G0.0+0.0 Sgr A East

RA: $17^h45^m44^s$ **1-GHz flux/Jy:** 100? **Size/arcmin:** 3.5×2.5
Dec: $-29°00'$ **Spectral index:** 0.8? **Type:** S

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

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 $5'' \times 8''$), $S_{1.4\ \mathrm{GHz}} = 77$ Jy, $S_{5.0\ \mathrm{GHz}} = 31$ Jy.
Pedlar *et al.* 1989, ApJ, 342, 769. VLA at 332 MHz ($12''$), 1.4 GHz ($1\farcs3 \times 2\farcs5$) and 5 GHz ($1\farcs3 \times 2\farcs5$).
Mezger *et al.* 1989, A&A, 209, 337. Nearby molecular material.
Ho *et al.* 1991, Nature, 350, 309. VLA of NH_3 emission from surroundings.
Anantharamaiah *et al.* 1991, MNRAS, 249, 262. VLA at 330 MHz ($17'' \times 33''$).
Serabyn *et al.* 1992, ApJ, 395, 166. Nearby molecular material.
Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 88''$).
Yusef-Zadeh & Mehringer 1995, ApJ, 452, L37. VLA of nearby H_2O masers.
Yusef-Zadeh *et al.* 1999, ApJ, 512, 230. OH maser observations.
Coil & Ho 2000, ApJ, 533, 245. NH_3 observations of surroundings.
LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz ($24'' \times 43''$).
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 ($6\farcm6 \times 11\farcm4$).
Sakano *et al.* 2004, MNRAS, 350, 129. XMM observations.
Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz ($1'' \times 2\farcs2$).
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 H_2 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: $17^h46^m15^s$ **1-GHz flux/Jy:** 22 **Size/arcmin:** 15×8
Dec: $-28°38'$ **Spectral index:** 0.6 **Type:** S

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

Radio: Bilateral shell, near Galactic Centre.

References:

Kassim & Frail 1996, MNRAS, 283, L51. VLA at 333 MHz ($23'' \times 42''$), 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: $17^h47^m21^s$ **1-GHz flux/Jy:** 18? **Size/arcmin:** 8
Dec: $-28°09'$ **Spectral index:** varies **Type:** C

Radio: Flat spectrum core within steep spectrum shell.

X-ray: Central core, with non-thermal spectrum.

References:

Helfand & Becker 1987, ApJ, 314, 203. VLA at 1.4 and 5 GHz, and Einstein observations.
Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 91''$).
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 ($43'' \times 24''$).
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 ($8\farcs6 \times 11\farcs3$).
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 ($1\farcs2 \times 2\farcs5 : S = 8.3 \pm 0.7$ Jy), 5 GHz ($1\farcs6 \times 2\farcs5$) and 8.3 GHz ($0\farcs8 \times 1\farcs5$).

G1.0–0.1

RA: $17^h48^m30^s$ **1-GHz flux/Jy:** 15 **Size/arcmin:** 8
Dec: –28°09′ **Spectral index:** 0.6? **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 ($64'' \times 100'' : S = 12.3$ Jy).
Liszt 1992, ApJS, 82, 495. VLA at 1.6 GHz ($13'' \times 23''$).
Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 91''$).
Mehringer *et al.* 1998, ApJ, 493, 274. VLA at 1.6 GHz ($15'' \times 28''$) 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 ($43'' \times 24''$).
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: $17^h49^m39^s$ **1-GHz flux/Jy:** 2? **Size/arcmin:** 10
Dec: –27°46′ **Spectral index:** ? **Type:** S

Radio: Shell, brightest in E.

References:
Gray 1994, MNRAS, 270, 847. MOST at 843 MHz ($43'' \times 92'' : S = 2$ Jy).
Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.
Bhatnagar 2002, MNRAS, 332, 1. GMRT at 327 MHz ($2\farcm7 \times 2\farcm4 : S = 4.2 \pm 0.5$).
Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz ($8\farcs2 \times 12\farcs2$).
Hewitt *et al.* 2008, ApJ, 683, 189. GBT at 1.6 and 1.7 GHz for OH masers.

G1.9+0.3

RA: $17^h48^m45^s$ **1-GHz flux/Jy:** 0.6 **Size/arcmin:** 1.5
Dec: –27°10′ **Spectral index:** 0.6 **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 ($4\farcs4 \times 2''$).
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 ($8\farcs3 \times 12''$).
Nord *et al.* 2004, AJ, 128, 1646. VLA at 330 MHz ($7'' \times 12''$).
Green 2004, BASI, 32, 335. VLA at 1.5 GHz ($7\farcs2 \times 9\farcs4$).
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: $17^h55^m26^s$ **1-GHz flux/Jy:** 2.3 **Size/arcmin:** 14×11
Dec: –25°50′ **Spectral index:** 0.65 **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 ($8\farcs4 \times 11\farcs4$).

G3.8+0.3

RA: $17^h52^m55^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 18
Dec: –25°28′ **Spectral index:** 0.6 **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: $18^h08^m55^s$ **1-GHz flux/Jy:** 3.2? **Size/arcmin:** 28
Dec: –27°03′ **Spectral index:** 0.6? **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: $17^h30^m42^s$ **1-GHz flux/Jy:** 19 **Size/arcmin:** 3
Dec: –21°29′ **Spectral index:** 0.64 **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 ($2''.5 \times 3''.2$) and 5 GHz ($3''.2 \times 4''.8$) and Einstein image ($5''$).
Dickel *et al.* 1988, ApJ, 330, 254. VLA at 1.4 ($1''.2 \times 2''.3$) and 5 GHz ($0''.6 \times 1''.0$) 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 ($23'' \times 13''$) 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: $17^h33^m25^s$ **1-GHz flux/Jy:** 3 **Size/arcmin:** 18
Dec: $-21°34'$ **Spectral index:** 0.6 **Type:** S

Has been called G4.5+6.2.

Radio: Faint shell.

References:
Bhatnagar 2000, MNRAS, 317, 453. GMRT at 327 MHz ($2'.2 \times 1'.3 : S = 5.5 \pm 1.2$ Jy), and NVSS at 1.4 GHz.

G5.2–2.6

RA: $18^h07^m30^s$ **1-GHz flux/Jy:** 2.6? **Size/arcmin:** 18
Dec: $-25°45'$ **Spectral index:** 0.6? **Type:** S

Radio: Poorly resolved shell.

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

G5.4–1.2 Milne 56

RA: $18^h02^m10^s$ **1-GHz flux/Jy:** 35? **Size/arcmin:** 35
Dec: $-24°54'$ **Spectral index:** 0.2? **Type:** C?

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

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

Optical: Detected.

X-ray: Pulsar detected, with faint extension.

Distance: HI absorption suggests > 4.3 kpc.

Point sources: Pulsar 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 ($6'.8 : S = 21.9 \pm 2.4$ Jy).
Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2'.6).
Zealey *et al.* 1979, A&AS, 38, 39. Optical detection.
Becker & Helfand 1985, 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 ($42'' \times 110''$).
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 ($4'.5 : S = 30.8 \pm 2.1$ Jy) and 8.4 GHz ($3' : S = 24 \pm 3$ Jy), including polarisation.
Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.0 \times 4'.9 : S = 38$ Jy).
Frail *et al.* 1994, AJ, 107, 1120. VLA at 327 MHz ($68'' \times 73''$), 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: $17^h57^m04^s$ **1-GHz flux/Jy:** 5.5 **Size/arcmin:** 15×12
Dec: $-24°00'$ **Spectral index:** 0.7 **Type:** S

Has been called G5.55+0.32.

Radio: Shell.

References:
Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S = 14.3 \pm 0.3$ Jy), plus other observations.

G5.9+3.1

RA: $17^h47^m20^s$ **1-GHz flux/Jy:** 3.3? **Size/arcmin:** 20
Dec: $-22°16'$ **Spectral index:** 0.4? **Type:** S

Radio: Asymmetric shell.

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

G6.1+0.5

RA: $17^h57^m29^s$ **1-GHz flux/Jy:** 4.5 **Size/arcmin:** 18×12
Dec: $-23°25'$ **Spectral index:** 0.9 **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: $17^h54^m55^s$ **1-GHz flux/Jy:** 4.0? **Size/arcmin:** 30×26
Dec: $-23°05'$ **Spectral index:** 0.3? **Type:** F

Has been called G6.1+1.15.

Radio: Faint, diffuse emission.

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

G6.4–0.1 W28

RA: $18^h00^m30^s$ **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 ($3'.1 \times 4'.4 : S = 660$ 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 ($2'.6 \times 5'.5$) and 1.48 GHz ($40'' \times 65''$).
Dubner *et al.* 2000, AJ, 120, 1933. VLA at 328 MHz ($97'' \times 52'' : S = 425 \pm 40$ Jy) and 1415 MHz ($88'' \times 48'' : S = 246 \pm 20$ 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: $18^h02^m11^s$ **1-GHz flux/Jy:** 27 **Size/arcmin:** 18
Dec: –23°34′ **Spectral index:** 0.6 **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: $18^h01^m50^s$ **1-GHz flux/Jy:** 2.5? **Size/arcmin:** 15
Dec: –22°54′ **Spectral index:** 0.5? **Type:** S

Has been called G7.06–0.12.

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

References:
Yusef-Zadeh *et al.* 2000, ApJ, 540, 842. VLA at 327 MHz (2′.6 × 5′.5) and 1.48 GHz (40″ × 65″).
Dubner *et al.* 2000, AJ, 120, 1933. VLA at 328 MHz (97″ × 52″) and 1415 MHz (88″ × 48″).

G7.2+0.2

RA: $18^h01^m07^s$ **1-GHz flux/Jy:** 2.8 **Size/arcmin:** 12
Dec: –22°38′ **Spectral index:** 0.6 **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 1814–24

RA: $18^h17^m25^s$ **1-GHz flux/Jy:** 11 **Size/arcmin:** 22
Dec: –24°04′ **Spectral index:** 0.32 **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: $18^h04^m34^s$ **1-GHz flux/Jy:** 1.2 **Size/arcmin:** 5 × 4
Dec: –21°49′ **Spectral index:** 0.6 **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: $18^h24^m10^s$ **1-GHz flux/Jy:** 4.4 **Size/arcmin:** 26
Dec: –23°48′ **Spectral index:** 0.3 **Type:** S

Radio: Asymmetric shell.

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

G8.7–0.1 (W30)

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

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 ($7'.2 \times 9'.7 : S = 190 \pm 50$ Jy).
Kassim & Weiler 1990, Nature, 343, 146. VLA at 327 MHz ($3'.0 \times 3'.7$).
Kassim & Weiler 1990, ApJ, 360, 184. VLA at 327 MHz ($2'.8 \times 4'.1 : S = 129 \pm 11$ Jy), and part at 1.4 GHz ($0'.9 \times 1'.8$), plus review of flux densities.
Frail *et al.* 1994, AJ, 107, 1120. VLA at 327 MHz ($37'' \times 55''$).
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: $18^h03^m58^s$ **1-GHz flux/Jy:** 9 **Size/arcmin:** 24
Dec: –21°03′ **Spectral index:** 0.6 **Type:** S

Has been called G8.90+0.40.

Radio: Shell.

References:
Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S = 18.2 \pm 0.5$ Jy), plus other observations.

G9.7–0.0

RA: $18^h07^m22^s$ **1-GHz flux/Jy:** 3.7 **Size/arcmin:** 15×11
Dec: –20°35′ **Spectral index:** 0.6 **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 ($42'' : S = 6.5 \pm 0.2$ Jy), plus other observations.

