001, A&A, 368, 267. BeppoSAX observations.
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 Hwang *et al.* 2001, ApJ, 560, L175. Chandra observations of Doppler shifted lines.
 Fesen *et al.* 2001, AJ, 122, 2644. HST observations.
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 Mereghetti *et al.* 2002, ApJ, 569, 275. XMM observations of central source.
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 Reich 2002, in NSPS, p1. Effelsberg 100-m at 32 GHz, including polarisation.
 Loinard *et al.* 2003, RMxAA, 15, 267. Sub-mm observations.
 Dunne *et al.* 2003, Nature, 424, 285. Sub-mm dust observations.
 Rho *et al.* 2003, ApJ, 592, 299. IR observations.
 Laming & Hwang 2003, ApJ, 597, 347. Chandra spectroscopy.
 DeLaney & Rudnick 2003, ApJ, 589, 818. Chandra expansion studies.
 Jones *et al.* 2003, ApJ, 587, 227. 2.2 micron polarisation.
 Hines *et al.* 2004, ApJS, 154, 290. Spitzer observations.
 DeLaney *et al.* 2004, ApJ, 613, 343. Chandra proper motion studies.
 Morse *et al.* 2004, ApJ, 614, 727. HST proper motion studies.
 Hwang *et al.* 2004, ApJ, 615, L117. Deep Chandra imaging.
 Krause *et al.* 2004, Nature, 432, 596. IR and molecular line observations of surroundings.
 Bamba *et al.* 2005, ApJ, 621, 793. Chandra observations of rim.
 Wilson & Batrla 2005, A&A, 430, 561. Observational constraints on dust.
 Krause *et al.* 2005, Science, 308, 1604. IR echoes from surroundings.
 Fesen *et al.* 2006, ApJ, 636, 848. Optical and IR limits for central sources.
 Fesen *et al.* 2006, ApJ, 636, 859. HST observations of outlying knots.
 Vinyaikin 2006, ARep, 50, 143. Secular decrease at 36, 81.5 and 151.5 MHz.
 Laming *et al.* 2006, ApJ, 644, 260. Chandra observations, particularly of NE ‘jet’.
 Fesen *et al.* 2006, ApJ, 645, 283. HST observations for expansion studies.
 Renaud *et al.* 2006, ApJ, 647, L41. γ -ray line observations.
 Lazendic *et al.* 2006, ApJ, 651, 250. Chandra spectroscopy of bright knots.
 Ennis *et al.* 2006, ApJ, 652, 376. Spitzer observations.
 Mookerjee *et al.* 2006, MNRAS, 371, 761. Sub-mm [C I] observations.
 Kang & Koo 2007, ApJS, 173, 85. SGPS of high velocity H I.
 Patnaude & Fesen 2007, AJ, 133, 147. X-ray variability of compact features.
 Albert *et al.* 2007, A&A, 474, 937. γ -ray observations.
 Rho *et al.* 2008, ApJ, 673, 271. Spitzer observations.
 Uchiyama & Aharonian 2008, ApJ, 677, L105. X-ray variability of compact features.
 Rest *et al.* 2008, ApJ, 681, L81. SN light echo.
 Hammell & Fesen 2008, ApJS, 179, 195. HST of outer knots.
 Krause *et al.* 2008, Science, 320, 1195. SN light echo spectrum.

G113.0+0.2

RA: 23^h36^m35^s
Dec: +61°22′

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

Size/arcmin: 40 × 17?
Type: ?

Radio: Elongated, extent not well defined.

Distance: Association for HI indicates 3.1 kpc.

Point sources: Contains old pulsar.

References:

Kothes *et al.* 2005, A&A, 444, 871. CGPS at 408 MHz (2′8 × 3′1) and 1.4 GHz (49″ × 55″) including HI.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz (~3′) and 1420 MHz (~1′).

G114.3+0.3

RA: 23^h37^m00^s
Dec: +61°55′

1-GHz flux/Jy: 5.5
Spectral index: 0.5

Size/arcmin: 90 × 55
Type: S

Radio: Shell, with HII region S165 within the boundary of the remnant.

Optical: Faint emission in centre and to S.

Distance: Association with HI and other features implies 0.7 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, Nature, 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.
 Reich 2002, in NSPS, p1. Effelsberg 100-m at 2.7 GHz.
 Mavromatakis *et al.* 2002, A&A, 383, 1011. Optical observations.
 Yar-Uyaniker *et al.* 2004, ApJ, 616, 247. CGPS at 1.4 GHz (49″ × 55″), including HI (1′0 × 1′1).
 Tian & Leahy 2006, ChJAA, 6, 543. CGPS at 408 MHz (3′4 × 3′9 : S = 12.0 ± 6.0 Jy) and 1.4 GHz (1′0 × 1′1 : S = 9.8 ± 0.8 Jy).
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 1420 MHz (~1′ : S = 5.4 ± 0.8 Jy), including review of flux densities.

G116.5+1.1

RA: 23^h53^m40^s
Dec: +63°15′

1-GHz flux/Jy: 10
Spectral index: 0.5

Size/arcmin: 80 × 60
Type: S

Radio: Distinct shell, with high polarisation.

Optical: Detected.

Distance: Association with HI features implies 1.6 kpc.

References:

Reich & Braunsfurth 1981, A&A, 99, 17. Effelsberg 100-m at 2.7 GHz (4′4 : S = 4.7 ± 0.4 Jy) and $S_{1.4\text{ GHz}} = 8.0 ± 0.8$ 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.
 Yar-Uyaniker *et al.* 2004, ApJ, 616, 247. CGPS at 1.4 GHz (49″ × 55″), including HI (1′0 × 1′1).
 Mavromatakis *et al.* 2005, A&A, 435, 141. Optical observations.
 Tian & Leahy 2006, ChJAA, 6, 543. CGPS at 408 MHz (3′4 × 3′8 : S = 15.0 ± 1.5 Jy) and 1.4 GHz (1′0 × 1′1 : S = 10.6 ± 0. Jy).
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz (~3′ : S = 12.5 ± 1.6 Jy) and 1420 MHz (~1′ : S = 10.3 ± 0.70 Jy), including polarisation and review of flux densities.

G116.9+0.2

CTB 1

RA: 23^h59^m10^s
Dec: +62°26′

1-GHz flux/Jy: 8
Spectral index: 0.61

Size/arcmin: 34
Type: S

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: Association with HI features implies 1.6 kpc.

References:

- Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ($S' : S = 3.9 \pm 1.0$ 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 observations.
- Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($S' : S = 4.2 \pm 0.2$ 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.
- Reich 2002, in NSPS, p1. Effelsberg 100-m at 10.6 GHz ($69''$), including polarisation.
- Yar-Uyaniker *et al.* 2004, ApJ, 616, 247. CGPS at 1.4 GHz ($49'' \times 55''$), including HI ($1'.0 \times 1'.1$).
- Lazendic & Slane 2006, ApJ, 647, 350. X-ray observations.
- Tian & Leahy 2006, ChJAA, 6, 543. CGPS at 408 MHz ($3'.4 \times 3'.8 : S = 15.0 \pm 1.5$ Jy) and 1.4 GHz ($1'.0 \times 1'.1 : S = 8.1 \pm 0.4$ Jy).
- Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 10.5 \pm 0.8$ Jy) and 1420 MHz ($\sim 1' : S = 7.0 \pm 0.8$ Jy), including review of flux densities.

G119.5+10.2

CTA 1

RA: 00^h06^m40^s**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: γ -ray pulsar.

Distance: Associated HI shell indicates 1.4 kpc.

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 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.
 Reich 2002, in NSPS, p1. Effelsberg 100-m at 1.4 GHz (9′.4).
 Slane *et al.* 2004, ApJ, 601, 1045. XMM observations of central source.
 Halpern *et al.* 2004, ApJ, 612, 398. Chandra observations of central nebula, plus optical and radio limits for compact source.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.
 Abdo *et al.* 2008, Science, 322, 1218. γ -ray detection of pulsar.

G120.1+1.4**RA:** 00^h25^m18^s**Dec:** +64°09′**1-GHz flux/Jy:** 56**Spectral index:** 0.65

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, 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 observations.
- Reid *et al.* 1982, ApJ, 261, 485. Einstein observations.
- Seward *et al.* 1983, ApJ, 266, 287. Einstein observations.
- Tan & Gull 1985, MNRAS, 216, 949. Radio 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 ($1''5$) polarisation 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 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 γ -rays.
- Hwang *et al.* 2002, ApJ, 581, 1101. Chandra observations.
- Lee *et al.* 2004, ApJ, 605, L113. Observations of molecular clouds in vicinity.
- Bamba *et al.* 2005, ApJ, 621, 793. Chandra observations of rim.
- Warren *et al.* 2005, ApJ, 634, 376. Chandra observations.
- Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 86 \pm 5$ Jy) and 1420 MHz ($\sim 1' : S = 40.5 \pm 1.5$ Jy), including polarisation and review of flux densities.
- Lee *et al.* 2007, ApJ, 659, L133. H α observations.
- Cassam-Chenaï *et al.* 2007, ApJ, 665, 315. Chandra observations.
- Rest *et al.* 2008, ApJ, 681, L81. SN light echo.
- Krause *et al.* 2008, Nature, 456, 617. SN light echo spectrum.

G126.2+1.6

RA: 01^h22^m00^s
Dec: +64°15′

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

Size/arcmin: 70
Type: S?

Radio: Poorly defined shell.

Optical: Filaments, mostly in W.

