

G0.0+0.0

RA: 17^h45^m44^s
Dec: –29°00′

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

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

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

References:

Ekers *et al.* 1983, A&A, 122, 143. VLA at 1.4 GHz and 5 GHz (both 5'' × 8''), $S_{1.4\text{ GHz}} = 77\text{ Jy}$, $S_{5.0\text{ GHz}} = 31\text{ Jy}$.
 Pedlar *et al.* 1989, ApJ, 342, 769. VLA at 332 MHz (12''), 1.4 GHz (1''.3 × 2''.5) and 5 GHz (1''.3 × 2''.5).
 Mezger *et al.* 1989, A&A, 209, 337. Nearby molecular material.
 Ho *et al.* 1991, Natur, 350, 309. VLA of NH₃ emission from surroundings.
 Anantharamaiah *et al.* 1991, MNRAS, 249, 262. VLA at 330 MHz (17'' × 33'').
 Serabyn *et al.* 1992, ApJ, 395, 166. Nearby molecular material.
 Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 88'').
 Yusef-Zadeh & Mehringer 1995, ApJ, 452, L37. VLA of nearby H₂O masers.
 Yusef-Zadeh *et al.* 1999, ApJ, 512, 230. OH maser observations.
 Coil & Ho 2000, ApJ, 533, 245. NH₃ observations of surroundings.
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43'' × 24'').
 Fatuzzo *et al.* 2001, ApJ, 549, 293. Electron–positron lines from the vicinity.
 Yusef-Zadeh *et al.* 2001, ApJ, 560, 749. Observations of nearby molecular hydrogen.
 Maeda *et al.* 2002, ApJ, 570, 671. Chandra observations.
 Sakano *et al.* 2003, AN, 324 (No S1), 197. XMM-Newton observations.

G0.3+0.0

RA: 17^h46^m15^s
Dec: –28°38′

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

Size/arcmin: 15 × 8
Type: S

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

Radio: Bilateral shell, near Galactic Centre.

References:

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

G0.9+0.1

RA: 17^h47^m21^s
Dec: –28°09′

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

Size/arcmin: 8
Type: C

Radio: Flat spectrum core within steep spectrum shell.

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

References:

Helfand & Becker 1987, ApJ, 314, 203. VLA at 1.4 and 5 GHz, and Einstein observations.
 Gray 1994, MNRAS, 270, 835. MOST at 843 MHz (43'' × 91'').
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Mereghetti *et al.* 1998, A&A, 331, L77. X-ray detection.
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43'' × 24'').
 Sidoli *et al.* 2000, A&A, 361, 719. BeppoSAX observations.
 Gaensler *et al.* 2001, ApJ, 556, L107. Chandra observations.
 Porquet *et al.* 2003, A&A, 401, 197. XMM-Newton observations.

G1.0–0.1

RA: 17^h48^m30^s
Dec: –28°09′

1-GHz flux/Jy: 15
Spectral index: 0.6?

Size/arcmin: 8
Type: S

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

Radio: Incomplete shell, to the S of Sgr D.

X-ray: Possibly detected.

References:

Downes *et al.* 1979, A&AS, 35, 1. Review of flux densities.
 Anantharamaiah *et al.* 1991, MNRAS, 249, 262. VLA at 330 MHz ($64'' \times 100''$: $S=12.3$ 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.

G1.4–0.1

RA: 17^h49^m39^s
Dec: –27°46′

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

Size/arcmin: 10
Type: S

Radio: Shell, brightest in E.

References:

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz ($43'' \times 92''$: $S=2$ Jy).
 Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.
 Bhatnagar 2002, MNRAS, 332, 1. GMRT at 327 MHz ($2.7' \times 2.4'$: $S=4.2 \pm 0.5$).

G1.9+0.3

RA: 17^h48^m45^s
Dec: –27°10′

1-GHz flux/Jy: 0.6
Spectral index: 0.7

Size/arcmin: 1.2
Type: S

Radio: Shell, brighter to the N.

References:

Green & Gull 1984, Natur, 312, 527. VLA at 5 GHz ($4''.4 \times 2''$).
 Gray 1994, MNRAS, 270, 835. MOST at 843 MHz ($43'' \times 94''$).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G3.7–0.2

RA: 17^h55^m26^s
Dec: –25°50′

1-GHz flux/Jy: 2.3
Spectral index: 0.65

Size/arcmin: 14 × 11
Type: S

Has been called G003.8–00.3.

Radio: Double arc.

References:

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz ($43'' \times 99''$: $S=2.4$ Jy).
 Gaensler 1998, ApJ, 493, 781. VLA at 1.4 GHz ($9'' \times 15''$: $S=1.7 \pm 0.1$ Jy).

G3.8+0.3

RA: 17^h52^m55^s
Dec: –25°28′

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

Size/arcmin: 18
Type: S?

Radio: Incomplete shell.

References:

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

G4.2–3.5

RA: 18^h08^m55^s
Dec: –27°03′

1-GHz flux/Jy: 3.2?
Spectral index: 0.6?

Size/arcmin: 28
Type: S

Radio: Elongated shell.

References:

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

G4.5+6.8

RA: 17^h30^m42^s
Dec: –21°29′

1-GHz flux/Jy: 19
Spectral index: 0.64

Kepler, SN1604, 3C358

Size/arcmin: 3
Type: S

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

Radio: Incomplete shell, brighter to the N.

Optical: Faint filaments.

X-ray: Shell, brighter to the N.

Distance: Optical expansion and proper motion indicates about 2.9 kpc, HI observations suggest 3.4 to 6.4 kpc.

References:

van den Bergh & 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.

G4.8+6.2

RA: 17^h33^m25^s
Dec: –21°34′

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

Size/arcmin: 18
Type: S

Has been called G4.5+6.2.

Radio: Faint shell.

References:

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

G5.2–2.6

RA: 18^h07^m30^s
Dec: –25°45′

1-GHz flux/Jy: 2.6?
Spectral index: 0.6?

Size/arcmin: 18
Type: S

Radio: Poorly resolved shell.

References:

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

G5.4–1.2

RA: 18^h02^m10^s
Dec: –24°54′

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

Milne 56
Size/arcmin: 35
Type: C?

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

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

Optical: Detected.

X-ray: Pulsar detected, with faint extension.

Distance: HI absorption suggests > 4.3 kpc.

Point sources: Pulsar associated with flat spectrum source.

References:

Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′ : S=38 Jy).
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz (6′.8 : S=21.9±2.4 Jy).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Zealey *et al.* 1979, A&AS, 38, 39. Optical detection.
 Becker & Helfand 1985, Natur, 313, 115. VLA at 1.4 and 5 GHz.
 Helfand & Becker 1985, Natur, 313, 118. Suggesting it is not a SNR.
 Manchester *et al.* 1985, MNRAS, 212, 975. Pulsar detection.
 Caswell *et al.* 1987, MNRAS, 225, 329. MOST at 843 MHz (42″ × 110″).
 Frail & Kulkarni 1991, Natur, 352, 785. Pulsar and remnant association.
 Manchester *et al.* 1991, MNRAS, 253, 7P. Pulsar and remnant association.
 Milne *et al.* 1992, MNRAS, 255, 707. Parkes 64-m at 4.75 (4′.5 : S=30.8±2.1 Jy) and 8.4 GHz (3′ : S=24±3 Jy), including polarization.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.0 × 4′.9 : S=38 Jy).
 Frail *et al.* 1994, AJ, 107, 1120. VLA at 327 MHz (68″ × 73″), plus HI absorption.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Gaensler & Frail 2000, Natur, 406, 158. Pulsar observations, including proper motion.
 Kaspi *et al.* 2001, ApJ, 562, L163. X-ray detection of pulsar, and upper limit for remnant.
 Thorsett *et al.* 2002, ApJ, 573, L111. Proper motion study of pulsar.

G5.9+3.1

RA: 17^h47^m20^s
Dec: –22°16′

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

Size/arcmin: 20
Type: S

Radio: Asymmetric shell.

References:

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

G6.1+1.2

RA: 17^h54^m55^s
Dec: –23°05′

1-GHz flux/Jy: 4.0?
Spectral index: 0.3?

Size/arcmin: 30 × 26
Type: F

Has been called G6.1+1.15.

Radio: Faint, diffuse emission.

References:

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

G6.4–0.1

RA: 18^h00^m30^s
Dec: –23°26′

1-GHz flux/Jy: 310
Spectral index: varies

Size/arcmin: 48
Type: C

W28

Has been called G6.6–0.2.

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

Optical: Filaments.