G9.8+0.6

RA: $18^h05^m08^s$ **1-GHz flux/Jy:** 3.9 **Size/arcmin:** 12
Dec: $-20°14'$ **Spectral index:** 0.5 **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 ($41'' \times 63'' : S = 3.5 \pm 0.4$ 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: $18^h10^m41^s$ **1-GHz flux/Jy:** 6.7 **Size/arcmin:** 12
Dec: $-20°43'$ **Spectral index:** 0.4 **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: $18^h09^m08^s$ **1-GHz flux/Jy:** 0.9 **Size/arcmin:** 6
Dec: $-19°47'$ **Spectral index:** 0.6 **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: $18^h10^m04^s$ **1-GHz flux/Jy:** 1.3 **Size/arcmin:** 11×9
Dec: $-19°25'$ **Spectral index:** 0.6 **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: $18^h14^m03^s$ **1-GHz flux/Jy:** 5.8 **Size/arcmin:** 18×12
Dec: $-19°46'$ **Spectral index:** 0.6 **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: $18^h12^m46^s$ **1-GHz flux/Jy:** 1.0 **Size/arcmin:** 11×7
Dec: $-19°38'$ **Spectral index:** 0.7 **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: $18^h09^m47^s$ **1-GHz flux/Jy:** 2.3 **Size/arcmin:** 12×10
Dec: $-19°12'$ **Spectral index:** 0.4 **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: $18^h11^m27^s$ **1-GHz flux/Jy:** 22 **Size/arcmin:** 4
Dec: $-19°25'$ **Spectral index:** 0.6 **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 ($20'' \times 25''$) 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 ($3'.2 \times 4'.1 : S = 39$ 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 ($2''.6 \times 1''.8 : S = 16.6 \pm 0.9$ Jy) and 5 GHz ($2''.1 \times 1''.5 : S = 8.4 \pm 0.9$ 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: $18^h10^m47^s$ **1-GHz flux/Jy:** 6 **Size/arcmin:** 8
Dec: $-19°05'$ **Spectral index:** 0.5 **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 ($3'.2 \times 4'.1 : S = 18$ Jy).
Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz ($44'' \times 63'' : S = 5.1 \pm 0.6$ 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: $18^h12^m25^s$ **1-GHz flux/Jy:** 0.7 **Size/arcmin:** 4
Dec: $-18°44'$ **Spectral index:** 0.3 **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: $18^h12^m11^s$ **1-GHz flux/Jy:** 3.5 **Size/arcmin:** 7?
Dec: $-18°37'$ **Spectral index:** 0.7 **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 ($3'.2 \times 4'.1$).
Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz ($41'' \times 61'' : S = 0.7$ 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: $18^h11^m17^s$ **1-GHz flux/Jy:** 0.8 **Size/arcmin:** 6×5
Dec: $-18°10'$ **Spectral index:** 0.7 **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: $18^h12^m14^s$ **1-GHz flux/Jy:** 0.6 **Size/arcmin:** 6×5
Dec: $-17°55'$ **Spectral index:** 0.4 **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: $18^h13^m19^s$ **1-GHz flux/Jy:** 0.8 **Size/arcmin:** 6
Dec: $-17°54'$ **Spectral index:** 0.8 **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: $18^h13^m37^s$ **1-GHz flux/Jy:** 0.8 **Size/arcmin:** 3
Dec: $-17°49'$ **Spectral index:** 0.5 **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 ($19'' \times 32''$), 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: $18^h19^m20^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 70×40
Dec: $-18°00'$ **Spectral index:** ? **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: $18^h14^m14^s$ **1-GHz flux/Jy:** 3.5? **Size/arcmin:** 5×4
Dec: $-17°12'$ **Spectral index:** 1.0? **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: $18^h15^m52^s$ **1-GHz flux/Jy:** 0.5 **Size/arcmin:** 6×5
Dec: $-16°34'$ **Spectral index:** 0.6 **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: $18^h15^m58^s$ **1-GHz flux/Jy:** 0.6 **Size/arcmin:** 5×4
Dec: $-16°27'$ **Spectral index:** 0.4 **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: $18^h24^m00^s$ **1-GHz flux/Jy:** 5.5? **Size/arcmin:** 30×24
Dec: $-16°34'$ **Spectral index:** 0.8? **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 ($4\farcm3$).
Boumis *et al.* 2008, A&A, 481, 705. Optical detection.

G15.4+0.1

RA: $18^h18^m02^s$ **1-GHz flux/Jy:** 5.6 **Size/arcmin:** 15×14
Dec: $-15°27'$ **Spectral index:** 0.6 **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: $18^h18^m52^s$ **1-GHz flux/Jy:** 5 **Size/arcmin:** 7×5
Dec: $-15°02'$ **Spectral index:** 0.6? **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 ($6\farcm8 : S = 1.1 \pm 0.2$ Jy).
Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ($2\farcm6$).
Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1415 MHz ($58'' \times 44''$).
Dubner *et al.* 1996, AJ, 111, 1304. VLA at 330 MHz ($77'' \times 61'' : S = 11.2 \pm 1.0$ Jy), 1.4 GHz ($23'' \times 14'' : S = 3.9 \pm 0.1$ Jy) and 4.9 GHz ($13'' \times 16''$).
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: $18^h21^m56^s$ **1-GHz flux/Jy:** 2.7 **Size/arcmin:** 15×10
Dec: $-15°14'$ **Spectral index:** 0.6 **Type:** S

Has been called G16.05–0.57.

Radio: Shell.

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

G16.2−2.7

RA: $18^h29^m40^s$ **1-GHz flux/Jy:** 2 **Size/arcmin:** 17
Dec: $-16°08'$ **Spectral index:** 0.5 **Type:** S

Radio: Double rim.

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

G16.4−0.5

RA: $18^h22^m38^s$ **1-GHz flux/Jy:** 4.6 **Size/arcmin:** 13
Dec: $-14°55'$ **Spectral index:** 0.7 **Type:** S

Has been called G16.41–0.55.

Radio: Partial shell.

References:
Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S = 10.0 \pm 0.3$ 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 ($5:S=0.95$ 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 ($19''\times25''$).
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 ($42'':S=0.7\pm0.1$ 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: $18^h23^m08^s$ **1-GHz flux/Jy:** 0.4 **Size/arcmin:** 6
Dec: $-13°46'$ **Spectral index:** 0.7 **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: $18^h32^m50^s$ **1-GHz flux/Jy:** 4.0? **Size/arcmin:** 24
Dec: $-14°39'$ **Spectral index:** 0.3? **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 ($4\farcm3$).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G18.1–0.1

RA: $18^h24^m34^s$ **1-GHz flux/Jy:** 4.6 **Size/arcmin:** 8
Dec: $-13°11'$ **Spectral index:** 0.5 **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: $18^h25^m55^s$ **1-GHz flux/Jy:** 1.4 **Size/arcmin:** 6
Dec: $-12°50'$ **Spectral index:** 0.4 **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: $18^h23^m58^s$ **1-GHz flux/Jy:** 33 **Size/arcmin:** 17×11
Dec: $-12°23'$ **Spectral index:** 0.4 **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: $18^h29^m50^s$ **1-GHz flux/Jy:** 37 **Size/arcmin:** 33
Dec: $-12°58'$ **Spectral index:** varies **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: $18^h24^m56^s$ **1-GHz flux/Jy:** 10 **Size/arcmin:** 27
Dec: $-12°07'$ **Spectral index:** 0.5 **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: $18^{h}28^{m}07^{s}$ **1-GHz flux/Jy:** 10 **Size/arcmin:** 10
Dec: $-11^{\circ}35'$ **Spectral index:** 0.0 **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 ($7'.2 \times 8' : S = 8.5 \pm 2$ Jy), plus review of flux densities.
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

G20.4+0.1

RA: $18^{h}27^{m}51^{s}$ **1-GHz flux/Jy:** 3.1 **Size/arcmin:** 8
Dec: $-11^{\circ}00'$ **Spectral index:** 0.4 **Type:** S

Has been called G20.47+0.16.

Radio: Shell.

References:
Brogan *et al.* 2006, ApJ, 639, L25. VLA at 330 MHz ($42'' : S = 4.2 \pm 0.1$ Jy), plus other observations.

G21.0−0.4

RA: $18^{h}31^{m}12^{s}$ **1-GHz flux/Jy:** 1.1 **Size/arcmin:** 9×7
Dec: $-10^{\circ}47'$ **Spectral index:** 0.6 **Type:** S

Has been called G21.04–0.47.

Radio: Shell.

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

G21.5−0.9

RA: $18^{h}33^{m}33^{s}$ **1-GHz flux/Jy:** 6? **Size/arcmin:** 4
Dec: $-10°35'$ **Spectral index:** 0.0 **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: $18^{h}30^{m}50^{s}$ **1-GHz flux/Jy:** 0.4 **Size/arcmin:** 5
Dec: $-10°09'$ **Spectral index:** 0.5 **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. H_2CO 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 ($5' : S = 42.3 \pm 4.6$ Jy).
Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
Seward 1990, ApJS, 73, 781. Einstein observations.
Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.3 \times 3'.5 : S = 132$ 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 ($3'.3 \times 3'.4 : S = 82$ 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 ($3'.3 \times 3'.4 : S = 138$ 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: $18^h33^m03^s$ **1-GHz flux/Jy:** 8? **Size/arcmin:** 10?
Dec: –08°13′ **Spectral index:** 0.3 **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: $18^h38^m43^s$ **1-GHz flux/Jy:** 8 **Size/arcmin:** 15?
Dec: –07°32′ **Spectral index:** 0.5 **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 ($44'' \times 56''$: $S = 1.9$ 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: $18^h34^m10^s$ **1-GHz flux/Jy:** 20? **Size/arcmin:** 30×15
Dec: –07°05′ **Spectral index:** 0.2? **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 4C–04.71

RA: $18^h41^m19^s$ **1-GHz flux/Jy:** 6 **Size/arcmin:** 4
Dec: –04°56′ **Spectral index:** 0.68 **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 $S_{408\ \mathrm{MHz}} = 10.4$ Jy, and $S_{5\ \mathrm{GHz}} = 1.9 \pm 0.2$ 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: $18^h39^m50^s$ **1-GHz flux/Jy:** 30 **Size/arcmin:** 50×30
Dec: –04°24′ **Spectral index:** varies **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: $18^h43^m55^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 13×9
Dec: –03°53′ **Spectral index:** ? **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: $18^h39^m00^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 100?
Dec: $-02°55'$ **Spectral index:** 0.4? **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: $18^h44^m52^s$ **1-GHz flux/Jy:** 1.5? **Size/arcmin:** 5
Dec: $-02°57'$ **Spectral index:** 0.5? **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 Kes 75

RA: $18^h46^m25^s$ **1-GHz flux/Jy:** 10 **Size/arcmin:** 3
Dec: $-02°59'$ **Spectral index:** 0.7 **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 ($8'.4 : S = 5 \pm 20\%$ 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 ($20'' \times 7''$) and 8 GHz ($25'' \times 8''$), 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 ($26''.5 : S = 1.02 \pm 0.07$ 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 ($3'.4 \times 3'.7 : S = 27.4$ 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 ($10'' \times 13''$).
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: $18^h54^m25^s$ **1-GHz flux/Jy:** 0.5? **Size/arcmin:** 16
Dec: $-02°54'$ **Spectral index:** 0.7? **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: $18^h44^m00^s$ **1-GHz flux/Jy:** 6 **Size/arcmin:** 24×18
Dec: $-01°32'$ **Spectral index:** 0.4 **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: $18^h51^m10^s$ **1-GHz flux/Jy:** 2? **Size/arcmin:** 18?
Dec: $-01°31'$ **Spectral index:** ? **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: $18^h49^m25^s$ **1-GHz flux/Jy:** 24 **Size/arcmin:** 7×5
Dec: $-00°55'$ **Spectral index:** 0.49 **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 ($20'' \times 23''$) and 8 GHz ($24'' \times 9''$), 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 ($54'' \times 66'' : S = 20 \pm 2$ 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 ($3'.4 \times 3'.7 : S = 44.8$ 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 ($6''.2 \times 6''.4$), 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: $19^h06^m00^s$ **1-GHz flux/Jy:** 22? **Size/arcmin:** 60?
Dec: $-03°00'$ **Spectral index:** 0.5? **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: $18^h53^m10^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 40?
Dec: $-01°08'$ **Spectral index:** ? **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: $18^h50^m05^s$ **1-GHz flux/Jy:** 0.25? **Size/arcmin:** 6
Dec: –00°25′ **Spectral index:** ? **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 Kes 78

RA: $18^h51^m25^s$ **1-GHz flux/Jy:** 11? **Size/arcmin:** 17
Dec: –00°08′ **Spectral index:** 0.2? **Type:** S?