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.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14′.5 : S = 6.1 \pm 1.6$ Jy).
 Boumis *et al.* 2005, A&A, 443, 175. Optical observations.
 Tian & Leahy 2006, A&A, 447, 205. CGPS at 408 MHz ($3′.4 \times 3′.8 : S = 9.7 \pm 3.9$ Jy) and 1.4 GHz ($1′.0 \times 1′.1 : S = 6.7 \pm 2.1$ Jy), plus other observations for spectral index studies.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3′ : S = 5.7 \pm 0.7$ Jy) and 1420 MHz ($\sim 1′ : S = 6.4 \pm 1.1$ Jy), including review of flux densities.
 Sun *et al.* 2007, A&A, 463, 993. Urumqi 25-m at 5 GHz ($9′.5 : S = 2.6 \pm 0.6$ Jy), including polarisation.
 see also: Sun *et al.* 2007, A&A, 469, 1003. Erratum.

G127.1+0.5

RA: 01^h28^m20^s
Dec: +63°10′

1-GHz flux/Jy: 12
Spectral index: 0.45

Size/arcmin: 45
Type: S

R5

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 NGC 559.

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 α 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 α 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.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14′.5 : S = 14.6 \pm 0.8$ Jy).
 Kaplan *et al.* 2004, ApJS, 153, 269. Chandra limits for any compact sources.
 Leahy & Tian 2006, A&A, 451, 251. CGPS at 408 MHz ($3′.4 \times 3′.8 : S = 17.1 \pm 1.7$ Jy) and 1.4 GHz ($1′.0 \times 1′.2 : S = 10.0 \pm 0.8$ Jy).
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3′ : S = 15.9 \pm 1.0$ Jy) and 1420 MHz ($\sim 1′ : S = 9.7 \pm 0.6$ Jy), including polarisation and review of flux densities.
 Sun *et al.* 2007, A&A, 463, 993. Urumqi 25-m at 5 GHz ($9′.5 : S = 6.3 \pm 0.7$ Jy), including polarisation.
 see also: Sun *et al.* 2007, A&A, 469, 1003. Erratum.

G130.7+3.1

3C58, SN1181

RA: 02^h05^m41^s**1-GHz flux/Jy:** 33**Size/arcmin:** 9 × 5**Dec:** +64°49′**Spectral index:** 0.07**Type:** F

This is the remnant of the SN of AD1181.

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

Optical: Faint filaments.

X-ray: Centrally brightened, with faint jet.

Point sources: Central pulsar.

Distance: HI 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, Nature, 299, 606. HI 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), plus 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. HI absorption.
 Wallace *et al.* 1994, A&A, 286, 565. HI of surroundings.
 Helfand *et al.* 1995, ApJ, 453, 741. ROSAT observations.
 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 and expansion studies.
 Bocchino *et al.* 2001, A&A, 369, 1078. XMM observations.
 Murray *et al.* 2002, ApJ, 568, 226. Chandra pulsar detection.
 Camilo *et al.* 2002, ApJ, 571, L41. Pulsar detection in radio.
 Reich 2002, in NSPS, p1. Effelsberg 100-m at 32 GHz ($26''$) for polarised intensity.
 Slane *et al.* 2002, ApJ, 571, L45. Chandra observations.
 Slane *et al.* 2004, ApJ, 616, 403. Deep Chandra imaging.
 Bietenholz 2006, ApJ, 645, 1180. VLA at 1.4 GHz ($1''36$) for expansion studies.
 Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 32.2 \pm 2.0$ Jy) and 1420 MHz ($\sim 1' : S = 31.9 \pm 1.0$ Jy), including polarisation and review of flux densities.
 Gotthelf *et al.* 2007, ApJ, 654, 267. XMM observations.
 Slane *et al.* 2008, ApJ, 676, L33. IR observations.
 Fesen *et al.* 2008, ApJS, 174, 379. Optical observations for proper motion studies.
 Shearer & Neustroev 2008, MNRAS, 390, 235. Optical observations of pulsar nebula.
 Shibano *et al.* 2008, A&A, 486, 273. Optical observations of pulsar nebula.

G132.7+1.3

HB3

RA: 02^h17^m40^s**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 observations.

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. Radio at 151 MHz (4.4') and 1.4 GHz (2') showing H α 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 (1.0×1.1) for H α , 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 (1.0×1.1).

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

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

Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14.5 : S = 51.5 \pm 3.5$ Jy).

Tian & Leahy 2005, A&A, 436, 187. CGPS at 408 MHz (3.4×3.8) and 1.4 GHz (1.0×1.1), for spectral index studies.

see also: Tian & Leahy 2006, A&A, 451, 991. Erratum.

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 61 \pm 9$ Jy) and 1420 MHz ($\sim 1' : S = 29.4 \pm 2.7$ Jy), including review of flux densities.

Lazendic & Slane 2006, ApJ, 647, 350. X-ray observations.

Green 2007, BASI, 35, 77. Review of radio spectrum.

Shi *et al.* 2008, A&A, 487, 601. Urumqi 25-m at 4.8 GHz (9.5'), plus other survey observations for spectral studies.

Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.

G156.2+5.7**RA:** 04^h58^m40^s**1-GHz flux/Jy:** 5**Size/arcmin:** 110**Dec:** +51°50′**Spectral index:** 0.5**Type:** S

Radio: Faint shell, brighter in E and W.

Optical: Filamentary ring and smaller patchy ring.

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 α 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.

Reich 2002, in NSPS, p1. Effelsberg 100-m at 2.7 GHz, including polarisation.

Kaplan *et al.* 2006, ApJS, 163, 344. X-ray upper limit on compact sources.

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 8.1 \pm 1.3$ Jy), including review of flux densities.

Xu *et al.* 2007, A&A, 470, 969. Urumqi 25-m at 4.8 GHz ($9.5 : S = 2.5 \pm 0.5$ Jy), including polarisation.

Gerardy & Fesen 2007, MNRAS, 376, 929. Optical observations.

G160.9+2.6

HB9

RA: 05^h01^m00^s
Dec: +46°40′

1-GHz flux/Jy: 110
Spectral index: 0.64

Size/arcmin: 140 × 120
Type: 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′ × 40′ : S = 750 ± 150 Jy), plus review of flux densities.

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

Seaquist & 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 × 4′8) and 1.4 GHz (1′0 × 1′4), including HI 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 × 5′2), CLFST at 151 MHz (4′2 × 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 ± 340 Jy).

Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz (14′5 : S = 91 ± 3 Jy).

Kaplan *et al.* 2006, ApJS, 163, 344. X-ray upper limit on compact sources.

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz (~3′ : S = 102 ± 7 Jy) and 1420 MHz (~1′ : S = 54.0 ± 2.9 Jy), including polarisation and review of flux densities.

Leahy & Tian 2007, A&A, 461, 1013. CGPS at 408 MHz (2′8 × 3′9 : S = 117.8 ± 5.3 Jy) and 1.4 GHz (58″ × 80″ : S = 65.9 ± 3.4 Jy).

G166.0+4.3

VRO 42.05.01

RA: 05^h26^m30^s
Dec: +42°56′

1-GHz flux/Jy: 7
Spectral index: 0.37

Size/arcmin: 55 × 35
Type: S

Radio: Two arcs of strikingly different radii.

Optical: Nearly complete ring.

X-ray: Predominantly in SW.

Distance: HI indicates 4.5 kpc.

References:

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

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

Lozinskaya 1979, AuJPh, 32, 113. H α interferometry.

Landecker *et al.* 1982, ApJ, 261, L41. DRAO at 1.4 GHz (1′0 × 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″ × 20″) of part of remnant, and optical observations.

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 HI Observations.

Landecker *et al.* 1989, MNRAS, 237, 277. DRAO at 1.4 GHz (1′0 × 1′4), including HI.

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.

Leahy & Tian 2005, A&A, 440, 929. CGPS at 408 MHz (3′4 × 5′0) and 1.4 GHz (1′0 × 1′4), for spectral index studies.

see also: Tian & Leahy 2006, A&A, 451, 991. Erratum.

Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz (~3′ : S = 8.1 ± 0.9 Jy) and 1420 MHz (~1′ : S = 5.1 ± 0.4 Jy), including polarisation and review of flux densities.

G179.0+2.6**RA:** 05^h53^m40^s**Dec:** +31°05′**1-GHz flux/Jy:** 7**Spectral index:** 0.4**Size/arcmin:** 70**Type:** 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.

Reich 2002, in NSPS, p1. Effelsberg 100-m at 2.7 GHz.

G180.0–1.7**RA:** 05^h39^m00^s**Dec:** +27°50′**1-GHz flux/Jy:** 65**Spectral index:** varies**Size/arcmin:** 180**Type:** S

S147

Radio: Large faint shell, with spectral break.**Optical:** Wispy ring.**X-ray:** Possible detection.**Point sources:** Pulsar within boundary, with faint wind nebula.**Distance:** Optical absorption towards stars indicates > 0.36 and < 0.88 kpc.**References:**van den Bergh *et al.* 1973, ApJS, 26, 19. Optical observations.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 ± 4 Jy) and 1.6 GHz (10′ : S = 60.2 ± 6 Jy).

Angerhofer & Kundu 1981, AJ, 86, 1003. Arecibo at 430 MHz (9′ : S = 97 ± 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.

Reich 2002, in NSPS, p1. Effelsberg 100-m at 2.7 GHz.

Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz (14′.5 : S = 77 ± 10 Jy).

Romani & Ng 2003, ApJ, 585, L41. Chandra of pulsar.

Kramer *et al.* 2003, ApJ, 593, L31. Pulsar observations.

Sallmen & Welsh 2004, A&A, 426, 555. Optical absorption towards background stars.

Drew *et al.* 2005, MNRAS, 362, 753. H α imaging.Ng *et al.* 2007, ApJ, 654, 487. Pulsar and wind nebula observations.Xiao *et al.* 2008, A&A, 482, 783. Urumqi 25-m at 4.8 GHz (9′.5 : S = 15.4 ± 3.0 Jy) and Effelsberg 100-m at 2.6 GHz (4′.4 : S = 34.6 ± 4.0 Jy).**G182.4+4.3****RA:** 06^h08^m10^s**Dec:** +29°00′**1-GHz flux/Jy:** 1.2**Spectral index:** 0.4**Size/arcmin:** 50**Type:** 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 ± 0.08 Jy, 4′.4 : S = 0.25 ± 0.04 Jy, 2′.5 : S = 0.20 ± 0.02 Jy and 1′.2 : S = 0.15 ± 0.03 Jy), plus X-ray upper limit.