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

Point sources: Young pulsar near edge of remnant, 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.
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
 Dopita *et al.* 1977, ApJ, 214, 179. Some optical line ratios.
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.
 Andrews *et al.* 1983, ApJ, 266, 684. VLA at 1.4 GHz (8″) 4.9 GHz (3″) and 15 GHz (1″) of central region only, plus Einstein image of central region.
 Bohigas *et al.* 1983, RMxAA, 8, 155. Optical spectra.
 Odenwald *et al.* 1984, ApJ, 279, 162. Nearby IR source.
 Andrews *et al.* 1985, AJ, 90, 310. VLA of central component.
 Long *et al.* 1991, ApJ, 373, 567. Einstein and optical observations.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.1 × 4′.4: S=660 Jy).
 Kaspi *et al.* 1993, ApJ, 409, L57. Pulsar association.
 Frail *et al.* 1993, Natur, 365, 136. VLA at 327 MHz (smoothed to 65″), plus pulsar association.
 Frail *et al.* 1994, ApJ, 424, L111. VLA of associated OH masers.
 Esposito *et al.* 1996, ApJ, 461, 820. Possible associated γ -ray emission.
 Frail *et al.* 1996, AJ, 111, 1651. OH maser emission.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Claussen *et al.* 1997, ApJ, 489, 143. VLA of OH masers.
 Claussen *et al.* 1999, ApJ, 522, 349. High resolution observations of OH masers.
 Arikawa *et al.* 1999, PASJ, 51, L7. Observations of shocked CO.
 Yusef-Zadeh *et al.* 2000, ApJ, 540, 842. VLA at 327 MHz (2′.6 × 5′.5) and 1.48 GHz (40″ × 65″).
 Dubner *et al.* 2000, AJ, 120, 1933. VLA at 328 MHz (97″ × 52″: S=425 ± 40 Jy) and 1415 MHz (88″ × 48″: S=246 ± 20 Jy), and comparison with other observations.
 Reach & Rho 2000, ApJ, 544, 843. ISO observations on 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.

G6.4+4.0

RA: 17^h45^m10^s
Dec: –21°22′

1-GHz flux/Jy: 1.3?
Spectral index: 0.4?

Size/arcmin: 31
Type: S

Radio: Faint asymmetric shell.

References:

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

G7.0–0.1

RA: 18^h01^m50^s
Dec: –22°54′

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

Size/arcmin: 15
Type: S

Has been called G7.06–0.12.

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

References:

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

G7.7–3.7

RA: 18^h17^m25^s
Dec: –24°04′

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

1814–24
Size/arcmin: 22
Type: S

Radio: Shell, with high polarization.

References:

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

G8.7–5.0

RA: 18^h24^m10^s
Dec: –23°48′

1-GHz flux/Jy: 4.4
Spectral index: 0.3

Size/arcmin: 26
Type: S

Radio: Asymmetric shell.

References:

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

G8.7–0.1

RA: 18^h05^m30^s
Dec: –21°26′

1-GHz flux/Jy: 80
Spectral index: 0.5

(W30)
Size/arcmin: 45
Type: S?

Radio: Clumpy non-thermal shell, with low-frequency turnover.

X-ray: Northern edge detected.

Point sources: Pulsar inside western edge.

References:

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

G9.8+0.6

RA: 18^h05^m08^s
Dec: –20°14′

1-GHz flux/Jy: 3.9
Spectral index: 0.5

Size/arcmin: 12
Type: S

Radio: Asymmetric shell.

References:

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

G11.2–0.3

RA: 18^h11^m27^s
Dec: –19°25′

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

Size/arcmin: 4
Type: C

Probably associated with the SN of AD386.

Radio: Symmetrical clumpy shell, with flatter spectrum core.

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

Point sources: Central pulsar.

Distance: HI absorption indicates 5 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Radhakrishnan *et al.* 1972, ApJS, 24, 49. HI absorption.
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz (20″ × 25″) and Einstein observations, with review of flux densities.
 Becker *et al.* 1985, ApJ, 296, 461. VLA at 1.4 and 5 GHz, plus HI absorption, Einstein observations.
 Morsi & Reich 1987, A&AS, 71, 189. Effelsberg 100-m at 32 GHz (26″.5: $S=4.04\pm 0.24$ Jy).
 Green *et al.* 1988, MNRAS, 231, 735. VLA at 1.4 and 5 GHz.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.2 × 4′.1: $S=39$ Jy).
 Reynolds *et al.* 1994, MNRAS, 271, L1. ROSAT image and spectra.
 Vasisht *et al.* 1996, ApJ, 456, L59. ASCA observations.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Torii *et al.* 1997, ApJ, 489, L145. ASCA detection of pulsar.
 Torii *et al.* 1999, ApJ, 523, L69. X-ray timing observations of pulsar.
 Kothes & Reich 2001, A&A, 372, 627. Effelsberg 100-m at 4.25, 10.45, 14.9 and 32 GHz (2′.5, 1′.1, 0′.86, 0′.45: $S=9.6\pm 0.5, 6.3\pm 0.4, 5.7\pm 0.4, 3.8\pm 0.4$).
 Kaspi *et al.* 2001, ApJ, 560, 371. Chandra observations.
 Tam *et al.* 2002, ApJ, 572, 202. VLA at 1.4/1.5 GHz (2″.6 × 1″.8: $S=16.6\pm 0.9$ Jy) and 5 GHz (2″.1 × 1″.5: $S=8.4\pm 0.9$ Jy) for spectral studies.
 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.

G11.4–0.1

RA: 18^h10^m47^s
Dec: –19°05′

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

Size/arcmin: 8
Type: S?

Radio: Incomplete shell, possibly with central core.

References:

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

G12.0–0.1

RA: 18^h12^m11^s
Dec: –18°37′

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

Size/arcmin: 7?
Type: ?

Radio: Incomplete shell, defined in E only.

X-ray: Detected.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz ($3'$: $S=6.6$ Jy) and Parkes 64-m at 5 GHz ($4'$: $S=1.1$ Jy).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ($2'.6$).
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.2 \times 4'.1$).
 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.

G13.3–1.3

RA: 18^h19^m20^s
Dec: –18°00′

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

Size/arcmin: 70 × 40
Type: S

Radio: Amorphous emission.

X-ray: Elongated emission.

Optical: Filaments in S.

Distance: Absorption indicates 2–4 kpc.

References:

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

G13.5+0.2

RA: 18^h14^m14^s
Dec: –17°12′

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

Size/arcmin: 5 × 4
Type: S

Has been called G13.46+0.16.

Radio: Elongated, incomplete shell.

References:

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

G15.1–1.6

RA: 18^h24^m00^s
Dec: –16°34′

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

Size/arcmin: 30 × 24
Type: S

Radio: Elongated, incomplete shell.

References:

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

G15.9+0.2

RA: 18^h18^m52^s
Dec: –15°02′

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

Size/arcmin: 7 × 5
Type: S?

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

References:

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

G16.2–2.7

RA: 18^h28^m50^s
Dec: –16°11′

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

Size/arcmin: 17
Type: S

Radio: Double rim.

References:

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

G16.7+0.1

RA: 18^h20^m56^s
Dec: –14°20′

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

Size/arcmin: 4
Type: C

Has been called G16.73+0.08.

Radio: Asymmetric shell with flat-spectrum core.

X-ray: 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-Newton observations.

G16.8–1.1

RA: 18^h25^m20^s
Dec: –14°46′

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

Size/arcmin: 30 × 24?
Type: ?

Has been called G16.85–1.05.

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

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

References:

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

G17.4–2.3

RA: 18^h30^m55^s
Dec: –14°52′

1-GHz flux/Jy: 4.8?
Spectral index: 0.8?

Size/arcmin: 24?
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.
 Boumim *et al.* 2002, A&A, 385, 1042. Optical observations.

G17.8–2.6

RA: 18^h32^m50^s
Dec: –14°39′

1-GHz flux/Jy: 4.0?
Spectral index: 0.3?

Size/arcmin: 24
Type: S

Radio: Well defined shell.

References:

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

G18.8+0.3

RA: 18^h23^m58^s
Dec: –12°23′

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

Size/arcmin: 17 × 11
Type: S

Kes 67

Has been called G18.9+0.3.

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

Distance: HI absorption indicates > 9.5 kpc, and possibly < 19 kpc.

References:

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

G18.9–1.1

RA: 18^h29^m50^s
Dec: –12°58′

1-GHz flux/Jy: 37
Spectral index: varies

Size/arcmin: 33
Type: C?

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

Radio: Non-thermal, diffuse partially limb-brightened, with central ridge.

X-ray: Partial shell.

References:

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

G20.0–0.2

RA: 18^h28^m07^s
Dec: –11°35′

1-GHz flux/Jy: 10
Spectral index: 0.0

Size/arcmin: 10
Type: F

Radio: Faint, filled-centre, polarized.

Point sources: OH source 20.1–0.1 is nearby.

References:

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

G21.5–0.9

RA: 18^h33^m33^s
Dec: –10°35′

1-GHz flux/Jy: 6?
Spectral index: 0.0

Size/arcmin: 4
Type: C

Early observations relate to the central core only.

Radio: Filled-centre, with high frequency turnover.

X-ray: Central core, with extended, faint halo.

Distance: HI absorption indicates 5.5 kpc or more.