Part has been called G33.1–0.1.

Radio: Elongated shell?

References:
Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft et 2.7 GHz ($5' : S = 7.2 \pm 0.5$ Jy).
Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo at 430 MHz ($S = 19.0 \pm 15.5$ Jy).
Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).
Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz ($3' : S = 12.8$ Jy) and Parkes 64-m at 5 GHz ($4' : S = 7.7$ Jy).
Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.6 \times 3'.8 : S = 31.3$ 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: $18^h53^m50^s$ **1-GHz flux/Jy:** 3.5 **Size/arcmin:** 18
Dec: –00°02′ **Spectral index:** varies **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 $S_{430\ \mathrm{MHz}} = 69 \pm 33$ 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 ($6\farcm8 : S = 11.4 \pm 1.1$ 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 ($1' \times 2\farcm9$), 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 ($3\farcm6 \times 3\farcm8 : S = 34.8$ 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 W44, 3C392

RA: $18^h56^m00^s$ **1-GHz flux/Jy:** 230 **Size/arcmin:** 35×27
Dec: $+01°22'$ **Spectral index:** 0.37 **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 ($3' : S = 105 \pm 7$ Jy).
Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5' : S = 177 \pm 10$ Jy).
Caswell *et al.* 1975, A&A, 45, 239. HI absorption.
Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz ($3' : S = 299$ Jy).
Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430\ \mathrm{MHz}} = 540 \pm 187$ Jy.
Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
Smith *et al.* 1985, MNRAS, 217, 99. Einstein observations.
Wolszczan *et al.* 1991, ApJ, 372, L99. Pulsar detection.
Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.6 \times 3'.8 : S = 469$ Jy).
Jones *et al.* 1993, MNRAS, 265, 631. VLA at 1.4 GHz (15″), plus X-ray spectra.
Rho *et al.* 1994, ApJ, 430, 757. Optical and ROSAT observations.
Koo & Heiles 1995, ApJ, 442, 679. HI of surrounding shell.
Esposito *et al.* 1996, ApJ, 461, 820. Possible associated 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 ($8''.9 \times 7''.8$) of pulsar nebula.
Frail *et al.* 1996, AJ, 111, 1651. OH maser emission.
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
Reach & Rho 1996, A&A, 315, L277. ISO spectroscopy.
Harrus *et al.* 1997, ApJ, 488, 781. X-ray observations.
Claussen *et al.* 1997, ApJ, 489, 143. VLA of associated OH masers.
Giacani *et al.* 1997, AJ, 113, 1379. VLA at 1.4 GHz (15″), plus optical images.
Seta *et al.* 1998, ApJ, 505, 286. CO observations of surroundings.
Cox *et al.* 1999, ApJ, 524, 179. Revision of distance.
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 ($36'' \times 39'' : S = 634 \pm 70$ Jy) and 324 MHz ($13'' : S = 411 \pm 50$ Jy).

G36.6−0.7

RA: $19^h00^m35^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 25?
Dec: $+02°56'$ **Spectral index:** ? **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 ($3'.4 \times 3'.7 : S = 6.7$ 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: $18^{h}48^{m}49^{s}$ **1-GHz flux/Jy:** 0.7? **Size/arcmin:** 17×13?
Dec: $+04°26'$ **Spectral index:** 0.5? **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 3C396, HC24, NRAO 593

RA: $19^{h}04^{m}08^{s}$ **1-GHz flux/Jy:** 18 **Size/arcmin:** 8×6
Dec: $+05°28'$ **Spectral index:** 0.6 **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 $S_{430\ \mathrm{MHz}} = 54 \pm 38$ 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 ($65'' \times 48''$).
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 ($7''.8 \times 7''.5$) and 5 GHz ($25''$) including polarisation, plus Ooty at 327 MHz ($100'' \times 31''$), including review of flux densities.
Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.5 \times 3'.6 : S = 42.5$ Jy).
Anderson & Rudnick 1993, ApJ, 408, 514. VLA at 1.45 and 4.89 GHz for spectral index studies.
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.
Harrus & Slane 1999, ApJ, 516, 811. ASCA observations.
Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy 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 W50, SS433

RA: $19^h12^m20^s$ **1-GHz flux/Jy:** 85? **Size/arcmin:** 120×60
Dec: $+04°55'$ **Spectral index:** 0.7? **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 Hα 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: $19^h07^m10^s$ **1-GHz flux/Jy:** 11 **Size/arcmin:** 22
Dec: $+06°31'$ **Spectral index:** 0.5 **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 $S_{430\ \mathrm{MHz}} = 82 \pm 51$ 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 ($58'' \times 52''$).
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 ($3'.5 \times 3'.6 : S = 46.3$ 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 ($6''.9 \times 6''.6$) and 4.8 GHz ($46''.4 \times 5''.6$), 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 ($3'.2 \times 3'.4$).
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 ($6.''7 \times 7.''7$: $S = 64.4$ Jy), 1.48 GHz ($4.''8 \times 5.''2$: $S = 31.8$ Jy) and 4.85 GHz ($4.''0 \times 4.''1$), 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 ($27'' \times 24''$ and 5″) for HI Zeeman splitting.
Lacey *et al.* 2001, ApJ, 559, 954. VLA at 74 MHz ($26'' \times 23''$: $S = 55.6$ Jy) and 326 MHz ($6.''6 \times 6.''2$: $S = 56.0$ 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 ($3.'2 \times 3.'4$).
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: $19^h18^m10^s$ **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 $S_{430\ \mathrm{MHz}} = 46 \pm 21$ 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: $19^h23^m50^s$ **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 3C400.2, NRAO 611

RA: $19^h38^m50^s$ **1-GHz flux/Jy:** 8 **Size/arcmin:** 33×28
Dec: $+17°14'$ **Spectral index:** 0.75 **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 ($5' : S = 5.3 \pm 0.6$ Jy).
van den Bergh 1978, ApJS, 38, 119. Optical observations.
Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5' : S = 4.8 \pm 0.3$ Jy).
Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz ($3' : S = 11.7$ Jy).
Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430\ \mathrm{MHz}} = 20 \pm 10$ Jy, $S_{318\ \mathrm{MHz}} = 20 \pm 3.6$ 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: $19^h30^m31^s$ **1-GHz flux/Jy:** 0.5 **Size/arcmin:** 1.5
Dec: $+18°52'$ **Spectral index:** 0.1 **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 ($2\farcm4 : S = 0.37 \pm 0.04$ 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 ($8'.8 : 1.34 \pm 0.1$), 2.7 GHz ($4'.3 : 0.86 \pm 0.1$), plus other surveys of the area.
Caswell *et al.* 1985, AJ, 90, 488. DRAO at 1.4 GHz ($1' \times 3'$).

G59.5+0.1

RA: $19^h42^m33^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 15
Dec: $+23°35'$ **Spectral index:** ? **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: $19^h38^m55^s$ **1-GHz flux/Jy:** 1.6 **Size/arcmin:** 20×16?
Dec: $+24°19'$ **Spectral index:** 0.5 **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: $19^h47^m52^s$ **1-GHz flux/Jy:** 1.8 **Size/arcmin:** 8
Dec: $+27°45'$ **Spectral index:** 0.3 **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: $19^h54^m40^s$ **1-GHz flux/Jy:** 5.5 **Size/arcmin:** 90×50
Dec: $+28°35'$ **Spectral index:** 0.61 **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.
Kothes *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: $19^h33^m00^s$ **1-GHz flux/Jy:** 52? **Size/arcmin:** 310×240
Dec: $+31°10'$ **Spectral index:** 0.6? **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 $S_{408\ \mathrm{MHz}} = 91 \pm 5$ 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 DA 495

RA: $19^h52^m10^s$ **1-GHz flux/Jy:** 5.1 **Size/arcmin:** 22
Dec: $+29°26'$ **Spectral index:** varies **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 ($5' : S = 2.8 \pm 0.4$ Jy), and VRO 37-m at 1.7 GHz ($S = 4.4 \pm 0.5$ Jy), plus review of flux densities.
Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430\ \mathrm{MHz}} = 8.7 \pm 4.9$ Jy, $S_{318\ \mathrm{MHz}} = 9.7 \pm 2.2$ 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.
Kothes *et al.* 2004, ApJ, 607, 855. HI polarisation absorption.
Arzoumanian *et al.* 2004, ApJ, 610, L101. ROSAT and ASCA observations of compact source.
Kothes *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.
Kothes *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: $19^h54^m32^s$ **1-GHz flux/Jy:** 1.0 **Size/arcmin:** 15×12
Dec: $+31°29'$ **Spectral index:** 0.5 **Type:** S

Radio: Double arc shell.

Optical: Filaments in N.

References:
Taylor *et al.* 1992, AJ, 103, 931. WSRT at 327 MHz ($1\farcm9 \times 1\farcm0 : S = 1.9 \pm 0.1$ 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: $20^h08^m40^s$ **1-GHz flux/Jy:** 0.7? **Size/arcmin:** 23
Dec: $+30°37'$ **Spectral index:** 0.0? **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 ($4\farcm3$).
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 ($2\farcm7$).
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 ($1\farcs7$) and 1.4 GHz.
Mantovani *et al.* 1985, A&A, 145, 50. Bologna at 408 MHz ($2\farcm6 \times 4\farcm9 : S = 67.5 \pm 10.5$ Jy), Effelsberg 100-m at 1.41 ($9' : S = 62 \pm 9$ Jy), 1.72 ($7\farcm6 : S = 66 \pm 5$ Jy), 2.7 ($4\farcm5 : S = 52 \pm 4$ Jy) and 4.75 GHz ($2\farcm4 : S = 44 \pm 3.3$ 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:** 16×14
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 ($4\farcm3$).
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: $20^{h}14^{m}15^{s}$ **1-GHz flux/Jy:** 9 **Size/arcmin:** 27
Dec: $+36°12'$ **Spectral index:** 0.23 **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 ($2\farcm4 : S = 6.7 \pm 0.5$ Jy), plus other flux densities.
Chastenay & Pineault 1988, in SNRISM, p297. DRAO at 408 MHz ($3\farcm5 \times 5\farcm9$) and 1.4 GHz ($1\farcm0 \times 1\farcm7$).
Pineault & Chastenay 1990, MNRAS, 246, 169. DRAO at 408 MHz ($3\farcm4 \times 5\farcm8 : S = 12.7 \pm 1.2$ Jy) and 1.4 GHz ($1\farcm0 \times 1\farcm7 : S = 7.4 \pm 1.0$ 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.
Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 10.0 \pm 1.7$ Jy) and 1420 MHz ($\sim 1' : S = 7.6 \pm 0.6$ 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 ($3'.3 \times 6'.7$) 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. Hα 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. Hα, [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.
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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 ($1'.0 \times 1'.9$) and 408 MHz ($3'.4 \times 6'.9$), for spectral index studies in comparison with other radio observations.
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Danforth *et al.* 2001, AJ, 122, 938. Far-UV spectroscopy, Hα and other optical observations of NE region.
Levenson & Graham 2001, ApJ, 559, 948. HST of SE region.
Uyanıker *et al.* 2002, A&A, 389, L61. Effelsberg 100-m at 2.7 GHz ($4'.3$) including polarisation, and comparison with ROSAT data.
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Sankrit & Blair 2002, ApJ, 565, 297. UV observations of NE filament.
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Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14'.5 : S = 184 \pm 18$ Jy).
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Uyanıker *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.
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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 CTB 87