Reich 2002, in NSPS, p1. Effelsberg 100-m at 2.7 GHz and 4.9 GHz (3′).

G184.6–5.8

Crab Nebula, 3C144, SN1054

RA: 05^h34^m31^s**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 polarised 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, *Nature*, 308, 251. VLA at 1.4 GHz, radio detection of ‘jet’.
- 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.
- Hickson & van den Bergh 1990, *ApJ*, 365, 224. Optical polarisation.
- Bietenholz & Kronberg 1990, *ApJ*, 357, L13. VLA at 1.4 GHz (1’8).
- 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.
- 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.
- Murdin 1994, *MNRAS*, 269, 89. Deep H α plates and spectroscopy of halo.
- Wallace *et al.* 1994, *A&A*, 286, 565. HI of surroundings.
- MacAlpine *et al.* 1994, *ApJ*, 432, L131. Prominent optical knots.
- Rudy *et al.* 1994, *ApJ*, 426, 646. IR spectroscopy.
- 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’)
- 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. γ -ray observations.
- Tanimori *et al.* 1998, *ApJ*, 492, L33. γ -ray observations.
- Nugent 1998, *PASP*, 110, 831. Optical expansion.
- Hillas *et al.* 1998, *ApJ*, 503, 744. γ -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 HI 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 γ -ray observations.
- Carramiñana *et al.* 2000, *ApJ*, 542, 974. Optical spectra of pulsar.
- Oser *et al.* 2001, *ApJ*, 547, 949. γ -ray observations.
- Willingale *et al.* 2001, *A&A*, 365, L212. XMM 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.
- Bandiera *et al.* 2002, *A&A*, 386, 1044. 1.3 mm observations.
- Hester *et al.* 2002, *ApJ*, 577, L49. HST and Chandra multi-epoch observations.
- Reich 2002, in *NSPS*, p1. Effelsberg 100-m at 32 GHz, including polarisation.
- Atkins *et al.* 2003, *ApJ*, 595, 803. High energy γ -ray observations.
- Green *et al.* 2004, *MNRAS*, 355, 1315. Sub-mm and ISO observations.
- Mori *et al.* 2004, *ApJ*, 609, 186. Chandra observations.
- Čadež *et al.* 2004, *ApJ*, 609, 797. Optical observations.
- Aharonian *et al.* 2004, *ApJ*, 614, 897. γ -ray observations.
- Bietenholz *et al.* 2004, *ApJ*, 615, 794. VLA at 5 GHz (1’4) and HST multi-epoch observation for proper motion studies.
- Melatos *et al.* 2005, *ApJ*, 633, 931. Multi-epoch near-IR observations central region.
- Seward *et al.* 2006, *ApJ*, 636, 873. Chandra observations of scattering halo.
- Temim *et al.* 2006, *AJ*, 132, 1610. Spitzer observations.
- Aharonian *et al.* 2006, *A&A*, 457, 899. γ -ray observations
- Seward *et al.* 2006, *ApJ*, 652, 1277. Chandra observations.
- MacAlpine *et al.* 2007, *AJ*, 133, 81. Optical spectroscopy.
- Kaplan *et al.* 2008, *ApJ*, 677, 1201. HST proper motion of pulsar.
- Rudie *et al.* 2008, *MNRAS*, 384, 1200. [OIII] observations of ‘jet’, for proper motion.

G189.1+3.0

IC443, 3C157

RA: 06^h17^m00^s**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, plus compact source with nebula.**Point sources:** X-ray source and nebula in S.**Distance:** Mean optical velocity suggests 0.7–1.5 kpc, association with S249 gives 1.5–2 kpc.**References:**

- 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 HI 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 $40''$).
 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 O₂.
 Wood *et al.* 1991, AJ, 102, 224. VLA at 5 GHz ($3''6 \times 3''8$) of northeast, including polarisation.
 Wang & Scoville 1992, ApJ, 386, 158. Observations of shocked molecular species.
 Turner *et al.* 1992, ApJ, 399, 114. Observations of shocked molecular species.
 Dickman *et al.* 1992, ApJ, 400, 203. Observations of shocked molecular species.
 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.
 Esposito *et al.* 1996, ApJ, 461, 820. γ -ray observations.
 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.
 Setá *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 H₂.
 Bocchino & Bykov 2000, A&A, 362, L29. BeppoSAX observations.
 Rho *et al.* 2001, ApJ, 547, 885. ISO 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 of compact X-ray source and surrounding nebula.
 Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.
 Kawasaki *et al.* 2002, ApJ, 572, 897. ASCA observations.
 Bocchino & Bykov 2003, A&A, 400, 203. XMM observations of compact sources.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14'5 : S = 160 \pm 5$ Jy).
 Welsh & Sallmen 2003, A&A, 408, 545. Optical absorption studies.
 Leahy 2004, AJ, 127, 2277. DRAO at 408 MHz ($3'3 \times 8'6$) and 1.4 GHz ($1'0 \times 2'6$), for spectral index studies.
 see also: Leahy 2004, AJ, 128, 1478. Addendum.
 Snell *et al.* 2005, ApJ, 620, 758. Molecular line and IR observations of shocked material.
 Bykov *et al.* 2005, ApJ, 624, L41. Chandra observations of compact source.
 Kawasaki *et al.* 2005, ApJ, 631, 935. ASCA observations.
 Neufeld *et al.* 2007, ApJ, 664, 890. Spitzer IR observations.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.
 Gaensler *et al.* 2006, ApJ, 648, 1037. Chandra of X-ray source and nebula.
 Hewitt *et al.* 2006, ApJ, 652, 1288. GBT at 1.6 and 1.7 GHz ($7'2$) for OH, and VLA at 330 MHz ($74'' \times 64''$).
 Rosado *et al.* 2007, AJ, 133, 89. Observations of shocked H₂.
 Albert *et al.* 2007, ApJ, 664, L87. γ -ray observations.
 Lee *et al.* 2008, AJ, 135, 796. VLA at 1.4 GHz ($39'' \times 42''$) including HI.
 Troja *et al.* 2008, A&A, 485, 777. XMM observations.
 Bocchino *et al.* 2008, AdSpR, 41, 396. Integral observations.
 Bykov *et al.* 2008, ApJ, 676, 1050. XMM, Chandra and Spitzer observations.

G192.8–1.1**RA:** 06^h09^m20^s**Dec:** +17°20′**1-GHz flux/Jy:** 20?**Spectral index:** 0.6?

PKS 0607+17

Size/arcmin: 78**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^h39^m00^s**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 & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz ($9'$).
 Velusamy & Kundu 1974, A&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 γ -ray emission.
 Biggs & 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. γ -ray detection.
 Kaplan *et al.* 2006, ApJS, 163, 344. X-ray upper limit on compact sources.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.

G206.9+2.3**RA:** 06^h48^m40^s**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 & Meaburn 1978, A&A, 69, 443. Optical observations.
 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 observations.
 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 & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Aharonian *et al.* 2004, A&A, 417, 973. γ -ray limits.

G260.4–3.4**RA:** 08^h22^m10^s**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 possible pulsating X-ray source.

Distance: Association with HI gives 2.2 kpc.

References:

Green 1971, AuJPh, 24, 773. Molonglo at 408 MHz ($3' : S = 198 \pm 20$ Jy).
 Goudis & Meaburn 1978, A&A, 62, 283. H α + [NII] optical image.
 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 ($44'' \times 65''$), with large scale emission added, plus IR, optical and X-ray observations.
 Dubner *et al.* 1991, AJ, 101, 1466. VLA at 327 MHz ($43'' \times 73''$) and 1.5 GHz ($43'' \times 77''$).
 Arendt *et al.* 1991, ApJ, 368, 474. IR observations.
 Milne *et al.* 1993, MNRAS, 261, 366. Parkes 64-m at 4.75 ($4'5 : S = 59 \pm 5$ Jy) and 8.4 GHz ($3' : S = 38 \pm 4$ Jy), plus polarisation.
 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 ($43'' \times 60''$).
 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.
 Reynoso *et al.* 2003, MNRAS, 345, 671. ATCA at 1.4 GHz ($90''$) for HI near central X-ray source.
 Hwang *et al.* 2005, ApJ, 635, 355. Chandra observations of E edge.
 Hui & Becker 2006, A&A, 454, 543. XMM and Chandra observations.
 Hui & Becker 2006, A&A, 457, L33. Chandra proper motion study of central source.
 Castelletti *et al.* 2006, A&A, 459, 535. VLA at 1.4 GHz ($16'' \times 34'' : S = 114 \pm 8$ Jy) and 327 MHz ($45'' \times 90'' : S = 263 \pm 20$ Jy).
 Winkler & Petre 2007, ApJ, 670, 635. Chandra proper motion study of central source.
 Paron *et al.* 2008, A&A, 480, 439. CO observations of E.
 Hwang *et al.* 2008, ApJ, 676, 378. Suzaku observations.

G261.9+5.5**RA:** 09^h04^m20^s**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 ($44'' \times 71''$).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G263.9–3.3**RA:** 08^h34^m00^s**Dec:** –45°50′**1-GHz flux/Jy:** 1750**Spectral index:** varies

Vela (XYZ)

Size/arcmin: 255**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), and pulsar nebula.