References:

Wilson & Weiler 1976, A&A, 53, 89. WSRT at 5 GHz (6'' × 35'').
 Becker & Kundu 1976, ApJ, 204, 427. NRAO interferometer at 2.7 GHz (20'' × 5'') and 8 GHz (7'' × 2''), plus review of flux densities.
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2'.6).
 Becker & Szymkowiak 1981, ApJ, 248, L23. VLA at 5 GHz (8''), and Einstein observations.
 Davelaar *et al.* 1986, ApJ, 300, L59. EXOSAT X-ray spectrum, and VLA HI observations.
 Morsi & Reich 1987, A&AS, 69, 533. Effelsberg 100-m at 32 GHz (26''.5 : S = 5.64 ± 0.29 Jy).
 Fürst *et al.* 1988, PASJ, 40, 347. NRO array at 22.3 GHz (4''.4 × 7''.3).
 Salter *et al.* 1989, A&A, 225, 167. Observations at 90.7 (29''.5 : S = 3.8 ± 0.4 Jy) and 141.9 GHz (S = 2.5 ± 1.2 Jy).
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz (S = 3.94 ± 0.70 Jy), plus review of flux densities.
 Asaoka & Koyama 1990, PASJ, 42, 625. Ginga X-ray spectrum.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3'.3 × 3'.4 : S = 9 Jy).
 Wallace *et al.* 1994, A&A, 286, 565. HI of surroundings.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Slane *et al.* 2000, ApJ, 533, L29. Chandra observations identifying X-ray halo.
 Warwick *et al.* 2001, A&A, 365, L248. XMM-Newton observations of X-ray halo.
 Bock *et al.* 2001, ApJ, 561, L203. BIMA at 94 GHz (8''.6 × 4''.6).
 Safi-Harb *et al.* 2001, ApJ, 561, 308. Chandra and other X-ray observations.
 La Palombara & Mereghetti 2002, A&A, 383, 916. XMM-Newton upper limit on pulsations.

G21.8–0.6

RA: 18^h32^m45^s
Dec: –10°08′

1-GHz flux/Jy: 69
Spectral index: 0.5

Size/arcmin: 20
Type: S

Kes 69

Radio: Incomplete shell.

X-ray: Detected.

Distance: H₂CO absorption indicates > 6.3 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3') and Parkes 64-m at 5 GHz (4').
 Wilson 1972, A&A, 19, 354. H₂CO absorption.
 Kundu *et al.* 1974, AJ, 79, 132. NRAO 140-ft at 5 GHz (6') and 10 GHz (3').
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz (5' : S = 42.3 ± 4.6 Jy).
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8'.4) and 5 GHz (4'.4).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2'.6).
 Seward 1990, ApJS, 73, 781. Einstein observations.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3'.3 × 3'.5 : S = 132 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations, including masers.

G22.7–0.2

RA: 18^h33^m15^s
Dec: –09°13′

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

Size/arcmin: 26
Type: S?

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

References:

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

G23.3–0.3

W41

RA: 18^h34^m45^s
Dec: –08°48′

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

Size/arcmin: 27
Type: S

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

Point sources: Pulsar association suggested.

References:

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

G23.6+0.3

RA: 18^h33^m03^s
Dec: –08°13′

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

Size/arcmin: 10?
Type: ?

Radio: Not well resolved, in complex region.

References:

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

G24.7–0.6

RA: 18^h38^m43^s
Dec: –07°32′

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

Size/arcmin: 15?
Type: S?

Radio: Incomplete shell, defined in SW.

References:

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

G24.7+0.6

RA: 18^h34^m10^s
Dec: –07°05′

1-GHz flux/Jy: 20?
Spectral index: 0.2?

Size/arcmin: 30 × 15
Type: C?

Radio: Filled-centre, with faint shell, and a compact HII region to the S.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Reich *et al.* 1984, A&A, 133, L4. Effelsberg 100-m at 2.7 GHz (4.3: $S=19\pm 3$ Jy) and 4.75 GHz (2′.4: $S=17\pm 4$ Jy) and NRO 45-m at 10.2 GHz (2′.7: $S=15\pm 3$ Jy).
 Becker & Helfand 1987, ApJ, 316, 660. VLA at 1.4 GHz (12′′), and X-ray upper limit.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

G27.4+0.0

RA: 18^h41^m19^s
Dec: –04°56′

1-GHz flux/Jy: 6
Spectral index: 0.68

4C–04.71
Size/arcmin: 4
Type: S

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

Radio: Incomplete shell.

X-ray: Diffuse emission, with central low period pulsar.

Point sources: Central AXP.

Distance: HI absorption indicates 6 to 7.5 kpc.

References:

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz (5′).
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
 Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz (6′.8: $S=2.0\pm 0.5$ Jy).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′: $S=4.4$ Jy).
 Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1415 MHz (60′′ × 45′′: $S=3.5$ Jy). Revise $S_{408\text{ MHz}}=10.4$ Jy, and $S_{5\text{ GHz}}=1.9\pm 0.2$ Jy.
 Kriss *et al.* 1985, ApJ, 288, 703. Einstein observations, plus VLA at 1.4 and 5 GHz (12′′).
 Sanbonmatsu & Helfand 1992, AJ, 104, 2189. VLA at 1.4 GHz for HI absorption.
 Helfand *et al.* 1994, ApJ, 434, 627. ROSAT observations, particularly of central source.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations, including nearby masers.
 Vasisht & Gotthelf 1997, ApJ, 486, L129. ASCA detection of pulsar.
 Gotthelf & Vasisht 1997, ApJ, 486, L133. ASCA observations.
 Gotthelf *et al.* 1999, ApJ, 522, L49. X-ray timing observations of pulsar.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Mereghetti *et al.* 2001, MNRAS, 321, 143. Search for optical/IR counterpart to pulsar.

G27.8+0.6

RA: 18^h39^m50^s
Dec: –04°24′

1-GHz flux/Jy: 30
Spectral index: varies

Size/arcmin: 50 × 30
Type: F

Radio: Filled-centre, with spectral turnover.

References:

Reich *et al.* 1984, A&A, 133, L4. Effelsberg 100-m at 2.7 GHz (4′.3: $S=23\pm 2$ Jy), and 4.75 GHz (2′.4: $S=18\pm 2$ Jy) and NRO 45-m at 10.2 GHz (smoothed to 4′.3: $S=8.5\pm 2$ Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

G28.6–0.1**RA:** 18^h43^m55^s**Dec:** –03°53′**1-GHz flux/Jy:** 3?**Spectral index:** ?**Size/arcmin:** 13 × 9**Type:** S**Radio:** Poorly defined regions of non-thermal emission.**X-ray:** Diffuse shell, with thermal and non-thermal emission.**References:**Helfand *et al.* 1989, ApJ, 341, 151. VLA at 1.4 GHz (15'') and 5 GHz (15'').Bamba *et al.* 2001, PASJ, 53, L21. ASCA observations.Ueno *et al.* 2003, ApJ, 588, 338. Chandra observations.**G28.8+1.5****RA:** 18^h39^m00^s**Dec:** –02°55′**1-GHz flux/Jy:** ?**Spectral index:** 0.4?**Size/arcmin:** 100?**Type:** S?**Radio:** Part of rim detected.**X-ray:** Diffuse, Centrally brightened.**References:**

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

Song *et al.* 2000, PASJ, 52, 181. ASCA observations.**G29.6+0.1****RA:** 18^h44^m52^s**Dec:** –02°57′**1-GHz flux/Jy:** 1.5?**Spectral index:** 0.5?**Size/arcmin:** 5**Type:** S**Radio:** Diffuse shell.**Point sources:** AXP associated.**References:**Gaensler *et al.* 1999, ApJ, 526, L37. VLA at 5 GHz (13'') and 8 GHz (8'')Vasisht *et al.* 2000, ApJ, 542, L49. X-ray observations of AXP.

G29.7–0.3

Kes 75

RA: 18^h46^m25^s
Dec: –02°59′

1-GHz flux/Jy: 10
Spectral index: 0.7

Size/arcmin: 3
Type: C

Radio: Shell with flatter spectrum emission from centre.

X-ray: Thermal shell and non-thermal core, and central pulsar.

Point sources: X-ray pulsar.

Distance: HI absorption indicates > 9 kpc and possibly at 21 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8′.4: S=5±20% Jy).
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).
 Becker & Kundu 1976, ApJ, 204, 427. NRAO interferometer at 2.7 GHz (20″ × 7″) and 8 GHz (25″ × 8″), plus review of flux densities.
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Becker *et al.* 1983, ApJ, 268, L93. VLA at 1.4 GHz (3″), plus Einstein observations.
 Becker & Helfand 1984, ApJ, 283, 154. VLA at 5 GHz (2′.6), plus HI.
 Morsi & Reich 1987, A&AS, 71, 189. Effelsberg 100-m at 32 GHz (26″.5: S=1.02±0.07 Jy).
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz of core, plus review of flux densities.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.4 × 3′.7: S=27.4 Jy).
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Blanton & Helfand 1996, ApJ, 470, 961. ASCA observations.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Gotthelf *et al.* 2000, ApJ, 542, L37. X-ray pulsar detection.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Mereghetti *et al.* 2002, ApJ, 574, 873. BeppoSAX observations of pulsar.
 Helfand *et al.* 2003, ApJ, 582, 783. Chandra observations.

G30.7–2.0

RA: 18^h54^m25^s
Dec: –02°54′

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

Size/arcmin: 16
Type: ?

Radio: Poorly defined.

References:

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

G30.7+1.0

RA: 18^h44^m00^s
Dec: –01°32′

1-GHz flux/Jy: 6
Spectral index: 0.4

Size/arcmin: 24 × 18
Type: S?