RA: $20^h16^m02^s$ **1-GHz flux/Jy:** 9 **Size/arcmin:** 8×6
Dec: $+37°12'$ **Spectral index:** varies **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 $S_{430\ MHz} = 12.2 \pm 9.7$ Jy, $S_{318\ MHz} = 17.7 \pm 5.0$ Jy.
Weiler & Shaver 1978, A&A, 70, 389. WSRT at 610 MHz ($57'' \times 94'' : S = 9.1 \pm 1.2$ Jy), 1.4 ($24'' \times 40'' : S = 8.7 \pm 1.2$ Jy) and 5 GHz ($24'' \times 40'' : S = 5.6 \pm 1.3$ Jy).
Geldzahler *et al.* 1980, A&A, 84, 237. Effelsberg 100-m at 2.7 GHz ($4'.4 : S = 7.6 \pm 0.5$ Jy).
Wilson 1980, ApJ, 241, L19. Einstein observations.
van Gorkom *et al.* 1982, MNRAS, 198, 757. WSRT HI absorption of nearby compact source.
Seaquist & 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).
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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: $20^h22^m20^s$ **1-GHz flux/Jy:** 1.2 **Size/arcmin:** 9
Dec: $+38°43'$ **Spectral index:** 0.60 **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 DR4, γ Cygni SNR

RA: $20^h20^m50^s$ **1-GHz flux/Jy:** 320 **Size/arcmin:** 60
Dec: $+40°26'$ **Spectral index:** 0.51 **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 ($2' \times 3'.1$).
Higgs *et al.* 1983, AJ, 88, 97. CO of surroundings.
Bohigas *et al.* 1983, RMxAA, 8, 155. Optical spectra, find thermal only.
Braun & Strom 1986, A&AS, 63, 345. WSRT HI observations.
Fukui & Tatematsu 1988, in SNRISM, p261. CO observations of the vicinity ($2'.7$).
Green 1989, MNRAS, 238, 737. OH observations.
Pineault & Chastenay 1990, MNRAS, 246, 169. DRAO at 408 MHz ($3'.4 \times 5'.8 : S = 480 \pm 60$ Jy) and 1.4 GHz ($1'.0 \times 1'.7 : S = 270 \pm 40$ Jy).
Wendker *et al.* 1991, A&A, 241, 551. DRAO at 408 MHz ($3'.5 \times 5'.2 : S = 540 \pm 40$ Jy) and Effelsberg 100-m at 4.8 GHz ($S = 150 \pm 15$ Jy).
Esposito *et al.* 1996, ApJ, 461, 820. Associated 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 W63

RA: $20^h19^m00^s$ **1-GHz flux/Jy:** 120? **Size/arcmin:** 95×65
Dec: $+45°30'$ **Spectral index:** 0.5? **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).
Uyanıker *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: $20^h46^m55^s$ **1-GHz flux/Jy:** 1 **Size/arcmin:** 9×7
Dec: $+42°52'$ **Spectral index:** 0.4 **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: $20^h53^m20^s$ **1-GHz flux/Jy:** 11 **Size/arcmin:** 20×16
Dec: $+43°27'$ **Spectral index:** 0.5 **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 ($4\farcm4 : S = 6.8 \pm 1.3$ Jy).
Matthews & Shaver 1980, A&A, 87, 255. WSRT at 1415 MHz ($23'' \times 32''$), and Effelsberg 100-m at 2.7 GHz ($4\farcm4 : S = 5.6 \pm 0.5$ Jy).
Feldt & Green 1993, A&A, 274, 421. DRAO at 1.4 GHz ($1' \times 1\farcm5$), including HI, plus CO observations.
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
Uyanıker *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: $20^h50^m40^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 24?
Dec: $+45°22'$ **Spectral index:** 0.2 **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 ($4\farcm4 \times 2\farcm8 : S < 0.45$ Jy) and 1.4 GHz ($1\farcm1 \times 0\farcm8$), 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: $20^h58^m40^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 24
Dec: $+44°53'$ **Spectral index:** 0.2 **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 ($4\farcm4 \times 2\farcm8 : S < 0.9$ Jy) and 1.4 GHz ($1\farcm1 \times 0\farcm8$), 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: $20^h45^m00^s$ **1-GHz flux/Jy:** 220 **Size/arcmin:** 120×90
Dec: $+50°35'$ **Spectral index:** 0.38 **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 ($3' \times 3'.9$).
Haslam *et al.* 1975, A&A, 39, 453. Effelsberg 100-m at 2.7 GHz ($4'.4$)
Fukui & Tatematsu 1988, in SNRISM, p261. CO observations of the vicinity ($2'.7$).
Tatematsu *et al.* 1990, A&A, 237, 189. DRAO at 408 MHz ($3'.5 \times 4'.5$) and 1.4 GHz ($1'.0 \times 1'.3$), including 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).
Uyanıker *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 ($2'.8 \times 3'.7$) and 1.4 GHz ($0'.8 \times 1'.1$).
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: $20^h52^m25^s$ **1-GHz flux/Jy:** 9 **Size/arcmin:** 27×20
Dec: $+55°21'$ **Spectral index:** 0.45 **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 ($2' \times 2'.4 : S = 6.9$ Jy).
Haslam *et al.* 1980, A&A, 92, 57. Effelsberg 100-m at 1.72 GHz ($7'.6 : S = 6.47 \pm 0.52$ Jy) and 2.7 GHz ($4'.4 : S = 5.64 \pm 0.64$ Jy), plus review of flux densities.
Lalitha *et al.* 1984, A&A, 131, 196. Effelsberg 100-m at 4.75 GHz (smoothed to $3' : S = 4.01 \pm 0.57$ Jy).
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
Landecker *et al.* 1999, ApJ, 527, 866. DRAO at 408 MHz ($3'.5 \times 4'.3$) and 1.4 GHz ($1'.0 \times 1'.2$), including polarisation and HI.
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 CTB 104A, DA 551

RA: $21^h29^m20^s$ **1-GHz flux/Jy:** 65 **Size/arcmin:** 80
Dec: $+50°50'$ **Spectral index:** 0.65 **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.
Uyanıker *et al.* 2002, ApJ, 565, 1022. CGPS 1.4 GHz ($54'' \times 49''$), including HI, and 408 MHz ($3'.7 \times 2'.8$).
Uyanıker *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 3C434.1

RA: $21^h24^m50^s$ **1-GHz flux/Jy:** 13 **Size/arcmin:** 30×25
Dec: $+51°53'$ **Spectral index:** 0.48 **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.
Uyanıker *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: $21^h30^m30^s$ **1-GHz flux/Jy:** 0.3 **Size/arcmin:** 26
Dec: $+53°59'$ **Spectral index:** 0.5 **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: $22^{h}27^{m}30^{s}$ **1-GHz flux/Jy:** 6 **Size/arcmin:** 60×24
Dec: $+60°50'$ **Spectral index:** 0.6 **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'.w
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: $22^{h}53^{m}40^{s}$ **1-GHz flux/Jy:** 8 **Size/arcmin:** 70×54
Dec: $+58°50'$ **Spectral index:** 0.5 **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 ($4\farcm4 : S = 13.0 \pm 1.5$ Jy).
Sofue *et al.* 1983, PASJ, 35, 447. NRO 45-m at 10.2 GHz ($2\farcm7$).
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 ($1' \times 1\farcm2 : S = 16.8 \pm 2$ Jy) and Algonquin 46-m at 6.5 GHz ($4\farcm5 : S = 6.7 \pm 1$ Jy).
Braun & Strom 1986, A&AS, 63, 345. WSRT HI observations.
Tatematsu *et al.* 1987, PASJ, 39, 755. NRO 45-m at 10 GHz ($2\farcm7$), plus polarisation.
Tatematsu *et al.* 1987, A&A, 184, 279. CO observations of the surroundings ($2\farcm7$).
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 observaitons 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 flocculli, 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 HI absorption.
Reynoso *et al.* 1997, A&A, 317, 203. VLA at 1.4 GHz (11″ × 14″) for HI absorption.
O'Sullivan & Green 1999, MNRAS, 303, 575. Flux density changes at 13.5, 15.5 and 16.5 GHz.
Agüeros & Green 1999, MNRAS, 305, 957. CLFST at 151 MHz for bulk expansion studies.
Mason *et al.* 1999, AJ, 118, 2908. Flux density at 32 GHz ($S = 194 \pm 5$ Jy).
Reichart & Stephens 2000, ApJ, 537, 904. Flux density changes at 1405 MHz.
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.
Douvion *et al.* 2001, A&A, 369, 589. ISO observations.
Thorstensen *et al.* 2001, AJ, 122, 297. Optical expansion studies.
Hwang *et al.* 2001, ApJ, 560, L175. Chandra observations of Doppler shifted lines.
Fesen *et al.* 2001, AJ, 122, 2644. HST observations.
Willingale *et al.* 2002, A&A, 381, 1039. XMM observations.
Mereghetti *et al.* 2002, ApJ, 569, 275. XMM observations of central source.
Reynoso & Goss 2002, ApJ, 575, 871. VLA at 5 GHz (6″.4 × 6″.0) for H_2CO absorption studies.
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.
Vinyaĭkin 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.
Mookerjea *et al.* 2006, MNRAS, 371, 761. Sub-mm [CI] observations.
Kang & Koo 2007, ApJS, 173, 85. SGPS of high velocity HI.
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: $23^h36^m35^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 40×17?
Dec: $+61°22'$ **Spectral index:** ? **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 ($2\farcm8 \times 3\farcm1$) and 1.4 GHz ($49'' \times 55''$) including HI.
Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3'$) and 1420 MHz ($\sim 1'$).

G114.3+0.3

RA: $23^h37^m00^s$ **1-GHz flux/Jy:** 5.5 **Size/arcmin:** 90×55
Dec: $+61°55'$ **Spectral index:** 0.5 **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 ($4\farcm4 : S = 3.6$ Jy) and $S_{1.4\ \mathrm{GHz}} = 4.4$ 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-Uyanıker *et al.* 2004, ApJ, 616, 247. CGPS at 1.4 GHz ($49'' \times 55''$), including HI ($1\farcm0 \times 1\farcm1$).
Tian & Leahy 2006, ChJAA, 6, 543. CGPS at 408 MHz ($3\farcm4 \times 3\farcm9 : S = 12.0 \pm 6.0$ Jy) and 1.4 GHz ($1\farcm0 \times 1\farcm1 : S = 9.8 \pm 0.8$ Jy).
Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 1420 MHz ($\sim 1' : S = 5.4 \pm 0.8$ Jy), including review of flux densities.

G116.5+1.1

RA: $23^h53^m40^s$ **1-GHz flux/Jy:** 10 **Size/arcmin:** 80×60
Dec: $+63°15'$ **Spectral index:** 0.5 **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 ($4\farcm4 : S = 4.7 \pm 0.4$ Jy) and $S_{1.4\ \mathrm{GHz}} = 8.0 \pm 0.8$ Jy from 1.4 GHz survey data, plus HI from Maryland-Green Bank survey.
Fesen *et al.* 1997, AJ, 113, 767. Optical observations.
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
Yar-Uyanıker *et al.* 2004, ApJ, 616, 247. CGPS at 1.4 GHz ($49'' \times 55''$), including HI ($1\farcm0 \times 1\farcm1$).
Mavromatakis *et al.* 2005, A&A, 435, 141. Optical observations.
Tian & Leahy 2006, ChJAA, 6, 543. CGPS at 408 MHz ($3\farcm4 \times 3\farcm8 : S = 15.0 \pm 1.5$ Jy) and 1.4 GHz ($1\farcm0 \times 1\farcm1 : S = 10.6 \pm 0.$ Jy).
Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim 3' : S = 12.5 \pm 1.6$ Jy) and 1420 MHz ($\sim 1' : S = 10.3 \pm 0.70$ Jy), including polarisation and review of flux densities.