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, AuJPh, 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.
- 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. Clarification of notation of this region and review previous observations.
- Bignami & 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.
- 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.
- Strom *et al.* 1995, Nature, 373, 590. Radio of X-ray extensions.
- Markwardt & Ögelman 1995, Nature, 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 polarisation, of Vela X.
- Danks & Sembach 1995, AJ, 109, 2627. Optical spectroscopy of background stars.
- Blair *et al.* 1995, AJ, 110, 312. UV spectroscopy.
- Duncan *et al.* 1996, MNRAS, 280, 252. Parkes 64-m at 2.4 GHz (8.9).
- 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. γ -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 γ -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.
- Moriguchi *et al.* 2001, PASJ, 53, 1025. CO observations.
- Dodson *et al.* 2003, MNRAS, 343, 116. ATCA at 1.4, 2.4, 5.2 and 8.5 GHz (8.1′ × 6.2′, 36″ × 26″, 12.1′ × 10.5′ and 11.2′ × 10.6′) of pulsar nebula.
- Sankrit *et al.* 2003, ApJ, 589, 242. Optical nebulosity to NE of G266.2–1.2.
- Nichols & Slavin 2004, ApJ, 610, 285. UV absorption toward background sources.
- Hales *et al.* 2004, ApJ, 613, 977. Vela X at 31 GHz (4.1).
- Mongano *et al.* 2005, A&A, 436, 917. XMM and other X-ray observations of pulsar nebula.
- Miceli *et al.* 2005, A&A, 442, 513. XMM observations of N rim.
- Katsuda & Tsunemi 2005, PASJ, 57, 621. XMM observations of E.
- Aharonian *et al.* 2006, A&A, 448, L43. γ -ray observations.
- McConnell *et al.* 2006, AJ, 131, 648. ATCA at 4.9 GHz (12′) including polarisation.
- Katsuda & Tsunemi 2006, ApJ, 642, 917. XMM observations of NE.
- Nishikida *et al.* 2006, ApJ, 644, L171. Far UV observations.
- Miceli *et al.* 2008, ApJ, 676, 1064. XMM observations.
- LaMassa *et al.* 2008, ApJ, 689, L121. XMM observations of Vela X.

G266.2–1.2

RA: 08^h52^m00^s
Dec: –46°20′

1-GHz flux/Jy: 50?
Spectral index: 0.3?

RX J0852.0–4622
Size/arcmin: 120
Type: S

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

Radio: Incomplete shell, confused by the Vela SNR.

Optical: Nebulosity offset to NE.

X-ray: Non-thermal shell, confused by the Vela SNR, with central source, and possible associated pulsar.

Point sources: Central X-ray source, with optical nebula, and possible associated pulsar.

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

References:

Aschenbach 1998, *Nature*, 396, 141. ROSAT identification.
 Iyudin *et al.* 1998, *Nature*, 396, 142. γ -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 nearly nebulosity.
 Tsunemi *et al.* 2000, *PASJ*, 52, 887. ASCA spectral observations.
 Slane *et al.* 2001, *ApJ*, 548, 814. ASCA observations.
 Mereghetti *et al.* 2001, *ApJ*, 548, L213. BeppoSAX observations of central sources.
 Pavlov *et al.* 2001, *ApJ*, 559, L131. Chandra of central X-ray source.
 Moriguchi *et al.* 2001, *PASJ*, 53, 1025. CO observations.
 Pellizzoni *et al.* 2002, *A&A*, 393, L65. Optical observations of central source.
 Redman *et al.* 2002, *MNRAS*, 336, 1093. Optical nebulosity to NE.
 Kargaltsev *et al.* 2002, *ApJ*, 580, 1060. Chandra observations of central source.
 Sankrit *et al.* 2003, *ApJ*, 589, 242. Optical nebulosity to NE.
 Redman & Meaburn 2005, *MNRAS*, 356, 969. Possible pulsar association.
 Iyudin *et al.* 2005, *A&A*, 429, 225. XMM observations.
 Aharonian *et al.* 2005, *A&A*, 437, L7. γ -ray observations.
 Katagiri *et al.* 2005, *ApJ*, 619, L163. γ -ray observations.
 Bamba *et al.* 2005, *ApJ*, 632, 294. Chandra of NW rim.
 Reynoso *et al.* 2006, *A&A*, 449, 243. ATCA at 1.38 GHz (32'' \times 37'').
 Enomoto *et al.* 2006, *ApJ*, 652, 1268. γ -ray observations.
 Mignami *et al.* 2007, *A&A*, 473, 883. Deep optical observations of compact X-ray source.
 Aharonian *et al.* 2007, *ApJ*, 661, 236. γ -ray observations.
 Katsuda *et al.* 2008, *ApJ*, 678, L35. XMM proper motion study.
 Katsuda *et al.* 2008, *ApJ*, 678, 297. XMM observations.

G272.2–3.2

RA: 09^h06^m50^s
Dec: –52°07′

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 observations.
 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'' \times 70'' : $S = 0.45 \pm 0.10$ Jy), and ATCA at 2.4 GHz (37'' \times 52''), plus ROSAT observations.
 Harus *et al.* 2001, *ApJ*, 552, 614. ASCA and ROSAT observations, plus review of earlier observations.

G279.0+1.1

RA: 09^h57^m40^s
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 polarisation.
 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^h18^m15^s
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 with wind nebula nearby.

References:

Ruiz & May 1986, ApJ, 309, 667. CO and optical observations.
 Milne *et al.* 1989, PASA, 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 polarisation, 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.
 Camilo *et al.* 2004, ApJ, 616, 1118. Chandra observations of pulsar and nebula.

G286.5–1.2

RA: 10^h35^m40^s
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^h01^m15^s
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^h03^m05^s
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: Centrally brightened.

Point sources: Pulsar nearby.

Distance: HI absorption indicates 7 ± 1 kpc.

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).
 Elliott & Malin 1979, MNRAS, 186, 45P. Optical image and spectra.
 Kirshner & Winkler 1979, ApJ, 227, 853. Optical observations.
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 50″).
 Milne *et al.* 1989, PASA, 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 polarisation.
 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.
 Gotthelf & Kaspi 1998, ApJ, 497, L29. ASCA observations of pulsar.
 Slane *et al.* 2002, ApJ, 564, 284. ASCA observations.
 Filipović *et al.* 2005, SerAJ, 170, 47. ATCA at 1.4 GHz (21″), plus other observations, including CO of surroundings.
 Reynoso *et al.* 2006, MNRAS, 369, 416. ATCA at 1.4 GHz (22″.5 × 25″.0) including HI.

G291.0–0.1

RA: 11^h11^m54^s
Dec: –60°38′

1-GHz flux/Jy: 16
Spectral index: 0.29

(MSH 11–62)

Size/arcmin: 15 × 13
Type: C

Radio: Centrally brightened core, with surrounding arcs.

X-ray: Centrally brightened.

Point sources: Central compact X-ray source.

References:

Shaver & 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 polarisation.
 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**RA:** 11^h24^m36^s**Dec:** –59°16′**1-GHz flux/Jy:** 15**Spectral index:** 0.4

MSH 11–54

Size/arcmin: 12 × 8**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 pulsar.**Point sources:** Central pulsar.**Distance:** HI absorption implies 6.0 kpc.**References:**

Shaver & 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 & Tuohy 1984, ApJ, 282, 135. Optical spectra.
 Braun *et al.* 1986, A&A, 162, 259. MOST at 843 MHz (0′.8) and IRAS.
 Hughes & Singh 1994, ApJ, 422, 126. EXOSAT spectrum.
 Sutherland & Dopita 1995, ApJ, 439, 365. Spectrophotometry.
 Hughes *et al.* 2001, ApJ, 559, L153. Chandra observations, including central nebula.
 Camilo *et al.* 2002, ApJ, 567, L71. Pulsar detection.
 Park *et al.* 2002, ApJ, 564, L39. Chandra observations.
 Gonzalez & Safi-Harb 2003, ApJ, 583, L91. Chandra observations.
 Hughes *et al.* 2003, ApJ, 591, L139. Chandra observations of pulsar.
 Gaensler & Wallace 2003, ApJ, 594, 326. ATCA at 1.4, 2.3 and 5.2 GHz (9′.6 × 8′.0, 7′.2 × 6′.2 and 5′.5 × 4′.8 : S=11.9±0.1, 11.4±0.1 and 8.8±0.1), plus HI observations.
 Park *et al.* 2004, ApJ, 602, L33. Chandra observations.
 Vink *et al.* 2004, NuPhS, 132, 62. XMM observations.
 Ghavamian *et al.* 2005, ApJ, 635, 365. Optical imaging spectroscopy.
 Winkler & Long 2006, AJ, 132, 360. Optical observations.
 Park *et al.* 2007, ApJ, 670, L121. Chandra observations.
 Zharikov *et al.* 2008, A&A, 492, 805. Possible optical counterpart to pulsar and nebula.

G292.2–0.5**RA:** 11^h19^m20^s**Dec:** –61°28′**1-GHz flux/Jy:** 7**Spectral index:** 0.5**Size/arcmin:** 20 × 15**Type:** S**Radio:** Shell.**X-ray:** Detected.**Point sources:** Central, young pulsar with X-ray nebula.**Distance:** HI absorption indicates 8.4 kpc.**References:**

Camilo *et al.* 2000, ApJ, 541, 367. Pulsar detection.
 Crawford *et al.* 2001, ApJ, 554, 152. ATCA at 1.4 GHz (29″ × 25″ : S=5.6 × 0.3 Jy) and 2.5 GHz (21″ × 20″).
 Pivovarov *et al.* 2001, ApJ, 554, 161. ROSAT and ASCA observations.
 Gonzalez & Safi-Harb 2003, ApJ, 591, L143. Chandra observations of pulsar.
 Caswell *et al.* 2004, MNRAS, 352, 1405. ATCA at 5 GHz (1′ : S=2.8 Jy), including polarisation, and 1.4 GHz for HI absorption.
 Gonzalez & Safi-Harb 2005, ApJ, 619, 856. Chandra observations.
 Gonzalez *et al.* 2005, ApJ, 630, 489. XMM observations of pulsar.
 Safi-Harb *et al.* 2008, ApJ, 684, 532. Chandra observations of pulsar and nebula.