Radio: Non-thermal, highly polarized part shell?

Point sources: Compact source near centre.

References:

Reich *et al.* 1986, A&A, 155, 185. Effelsberg 100-m at 4.75 GHz (2′.4: S=3.4±0.4 Jy), plus other flux densities.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.6 × 3′.9: S=8.6 Jy).
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.

G31.5–0.6

RA: 18^h51^m10^s
Dec: –01°31′

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

Size/arcmin: 18?
Type: S?

Has been called G31.55–0.65.

Radio: Distorted shell? near HII region.

Optical: Diffuse, incomplete shell.

References:

Fürst *et al.* 1987, A&AS, 69, 403. Effelsberg 100-m at 4.75 GHz (2′.4), plus other flux densities.
 Mavromatakis *et al.* 2001, A&A, 370, 265. Optical observations.

G31.9+0.0

3C391

RA: 18^h49^m25^s
Dec: –00°55′

1-GHz flux/Jy: 24
Spectral index: 0.55

Size/arcmin: 7 × 5
Type: S

Radio: Shell, brightest in NW.

X-ray: Diffuse with central core.

Distance: HI absorption is seen to the tangent point (8.5 kpc).

References:

Radhakrishnan *et al.* 1972, ApJS, 24, 49. HI absorption.
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).
 Green *et al.* 1975, A&A, 44, 187. Effelsberg 100-m at 15 GHz (58″ : $S > 1.6$).
 Becker & Kundu 1976, ApJ, 204, 427. NRAO interferometer at 2.7 GHz (20″ × 23″) and 8 GHz (24″ × 9″), plus review of flux densities.
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Goss *et al.* 1979, A&A, 78, 75. FIRST at 1.4 GHz (54″ × 66″ : $S = 20 \pm 2$ Jy) and Effelsberg 100-m at 10.7 GHz (77″ : $S = 7.5 \pm 0.8$ Jy).
 Wang & Seward 1984, ApJ, 279, 705. Einstein observations.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.4 × 3′.7 : $S = 44.8$ Jy).
 Reynolds & Moffett 1993, AJ, 105, 2226. VLA at 1.4 GHz (6″), including possible associated CO.
 Moffett & Reynolds 1994, ApJ, 425, 668. VLA at 330 MHz (smoothed to 30″ : $S = 38.5 \pm 0.5$ Jy) 1.46 GHz (6″.7) and 4.85 GHz (6″.2 × 6″.4), including spectral index and polarization studies.
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Reach & 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.
 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.

G32.0–4.9

3C396.1

RA: 19^h06^m00^s
Dec: –03°00′

1-GHz flux/Jy: 22?
Spectral index: 0.5?

Size/arcmin: 60?
Type: S?

Radio: Possible large shell?

References:

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

G32.1–0.9**RA:** 18^h53^m10^s**Dec:** –01°08′**1-GHz flux/Jy:** ?**Spectral index:** ?**Size/arcmin:** 40?**Type:** C?**Radio:** Possible faint shell, not well defined.**X-ray:** Diffuse, with clumps.**References:**Folgheraiter *et al.* 1997, MNRAS, 292, 365. ROSAT and ASCA observations.**G32.8–0.1****RA:** 18^h51^m25^s**Dec:** –00°08′**1-GHz flux/Jy:** 11?**Spectral index:** 0.2?**Size/arcmin:** 17**Type:** S?

Kes 78

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 ($S' : S = 7.2 \pm 0.5$ Jy).Dicke & 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 (S').Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz ($S' : S = 12.8$ Jy) and Parkes 64-m at 5 GHz ($S' : S = 7.7$ Jy).Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ($S' : S = 2.6$).Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.6 \times 3'.8 : S = 31.3$ Jy).Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Koralesky *et al.* 1998, AJ, 116, 1323. VLA detection of compact OH emission.**G33.2–0.6****RA:** 18^h53^m50^s**Dec:** –00°02′**1-GHz flux/Jy:** 3.5**Spectral index:** varies**Size/arcmin:** 18**Type:** S**Radio:** Incomplete shell.**References:**Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ($S' : S = 2.6$).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: Centrally brightened.

Point sources: Central X-ray source.

Distance: HI absorption gives about 10 kpc.

References:

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

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:** 0.30**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 2.5 kpc.

References:

Kundu & Velusamy 1972, A&A, 20, 237. NRAO 140-ft at 10.7 GHz ($3' : S = 105 \pm 7$ Jy).
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5' : S = 177 \pm 10$ Jy).
 Caswell *et al.* 1975, A&A, 45, 239. HI absorption.
 Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz ($3' : S = 299$ Jy).
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo S_{430} MHz = 540 ± 187 Jy.
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz ($8'.4$) and 5 GHz ($4'.4$).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ($2'.6$).
 Smith *et al.* 1985, MNRAS, 217, 99. Einstein observations.
 Wolszczan *et al.* 1991, ApJ, 372, L99. Pulsar detection.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.6 \times 3'.8 : S = 469$ 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.
 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.

G36.6–0.7**RA:** 19^h00^m35^s**1-GHz flux/Jy:** ?**Size/arcmin:** 25?**Dec:** +02°56′**Spectral index:** ?**Type:** S?

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

References:

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

G36.6+2.6**RA:** 18^h48^m49^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

RA: 19^h04^m08^s
Dec: +05°28'

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

3C396, HC24, NRAO 593

Size/arcmin: 8 × 6
Type: C

Radio: Shell, brighter to W, with faint ‘tail’ to E.

X-ray: Diffuse, brighter to W, with central core.

Point sources: Central X-ray source.

Distance: HI absorption suggests at least 7.7 kpc.

References:

- Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3').
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo S₄₃₀ MHz = 54 ± 38 Jy.
 Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3' : S = 4.1 ± 1.0 Jy).
 Caswell *et al.* 1975, A&A, 45, 239. HI absorption.
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2'.6).
 Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1.4 GHz (65'' × 48'').
 Becker & Helfand 1987, AJ, 94, 1629. VLA at 1.4 GHz (12'' : S = 14 Jy) and 5 GHz, plus Einstein observations.
 Patnaik *et al.* 1990, A&A, 232, 467. VLA at 1.5 GHz (25'') and 1.4 GHz (7''.8 × 7''.5) and 5 GHz (25'') including polarization, plus Ooty at 327 MHz (100'' × 31''), including review of flux densities.
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3'.5 × 3'.6 : S = 42.5 Jy).
 Anderson & Rudnick 1993, ApJ, 408, 514. VLA at 1.45 and 4.89 GHz for spectral index studies.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.
 Harrus & Slane 1999, ApJ, 516, 811. ASCA observations.
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.
 Olbert *et al.* 2003, ApJ, 592, L45. Chandra observations.

G39.7–2.0

RA: 19^h12^m20^s
Dec: +04°55'

1-GHz flux/Jy: 85?
Spectral index: 0.7?

W50, SS433

Size/arcmin: 120 × 60
Type: ?

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

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

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

X-ray: Emission from SS433 and two lobes.

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

Distance: Distance to SS433 is 5 kpc.

References:

- van den Bergh 1980, ApJ, 236, L23. Optical in H α and [SII].
 Zealey *et al.* 1980, MNRAS, 192, 731. Optical spectra.
 van Gorkom *et al.* 1982, MNRAS, 198, 757. WSRT HI absorption to nearby point source (not SS433).
 Seaquist & Gilmore 1982, AJ, 87, 378. VLA observations of nearby source.
 Watson *et al.* 1983, ApJ, 273, 688. X-ray observations.
 Downes *et al.* 1986, MNRAS, 218, 393. Effelsberg 100-m at 4.75 GHz (2'.4 : S = 34 ± 4 Jy), plus previous 1.7 and 2.7 GHz data.
 Romney *et al.* 1987, ApJ, 321, 822. VLBI of SS433, including distance.
 Elston & Baum 1987, AJ, 94, 1633. Mosaic with VLA at 1.4 GHz (30'') of fine structure only.
 Kawai *et al.* 1989, PASJ, 41, 491. X-ray observations of SS433.
 Band 1989, ApJ, 336, 937. Einstein and EXOSAT observations.
 Yamauchi *et al.* 1994, PASJ, 46, L109. X-ray spectral observations.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Brinkmann *et al.* 1996, A&A, 312, 306. ROSAT observations.
 Kotami *et al.* 1996, PASJ, 48, 619. X-ray line emission from SS433.
 Safi-Harb & Ögelman 1997, ApJ, 483, 868. ROSAT observations.
 Dubner *et al.* 1998, AJ, 116, 1842. VLA at 328 MHz (64'' × 60'' : S = 160 ± 20 Jy), and 1.4 GHz (56'' × 54''), plus NRAO 140-ft at 1.4 GHz (21') for HI observations.
 Safi-Harb & Petre 1999, ApJ, 512, 784. X-ray observations.
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.

G40.5–0.5

RA: 19^h07^m10^s
Dec: +06°31′

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

Size/arcmin: 22
Type: S

Radio: Shell, brightest to the NE.