G116.9+0.2 CTB 1

RA: $23^h59^m10^s$ **1-GHz flux/Jy:** 8 **Size/arcmin:** 34
Dec: $+62^\circ26'$ **Spectral index:** 0.61 **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 ($5'$: $S=3.9\pm1.0$ Jy), and VRO 37-m at 1.7 GHz ($S=5.5\pm2.0$ 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 ($5'$: $S=4.2\pm0.2$ Jy).
Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ($6\farcm8$: $S=3.0\pm0.3$ Jy).
Dickel & Willis 1980, A&A, 85, 55. WSRT at 610 MHz ($56''\times64''$) and 1.4 GHz ($22''\times25''$).
Reich & Braunsfurth 1981, A&A, 99, 17. Effelsberg 100-m at 2.7 GHz ($4\farcm4$: $S=4.8\pm0.4$ Jy) and $S_{1.4\ \mathrm{GHz}}=7.8\pm0.8$ 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 ($2'\times2\farcm3$: $S=8.3\pm0.5$ 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-Uyanıker *et al.* 2004, ApJ, 616, 247. CGPS at 1.4 GHz ($49''\times55''$), including HI ($1\farcm0\times1\farcm1$).
Lazendic & Slane 2006, ApJ, 647, 350. X-ray observations.
Tian & Leahy 2006, ChJAA, 6, 543. CGPS at 408 MHz ($3\farcm4\times3\farcm8$: $S=15.0\pm1.5$ Jy) and 1.4 GHz ($1\farcm0\times1\farcm1$: $S=8.1\pm0.4$ Jy).
Kothes *et al.* 2006, A&A, 457, 1081. CGPS at 408 MHz ($\sim3'$: $S=10.5\pm0.8$ Jy) and 1420 MHz ($\sim1'$: $S=7.0\pm0.8$ 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 Tycho, 3C10, SN1572

RA: $00^h25^m18^s$ **1-GHz flux/Jy:** 56 **Size/arcmin:** 8
Dec: $+64°09'$ **Spectral index:** 0.65 **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. Hα 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: $01^h22^m00^s$ **1-GHz flux/Jy:** 6 **Size/arcmin:** 70
Dec: $+64°15'$ **Spectral index:** 0.5 **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 R5

RA: $01^h28^m20^s$ **1-GHz flux/Jy:** 12 **Size/arcmin:** 45
Dec: $+63°10'$ **Spectral index:** 0.45 **Type:** S

Has been called G127.3+0.7.

Radio: Distinct shell, with bright central source.

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

Optical: Detected.

Distance: 1.2–1.3 kpc if associated with 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 HI 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 HI 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.
Shibanov *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 ($5' : S = 33.8 \pm 7.0$ Jy).
d'Odorico & Sabbadin 1977, A&AS, 28, 439. Optical spectra.
Read 1981, MNRAS, 194, 863. Radio at 151 MHz ($4\farcm4$) and 1.4 GHz ($2'$) showing HI 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 ($3\farcm5 \times 4' : S = 75 \pm 15$ Jy), plus review of flux densities.
Routledge *et al.* 1991, A&A, 247, 529. DRAO at 1.4 GHz ($1\farcm0 \times 1\farcm1$) for HI, plus CO observations.
Fesen *et al.* 1995, AJ, 110, 2876. Optical imaging and spectroscopy, DRAO at 408 MHz ($3\farcm5 \times 4'$) and 1.4 GHz ($1\farcm0 \times 1\farcm1$).
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 ($14\farcm5 : S = 51.5 \pm 3.5$ Jy).
Tian & Leahy 2005, A&A, 436, 187. CGPS at 408 MHz ($3\farcm4 \times 3\farcm8$:) and 1.4 GHz ($1\farcm0 \times 1\farcm1$), 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 ($9\farcm5$), 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 ($4\farcm3 : S = 3.0 \pm 1.0$ Jy), plus HI 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 ($9\farcm5 : S = 2.5 \pm 0.5$ Jy), including polaristion.
Gerardy & Fesen 2007, MNRAS, 376, 929. Optical observations.

G160.9+2.6 HB9

RA: $05^h01^m00^s$ **1-GHz flux/Jy:** 110 **Size/arcmin:** 140×120
Dec: $+46°40'$ **Spectral index:** 0.64 **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 ($26' \times 40' : S = 750 \pm 150$ 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 ($3\farcm5 \times 4\farcm8$) and 1.4 GHz ($1\farcm0 \times 1\farcm4$), 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 ($3\farcm8 \times 5\farcm2$), CLFST at 151 MHz ($4\farcm2 \times 5\farcm8$) and Effelsberg 100-m at 4.7 GHz ($2\farcm5$) for spectral index studies.
Roger *et al.* 1999, A&AS, 137, 7. 22 MHz flux density ($S = 1130 \pm 340$ Jy).
Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14\farcm5 : S = 91 \pm 3$ 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 ($\sim 3' : S = 102 \pm 7$ Jy) and 1420 MHz ($\sim 1' : S = 54.0 \pm 2.9$ Jy), including polarisation and review of flux densities.
Leahy & Tian 2007, A&A, 461, 1013. CGPS at 408 MHz ($2\farcm8 \times 3\farcm9 : S = 117.8 \pm 5.3$ Jy) and 1.4 GHz ($58'' \times 80'' : S = 65.9 \pm 3.4$ Jy).

G166.0+4.3 VRO 42.05.01

RA: $05^h26^m30^s$ **1-GHz flux/Jy:** 7 **Size/arcmin:** 55×35
Dec: $+42°56'$ **Spectral index:** 0.37 **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 ($5' : S = 5.2 \pm 1.0$ Jy).
Lozinskaya 1979, AuJPh, 32, 113. Hα interferometry.
Landecker *et al.* 1982, ApJ, 261, L41. DRAO at 1.4 GHz ($1\farcm0 \times 1\farcm4$), plus review of flux densities.
Fesen *et al.* 1983, ApJS, 51, 337. Deep [OIII] imagery.
Pineault *et al.* 1985, A&A, 151, 52. VLA at 1.4 GHz ($16'' \times 20''$) of part of remnant, and optical 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 ($1\farcm0 \times 1\farcm4$), 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 ($3\farcm4 \times 5\farcm0$) and 1.4 GHz ($1\farcm0 \times 1\farcm4$), 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 ($\sim 3' : S = 8.1 \pm 0.9$ Jy) and 1420 MHz ($\sim 1' : S = 5.1 \pm 0.4$ Jy), including polarisation and review of flux densities.

G179.0+2.6

RA: $05^h53^m40^s$ **1-GHz flux/Jy:** 7 **Size/arcmin:** 70
Dec: $+31°05'$ **Spectral index:** 0.4 **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 S147

RA: $05^h39^m00^s$ **1-GHz flux/Jy:** 65 **Size/arcmin:** 180
Dec: $+27°50'$ **Spectral index:** varies **Type:** S

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 : $S = 34.9 \pm 4$ Jy) and 1.6 GHz (10′ : $S = 60.2 \pm 6$ Jy).
Angerhofer & Kundu 1981, AJ, 86, 1003. Arecibo at 430 MHz (9′ : $S = 97 \pm 20$ Jy).
Fürst *et al.* 1982, A&A, 115, 428. Observations of compact radio sources near the remnant.
Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.
Fürst & Reich 1986, A&A, 163, 185. Effelsberg 100-m at 1.4, 2.7 and 4.7/5.0 GHz (9.′4, 4.′3 and 2.′4/2.′6).
Sauvageot *et al.* 1990, A&A, 227, 183. EXOSAT possible detection.
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
Anderson *et al.* 1996, ApJ, 468, L55. Pulsar detection.
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 : $S = 77 \pm 10$ 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. Hα 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 : $S = 15.4 \pm 3.0$ Jy) and Effelsberg 100-m at 2.6 GHz (4.′4 : $S = 34.6 \pm 4.0$ Jy).

G182.4+4.3

RA: $06^h08^m10^s$ **1-GHz flux/Jy:** 1.2 **Size/arcmin:** 50
Dec: $+29°00'$ **Spectral index:** 0.4 **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 : $S = 0.36 \pm 0.08$ Jy, 4.′4 : $S = 0.25 \pm 0.04$ Jy, 2.′5 : $S = 0.20 \pm 0.02$ Jy and 1.′2 : $S = 0.15 \pm 0.03$ Jy), plus X-ray upper limit.
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 Hα 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″) for limits on shell.
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 O_2.
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.
Seta *et al.* 1998, ApJ, 505, 286. CO observations of surroundings.
Oliva *et al.* 1999, A&A, 341, L75. ISO observations.
Cesarsky *et al.* 1999, A&A, 348, 945. ISO observations of shocked molecular H_2.
Bocchino & Bykov 2000, A&A, 362, L29. BeppoSAX observations.
Rho *et al.* 2001, ApJ, 547, 885. 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 H_2.
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 PKS 0607+17

RA: $06^h09^m20^s$ **1-GHz flux/Jy:** 20? **Size/arcmin:** 78
Dec: $+17°20'$ **Spectral index:** 0.6? **Type:** S

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

Radio: In complex region.

Optical: Encompasses S261 and S254–258.

References:
Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz ($9' : S = 13 \pm 15\%$ Jy).
Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo at 318 MHz ($15' : S = 74 \pm 32$ Jy), and $S_{610\ \mathrm{MHz}} = 40$ 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 Monoceros Nebula

RA: $06^h39^m00^s$ **1-GHz flux/Jy:** 160 **Size/arcmin:** 220
Dec: $+06°30'$ **Spectral index:** 0.5 **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 $S_{610\ \mathrm{MHz}} = 245$ 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 PKS 0646+06

RA: $06^h48^m40^s$ **1-GHz flux/Jy:** 6 **Size/arcmin:** 60×40
Dec: $+06°26'$ **Spectral index:** 0.5 **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 Puppis A, MSH 08–44

RA: $08^h22^m10^s$ **1-GHz flux/Jy:** 130 **Size/arcmin:** 60×50
Dec: $-43°00'$ **Spectral index:** 0.5 **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. Hα+[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 ($4\farcm5 : S = 59 \pm 5$ 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: $09^h04^m20^s$ **1-GHz flux/Jy:** 10? **Size/arcmin:** 40×30
Dec: $-38°42'$ **Spectral index:** 0.4? **Type:** S

Radio: Faint shell with little limb brightening.

References:
Hill 1967, AuJPh, 20, 297. Parkes 64-m at 2650 MHz ($7\farcm5 : S = 7$ Jy) also $S_{1410\ \mathrm{MHz}} = 8$ Jy, $S_{81.5\ \mathrm{MHz}} = 25$ 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 Vela (XYZ)

RA: $08^h34^m00^s$ **1-GHz flux/Jy:** 1750 **Size/arcmin:** 255
Dec: –45°50′ **Spectral index:** varies **Type:** C

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

Radio: Large shell, with flatter spectrum component (Vela X), 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. Clarificaton 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 RX J0852.0–4622

RA: $08^h52^m00^s$ **1-GHz flux/Jy:** 50? **Size/arcmin:** 120
Dec: –46°20′ **Spectral index:** 0.3? **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 observatins 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: $09^h06^m50^s$ **1-GHz flux/Jy:** 0.4 **Size/arcmin:** 15?
Dec: –52°07′ **Spectral index:** 0.6 **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.
Harrus *et al.* 2001, ApJ, 552, 614. ASCA and ROSAT observations, plus review of earlier observations.

G279.0+1.1

RA: $09^h57^m40^s$ **1-GHz flux/Jy:** 30? **Size/arcmin:** 95
Dec: –53°15′ **Spectral index:** 0.6? **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 ($43'' \times 53''$) of part.
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G284.3–1.8 MSH 10–53

RA: $10^h18^m15^s$ **1-GHz flux/Jy:** 11? **Size/arcmin:** 24?
Dec: –59°00′ **Spectral index:** 0.3? **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 ($43'' \times 50''$) 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: $10^h35^m40^s$ **1-GHz flux/Jy:** 1.4? **Size/arcmin:** 26×6
Dec: –59°42′ **Spectral index:** ? **Type:** S?