G293.8+0.6**RA:** 11^h35^m00^s**Dec:** –60°54′**1-GHz flux/Jy:** 5?**Spectral index:** 0.6?**Size/arcmin:** 20**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 & Caswell 1987, A&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^h36^m10^s**Dec:** –61°38′**1-GHz flux/Jy:** >2?**Spectral index:** ?**Size/arcmin:** 40**Type:** S**Radio:** Faint shell.**References:**Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ : $S>2$).**G296.1–0.5****RA:** 11^h51^m10^s**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′ : $S>0.74$).Longmore *et al.* 1977, MNRAS, 181, 541. Optical spectra.

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

Markert *et al.* 1981, ApJ, 248, L17. Einstein observations.Caswell & Barnes 1983, ApJ, 271, L55. Molonglo at 408 MHz (3′ : $S=12.4$ Jy).Bignami *et al.* 1986, ApJ, 302, 606. EXOSAT and Einstein observations.

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

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : $S>2.4$).Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G296.5+10.0

RA: 12^h09^m40^s
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 & Irvine 1974, ApJ, 192, L111. Optical observations.
 Danziger & Dennefeld 1976, PASP, 88, 44. Optical spectra.
 Dickel & 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.
 Kellett *et al.* 1987, MNRAS, 225, 199. EXOSAT of the west of the remnant, including the compact source.
 Kesteven & Caswell 1987, A&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″).
 Bignami *et al.* 1992, ApJ, 389, L67. Optical in vicinity of X-ray source.
 Milne & 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 polarisation 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.
 Gotthelf & Halpern 2007, ApJ, 664, L35. X-ray timing observations of pulsar.

G296.8–0.3

RA: 11^h58^m30^s
Dec: –62°35′

1-GHz flux/Jy: 9
Spectral index: 0.6

1156–62

Size/arcmin: 20 × 14
Type: S

Radio: Shell, brighter to the NW.

Distance: HI absorption gives 9.6 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 ± 0.3 Jy), including polarisation and HI observations, plus review of flux densities.

G298.5–0.3

RA: 12^h12^m40^s
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).
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G298.6–0.0

RA: 12^h13^m41^s
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).
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G299.2–2.9

RA: 12^h15^m13^s
Dec: –65°30′

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

Size/arcmin: 18 × 11
Type: S

Radio: Faint source.

X-ray: Centrally brightened with shell at higher energies.

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.
 Park *et al.* 2007, ApJ, 665, 1173. Chandra observations.

G299.6–0.5

RA: 12^h21^m45^s
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^h37^m55^s
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 & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=2.3 Jy).

G302.3+0.7

RA: 12^h45^m55^s
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 & Green 1996, A&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

Kes 17

RA: 13^h05^m59^s**1-GHz flux/Jy:** 14**Size/arcmin:** 8**Dec:** –62°42′**Spectral index:** 0.5**Type:** S**Radio:** Incomplete shell.**Distance:** Possible limit of > 9.7 kpc from HI absorption.**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=6.9 Jy).
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=18 Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.

G308.1–0.7**RA:** 13^h37^m37^s**1-GHz flux/Jy:** 1.2?**Size/arcmin:** 13**Dec:** –63°04′**Spectral index:** ?**Type:** S**Radio:** Faint shell.**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=1.3 Jy).

G308.8–0.1**RA:** 13^h42^m30^s**1-GHz flux/Jy:** 15?**Size/arcmin:** 30 × 20?**Dec:** –62°23′**Spectral index:** 0.4?**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 & 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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G309.2–0.6**RA:** 13^h46^m31^s**1-GHz flux/Jy:** 7?**Size/arcmin:** 15 × 12**Dec:** –62°54′**Spectral index:** 0.4?**Type:** S

Has been called G309.2–0.7.

Radio: Distorted shell.**X-ray:** Extended emission, with unrelated 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 ± 0.2 Jy).
 Rakowski *et al.* 2001, ApJ, 548, 258. ASCA and ROSAT observations.
 Rakowski *et al.* 2006, ApJ, 649, L111. Observations of central source.
 Safi-Harb *et al.* 2007, ApJ, 659, 407. Observations of central source.

G309.8+0.0

RA: 13^h50^m30^s
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^h58^m00^s
Dec: –62°09′

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

Kes 20B
Size/arcmin: 8
Type: S

Radio: Asymmetric shell.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″: $S=5.4$ Jy).
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G310.8–0.4

RA: 14^h00^m00^s
Dec: –62°17′

1-GHz flux/Jy: 6?
Spectral index: ?

Kes 20A
Size/arcmin: 12
Type: S

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).
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.

G311.5–0.3

RA: 14^h05^m38^s
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).
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.

G312.4–0.4

RA: 14^h13^m00^s
Dec: –61°44′

1-GHz flux/Jy: 45
Spectral index: 0.36

Size/arcmin: 38
Type: S

Radio: Irregular, incomplete shell.

Point sources: Nearby γ -ray sources and pulsars.

X-ray: Weak emission in W.

Distance: HI absorption suggests > 6 kpc and possibly > 14 kpc.

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 γ -ray sources.

Roberts *et al.* 1999, ApJ, 515, 712. MOST at 843 MHz ($43'' \times 49''$).

Doherty *et al.* 2003, MNRAS, 339, 1048. ATCA at 1.4 GHz ($25''$) plus HI absorption, and Chandra observations.

G312.5–3.0

RA: 14^h21^m00^s
Dec: –64°12′

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

Size/arcmin: 20 \times 18
Type: S

Radio: Distorted shell.

References:

Kane & Vaughan 2003, MNRAS, 344, 625. ATCA at 1.4 GHz ($129'' \times 116''$) and 2.4 GHz ($75'' \times 67''$).

G315.1+2.7

RA: 14^h24^m30^s
Dec: –57°50′

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

Size/arcmin: 190 \times 150
Type: S

Radio: Poorly defined shell.

Optical: Filaments, brighter in NE.

References:

Duncan *et al.* 1997, MNRAS, 287, 722. Parkes 64-m at 2.4 GHz ($11'$: $S=19 \pm 3$ Jy).

Stupar *et al.* 2007, MNRAS, 374, 1441. Optical and various radio observations.

G315.4–2.3**RA:** 14^h43^m00^s**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, with thermal and non-thermal emission.**Point sources:** Several X-ray sources.**Distance:** Optical observations imply 2.3 kpc.**References:**

- van den Bergh *et al.* 1973, ApJS, 26, 19. Optical observations.
 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 & Danziger 1983, MNRAS, 204, 273. Optical spectra.
 Pisarski *et al.* 1984, ApJ, 277, 710. Einstein observations
 Nugent *et al.* 1984, ApJ, 284, 612. X-ray spectrum.
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 50″).
 Long & Blair 1990, ApJ, 358, L13. Balmer dominated optical filaments.
 Greidanus & Strom 1990, A&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 & Huang 1994, Nature, 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″ × 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. BeppoSAX observations of N and SW.
 Bamba *et al.* 2000, PASJ, 52, 1157. ASCA observations.
 Ghavamian *et al.* 2001, ApJ, 547, 995. Optical spectroscopy.
 Dickel *et al.* 2001, ApJ, 546, 447. ATCA at 1.34 GHz (8″), including polarisation.
 Bokowski *et al.* 2001, ApJ, 550, 334. ASCA observations.
 Rho *et al.* 2002, ApJ, 581, 1116. Chandra observations.
 Gvaramadze & Vikhlinin 2003, A&A, 401, 625. Chandra point source search.
 Sollerman *et al.* 2003, A&A, 407, 249. Optical spectroscopy.
 Bamba *et al.* 2005, ApJ, 621, 793. Chandra observations of rim.
 Kaplan *et al.* 2004, ApJS, 153, 269. Chandra limits for any compact source.
 Vink *et al.* 2006, ApJ, 648, L33. Chandra and XMM observations.
 Ueno *et al.* 2007, PASJ, 59, S171. Suzaku observations.

G315.4–0.3**RA:** 14^h35^m55^s**Dec:** –60°36′**1-GHz flux/Jy:** 8**Spectral index:** 0.4**Size/arcmin:** 24 × 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″ × 49″ : S=3.1 Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G315.9–0.0**RA:** 14^h38^m25^s**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 & Green 1996, A&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**RA:** 14^h41^m30^s**Dec:** –60°00′**1-GHz flux/Jy:** 20?**Spectral index:** 0.4**Size/arcmin:** 29 × 14**Type:** S

(MSH 14–57)

Radio: Distorted shell, with possible ‘blowout’.**X-ray:** Detected.**Distance:** HI absorption data suggests > 7.2 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.
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4.4 : $S=16.7$ Jy).
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 51″).
 Whiteoak & Green 1996, A&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^h49^m40^s**Dec:** –59°46′**1-GHz flux/Jy:** 4.7?**Spectral index:** ?**Size/arcmin:** 11**Type:** S**Radio:** Incomplete shell.**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ : $S=5.2$ Jy).