References:

Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Downes *et al.* 1980, A&A, 92, 47. Effelsberg 100-m at 1.7 GHz (7′.6 : $S=9.3 \pm 1.3$ Jy), and 2.7 GHz (4′.4 : $S=7.2 \pm 0.5$ Jy), plus review of flux densities.
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.

G41.1–0.3

3C397

RA: 19^h07^m34^s
Dec: +07°08′

1-GHz flux/Jy: 22
Spectral index: 0.48

Size/arcmin: 4.5 × 2.5
Type: S

Radio: 3C397 is two sources: the E is the SNR, the W is a HII region.

X-ray: Brighter to the E and W, with possible central component.

Distance: Possible limit of > 7.5 kpc for non-thermal component from HI absorption.

References:

Kundu *et al.* 1974, AJ, 79, 132. NRAO 140-ft at 10 GHz (3′) and 5 GHz (6′).
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz (5′ : $S=21.3 \pm 1.2$ Jy for both components).
 Caswell *et al.* 1975, A&A, 45, 239. HI absorption.
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430\text{ MHz}}=82 \pm 51$ Jy, also Algonquin 46-m at 10.6 GHz (3′ : $S=12 \pm 2$ Jy), and Haystack 36-m at 15.5 GHz (2′.3 : $S=8.5 \pm 3.0$ Jy).
 Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : $S=29.8$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=8.7$ Jy).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Caswell *et al.* 1982, MNRAS, 200, 1143. FIRST at 1.4 GHz (58″ × 52″).
 Becker *et al.* 1985, ApJ, 296, 461. VLA at 1.4 and 5 GHz (8″), plus Einstein observations.
 Morsi & Reich 1987, A&AS, 71, 189. Effelsberg 100-m at 32 GHz (smoothed to 30″ : $S=1.10 \pm 0.19$ Jy).
 Kassim 1992, AJ, 103, 943. VLA at 327 MHz (3′.5 × 3′.6 : $S=46.3$ Jy).
 Anderson & Rudnick 1993, ApJ, 408, 514. VLA at 1.45 and 4.89 GHz, for spectral index studies.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Chen *et al.* 1999, ApJ, 520, 737. ASCA and ROSAT observations.
 Dyer & Reynolds 1999, ApJ, 526, 365. VLA at 1.5 GHz (6″.9 × 6″.6) and 4.8 GHz (46″.4 × 5″.6), including polarization and comparison with ROSAT image.
 Safi-Harb *et al.* 2000, ApJ, 545, 922. ROSAT, ASCA and other X-ray observations.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.

G42.8+0.6

RA: 19^h07^m20^s
Dec: +09°05′

1-GHz flux/Jy: 3?
Spectral index: 0.5?

Size/arcmin: 24
Type: S

Has been called G42.8+0.65.

Radio: Faint shell.

Point sources: Near soft gamma repeater, and young pulsar.

References:

Fürst *et al.* 1987, A&AS, 69, 403. Effelsberg 100-m at 4.75 GHz (2′.4 : $S=1.5 \pm 0.2$ Jy), plus other flux densities.
 Vasisht *et al.* 1994, ApJ, 431, L35. VLA at 327 MHz (3′.2 × 3′.4).
 Hurley *et al.* 1996, ApJ, 463, L13. Observations of soft gamma repeater field.
 Lorimer & Xilouris 2000, ApJ, 545, 385. Pulsar detection.
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.
 Kaplan *et al.* 2002, ApJ, 566, 378. VLA at 333 MHz (50″), and other observations of the region.

G43.3–0.2

W49B

RA: 19^h11^m08^s
Dec: +09°06′

1-GHz flux/Jy: 38
Spectral index: 0.48

Size/arcmin: 4 × 3
Type: S

Radio: Shell, brightest to the SE and W, near the HII region W49A.

X-ray: Filled-centre.

Distance: HI absorption indicates 12.5 to 14 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 2.7 GHz (4′).
 Downes & Wilson 1974, A&A, 34, 133. Effelsberg 100-m at 10.7 GHz (1′.3).
 Green *et al.* 1975, A&A, 44, 187. Effelsberg 100-m at 15.0 GHz (58″: $S=9.0\pm 0.7$ Jy).
 Lockhart & Goss 1978, A&A, 67, 355. HI absorption.
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6).
 Pye *et al.* 1984, MNRAS, 207, 649. Einstein observations, and VLA at 1.4 and 5 GHz (both 12″).
 Smith *et al.* 1985, ApJ, 296, 469. EXOSAT spectrum.
 Morsi & Reich 1987, A&AS, 71, 189. Effelsberg 100-m at 32 GHz (smoothed to 30″: $S=6.90\pm 0.38$ Jy).
 Moffett & Reynolds 1994, ApJ, 437, 705. VLA at 330 MHz (6″.7 × 7″.7 : $S=64.4$ Jy), 1.48 GHz (4″.8 × 5″.2 : $S=31.8$ Jy) and 4.85 GHz (4″.0 × 4″.1), including polarization.
 Fujimoto *et al.* 1995, PASJ, 47, L31. ASCA observations.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Hwang *et al.* 2000, ApJ, 532, 970. ROSAT image and ASCA spectroscopy.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.
 Aharonian *et al.* 2001, A&A, 375, 1008. Limit on high energy γ -rays.
 Brogan & Troland 2001, ApJ, 550, 799. VLA at 1.4 GHz (27″ × 24″ and 5″) for HI Zeeman splitting.
 Lacey *et al.* 2001, ApJ, 559, 954. VLA at 74 MHz (26″ × 23″: $S=55.6$ Jy) and 326 MHz (6″.6 × 6″.2 : $S=56.0$ Jy).
 Kaplan *et al.* 2002, ApJ, 566, 378. VLA at 333 MHz (50″), and other observations of the region.

G43.9+1.6

RA: 19^h05^m50^s
Dec: +10°30′

1-GHz flux/Jy: 8.6?
Spectral index: 0.2?

Size/arcmin: 60?
Type: S?

Radio: Large, poorly defined faint shell.

Point sources: Soft gamma repeater nearby.

References:

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).
 Vasisht *et al.* 1994, ApJ, 431, L35. VLA at 327 MHz (3′.2 × 3′.4).
 Hurley *et al.* 1996, ApJ, 463, L13. Observations of soft gamma repeater field.
 Kaplan *et al.* 2002, ApJ, 566, 378. VLA at 333 MHz (50″), and other observations of the region.

G45.7–0.4

RA: 19^h16^m25^s
Dec: +11°09′

1-GHz flux/Jy: 4.2?
Spectral index: 0.4?

Size/arcmin: 22
Type: S

Radio: Shell, brightest to the SE, poorly defined to NW.

References:

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

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} MHz = 46 ± 21 Jy.

Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ($6'.8 : S=5.9 \pm 0.6$ Jy).

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

Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz ($58'' \times 53'' : S=13.3 \pm 0.1$ Jy).

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: HI absorption suggests 4.1 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Parkes 64-m at 5 GHz ($4'$).

Sato 1973, PASJ, 25, 135. HI absorption.

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5'$), $S=51.5 \pm 3.2$ Jy, for the non-thermal component, but probably confused.

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

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

Copetti & Schmidt 1991, MNRAS, 250, 127. CLFST at 151 MHz.

Kassim 1992, AJ, 103, 943. VLA at 327 MHz ($3'.1 \times 3'.5$).

Subrahmanyan & Goss 1995, MNRAS, 275, 755. VLA at 330 MHz ($1'.1$).

Koo *et al.* 1995, ApJ, 447, 211. ROSAT observations.

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

Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.

Green *et al.* 1997, AJ, 114, 2058. OH masers.

Koo & Moon 1997, ApJ, 475, 194. Arecibo ($3'$) and VLA ($40'' \times 42''$) at 1.4 GHz for HI.

Koo & Moon 1997, ApJ, 485, 263. NRAO 12-m CO and HCO⁺ 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.

G53.6–2.2

RA: 19^h38^m50^s
Dec: +17°14′

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

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

Has been called G53.7–2.2.

Radio: Ring of emission, with extension to NW.

Optical: Filaments and diffuse emission.

X-ray: Centrally brightened, offset to NW.

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

References:

- Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ($5' : S = 5.3 \pm 0.6$ Jy).
 van den Bergh 1978, ApJS, 38, 119. Optical.
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5' : S = 4.8 \pm 0.3$ Jy).
 Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz ($3' : S = 11.7$ Jy).
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430 \text{ MHz}} = 20 \pm 10$ Jy, $S_{318 \text{ MHz}} = 20 \pm 3.6$ Jy.
 Goss *et al.* 1975, A&A, 43, 459. WSRT at 610 MHz ($1' \times 3' : S = 13.2 \pm 1.6$ Jy).
 Sabbadin & d'Odorico 1976, A&A, 49, 119. Optical spectra.
 Rosado 1983, RMxAA, 8, 59. Optical spectra.
 Blair & Long 1988, PASP, 100, 461. Optical imaging and spectroscopy.
 Long *et al.* 1991, ApJ, 373, 567. Einstein and optical observations.
 Winkler *et al.* 1993, ApJ, 405, 608. Optical imaging.
 Dubner *et al.* 1994, AJ, 108, 207. VLA at 327 MHz ($59''$) and 1.49 GHz ($52''$), plus X-rays.
 Saken *et al.* 1995, ApJ, 443, 231. ROSAT observations.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Giacani *et al.* 1998, A&AS, 133, 61. DRAO at 1.4 GHz for HI studies, including distance.
 Yoshita *et al.* 2001, PASJ, 53, 93. ASCA observations, and spectral comparison with ROSAT.