Radio: Double, elongated arc.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 50'' : S = 1.6$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G289.7–0.3

RA: $11^h01^m15^s$ **1-GHz flux/Jy:** 6.2 **Size/arcmin:** 18×14
Dec: –60°18′ **Spectral index:** 0.2? **Type:** S

Radio: Incomplete shell.

Point sources: Compact radio source near centre.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 50'' : S = 6.4 \pm 0.5$ 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 MSH 11–61A

RA: $11^h03^m05^s$ **1-GHz flux/Jy:** 42 **Size/arcmin:** 19×14
Dec: $-60°56'$ **Spectral index:** 0.4 **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 ($44'' \times 50''$).
Milne *et al.* 1989, PASA, 8, 187. MOST at 843 MHz ($43'' \times 49''$: $S = 45 \pm 11$ 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 ($43'' \times 49''$: $S = 43$ 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 (MSH 11–62)

RA: $11^h11^m54^s$ **1-GHz flux/Jy:** 16 **Size/arcmin:** 15×13
Dec: $-60°38'$ **Spectral index:** 0.29 **Type:** C

Radio: Centrally brightened core, with surrounding arcs.

X-ray: Centrally brightened.

Point sources: Central compact X-ray source.

References:

Shaver & 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 ($43'' \times 50''$: $S = 17.2 \pm 1.0$ 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 ± 0.2), with polarisation.
Wilson 1986, ApJ, 302, 718. Einstein observations.
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 49''$: $S = 12.7$ Jy).
Harrus *et al.* 1998, ApJ, 499, 273. ASCA observations.

G292.0+1.8 MSH 11–54

RA: $11^h24^m36^s$ **1-GHz flux/Jy:** 15 **Size/arcmin:** 12×8
Dec: $-59°16'$ **Spectral index:** 0.4 **Type:** C

Radio: Centrally brightened source surrounded by a plateau of faint emission.

Optical: Oxygen rich.

X-ray: Ring of emission, with diffuse central nebula and 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 ($9.''6 \times 8.''0, 7.''2 \times 6.''2$ and $5.''5 \times 4.''8$: $S = 11.9 \pm 0.1, 11.4 \pm 0.1$ 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: $11^h19^m20^s$ **1-GHz flux/Jy:** 7 **Size/arcmin:** 20×15
Dec: $-61°28'$ **Spectral index:** 0.5 **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 ($29'' \times 25''$: $S = 5.6 \times 0.3$ Jy) and 2.5 GHz ($21'' \times 20''$).
Pivovaroff *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: $11^h35^m00^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 20
Dec: $-60°54'$ **Spectral index:** 0.6? **Type:** C

Radio: Central source, with faint extended plateau.

References:
Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : $S = 9.0$ Jy) and Parkes 64-m at 5 GHz (4′ : $S = 2.1$ Jy).
Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz ($44'' \times 51''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 49''$: $S = 2.6$ Jy).

G294.1−0.0

RA: $11^h36^m10^s$ **1-GHz flux/Jy:** >2? **Size/arcmin:** 40
Dec: –61°38′ **Spectral index:** ? **Type:** S

Radio: Faint shell.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 49'' : S > 2$).

G296.1−0.5

RA: $11^h51^m10^s$ **1-GHz flux/Jy:** 8? **Size/arcmin:** 37×25
Dec: –62°34′ **Spectral index:** 0.6? **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 ($43'' \times 48'' : S > 2.4$).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G296.5+10.0 PKS 1209–51/52

RA: $12^h09^m40^s$ **1-GHz flux/Jy:** 48 **Size/arcmin:** 90×65
Dec: –52°25′ **Spectral index:** 0.5 **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 ($44'' \times 56''$).
Matsui *et al.* 1988, ApJ, 329, 838. Einstein observations, including compact source.
Roger *et al.* 1988, ApJ, 332, 940. MOST at 843 MHz ($44'' \times 56''$).
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 ($8'.3 : S = 33 \pm 3$ Jy), 4.8 GHz ($4'.5 : S = 23.3 \pm 3$ Jy) and 8.4 GHz ($3'.0 : 18.8 \pm 3$), including polarisation and review of flux densities.
Mereghetti *et al.* 1996, ApJ, 464, 842. Radio, optical and X-tray 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 ($2'.7 \times 4'.0$) 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 1156–62

RA: $11^h58^m30^s$ **1-GHz flux/Jy:** 9 **Size/arcmin:** 20×14
Dec: $-62°35'$ **Spectral index:** 0.6 **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 ($43'' \times 48''$: $S = 9.2$ Jy).
Gaensler *et al.* 1998, MNRAS, 296, 813. ATCA at 1.3 GHz ($22'' \times 24''$: $S = 7.0 \pm 0.3$ Jy), including polarisation and HI observations, plus review of flux densities.

G298.5–0.3

RA: $12^h12^m40^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 5?
Dec: $-62°52'$ **Spectral index:** 0.4? **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 ($43'' \times 48''$: $S = 1.8$ Jy).
Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G298.6–0.0

RA: $12^h13^m41^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 12×9
Dec: $-62°37'$ **Spectral index:** 0.3 **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 ($44'' \times 50''$).
Hwang & Markert 1994, ApJ, 431, 819. ROSAT upper limit.
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 48''$: $S = 7.4$ Jy).
Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G299.2–2.9

RA: $12^h15^m13^s$ **1-GHz flux/Jy:** 0.5? **Size/arcmin:** 18×11
Dec: $-65°30'$ **Spectral index:** ? **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: $12^h21^m45^s$ **1-GHz flux/Jy:** 1.0? **Size/arcmin:** 13
Dec: –63°09′ **Spectral index:** ? **Type:** S

Radio: Faint shell, brightest to E.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 48'' : S = 1.1$ Jy).

G301.4−1.0

RA: $12^h37^m55^s$ **1-GHz flux/Jy:** 2.1? **Size/arcmin:** 37×23
Dec: –63°49′ **Spectral index:** ? **Type:** S

Radio: Faint, incomplete shell, with possible extension to southwest.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 48'' : S = 2.3$ Jy).

G302.3+0.7

RA: $12^h45^m55^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 17
Dec: –62°08′ **Spectral index:** 0.4? **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 ($43'' \times 49'' : S = 3.2$ 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 ($4\farcm4 : S = 6.9$ Jy).
Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 48'' : S = 18$ 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 ($43'' \times 48'' : S = 1.3$ 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 ($4\farcm4$: $S = 6.5$ 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 ($43'' \times 49''$).
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 ($1\farcm5$).
Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz ($44'' \times 50''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 48''$: $S = 6$ 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 ($24'' \times 23''$: $S = 5.2 \pm 0.2$ 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: $13^h50^m30^s$ **1-GHz flux/Jy:** 17 **Size/arcmin:** 25×19
Dec: $-62°05'$ **Spectral index:** 0.5 **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 ($43'' \times 49''$: $S > 8.8$).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G310.6–0.3 Kes 20B

RA: $13^h58^m00^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 8
Dec: $-62°09'$ **Spectral index:** ? **Type:** S

Radio: Asymmetric shell.

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

G310.8−0.4 Kes 20A

RA: $14^h00^m00^s$ **1-GHz flux/Jy:** 6? **Size/arcmin:** 12
Dec: $-62°17'$ **Spectral index:** ? **Type:** S

Radio: Arc in E, in complex region.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 49'' : S = 6.9$ Jy).
Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.

G311.5−0.3

RA: $14^h05^m38^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 5
Dec: $-61°58'$ **Spectral index:** 0.5 **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 ($43'' \times 49'' : S = 2.9$ Jy).
Reach *et al.* 2006, AJ, 131, 1479. Spitzer observations.

G312.4−0.4

RA: $14^h13^m00^s$ **1-GHz flux/Jy:** 45 **Size/arcmin:** 38
Dec: $-61°44'$ **Spectral index:** 0.36 **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: $14^h21^m00^s$ **1-GHz flux/Jy:** 3.5? **Size/arcmin:** 20×18
Dec: $-64°12'$ **Spectral index:** ? **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: $14^h24^m30^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 190×150
Dec: $-57°50'$ **Spectral index:** ? **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 RCW 86, MSH 14–63

RA: $14^h43^m00^s$ **1-GHz flux/Jy:** 49 **Size/arcmin:** 42
Dec: $-62°30'$ **Spectral index:** 0.6 **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 ($44'' \times 50''$).
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 ($43'' \times 48'' : S > 22$).
Rosado *et al.* 1996, A&A, 315, 243. Optical kinematics.
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
Smith *et al.* 1997, AJ, 114, 2664. Observations of Balmer dominated filaments.
Vink *et al.* 1997, A&A, 328, 628. ASCA spectroscopy.
Bocchino *et al.* 2000, A&A, 360, 671. 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: $14^h35^m55^s$ **1-GHz flux/Jy:** 8 **Size/arcmin:** 24×13
Dec: $-60°36'$ **Spectral index:** 0.4 **Type:** ?

Radio: Irregular non-thermal emission, with HII region superposed in E.

References:
Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz ($3' : S = 15.9$ Jy) and Parkes 64-m at 5 GHz ($4' : S = 4.9$ Jy).
Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz ($50'' : S = 6.25$ Jy), re-assessment of earlier flux densities.
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 49'' : S = 3.1$ Jy).
Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.
Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G315.9–0.0

RA: $14^h38^m25^s$ **1-GHz flux/Jy:** 0.8? **Size/arcmin:** 25×14
Dec: $-60°11'$ **Spectral index:** ? **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 ($44'' \times 50''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 50'' : S = 0.9$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.

G316.3–0.0 (MSH 14–57)

RA: $14^h41^m30^s$ **1-GHz flux/Jy:** 20? **Size/arcmin:** 29×14
Dec: $-60°00'$ **Spectral index:** 0.4 **Type:** S

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 ($4\farcm4 : S = 16.7$ Jy).
Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz ($44'' \times 51''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 50'' : S = 20$ 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: $14^h49^m40^s$ **1-GHz flux/Jy:** 4.7? **Size/arcmin:** 11
Dec: $-59°46'$ **Spectral index:** ? **Type:** S

Radio: Incomplete shell.

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

G318.2+0.1

RA: $14^h54^m50^s$ **1-GHz flux/Jy:** >3.9? **Size/arcmin:** 40×35
Dec: $-59°04'$ **Spectral index:** ? **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 ($43'' \times 50'' : S > 4.3$).
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: $14^h58^m30^s$ **1-GHz flux/Jy:** 4? **Size/arcmin:** 30×14
Dec: $-58°29'$ **Spectral index:** 0.2? **Type:** C

May not be a SNR?

Radio: Complex arcs, with off-centre core.

References:
Whiteoak 1990, Nature, 347, 157. MOST at 843 MHz ($43'' \times 51''$).
Whiteoak 1993, ApJ, 415, 701. MOST at 843 MHz ($43'' \times 51'' : S = 4.8 \pm 0.6$ 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 ($11'' \times 13''$) of core.
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 50'' : S = 4.8$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G320.4−1.2 MSH 15–52, RCW 89

RA: $15^h14^m30^s$ **1-GHz flux/Jy:** 60? **Size/arcmin:** 35
Dec: $-59°08'$ **Spectral index:** 0.4 **Type:** C

Has been suggested as the remnant of the SN of AD185?

Radio: Ragged shell.

Optical: RCW 89 is the Hα 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, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz ($8'.4$) and 5 GHz ($4'.4$).
Dopita *et al.* 1977, ApJ, 214, 179. Optical spectra.
Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz ($50''$).
Seward & Harnden 1982, ApJ, 256, L45. X-ray 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 ($43'' \times 50'' : S = 62$ 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 ($24'' \times 21''$), plus HI observations, and 5.3 GHz ($15'' \times 10''$).
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 ($4'.0 \times 2'.7$), 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: $15^h17^m50^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 60×30
Dec: $-59°16'$ **Spectral index:** ? **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 ($43'' \times 50'' : S > 9.3$).