G318.2+0.1**RA:** 14^h54^m50^s**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 & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ : $S>4.3$).
 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^h58^m30^s**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, *Nature*, 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 polarisation, 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^h14^m30^s**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 α emitting region to the NW.**X-ray:** Partial shell, central nebula and pulsar and ‘jet’.**Point sources:** Radio and X-ray pulsar, with wind nebula.**Distance:** HI absorption indicates 5.2 kpc.**References:**Caswell *et al.* 1975, *A&A*, 45, 239. Parkes HI absorption.Dickel & Milne 1976, *AuPh*, 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 observations of pulsar.Manchester *et al.* 1982, *ApJ*, 262, L31. Radio observations 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 polarisation and review of flux densities.Strom 1994, *MNRAS*, 268, L5. Historical association.Chin & Huang 1994, *Nature*, 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 γ -ray detection of pulsar.Mineo *et al.* 2001, *A&A*, 380, 695. BeppoSAX observations.Gaensler *et al.* 2002, *ApJ*, 569, 878. Chandra observations of pulsar and nebula.Dubner *et al.* 2002, *AJ*, 123, 337. ATCA at 1.4 GHz (4′0″ × 2′7″), plus HI observations.Aharonian *et al.* 2005, *A&A*, 435, L17. γ -ray detection.Yatsu *et al.* 2005, *ApJ*, 631, 312. Chandra observations of pulsar and jet.DeLaney *et al.* 2006, *ApJ*, 640, 929. Chandra and ROSAT multi-epoch observations of pulsar wind nebula.Kaplan & Moon 2006, *ApJ*, 644, 1056. Possible IR detection of pulsar.Forot *et al.* 2006, *ApJ*, 651, L45. X-ray observations of pulsar and nebula.Nakamori *et al.* 2008, *ApJ*, 677, 297. γ -ray observations.

G320.6–1.6**RA:** 15^h17^m50^s**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 polarisation.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ : $S > 9.3$).

G321.9–1.1**RA:** 15^h23^m45^s**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^h20^m40^s**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.
 Mignami *et al.* 2002, A&A, 386, 487. HST proper motion study of Cir X-1.
 Tudose *et al.* 2006, MNRAS, 372, 417. MOST at 843 MHz.

G322.5–0.1**RA:** 15^h23^m23^s**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 Parkes 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^h28^m42^s**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 ($43'' \times 52'' : S = 4.2$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G326.3–1.8**RA:** 15^h53^m00^s**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 H α absorption.
 Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz ($0'8 : S > 95$) and Parkes 64-m at 14.7 GHz ($2'2 : S = 69 \pm 8$ 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 ($44'' \times 53''$).
 Milne *et al.* 1989, PASA, 8, 187. MOST at 843 MHz ($43'' \times 52'' : S = 153 \pm 40$ Jy), and Parkes 64-m at 8.4 GHz ($3' : S = 68 \pm 5$ Jy), including polarisation.
 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 ($43'' \times 52'' : S > 130$).
 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 ($8'5 \times 6'4 : S > 60$ 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^h54^m25^s**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 ($8'4 : S = 10 \pm 15\%$ 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 ($43'' \times 52'' : S = 7.6$ 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.
 Bocchino & Bandiera 2003, A&A, 398, 195. BeppoSAX observations.

G327.2–0.1

RA: 15^h50^m55^s
Dec: –54°18′

1-GHz flux/Jy: 0.4
Spectral index: ?

Size/arcmin: 5
Type: S

Has been called G327.24–0.13.

Radio: Shell, possibly with central emission.

Point sources: Central pulsar (magnetar).

References:

Camilo *et al.* 2007, ApJ, 666, L93. Pulsar observations.

Gelfand & Gaensler 2007, ApJ, 667, 1111. Chandra and XMM observations, and 843 GHz ($43'' \times 53''$: $S=0.5 \pm 0.1$ Jy) and SGPS at 1.4 GHz ($S=0.3 \pm 0.1$ Jy).

G327.4+0.4

RA: 15^h48^m20^s
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 ($44'' \times 55''$).

Milne *et al.* 1989, PASA, 8, 187. MOST at 843 MHz ($43'' \times 53''$: $S=32.2 \pm 6$ Jy), and Parkes 64-m at 8.4 GHz ($3'$: $S=9.4 \pm 0.8$ Jy), including polarisation.

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 53''$: $S=25$ 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 Parkes 64-m at 1.4 GHz ($2'0 \times 1'8$), plus HI.

Enoguchi *et al.* 2002, PASJ, 54, 229. ASCA observations.

Kawasaki *et al.* 2005, ApJ, 631, 935. ASCA observations.

Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

Chen *et al.* 2008, ApJ, 676, 1040. Chandra observations.

G327.4+1.0

RA: 15^h46^m48^s
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 ($43'' \times 54''$: $S=2.1$ 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 ($2'0 \times 1'8$), plus HI.

G327.6+14.6

SN1006, PKS 1459–41

RA: 15^h02^m50^s**1-GHz flux/Jy:** 19**Size/arcmin:** 30**Dec:** –41°56′**Spectral index:** 0.6**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 α 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 2.2 kpc.

References:

- van den Bergh 1976, ApJ, 208, L17. Optical observations.
 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'' \times 20'').
 Kirshner *et al.* 1987, ApJ, 315, L135. Broad H α optical component.
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44'' \times 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'' \times 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.
 Reynolds & Gilmore 1993, AJ, 106, 272. VLA at 1.37 and 1.67 GHz (24''), including polarisation.
 Moffett *et al.* 1993, AJ, 106, 1566. VLA at 1.37 and 1.67 GHz (10'' \times 14''), for proper motion studies.
 Ozaki *et al.* 1994, PASJ, 46, 367. X-ray observations.
 Raymond *et al.* 1995, ApJ, 454, L31. Far UV spectroscopy.
 Koyama *et al.* 1995, Nature, 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. γ -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.
 Dubner *et al.* 2002, A&A, 387, 1047. ATCA at 1.4 GHz (4'7 \times 3'0) for H α , plus CO observations.
 Ghavamian *et al.* 2002, ApJ, 572, 888. Optical of filaments in NW.
 Sollerman *et al.* 2003, A&A, 407, 249. Optical spectroscopy.
 Winkler *et al.* 2003, ApJ, 585, 324. Optical proper motion studies.
 Vink *et al.* 2003, ApJ, 587, L31. Chandra observations.
 Bamba *et al.* 2003, ApJ, 589, 827. Chandra observations of NE.
 Korreck *et al.* 2004, ApJ, 615, 280. Far-uv observations.
 Aharonian *et al.* 2005, A&A, 437, 135. γ -ray limit.
 Winkler *et al.* 2005, ApJ, 624, 189. HST absorption towards background sources.
 Kalemci *et al.* 2006, ApJ, 640, L55. γ -ray limit upper limit.
 Kalemci *et al.* 2006, ApJ, 644, 274. Integral observations.
 Acero *et al.* 2007, A&A, 475, 883. XMM observations.
 Raymond *et al.* 2007, ApJ, 659, 1257. HST H α observations.
 Hamilton *et al.* 2007, MNRAS, 381, 771. UV spectroscopy of the Schweizer–Middleditch star.
 Bamba *et al.* 2008, AdSpR, 41, 411. Suzaku observations.
 Cassam-Chanaï *et al.* 2008, ApJ, 680, 1180. ATCA and VLA at 1.5 GHz (6'' \times 9'') plus Chandra observations.
 Yamaguchi *et al.* 2008, PASJ, 60, S141. Suzaku observations.
 Bamba 2008, PASJ, 60, S153. Suzaku observations.

G328.4+0.2

RA: 15^h55^m30^s
Dec: –53°17′

1-GHz flux/Jy: 15
Spectral index: 0.0

(MSH 15–57)

Size/arcmin: 5
Type: F

Radio: Amorphous emission, with central bar.

X-ray: Detected at high energies.

Distance: HI absorption indicates > 17.4 kpc.

References:

Shaver & 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 & Green 1996, A&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 (16′′5 × 19′′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 Parkes 64-m at 1.4 GHz (1′8 × 2′0), plus HI.

Johnston *et al.* 2004, MNRAS, 348, L19. ATCA at 19 GHz (6′′1 × 7′′7), including polarisation.

Gelfand *et al.* 2007, ApJ, 663, 468. ATCA at 1.4 GHz (5′′8 × 7′′0 : S = 13.8 ± 0.4 Jy), plus XMM observations.

G329.7+0.4

RA: 16^h01^m20^s
Dec: –52°18′

1-GHz flux/Jy: >34?
Spectral index: ?

Size/arcmin: 40 × 33
Type: S

Radio: Diffuse shell, in complex region.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43′′ × 53′′ : S > 38).

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.

Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G330.0+15.0

RA: 15^h10^m00^s
Dec: –40°00′

1-GHz flux/Jy: 350?
Spectral index: 0.5?

Lupus Loop
Size/arcmin: 180?
Type: S

Radio: Low surface brightness loop with HI shell.

X-ray: Detected, with central source.

Point sources: Central, possibly pulsating, X-ray source.

References:

Milne 1971, AuJPh, 24, 757. Parkes 64-m at 408 MHz (48′), 635 MHz (31′) and 1410 MHz (15′).

Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8′4 : S = 120 ± 30% Jy).

Toor 1980, A&A, 85, 184. X-ray image and spectrum.

Colomb & Dubner 1982, A&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.

Kaplan *et al.* 2006, ApJS, 163, 344. X-ray upper limit on compact sources.

Shinn *et al.* 2006, ApJ, 644, L189. Far UV observations.

Park *et al.* 2006, ApJ, 653, L37. Chandra observations.

G330.2+1.0**RA:** 16^h01^m06^s**Dec:** –51°34′**1-GHz flux/Jy:** 5?**Spectral index:** 0.3**Size/arcmin:** 11**Type:** S?**Radio:** Clumpy non-thermal emission, possibly a distorted shell.**X-ray:** Shell.**Distance:** HI absorption indicates > 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 & Green 1996, A&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 Parkes 64-m at 1.4 GHz (2′0 × 1′8), plus HI.
 Torii *et al.* 2006, PASJ, 58, L11. ASCA detection.

G332.0+0.2**RA:** 16^h13^m17^s**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 Parkes 64-m at 1.4 GHz (2′0 × 1′8), plus HI.