G54.1+0.3

RA: 19^h30^m31^s
Dec: +18°52′

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

Size/arcmin: 1.5
Type: F?

Radio: Filled-centre.

X-ray: Centrally concentrated, with extensions and diffuse emission.

Point sources: Central pulsar.

References:

- Green 1985, MNRAS, 216, 691. 5km at 2.7 GHz ($7'' \times 20''$).
 Reich *et al.* 1985, A&A, 151, L10. Effelsberg 100-m at 4.75 GHz ($2'.4 : S = 0.37 \pm 0.04$ Jy)
 Velusamy & Becker 1988, AJ, 95, 1162. VLA at 1.4 ($14'' : S = 0.48 \pm 0.03$ Jy), 1.6 ($14'' : S = 0.42 \pm 0.03$ Jy) and 5 GHz ($5'' : S = 0.33 \pm 0.02$ Jy),
 Ooty at 327 MHz ($S = 0.50 \pm 0.08$ Jy), plus review of flux densities.
 Seward 1989, AJ, 97, 481. Einstein observations.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Lu *et al.* 2001, A&A, 370, 570. ROSAT and ASCA observations.
 Lu *et al.* 2002, ApJ, 568, L49. Chandra observations.
 Camilo *et al.* 2002, ApJ, 574, L71. Pulsar detection.

G54.4–0.3

(HC40)

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

Has been called G54.5–0.3.

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

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5' : S=34.4 \pm 5.0$ 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.

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

Has been called G55.2+0.5.

Radio: Faint, partial shell.**Distance:** Association with HI features implies 14 kpc.**Point sources:** Old pulsar nearby.**References:**

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.

G55.7+3.4**RA:** 19^h21^m20^s
Dec: +21°44′**1-GHz flux/Jy:** 1.4
Spectral index: 0.6**Size/arcmin:** 23
Type: S**Radio:** Incomplete shell.**Point sources:** Old pulsar within the boundary of the remnant.**References:**

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

G57.2+0.8

(4C21.53)

RA: 19^h34^m59^s
Dec: +21°57′**1-GHz flux/Jy:** 1.8?
Spectral index: ?**Size/arcmin:** 12?
Type: S?**Radio:** Extended non-thermal arc.**Point sources:** Near the millisecond pulsar, but not thought to be related.**References:**

Sieber & Seiradakis 1984, A&A, 130, 257. Effelsberg 100-m at 1.4 GHz ($8'.8 : 1.34 \pm 0.1$), 2.7 GHz ($4'.3 : 0.86 \pm 0.1$), plus other surveys of the area.
 Caswell *et al.* 1985, AJ, 90, 488. DRAO at 1.4 GHz ($1' \times 3'$).

G59.5+0.1

RA: 19^h42^m33^s
Dec: +23°35'

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

Size/arcmin: 5
Type: S

Has been called G59.6+0.1.

Radio: Incomplete shell.

References:

Taylor *et al.* 1992, AJ, 103, 931. WSRT at 327 MHz ($1'.0 \times 2'.5$: $S = 5.1 \pm 0.2$ Jy), and northern sky survey at 4.9 GHz.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G59.8+1.2

RA: 19^h38^m55^s
Dec: +24°19'

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

Size/arcmin: 20 × 16?
Type: ?

Has been called G59.7+1.2.

Radio: Poorly defined source.

References:

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

G63.7+1.1

RA: 19^h47^m52^s
Dec: +27°45'

1-GHz flux/Jy: 1.8
Spectral index: 0.3

Size/arcmin: 8
Type: F

Radio: Centrally brightened, with core.

References:

Wallace *et al.* 1997, AJ, 114, 2068. WSRT at 1.4 GHz ($14'' \times 26''$: $S = 1.63$ Jy), DRAO at 1.4 GHz (smoothed to $2'$), plus review of flux densities and other observations.

G65.1+0.6

RA: 19^h54^m40^s
Dec: +28°35'

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

Size/arcmin: 90 × 50
Type: S

Radio: Large, faint shell.

Point sources: Pulsar nearby.

References:

Landecker *et al.* 1990, A&A, 232, 207. DRAO at 408 MHz ($3'.5 \times 7'.0$: $S = 9.5 \pm 0.1$ 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.

G65.3+5.7

RA: 19^h33^m00^s
Dec: +31°10′

1-GHz flux/Jy: 52?
Spectral index: 0.6?

Size/arcmin: 310 × 240
Type: S?

Has been called G65.2+5.7.

Radio: Large, faint ring? near S91 and S94.

Optical: Filamentary ring.

X-ray: Detected.

Distance: Mean optical velocity suggests 0.8 kpc.

References:

Gull *et al.* 1977, ApJ, 215, L69. Optical plates.

Reich *et al.* 1979, A&A, 72, 270. Effelsberg 100-m observations at 1.42 GHz (smoothed to 11′ : $S = 42.4 \pm 1.6$ Jy), estimate $S_{408 \text{ MHz}} = 91 \pm 5$ Jy from previous sky survey.

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

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

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

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

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

Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.

Mavromatakis *et al.* 2002, A&A, 388, 355. Optical observations.

G65.7+1.2

RA: 19^h52^m10^s
Dec: +29°26′

1-GHz flux/Jy: 5.1
Spectral index: 0.6

DA 495
Size/arcmin: 18
Type: ?

Has mistakenly been called G55.7+1.2.

Radio: Filled-centre or thick shell?

References:

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ($5′ : S = 2.8 \pm 0.4$ Jy), and VRO 37-m at 1.7 GHz ($S = 4.4 \pm 0.5$ Jy), plus review of flux densities.

Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430 \text{ MHz}} = 8.7 \pm 4.9$ Jy, $S_{318 \text{ MHz}} = 9.7 \pm 2.2$ Jy.

Landecker & Caswell 1983, AJ, 88, 1810. DRAO at 1.4 GHz ($0′.9 \times 1′.5 : S = 4.4 \pm 0.2$ 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.

G67.7+1.8

RA: 19^h54^m32^s
Dec: +31°29′

1-GHz flux/Jy: 1.4
Spectral index: 0.3

Size/arcmin: 9
Type: S

Radio: Double arc shell.

Optical: Filaments in N.

References:

Taylor *et al.* 1992, AJ, 103, 931. WSRT at 327 MHz ($1′.9 \times 1′.0 : S = 1.9 \pm 0.1$ Jy), and northern sky survey at 4.9 GHz ($S = 0.42 \pm 0.05$ Jy).

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

Mavromatakis *et al.* 2001, A&A, 370, 265. Optical observations.

G68.6–1.2

RA: 20^h08^m40^s
Dec: +30°37′

1-GHz flux/Jy: 0.7?
Spectral index: 0.0?

Size/arcmin: 28 × 25?
Type: ?

Radio: Faint, poorly defined source.

References:

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

G69.0+2.7

CTB 80

RA: 19^h53^m20^s
Dec: +32°55′

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

Size/arcmin: 80?
Type: ?

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

Radio: Compact core, flat spectrum plateau, and steeper spectrum extensions, with spectral break?

Optical: Expanding nebulosity near centre, with filaments to the SW and far NE.

X-ray: Diffuse emission with compact source.

Point sources: Pulsar at western edge of core.

References:

Angerhofer *et al.* 1981, A&A, 94, 313. WSRT at 610 MHz (56″ × 103″) 1.4 GHz (24″ × 44″) and 5 GHz (7″ × 13″), plus optical.
 Becker *et al.* 1982, ApJ, 255, 557. X-ray observations.
 Sofue *et al.* 1983, PASJ, 35, 437. NRO 45-m at 10.2 GHz (2′.7).
 Velusamy & Kundu 1983, JApA, 3, 253. VLA of compact sources.
 Blair *et al.* 1984, ApJ, 282, 161. Optical images and spectra.
 Wang & Seward 1984, ApJ, 285, 607. Einstein observations.
 Strom *et al.* 1984, A&A, 139, 43. Radio observations of flat spectrum component, VLA 5 GHz (1″.7) and 1.4 GHz.
 Mantovani *et al.* 1985, A&A, 145, 50. Bologna at 408 MHz (2′.6 × 4′.9 : S = 67.5 ± 10.5 Jy), Effelsberg 100-m at 1.41 (9′ : S = 62 ± 9 Jy), 1.72 (7′.6 : S = 66 ± 5 Jy), 2.7 (4′.5 : S = 52 ± 4 Jy) and 4.75 GHz (2′.4 : S = 44 ± 3.3 Jy), plus review of flux densities.
 Kulkarni *et al.* 1988, Natur, 331, 50. Pulsar detection.
 Angelini *et al.* 1988, ApJ, 330, L43. EXOSAT spectra.
 Fesen *et al.* 1988, Natur, 334, 229. IRAS of surrounding shell.
 Whitehead *et al.* 1989, MNRAS, 237, 1109. Optical of core.
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz of core, plus review of flux densities.
 Hester & Kulkarni 1989, ApJ, 340, 362. Optical imaging and spectroscopy.
 Koo *et al.* 1990, ApJ, 364, 178. Large, expanding H I shell.
 Greidanus & Strom 1990, A&A, 240, 376. Optical kinematics of core.
 Koo *et al.* 1993, ApJ, 417, 196. VLA at 1.4 GHz of surrounding H I (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″ × 17″ and 10″ × 6″) and VLA at 324 and 1380 MHz (73″ × 63″ and 93″ × 78″).