G321.9–1.1

RA: $15^h23^m45^s$ **1-GHz flux/Jy:** >3.4? **Size/arcmin:** 28
Dec: $-58°13'$ **Spectral index:** ? **Type:** S

Radio: Faint shell.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 51'' : S > 3.8$).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G321.9–0.3

RA: $15^h20^m40^s$ **1-GHz flux/Jy:** 13 **Size/arcmin:** 31×23
Dec: $-57°34'$ **Spectral index:** 0.3 **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 ($44'' \times 52''$).
Stewart *et al.* 1993, MNRAS, 261, 593. ATCA at 1.5 GHz ($21''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 51'' : S > 8.3$).
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: $15^h23^m23^s$ **1-GHz flux/Jy:** 1.5 **Size/arcmin:** 15
Dec: $-57°06'$ **Spectral index:** 0.4 **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 ($43'' \times 51'' : S = 2.0 \pm 0.3$ Jy).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 51'' : S = 1.7$ 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: $15^h28^m42^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 13
Dec: $-56°21'$ **Spectral index:** 0.4? **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 MSH 15–56

RA: $15^h53^m00^s$ **1-GHz flux/Jy:** 145 **Size/arcmin:** 38
Dec: –56°10′ **Spectral index:** varies **Type:** C

Has been called G326.2–1.7.

Radio: Shell, with elongated, flat-spectrum core.

Optical: Emission around the shell.

X-ray: Shell, with central extended emission.

References:
Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz ($3' : S = 180$ Jy).
Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz ($0'.8 : S > 95$) and Parkes 64-m at 14.7 GHz ($2'.2 : S = 69 \pm 8$ 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: $15^h54^m25^s$ **1-GHz flux/Jy:** 7? **Size/arcmin:** 18
Dec: –55°09′ **Spectral index:** ? **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. BepposSAX observations.

G327.2–0.1

RA: $15^h50^m55^s$ **1-GHz flux/Jy:** 0.4 **Size/arcmin:** 5
Dec: –54°18′ **Spectral index:** ? **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 Kes 27

RA: $15^h48^m20^s$ **1-GHz flux/Jy:** 30? **Size/arcmin:** 21
Dec: –53°49′ **Spectral index:** 0.6 **Type:** S

Has been called G327.3+0.4 and G327.3+0.5.

Radio: Incomplete, multi-arc shell, brightest to the SE.

X-ray: Diffuse, best defined to E.

Distance: HI absorption indicates 4.3 to 5.4 kpc.

References:
Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : S = 58 Jy) and Parkes 64-m at 5 GHz (4′ : S = 12.4 Jy).
Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
Lamb & Markert 1981, ApJ, 244, 94. Einstein observations.
Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 55″).
Milne *et al.* 1989, PASA, 8, 187. MOST at 843 MHz (43″ × 53″ : S = 32.2 ± 6 Jy), and Parkes 64-m at 8.4 GHz (3′ : S = 9.4 ± 0.8 Jy), including polarisation.
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 53″ : S = 25 Jy).
Seward *et al.* 1996, ApJ, 471, 887. ROSAT observations.
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.
McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parkes 64-m at 1.4 GHz (2′.0 × 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: $15^h46^m48^s$ **1-GHz flux/Jy:** 1.9? **Size/arcmin:** 14
Dec: –53°20′ **Spectral index:** ? **Type:** S

Radio: Asymmetric shell.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 54″ : S = 2.1 Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parkes 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

G327.6+14.6 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 Hα 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″ × 20″).
Kirshner *et al.* 1987, ApJ, 315, L135. Broad Hα optical component.
Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 66″).
Fesen *et al.* 1988, ApJ, 327, 164. UV absorption spectra of the Schweizer–Middleditch star.
Roger *et al.* 1988, ApJ, 332, 940. MOST at 843 MHz (44″ × 66″ : $S = 17.5 \pm 1.5$ Jy).
Long *et al.* 1988, ApJ, 333, 749. Optical proper motion for distance.
Jones & Pye 1989, MNRAS, 238, 567. EXOSAT observations.
Leahy *et al.* 1991, ApJ, 374, 218. HEAO-1 X-ray spectra.
Wu *et al.* 1993, ApJ, 416, 247. UV spectra.
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″ × 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 × 3′.0) for HI, 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 Hα 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″ × 9″) plus Chandra observations.
Yamaguchi *et al.* 2008, PASJ, 60, S141. Suzaku observations.
Bamba 2008, PASJ, 60, S153. Suzaku observations.

G328.4+0.2 (MSH 15–57)

RA: $15^h55^m30^s$ **1-GHz flux/Jy:** 15 **Size/arcmin:** 5
Dec: $-53°17'$ **Spectral index:** 0.0 **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 ($43'' \times 54'' : S = 15$ 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 ($16\farcs5 \times 19\farcs5 : S = 14.3 \pm 0.1$ Jy) and 4.5 GHz ($2\farcs0 \times 1\farcs5 : S = 12.5 \pm 0.2$ 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 ($1\farcm8 \times 2\farcm0$), plus HI.
Johnston *et al.* 2004, MNRAS, 348, L19. ATCA at 19 GHz ($6\farcs1 \times 7\farcs7$), including polarisation.
Gelfand *et al.* 2007, ApJ, 663, 468. ATCA at 1.4 GHz ($5\farcs8 \times 7\farcs0 : S = 13.8 \pm 0.4$ Jy), plus XMM observations.

G329.7+0.4

RA: $16^h01^m20^s$ **1-GHz flux/Jy:** >34? **Size/arcmin:** 40×33
Dec: $-52°18'$ **Spectral index:** ? **Type:** S

Radio: Diffuse shell, in complex region.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 53'' : S > 38$).
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 ($2\farcm0 \times 1\farcm8$), plus HI.
Reach *et al.* 2006, AJ, 131, 1479. Spitzer possible detection.

G330.0+15.0 Lupus Loop

RA: $15^h10^m00^s$ **1-GHz flux/Jy:** 350? **Size/arcmin:** 180?
Dec: $-40°00'$ **Spectral index:** 0.5? **Type:** S

Radio: Low surface brightness loop with HI shell.

X-ray: Detected, 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 ($8\farcm4 : S = 120 \pm 30\%$ 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: $16^{h}01^{m}06^{s}$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 11
Dec: $-51°34'$ **Spectral index:** 0.3 **Type:** S?

Radio: Clumpy non-thermal emission, possibly a distorted shell.

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 ($52'' \times 47''$), and MOST at 843 MHz ($43'' \times 55''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 55''$: $S = 4.7$ 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 ($2\farcm0 \times 1\farcm8$), plus HI.
Torii *et al.* 2006, PASJ, 58, L11. ASCA detection.

G332.0+0.2

RA: $16^{h}13^{m}17^{s}$ **1-GHz flux/Jy:** 8? **Size/arcmin:** 12
Dec: $-50°53'$ **Spectral index:** 0.5 **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 ($44'' \times 57''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 55''$: $S = 8.9$ 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 ($2\farcm0 \times 1\farcm8$), plus HI.

G332.4−0.4 RCW 103

RA: $16^h17^m33^s$ **1-GHz flux/Jy:** 28 **Size/arcmin:** 10
Dec: –51°02′ **Spectral index:** 0.5 **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. Hα 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 MSH 16–5*1*, Kes 32

RA: $16^h15^m20^s$ **1-GHz flux/Jy:** 26 **Size/arcmin:** 15
Dec: –50°42′ **Spectral index:** 0.5 **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: $16^h43^m20^s$ **1-GHz flux/Jy:** 2? **Size/arcmin:** 35
Dec: –54°30′ **Spectral index:** 0.7? **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 ($43'' \times 53''$) 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: $16^h27^m45^s$ **1-GHz flux/Jy:** 16 **Size/arcmin:** 21
Dec: –48°47′ **Spectral index:** 0.5 **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 ($43'' \times 57'' : S = 16$ 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: $16^h32^m11^s$ **1-GHz flux/Jy:** 6 **Size/arcmin:** 14×10
Dec: –47°19′ **Spectral index:** 0.5 **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 ($44'' \times 60''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 58'' : S = 6.1$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G337.0–0.1 (CTB 33)

RA: $16^h35^m57^s$ **1-GHz flux/Jy:** 1.5 **Size/arcmin:** 1.5
Dec: –47°36′ **Spectral index:** 0.6? **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 ($43'' \times 58'' : S = 21$ Jy).
Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.
Sarma *et al.* 1997, ApJ, 483, 335. ATCA at 1.4 GHz ($12''$) including HI, and 8.9 GHz ($13'' \times 15''$) 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: $16^h39^m28^s$ **1-GHz flux/Jy:** 1.5 **Size/arcmin:** 6
Dec: –47°51′ **Spectral index:** 0.4 **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 ($43'' \times 58'' : S = 2.0$ 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: $16^h35^m55^s$ **1-GHz flux/Jy:** 1.5? **Size/arcmin:** 3×2
Dec: –47°20′ **Spectral index:** ? **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 ($43'' \times 59'' : S = 1.6$ 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 Kes 40

RA: $16^h32^m39^s$ **1-GHz flux/Jy:** 16 **Size/arcmin:** 15×12
Dec: –46°36′ **Spectral index:** 0.55 **Type:** S

Radio: Nearly complete shell.

References:
Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz ($3' : S = 24.6$ Jy) and Parkes 64-m at 5 GHz ($4' : S = 7.2$ Jy).
Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz ($44'' \times 61''$).
Milne *et al.* 1989, PASA, 8, 187. MOST at 843 MHz ($43'' \times 59'' : S = 14.8 \pm 3.0$ 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 ($43'' \times 59'' : S = 20$ 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 ($43'' \times 59'' : S = 18$ 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.
Kothes & 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 ($43'' \times 59'' : S = 3.8$ 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 ($43'' \times 59'' : S = 7.4$ 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.
Kothes & 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: $16^h41^m09^s$ **1-GHz flux/Jy:** 12? **Size/arcmin:** 9
Dec: –46°19′ **Spectral index:** ? **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 ($43'' \times 59'' : S = 13$ 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: $16^h46^m31^s$ **1-GHz flux/Jy:** 5 **Size/arcmin:** 10×7
Dec: –44°39′ **Spectral index:** 0.4 **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 ($75'' \times 48'' : S = 9.8 \pm 0.9$ Jy) and 1.4 GHz ($27'' \times 9'' : S = 3.6 \pm 0.1$ Jy).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 61'' : S = 5.9$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G340.6+0.3

RA: $16^h47^m41^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 6
Dec: –44°34′ **Spectral index:** 0.4? **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 ($75'' \times 48'' : S = 9.2 \pm 0.9$ Jy) and 1.4 GHz ($27'' \times 9'' : S = 5.8 \pm 0.1$ Jy).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 61'' : S = 4.5$ 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: $16^h47^m35^s$ **1-GHz flux/Jy:** 1.5? **Size/arcmin:** 22×16
Dec: –43°47′ **Spectral index:** 0.6? **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 ($54'' \times 116'' : S = 3.0 \pm 0.1$ Jy) and 1.4 GHz ($21'' \times 25'' : S = 12.5 \pm 0.05$ 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: $16^h55^m01^s$ **1-GHz flux/Jy:** 2.5 **Size/arcmin:** 7
Dec: –44°01′ **Spectral index:** 0.5 **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 ($35'' \times 11'' : S = 2.2 \pm 0.1$ Jy).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 62'' : S = 2.7$ 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: $16^h54^m50^s$ **1-GHz flux/Jy:** 3.5? **Size/arcmin:** 12×9
Dec: –43°53′ **Spectral index:** 0.4? **Type:** S

Radio: Distorted shell.