G332.4–0.4**RA:** 16^h17^m33^s**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, brightest in SE.**X-ray:** Brightest to NW, with point source near centre.**Point sources:** Central, variable X-ray source, and nearby pulsar.**Distance:** HI absorption indicates 3.1 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 polarisation.
 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.
 Carter *et al.* 1997, PASP, 109, 990. Optical expansion.
 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.
 Vink 2004, ApJ, 604, 693. Chandra observations.
 Reynoso *et al.* 2004, PASA, 21, 82. ATCA at 1.4 GHz (50′′), including HI absorption to central source.
 Russeil *et al.* 2005, A&A, 429, 497. H α observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Paron 2006, PASA, 23, 69. CO and HCO⁺ observations of surroundings.
 De Luca 2006, Science, 313, 814. XMM observations of central source.
 De Luca 2007, Ap&SS, 308, 231. XMM observation of periodicity of central source.
 Matsumoto *et al.* 2007, PASJ, 59, S199. Suaku observations.
 De Luca 2008, ApJ, 682, 1185. IR observations of central source.

G332.4+0.1**RA:** 16^h15^m20^s**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.**X-ray:** Shell, brightest to NW.**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, Nature, 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.
 Vink *et al.* 2004, ApJ, 604, 699. Chandra observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G332.5–5.6**RA:** 16^h43^m20^s**Dec:** –54°30′**1-GHz flux/Jy:** 2?**Spectral index:** 0.7?**Size/arcmin:** 35**Type:** S**Radio:** Bipolar shell, with central emission also.**Optical:** Patchy filaments.**X-ray:** Emission from centre.**References:**Reynoso & Green 2007, MNRAS, 375, 92. ATCA at 1.4 GHz (40′ : $S=1.90 \pm 0.15$ Jy) and 2.4 GHz (90′ : $S=1.3 \pm 0.2$ Jy) including polarisation, and 843 MHz (43′ × 53′) plus ROSAT observations.Stupar *et al.* 2007, MNRAS, 381, 377. Optical observations, plus ATCA at 1.4 GHz (58′) and 2.4 GHz (95′) including polarisation, and other observations.**G335.2+0.1****RA:** 16^h27^m45^s**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.Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.**G336.7+0.5****RA:** 16^h32^m11^s**Dec:** –47°19′**1-GHz flux/Jy:** 6**Spectral index:** 0.5**Size/arcmin:** 14 × 10**Type:** S**Radio:** Irregular 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′ × 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^h35^m57^s**Dec:** –47°36′**1-GHz flux/Jy:** 1.5**Spectral index:** 0.6?

(CTB 33)

Size/arcmin: 1.5**Type:** S

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 & 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 H_i, 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^h39^m28^s**Dec:** –47°51′**1-GHz flux/Jy:** 1.5**Spectral index:** 0.4**Size/arcmin:** 6**Type:** S**Radio:** Shell, brighter in S.**X-ray:** Extended emission.**Distance:** HI absorption suggests 2.0 to 9.3 kpc.**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.Rakowski *et al.* 2006, ApJ, 646, 982. ATCA observations at 1.3 GHz (15″ : $S=1.55 \pm 0.05$ Jy) and 5 GHz (15″ : $S=0.93 \pm 0.02$ Jy), plus HI and Chandra observations.**G337.2+0.1****RA:** 16^h35^m55^s**Dec:** –47°20′**1-GHz flux/Jy:** 1.5?**Spectral index:** ?**Size/arcmin:** 3 × 2**Type:** ?**Radio:** Not well defined.**X-ray:** Detected.**Distance:** Association with HI hole gives 14 kpc.**References:**Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ : $S=1.6$ Jy)Combi *et al.* 2005, A&A, 431, L9. ASCA and other observations.Aharonian *et al.* 2006, ApJ, 636, 777. γ -ray observations of nearby source.Combi *et al.* 2006, ApJ, 653, L41. XMM observations.**G337.3+1.0****RA:** 16^h32^m39^s**Dec:** –46°36′**1-GHz flux/Jy:** 16**Spectral index:** 0.55**Size/arcmin:** 15 × 12**Type:** S

Kes 40

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, PASA, 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 polarisation.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^h39^m01^s**1-GHz flux/Jy:** 18**Size/arcmin:** 9 × 6**Dec:** –46°59′**Spectral index:** 0.5**Type:** S**Radio:** Distorted shell.**X-ray:** Centrally brightened.**Distance:** HI absorption suggests 11 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.

Caswell 2004, MNRAS, 349, 99. ATCA at 1.7 GHz, for associated OH masers.

Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

Kotthes & Dougherty 2007, A&A, 468, 993. SGPS at 1.4 GHz including HI.

Combi *et al.* 2008, A&A, 488, L25. XMM observations.**G338.1+0.4****RA:** 16^h37^m59^s**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.

Caswell 2004, MNRAS, 349, 99. ATCA at 1.7 GHz of associated OJ masers.

G338.3–0.0**RA:** 16^h41^m00^s**1-GHz flux/Jy:** 7?**Size/arcmin:** 8**Dec:** –46°34′**Spectral index:** ?**Type:** C?**Radio:** Irregular shell, in complex region.**X-ray:** Central X-ray source and nebula.**Distance:** HI observations suggest 11 kpc.**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.Aharonian *et al.* 2005, Science, 307, 1938. γ -ray detection.Aharonian *et al.* 2006, ApJ, 636, 777. γ -ray observations.Landi *et al.* 2006, ApJ, 651, 190. X-ray observations.

Kotthes & Dougherty 2007, A&A, 468, 993. SGPS at 1.4 GHz including HI.

Funk *et al.* 2007, ApJ, 662, 517. XMM observations.

G338.5+0.1**RA:** 16^h41^m09^s**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.**Distance:** HI absorption suggests 11 kpc.**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.
 Kothes & Dougherty 2007, A&A, 468, 993. SGPS at 1.4 GHz including HI.

G340.4+0.4**RA:** 16^h46^m31^s**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^h47^m41^s**Dec:** –44°34′**1-GHz flux/Jy:** 5?**Spectral index:** 0.4?**Size/arcmin:** 6**Type:** S**Radio:** Incomplete shell.**Optical:** Possible associated filaments.**Distance:** HI absorption suggests 15 kpc.**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 observations.
 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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.
 Kothes & Dougherty 2007, A&A, 468, 993. SGPS at 1.4 GHz including HI.

G341.2+0.9**RA:** 16^h47^m35^s**Dec:** –43°47′**1-GHz flux/Jy:** 1.5?**Spectral index:** 0.6?**Size/arcmin:** 22 × 16**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^h55^m01^s
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).
 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^h54^m50^s
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^h50^m43^s
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^h25^m00^s
Dec: –46°30′

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

RCW 114
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.
 Welsh *et al.* 2003, A&A, 403, 605. Optical spectroscopy.
 Casandjian & Grenier 2008, A&A, 489, 849. γ -ray observations.

G343.1–2.3

RA: 17^h08^m00^s
Dec: –44°16′

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

Size/arcmin: 32?
Type: C?

Radio: Incomplete shell?

X-ray: Pulsar wind nebula.

Point sources: Pulsar near edge, with wind nebula.

References:

McAdam *et al.* 1993, *Nature*, 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.
 Gotthelf *et al.* 2002, *ApJ*, 567, L125. Pulsar x-ray detection.
 Dodson & Golap 2002, *MNRAS*, 334, L1. ATCA at 1.4 GHz (70″ × 47″) including polarisation, and Chandra observations of pulsar wind nebula.
 Aharonian *et al.* 2005, *A&A*, 432, L9. γ -ray limit.

G343.1–0.7

RA: 17^h00^m25^s
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″ : $S8.5 \pm 0.6$), 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^h03^m51^s
Dec: –41°42′

1-GHz flux/Jy: 2.5?
Spectral index: 0.5

Size/arcmin: 10
Type: C?

Radio: Asymmetric 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.
 Yamauchi *et al.* 2005, *PASJ*, 57, 459. ASCA observations.
 Reach *et al.* 2006, *AJ*, 131, 1479. Spitzer observations.

G345.7–0.2

RA: 17^h07^m20^s
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^h10^m19^s**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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.

G347.3–0.5**RA:** 17^h13^m50^s**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.**Point sources:** Central X-ray source.**Distance:** Association with molecular clouds and X-ray observations imply 1.3 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 γ -ray detection.
 Butt *et al.* 2001, ApJ, 562, L167. Associated γ -ray emission.
 Ellison *et al.* 2001, ApJ, 563, 191. ATCA at 1.4 GHz (46″ × 36″), and ASCA observations.
 Enomoto *et al.* 2002, Nature, 416, 823. γ -ray observations.
 Uchiyama *et al.* 2002, PASJ, 54, L73. ASCA observations.
 Uchiyama *et al.* 2003, A&A, 400, 567. Chandra spectroscopy.
 Pannuti *et al.* 2003, ApJ, 593, 377. ROSAT and ASCA observations.
 Lazendic *et al.* 2003, ApJ, 593, L27. Chandra, XMM and other X-ray observations of central source.
 Fukui *et al.* 2003, PASJ, 55, L61. CO observations of surroundings.
 Cassam-Chenaï *et al.* 2004, A&A, 427, 199. XMM and other observations.
 Aharonian *et al.* 2004, Nature, 432, 75. γ -ray detection.
 Lazendic *et al.* 2004, ApJ, 602, 271. Chandra observations of parts, and ATCA at 1.4 GHz (36″ × 46″).
 Hirga *et al.* 2005, A&A, 431, 953. XMM observations.
 Moriguchi *et al.* 2005, ApJ, 631, 947. CO observations of surroundings.
 Aharonian *et al.* 2007, A&A, 464, 235. γ -ray observations.
 Tanaka *et al.* 2008, ApJ, 685, 988. Suzaku observations.
 Takahashi *et al.* 2008, PASJ, 60, S131. Suzaku observations of SW.
 Uchiyama *et al.* 2007, Nature, 449, 576. Chandra multi-epoch observations for study of small-scale variability.
 Mignami *et al.* 2008, A&A, 484, 457. Optical and IR observations of central source.