G69.7+1.0

RA: 20^h02^m40^s
Dec: +32°43′

1-GHz flux/Jy: 1.6
Spectral index: 0.8

Size/arcmin: 16
Type: S

Radio: Poorly resolved source.

References:

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

G73.9+0.9**RA:** 20^h14^m15^s**Dec:** +36°12′**1-GHz flux/Jy:** 9?**Spectral index:** 0.3?**Size/arcmin:** 22?**Type:** S?**Radio:** Diffuse, centrally brightened to SW.**Optical:** Faint shell.**References:**Reich *et al.* 1986, A&A, 155, 185. Effelsberg 100-m at 4.75 GHz (2′.4: S=6.7±0.5 Jy), plus other flux densities.

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

Pineault & Chastenay 1990, MNRAS, 246, 169. DRAO at 408 MHz (3′.4×5′.8: S=12.7±1.2 Jy) and 1.4 GHz (1′.0×1′.7: S=7.4±1.0 Jy).

Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.Pineault *et al.* 1996, AJ, 112, 201. DRAO at 1.4 GHz (smoothed to 2′) for HI.Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

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

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:

- Seaquist & Gilmore 1982, AJ, 87, 378. VLA observations of CL4.
 Green 1984, MNRAS, 211, 433. Most of remnant at 408 MHz (80'' × 160'').
 Braun & Strom 1986, A&A, 164, 208. IRAS observations.
 Straka *et al.* 1986, ApJ, 306, 266. Radio and optical comparison of NE. VLA at 1.6 GHz (4''.7) plus optical.
 Raymond *et al.* 1988, ApJ, 324, 869. Detailed optical study of filaments.
 Green 1990, AJ, 100, 1927. DRAO at 408 MHz (3'.3 × 6'.7) for spectral index study, plus X-ray and optical.
 Graham *et al.* 1991, AJ, 101, 175. Shocked molecular H outside rim in NE.
 Shull & Clarke 1991, PASP, 103, 811. Optical spectroscopy of nearside filaments.
 Greidanus & Strom 1992, A&A, 257, 265. Optical kinematics.
 Shull & Hippelein 1992, ApJ, 383, 714. Optical kinematics and proper motion.
 Fesen *et al.* 1992, AJ, 104, 719. H α imagery.
 Cornett *et al.* 1992, ApJ, 395, L9. UV imagery.
 Long *et al.* 1992, ApJ, 400, 214. Optical of Balmer dominated filament.
 Arendt *et al.* 1992, ApJ, 400, 562. IRAS observations.
 Vancura *et al.* 1993, ApJ, 417, 663. Far UV observations.
 Hester *et al.* 1994, ApJ, 420, 721. H α , [OIII] and other optical observations of Balmer dominated filaments in NE.
 Miyata *et al.* 1994, PASJ, 46, L101. X-ray observations of NE.
 Graham *et al.* 1995, ApJ, 444, 787. X-ray and optical studies of interaction with surroundings.
 Sauvageot & Decourchelle 1995, A&A, 296, 201. [Fex] and [FexIV] observations.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Levenson *et al.* 1996, ApJ, 468, 323. ROSAT and optical observations of W.
 Decourchelle *et al.* 1997, A&A, 326, 811. ROSAT observations of N.
 Levenson *et al.* 1997, ApJ, 484, 304. ROSAT observations.
 Leahy *et al.* 1997, AJ, 114, 2081. DRAO at 1.4 GHz (1' × 2'), including polarisation.
 Miyata *et al.* 1998, PASJ, 50, 257. ASCA observations.
 Miyata *et al.* 1998, PASJ, 50, 475. ASCA observations of compact X-ray source in S.
 Leahy & Roger 1998, ApJ, 505, 784. DRAO at 1.4 GHz (1'.0 × 1'.9) and 408 MHz (3'.4 × 6'.9), for spectral index studies in comparison with other radio observations.
 Levenson *et al.* 1998, ApJS, 118, 541. Optical images.
 Roger *et al.* 1999, A&AS, 137, 7. 22 MHz flux density ($S = 1400 \pm 400$ Jy).
 Bohigas *et al.* 1999, ApJ, 518, 324. Optical spectroscopy of surroundings.
 Levenson *et al.* 1999, ApJ, 526, 874. ROSAT images.
 Blair *et al.* 1999, AJ, 118, 942. HST observations, for distance.
 Aschenbach & Leahy 1999, A&A, 341, 602. ROSAT image, and comparison with radio.
 Sauvageot *et al.* 1999, A&A, 351, 669. [Nev] observations.
 Szentgyorgyi *et al.* 2000, ApJ, 529, 279. [Nev] images.
 Danforth *et al.* 2000, AJ, 119, 2319. UV, optical and X-ray comparison of selected regions.
 Sankrit *et al.* 2000, AJ, 120, 1925. HST far-UV spectra on non-radiative shock.
 Miyata *et al.* 2001, ApJ, 550, 1023. ASCA observations of compact X-ray sources.
 Miyata & Tsunemi 2001, ApJ, 552, 624. ASCA spectroscopy of regions in N and E.
 Ghavamian *et al.* 2001, ApJ, 547, 995. Optical spectroscopy.
 Danforth *et al.* 2001, AJ, 122, 938. Far-UV spectroscopy, H α and other optical observations of NE region.
 Levenson & Graham 2001, ApJ, 559, 948. HST of SE region.
 Uyaniker *et al.* 2002, A&A, 389, L61. Effelsberg 100-m at 2.7 GHz (4'.3) including polarisation, and comparison with ROSAT data.
 Leahy 2002, AJ, 123, 2689. DRAO at 1.4 GHz (4' × 2') for H α .
 Patnaude *et al.* 2002, AJ, 124, 2118. Optical and ROSAT observations of region in SW.
 Blair *et al.* 2002, ApJS, 140, 367. UV spectroscopy.
 Welsh *et al.* 2002, A&A, 391, 705. Optical absorption to background stars.
 Sankrit & Blair 2002, ApJ, 565, 297. UV observations of NE filament.
 Levenson *et al.* 2002, ApJ, 576, 798. Chandra observations of W edge.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz (14'.5 : $S = 184 \pm 18$ Jy).

G74.9+1.2

CTB 87

RA: 20^h16^m02^s
Dec: +37°12'

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

Size/arcmin: 8 × 6
Type: F

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

X-ray: Centrally brightened.

Distance: HI absorption indicates 12 kpc, optical extinction gives 6.1 ± 0.9 kpc.

Point sources: Extragalactic compact source is nearby.

References:

- Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo $S_{430 \text{ MHz}} = 12.2 \pm 9.7$ Jy, $S_{318 \text{ MHz}} = 17.7 \pm 5.0$ Jy.
 Weiler & Shaver 1978, A&A, 70, 389. WSRT at 610 MHz ($57'' \times 94''$: $S = 9.1 \pm 1.2$ Jy), 1.4 ($24'' \times 40''$: $S = 8.7 \pm 1.2$ Jy) and 5 GHz ($24'' \times 40''$: $S = 5.6 \pm 1.3$ Jy).
 Geldzahler *et al.* 1980, A&A, 84, 237. Effelsberg 100-m at 2.7 GHz ($4'.4$: $S = 7.6 \pm 0.5$ Jy).
 Wilson 1980, ApJ, 241, L19. Einstein observations.
 van Gorkom *et al.* 1982, MNRAS, 198, 757. WSRT HI absorption of nearby compact source.
 Seaquist & Gilmore 1982, AJ, 87, 378. VLA observations of nearby source.
 Morsi & Reich 1987, A&AS, 69, 533. Effelsberg 100-m at 32 GHz (smoothed to $40''$: $S = 1.47 \pm 0.19$ Jy).
 Green & Gull 1989, MNRAS, 237, 555. VLA at 1.4 GHz ($1'.2 \times 1'.4$) including HI.
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz, plus review of flux densities.
 Pineault & Chastenay 1990, MNRAS, 246, 169. DRAO at 408 MHz ($3'.4 \times 5'.8$: $S = 11.6 \pm 0.4$ Jy) and 1.4 GHz ($1'.0 \times 1'.7$: $S = 7.2 \pm 0.3$ Jy).
 Asaoka & Koyama 1990, PASJ, 42, 625. Ginga X-ray spectrum.
 Wendker *et al.* 1991, A&A, 241, 551. DRAO at 408 MHz ($3'.5 \times 5'.2$: $S = 13.3 \pm 0.8$ Jy) and Effelsberg 100-m at 4.8 GHz ($S = 7.5 \pm 0.7$ Jy).
 Wallace *et al.* 1994, A&A, 286, 565. HI of surroundings.
 Cho *et al.* 1994, AJ, 108, 634. CO of adjacent molecular clouds.
 Gorham *et al.* 1996, ApJ, 458, 257. Pulsar search.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Wallace *et al.* 1997, A&A, 317, 212. DRAO at 408 MHz ($3'.4 \times 5'.5$) and 1.4 GHz ($1'.0 \times 1'.6$) including HI (smoothed to $2'$).
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Kothes *et al.* 2003, ApJ, 588, 852. DRAO at 1.4 GHz ($1'.6 \times 1'$) including HI, plus CO observations.