References:
Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″), estimate $S_{408\ \mathrm{MHz}} = 5$ Jy, $S_{5\ \mathrm{GHz}} = 2$ Jy from previous maps.
Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz ($35'' \times 11''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 62'' : S = 3.5$ 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: $16^h50^m43^s$ **1-GHz flux/Jy:** 0.5? **Size/arcmin:** 10×9
Dec: $-43°04'$ **Spectral index:** ? **Type:** S

Radio: Incomplete shell.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 63'' : S = 0.6$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G343.0−6.0 RCW 114

RA: $17^h25^m00^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 250
Dec: $-46°30'$ **Spectral index:** ? **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: $17^h08^m00^s$ **1-GHz flux/Jy:** 8? **Size/arcmin:** 32?
Dec: $-44°16'$ **Spectral index:** 0.5? **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 ($56'' \times 111'' : S = 10.6$ Jy) and 1.4 GHz ($22'' \times 27''$) 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 ($70'' \times 47''$) 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: $17^h00^m25^s$ **1-GHz flux/Jy:** 7.8 **Size/arcmin:** 27×21
Dec: $-43°14'$ **Spectral index:** 0.55 **Type:** S

Radio: Shell, with smaller thermal shell adjacent.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 63'' : S8.5 \pm 0.6$), 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: $17^h03^m51^s$ **1-GHz flux/Jy:** 2.5? **Size/arcmin:** 10
Dec: $-41°42'$ **Spectral index:** 0.5 **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 ($30'' \times 43'' : S = 1.7 \pm 0.1$ Jy).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 65'' : S = 2.5$ 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: $17^h07^m20^s$ **1-GHz flux/Jy:** 0.6? **Size/arcmin:** 6
Dec: $-40°53'$ **Spectral index:** ? **Type:** S

Radio: Poorly defined diffuse shell.

Point sources: Old pulsar nearby.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 66'' : S = 0.7$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G346.6−0.2

RA: $17^h10^m19^s$ **1-GHz flux/Jy:** 8? **Size/arcmin:** 8
Dec: $-40°11'$ **Spectral index:** 0.5? **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 ($31'' \times 43'' : S = 8.1 \pm 0.9$ Jy).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 67'' : S = 8.7$ 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: $17^h13^m50^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 65×55
Dec: $-39°45'$ **Spectral index:** ? **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 ($46'' \times 36''$), 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 ($36'' \times 46''$).
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: $17^h15^m26^s$ **1-GHz flux/Jy:** 10? **Size/arcmin:** 10?
Dec: $-38°28'$ **Spectral index:** 0.4? **Type:** S?

Radio: Arc, overlapping G348.5+0.1.

References:
Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz ($46'' \times 53''$), 1.4 GHz ($18'' \times 33''$) and part at 5 GHz ($2\farcs5 \times 3\farcs9$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 69'' : S = 10.2$ 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 CTB 37A

RA: $17^h14^m06^s$ **1-GHz flux/Jy:** 72 **Size/arcmin:** 15
Dec: $-38°32'$ **Spectral index:** 0.3 **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 ($4\farcm4 : S = 43$ Jy).
Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz ($0\farcm8 : S > 50$) and Parkes 64-m at 14.7 GHz ($2\farcm2 : S = 18 \pm 5$ Jy).
Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz ($20'' \times 45''$).
Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz ($46'' \times 53''$), 1.4 GHz ($18'' \times 33''$) and part at 5 GHz ($2\farcs5 \times 3\farcs9$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 69'' : S = 71$ 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 CTB 37B

RA: $17^h13^m55^s$ **1-GHz flux/Jy:** 26 **Size/arcmin:** 17?
Dec: $-38°11'$ **Spectral index:** 0.3 **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 ($4\farcm4 : S = 32$ Jy).
Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz ($0\farcm8 : S > 20$) and Parkes 64-m at 14.7 GHz ($2\farcm2 : S = 8 \pm 3$ Jy).
Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz ($20'' \times 45''$).
Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz ($46'' \times 53''$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 69'' : S = 33$ 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: $17^h17^m15^s$ **1-GHz flux/Jy:** 1.4? **Size/arcmin:** 9×6
Dec: $-38°04'$ **Spectral index:** ? **Type:** S

Radio: Elongated shell, adjacent to bright HII region.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 70'' : S = 1.6$ Jy).
Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

G349.7+0.2

RA: $17^h17^m59^s$ **1-GHz flux/Jy:** 20 **Size/arcmin:** 2.5×2
Dec: $-37°26'$ **Spectral index:** 0.5 **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 ($3\farcs4 \times 14\farcs5$).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 71'' : S = 22$ 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: $17^h27^m50^s$ **1-GHz flux/Jy:** 26 **Size/arcmin:** 45
Dec: –38°32′ **Spectral index:** 0.4 **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 ($18'' \times 21'' : S = 22.3 \pm 0.3$ Jy), clarifying extent of remnant.

G350.1–0.3

RA: $17^h17^m40^s$ **1-GHz flux/Jy:** 6? **Size/arcmin:** 4?
Dec: –37°24′ **Spectral index:** 0.8? **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 ($4'' \times 10.''4$) and 4.8 GHz ($15'' \times 35''$) and 15 GHz ($5'' \times 2''$).
Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA observations.
Gaensler *et al.* 2008, ApJ, 680, L37. VLA at 4.8 GHz ($11.''4 \times 5.''6$) plus XMM observations.

G351.2+0.1

RA: $17^h22^m27^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 7
Dec: –36°11′ **Spectral index:** 0.4 **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 ($32'' \times 36'' : S = 4.8 \pm 0.2$ Jy).
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 73'' : S = 5.5$ Jy).
Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G351.7+0.8

RA: $17^h21^m00^s$ **1-GHz flux/Jy:** 10 **Size/arcmin:** 18×14
Dec: –35°27′ **Spectral index:** 0.5? **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 ($43'' \times 74'' : S = 11$ 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: $17^h28^m52^s$ **1-GHz flux/Jy:** 1.8? **Size/arcmin:** 12×9
Dec: –36°16′ **Spectral index:** ? **Type:** S

Radio: Asymmetric shell.

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

G352.7−0.1

RA: $17^h27^m40^s$ **1-GHz flux/Jy:** 4 **Size/arcmin:** 8×6
Dec: $-35°07'$ **Spectral index:** 0.6 **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 ($1\farcm1$).
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 ($43'' \times 75'' : S = 4.4$ 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: $17^h32^m00^s$ **1-GHz flux/Jy:** 2.5? **Size/arcmin:** 30
Dec: $-34°44'$ **Spectral index:** ? **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: $17^h38^m55^s$ **1-GHz flux/Jy:** 1? **Size/arcmin:** 13
Dec: $-35°11'$ **Spectral index:** 0.5? **Type:** S

Radio: Shell, with central double source.

References:
Green 2001, MNRAS, 326, 283. VLA at 327 MHz ($3\farcm0 \times 2\farcm7$) and 1.4 GHz ($42'' \times 36''$), plus 8.4 GHz ($8\farcs4 \times 6\farcs1$) of central source only.

G354.1+0.1

RA: $17^h30^m28^s$ **1-GHz flux/Jy:** ? **Size/arcmin:** 15×3?
Dec: $-33°46'$ **Spectral index:** varies **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 ($47'' \times 99''$) and 1.4 GHz ($8\farcs8 \times 21''$).

G354.8−0.8

RA: $17^h36^m00^s$ **1-GHz flux/Jy:** 2.8? **Size/arcmin:** 19
Dec: $-33°42'$ **Spectral index:** ? **Type:** S

Radio: Distorted shell.

References:
Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 78'' : S = 3.1$ 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: $17^h31^m20^s$ **1-GHz flux/Jy:** 5? **Size/arcmin:** 25
Dec: $-32°26'$ **Spectral index:** ? **Type:** S

Radio: Faint, incomplete shell.

References:
Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 77''$).
Roy & Bhatnagar 2006, JPhCS, 54, 152. GMRT at 330 MHz ($1' : S = 8.9 \pm 1.3$ Jy).

G355.6−0.0

RA: $17^h35^m16^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 8×6
Dec: $-32°38'$ **Spectral index:** ? **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: $17^h45^m53^s$ **1-GHz flux/Jy:** 8 **Size/arcmin:** 13
Dec: $-33°43'$ **Spectral index:** 0.5 **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: $17^h19^m00^s$ **1-GHz flux/Jy:** 4 **Size/arcmin:** 25
Dec: $-29°40'$ **Spectral index:** 0.7 **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: $17^h37^m56^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 11×7
Dec: $-32°16'$ **Spectral index:** ? **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: $17^h42^m35^s$ **1-GHz flux/Jy:** 3? **Size/arcmin:** 20×15
Dec: $-32°52'$ **Spectral index:** ? **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 MSH 17–39

RA: $17^h40^m29^s$ **1-GHz flux/Jy:** 37 **Size/arcmin:** 8×3?
Dec: $-30°58'$ **Spectral index:** 0.4 **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 ($3.''8 \times 10.''9$) and 5 GHz ($12'' \times 26''$).
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 ($43'' \times 83''$).
Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 84''$).
Stewart *et al.* 1994, ApJ, 432, L39. ATCA at 4.79 and 5.84 GHz ($12'' \times 22''$) 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 ($43'' \times 24''$).
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 ($13.''6 \times 11.''4$), including HI, and 8.3 GHz ($14.''3 \times 6.''8$) 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: $17^h38^m35^s$ **1-GHz flux/Jy:** 10 **Size/arcmin:** 24
Dec: $-30°44'$ **Spectral index:** 0.4? **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), $S_{5\ \mathrm{GHz}} = 5.5 \pm 1.5$ Jy from surveys.
Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 84''$).
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: $17^h26^m00^s$ **1-GHz flux/Jy:** 1.5? **Size/arcmin:** 38
Dec: $-28°36'$ **Spectral index:** ? **Type:** S

Radio: Faint shell.

References:
Bhatnagar 2000, MNRAS, 317, 453. GMRT at 327 MHz ($2.'2 \times 1.'3 : S = 2.5 \pm 1.3$ Jy), and NVSS at 1.4 GHz.

G358.1+0.1

RA: $17^h37^m00^s$ **1-GHz flux/Jy:** 2? **Size/arcmin:** 20
Dec: $-29°59'$ **Spectral index:** ? **Type:** S

Radio: Faint shell.

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

G358.5−0.9

RA: $17^h46^m10^s$ **1-GHz flux/Jy:** 4? **Size/arcmin:** 17
Dec: $-30°40'$ **Spectral index:** ? **Type:** S

Radio: Shell, brighter to NE.

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

G359.0−0.9

RA: $17^h46^m50^s$ **1-GHz flux/Jy:** 23 **Size/arcmin:** 23
Dec: $-30°16'$ **Spectral index:** 0.5 **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 ($43'' \times 86''$).
LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz ($43'' \times 24''$).
Bamba *et al.* 2000, PASJ, 52, 259. ASCA observations.
Yusef-Zadeh *et al.* 2004, ApJS, 155, 421. VLA at 1.4 GHz ($8''.4 \times 12''.8$) of part.

G359.1−0.5

RA: $17^h45^m30^s$ **1-GHz flux/Jy:** 14 **Size/arcmin:** 24
Dec: $-29°57'$ **Spectral index:** 0.4? **Type:** S

Radio: Non-thermal shell in complex region, crossed by the 'snake'.

X-ray: Centrally brightened.

Point sources: Several compact radio sources near centre, OH masers around edge.

References:
Downes *et al.* 1979, A&AS, 35, 1. From observations by Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ($2'.6 : S = 13$ Jy).
Reich & Fürst 1984, A&AS, 57, 165. Effelsberg 100-m at 2.7 GHz ($4'.3 : S = 10 \pm 1.5$ Jy) and 4.8 GHz ($2'.4 : S = 8.1 \pm 0.5$ Jy).
Uchida *et al.* 1992, ApJ, 398, 128. VLA at 1.5 GHz ($11'' \times 10''$), 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 ($43'' \times 85''$).
Yusef-Zadeh *et al.* 1995, Science, 270, 1801. VLA at 1.4 GHz ($33'' \times 31''$), and 1.7 GHz for OH survey.
LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz ($43'' \times 24''$).
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 ($8''.4 \times 12''.8$).
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: $17^{h}39^{m}36^{s}$ **1-GHz flux/Jy:** 2? **Size/arcmin:** 12×11
Dec: $-29^{\circ}11'$ **Spectral index:** ? **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).