G348.5–0.0**RA:** 17^h15^m26^s**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 & Green 1996, A&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.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G348.5+0.1**RA:** 17^h14^m06^s**Dec:** –38°32′**1-GHz flux/Jy:** 72**Spectral index:** 0.3

CTB 37A

Size/arcmin: 15**Type:** S**Radio:** Shell, poorly define to S and W, overlapping G348.5–0.0 in E.**Distance:** HI absorption indicates 8.0 kpc.**References:**

Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′ : $S=97$ Jy).
 Milne & 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 : $S=18 \pm 5$ 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 & Green 1996, A&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.
 Reynoso & Mangum 2000, ApJ, 545, 874. CO observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Aharonian *et al.* 2008, A&A, 490, 685. γ -ray observations.

G348.7+0.3**RA:** 17^h13^m55^s**Dec:** –38°11′**1-GHz flux/Jy:** 26**Spectral index:** 0.3

CTB 37B

Size/arcmin: 17?**Type:** S**Radio:** Incomplete shell with faint eastern extensions.**X-ray:** Diffuse emission.**Distance:** HI absorption indicates 8.0 kpc.**References:**

Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′ : $S=34$ Jy).
 Milne & 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 : $S=8 \pm 3$ 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 & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 69″ : $S=33$ Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.
 Aharonian *et al.* 2006, ApJ, 636, 777. γ -ray detection.
 Aharonian *et al.* 2008, A&A, 486, 829. γ -ray and Chandra observations.

G349.2–0.1**RA:** 17^h17^m15^s**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^h17^m59^s
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 14.8 kpc, association with OH features gives 22 kpc.

X-ray: Irregular shell, brighter to S and E.

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, Nature, 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.
 Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.
 Reynoso & Mangum 2001, AJ, 121, 347. CO observations of the vicinity.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Slane *et al.* 2002, ApJ, 580, 904. ASCA observations.
 Dubner *et al.* 2004, A&A, 426, 201. CO observations of surroundings.
 Lazendic *et al.* 2005, ApJ, 618, 733. Chandra observations.
 Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G350.0–2.0

RA: 17^h27^m50^s
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.

G350.1–0.3

RA: 17^h17^m40^s
Dec: –37°24′

1-GHz flux/Jy: 6?
Spectral index: 0.8?

Size/arcmin: 4?
Type: ?

Radio: Several clumps of emission.

X-ray: Diffuse emission, with compact source.

Distance: HI absorption indicates 4.5 to 10.7 kpc, possible interaction with molecular cloud indicates 4.5 kpc.

Point sources: X-ray source.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=10.7) and Parkes 64-m at 5 GHz (4′ : S=1.7).
 Salter *et al.* 1986, A&A, 162, 217. VLA at 1.5 (4″ × 10″4) and 4.8 GHz (15″ × 35″) and 15 GHz (5″ × 2″).
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA observations.
 Gaensler *et al.* 2008, ApJ, 680, L37. VLA at 4.8 GHz (11″4 × 5″6) plus XMM observations.

G351.2+0.1**RA:** 17^h22^m27^s**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).
 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″: $S=4.8 \pm 0.2$ 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^h21^m00^s**Dec:** –35°27′**1-GHz flux/Jy:** 10**Spectral index:** 0.5?**Size/arcmin:** 18 × 14**Type:** S**Radio:** Elongated shell, adjacent to bright HII region.**Point sources:** Pulsar nearby.**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 74″: $S=11$ Jy).
 Tian *et al.* 2007, MNRAS, 378, 1283. SGPS at 1.4 GHz (100″: $S=8.4 \pm 0.7$ Jy) including HI.

G351.9–0.9**RA:** 17^h28^m52^s**Dec:** –36°16′**1-GHz flux/Jy:** 1.8?**Spectral index:** ?**Size/arcmin:** 12 × 9**Type:** S**Radio:** Asymmetric shell.**References:**

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 73″: $S=2.0$ Jy).

G352.7–0.1**RA:** 17^h27^m40^s**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″: $S=3.4 \pm 0.4$ Jy).
 Whiteoak & Green 1996, A&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.

G353.6–0.7

RA: 17^h32^m00^s
Dec: –34°44′

1-GHz flux/Jy: 2.5?
Spectral index: ?

Size/arcmin: 30
Type: S

Radio: Shell, brighter to S.

X-ray: Detected.

References:

Tian *et al.* 2008, ApJ, 679, L85. SGPS at 1.4 GHz (100''), plus 843 MHz (43'') and X-ray observations.

G353.9–2.0

RA: 17^h38^m55^s
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^h30^m28^s
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^h36^m00^s
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.

G355.4+0.7

RA: 17^h31^m20^s
Dec: –32°26′

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

Size/arcmin: 25
Type: S

Radio: Faint, incomplete shell.

References:

Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 77'').

Roy & Bhatnagar 2006, JPhCS, 54, 152. GMRT at 330 MHz (1' : $S=8.9 \pm 1.3$ Jy).

G355.6–0.0

RA: 17^h35^m16^s
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 ($43'' \times 80''$: $S=2.6$ Jy).
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Roy & Bhatnagar 2006, JPhCS, 54, 152. GMRT at 330 MHz ($1'$: $S=3.3 \pm 0.5$ Jy).

G355.9–2.5

RA: 17^h45^m53^s
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).
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz ($32'' \times 34''$: $S=5.0 \pm 0.3$ Jy).
 Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 77''$).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G356.2+4.5

RA: 17^h19^m00^s
Dec: –29°40′

1-GHz flux/Jy: 4
Spectral index: 0.7

Size/arcmin: 25
Type: S

Has been called G356.2+4.4.

Radio: Faint shell.

References:

Bhatnagar 2000, MNRAS, 317, 453. GMRT at 327 MHz ($3' \times 1'5$: $S=8.1 \pm 1.7$ Jy), and NVSS at 1.4 GHz.

G356.3–0.3

RA: 17^h37^m56^s
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 ($43'' \times 81''$: $S=2.6$ Jy).
 Bhatnagar 2002, MNRAS, 332, 1. GMRT at 327 MHz ($0'8 \times 1'7$: $S=5.7 \pm 0.2$).

G356.3–1.5

RA: 17^h42^m35^s
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 ($43'' \times 79''$: $S=2.8$ Jy).

G357.7–0.1

RA: 17^h40^m29^s
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, with compact HII region at W edge.

X-ray: Detected.

Distance: HI absorption suggests beyond Galactic Centre.

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, Nature, 313, 113. VLA at 1.4 GHz (3.8″ × 10.9″) and 5 GHz (12″ × 26″).
 Becker & Helfand 1985, Nature, 313, 115. VLA at 1.4 GHz and 5 GHz.
 Helfand & Becker 1985, Nature, 313, 118. Suggest it is not a SNR.
 Shaver *et al.* 1985, A&A, 147, L23. Observations of peripheral compact source.
 Caswell *et al.* 1989, PASA, 8, 184. MOST at 843 MHz (43″ × 83″).
 Gray 1994, MNRAS, 270, 835. 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 polarisation.
 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.
 Brogan & Goss 2003, AJ, 125, 272. VLA at 1.4 GHz (13.6″ × 11.4″), including HI, and 8.3 GHz (14.3″ × 6.8″) recombination line observation of HII region.
 Gaensler *et al.* 2003, ApJ, 594, L35. Chandra detection.
 Lazendic *et al.* 2003, AN, 324 (No S1), 157. Molecular line observations.
 Burton *et al.* 2004, MNRAS, 348, 638. IR and radio observations of HII region.
 Lazendic *et al.* 2004, MNRAS, 354, 393. IF and molecular line observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G357.7+0.3

RA: 17^h38^m35^s
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, 835. MOST at 843 MHz (43″ × 84″).
 Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G358.0+3.8

RA: 17^h26^m00^s
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.

G358.1+0.1

RA: 17^h37^m00^s
Dec: –29°59′

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

Size/arcmin: 20
Type: S

Radio: Faint shell.

References:

Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 77'').
 Roy & Bhatnagar 2006, JPhCS, 54, 152. GMRT at 330 MHz (1': S=6.0 ± 2.5 Jy).

G358.5–0.9

RA: 17^h46^m10^s
Dec: –30°40′

1-GHz flux/Jy: 4?
Spectral index: ?

Size/arcmin: 17
Type: S

Radio: Shell, brighter to NE.

References:

Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 77'').
 Roy & Bhatnagar 2006, JPhCS, 54, 152. GMRT at 330 MHz (1': S=8.0 ± 2.5 Jy).

G359.0–0.9

RA: 17^h46^m50^s
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, 835. 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.
 Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz (8''4 × 12''8) of part.

G359.1–0.5

RA: 17^h45^m30^s
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 ± 1.5 Jy) and 4.8 GHz (2'4: S=8.1 ± 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, 835. MOST at 843 MHz (43'' × 85'').
 Yusef-Zadeh *et al.* 1995, Science, 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.
 Lazendic *et al.* 2002, MNRAS, 331, 537. Observations of shocked molecular gas where the ‘snake’ crosses the remnant.
 Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz (8''4 × 12''8).
 Aharonian *et al.* 2008, A&A, 483, 509. γ -ray observations.
 Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G359.1+0.9**RA:** $17^{\text{h}}39^{\text{m}}36^{\text{s}}$ **Dec:** $-29^{\circ}11'$ **1-GHz flux/Jy:** 2?**Spectral index:** ?**Size/arcmin:** 12×11 **Type:** S**Radio:** Shell, brightest in E.**References:**Gray 1994, MNRAS, 270, 847. MOST at 843 MHz ($43'' \times 88''$: $S=4.3$ Jy).Roy & Bhatnagar 2006, JPhCS, 54, 152. GMRT at 330 MHz ($1'$: $S=4.3 \pm 1.0$ Jy).Law *et al.* 2008, ApJS, 177, 515. VLA at 1.4 GHz ($10''9 \times 15''9$: $S=1.3 \pm 0.5$ Jy).