G76.9+1.0

RA: 20^h22^m20^s
Dec: +38°43'

1-GHz flux/Jy: 2
Spectral index: 0.6

Size/arcmin: 12 × 9
Type: ?

Radio: Diffuse, non-thermal, with low frequency turnover.

References:

- Landecker *et al.* 1993, A&A, 276, 522. VLA at 1.49 GHz ($14''$), 4.86 GHz ($13'' \times 16''$) and 8.55 GHz ($11'' \times 12''$), including polarization and review of flux densities.
 Landecker *et al.* 1997, A&AS, 123, 199. Miyun at 232-MHz ($3'.8 \times 5'.4$).
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.

G78.2+2.1

RA: 20^h20^m50^s
Dec: +40°26′

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

DR4, γ Cygni SNR

Size/arcmin: 60
Type: S

Has been called G78.1+1.8.

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

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

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

Point sources: γ -ray and X-ray point source in remnant.

References:

Higgs *et al.* 1977, AJ, 82, 718. DRAO at 1.4 GHz ($2' \times 3'$: $S=270 \pm 40$ Jy) plus some 10 GHz ($4'$) survey data, reveals true extent of remnant.
d'Odorico & Sabbadin 1977, A&AS, 28, 439. Optical spectra.
van den Bergh 1978, ApJS, 38, 119. Optical.
Landecker *et al.* 1980, A&AS, 39, 133. DRAO H α 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 H α 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.

G82.2+5.3

RA: 20^h19^m00^s
Dec: +45°30′

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

W63

Size/arcmin: 95 \times 65
Type: S

Has been called G82.5+5.3.

Radio: Shell in the Cygnus X complex.

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

X-ray: Detected.

References:

Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5'$: $S=59.0 \pm 3.5$ Jy).
Sabbadin 1976, A&A, 51, 159. Optical spectra.
Angerhofer *et al.* 1977, A&A, 55, 11. NRAO 140-ft at 5 GHz ($6'.8$). Incomplete mapping.
Rosado & González 1981, RMxAA, 5, 93. Optical spectra.
Seward 1990, ApJS, 73, 781. Einstein observations.
Higgs *et al.* 1991, JRASC, 85, 24. DRAO at 408 MHz ($3'.4 \times 5'.0$: $S=165 \pm 21$ Jy), plus review of flux densities.
Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14'.5$: $S=82.5 \pm 5.5$ Jy).
Uyaniker *et al.* 2003, ApJ, 585, 785. DRAO at 1.4 GHz ($1'$) including polarisation, of part.

G84.2–0.8

RA: 20^h53^m20^s
Dec: +43°27′

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

Size/arcmin: 20 × 16
Type: S

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

References:

Matthews *et al.* 1977, A&A, 55, 1. WSRT at 610 MHz ($56'' \times 81''$: $S = 12.4 \pm 1.5$ Jy) and Effelsberg 100-m at 2.7 GHz ($4'.4$: $S = 6.8 \pm 1.3$ Jy).
 Matthews & Shaver 1980, A&A, 87, 255. WSRT at 1415 MHz ($23'' \times 32''$), and Effelsberg 100-m at 2.7 GHz ($4'.4$: $S = 5.6 \pm 0.5$ Jy).
 Feldt & Green 1993, A&A, 274, 421. DRAO at 1.4 GHz ($1' \times 1'.5$), including H_I, plus CO observations.
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Uyaniker *et al.* 2003, ApJ, 585, 785. DRAO at 1.4 GHz ($1'$) including polarisation.

G84.9+0.5

RA: 20^h50^m30^s
Dec: +44°53′

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

Size/arcmin: 6
Type: S

Radio: Incomplete shell.

References:

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

G85.4+0.7

RA: 20^h50^m40^s
Dec: +45°22′

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

Size/arcmin: 24
Type: S

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

X-ray: Detected.

References:

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

G85.9–0.6

RA: 20^h58^m40^s
Dec: +44°53′

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

Size/arcmin: 24
Type: S

Radio: Faint, incomplete shell.

X-ray: Detected.

References:

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

G89.0+4.7			HB21
RA: 20 ^h 45 ^m 00 ^s	1-GHz flux/Jy: 220	Size/arcmin: 120 × 90	
Dec: +50°35′	Spectral index: 0.40	Type: S	

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

Optical: Filaments possibly associated.

X-ray: Centrally brightened.

Distance: Various associations suggest 0.8 kpc.

References:

Hirabayashi & Takahashi 1972, PASJ, 24, 231. 30-m dish at 4.2 GHz (11′ : $S=160 \pm 40$ Jy).
 Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz (5′ : $S=148 \pm 16$ Jy), plus optical filaments.
 Hill 1974, MNRAS, 169, 59. Half-Mile Telescope at 1.4 GHz (3′ × 3′.9).
 Haslam *et al.* 1975, A&A, 39, 453. Effelsberg 100-m at 2.7 GHz (4′.4).
 Fukui & Tatematsu 1988, in SNRISM, p261. CO observations of the vicinity (2′.7).
 Tatematsu *et al.* 1990, A&A, 237, 189. DRAO at 408 MHz (3′.5 × 4′.5) and 1.4 GHz (1′.0 × 1′.3), including Hi, plus CO observations of adjacent molecular cloud.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Leahy & Aschenbach 1996, A&A, 315, 260. ROSAT observations.
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Koo *et al.* 2001, ApJ, 552, 175. NRAO 12-m and other CO observations (27″ and 45″) of eastern part.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz (14′.5 : $S=228 \pm 5$ Jy).
 Uyaniker *et al.* 2003, ApJ, 585, 785. DRAO at 1.4 GHz (1′) including polarisation.

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

Has been called G93.2+6.7.

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

Distance: Hi observations suggest 2.2 kpc.

References:

Roger & Costain 1976, A&A, 51, 151. DRAO at 1.42 GHz (2′ × 2′.4 : $S=6.9$ Jy).
 Haslam *et al.* 1980, A&A, 92, 57. Effelsberg 100-m at 1.72 GHz (7′.6 : $S=6.47 \pm 0.52$ Jy) and 2.7 GHz (4′.4 : $S=5.64 \pm 0.64$ Jy), plus review of flux densities.
 Lalitha *et al.* 1984, A&A, 131, 196. Effelsberg 100-m at 4.75 GHz (smoothed to 3′ : $S=4.01 \pm 0.57$ Jy).
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Landecker *et al.* 1999, ApJ, 527, 866. DRAO at 408 MHz (3′.5 × 4′.3) and 1.4 GHz (1′.0 × 1′.2), including polarisation and Hi.
 Foster & Routledge 2003, ApJ, 598, 1005. Hi for distance.

G93.7–0.2			CTB 104A, DA 551
RA: 21 ^h 29 ^m 20 ^s	1-GHz flux/Jy: 65	Size/arcmin: 80	
Dec: +50°50′	Spectral index: 0.4	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 polarization, plus review of flux densities.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.
 Uyaniker *et al.* 2002, ApJ, 565, 1022. DRAO 1.4 GHz (54″ × 49″), including Hi, and 408 MHz (3′.7 × 2′.8).
 Uyaniker *et al.* 2003, ApJ, 585, 785. DRAO at 1.4 GHz (1′) including polarisation.

G94.0+1.0

3C434.1

RA: 21^h24^m50^s
Dec: +51°53′**1-GHz flux/Jy:** 15
Spectral index: 0.44**Size/arcmin:** 30 × 25
Type: S**Radio:** Incomplete shell, in complex region.**References:**

Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ($S' : S = 6.1 \pm 0.8$ 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 ($S' : S = 5.8 \pm 0.4$ Jy). Also NRAO 140-ft at 5 GHz (6').
 Mantovani *et al.* 1982, A&A, 105, 176. Effelsberg 100-m at 1.7 GHz ($7' . 6 : S = 12.0 \pm 1.3$ Jy), plus review of flux densities.
 Goss *et al.* 1984, A&A, 138, 469. WSRT at 610 MHz (smoothed to 100'' : $S = 16 \pm 1.7$ Jy) and Effelsberg 100-m at 4.75 GHz ($2' . 4 : S = 7.2 \pm 0.5$ Jy).
 Landecker *et al.* 1985, AJ, 90, 1082. DRAO at 1.4 GHz (smoothed to 2' : $S = 16 \pm 3$ Jy).
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Uyaniker *et al.* 2003, ApJ, 585, 785. DRAO at 1.4 GHz (1') including polarisation.

G106.3+2.7**RA:** 22^h27^m30^s
Dec: +60°50′**1-GHz flux/Jy:** 6
Spectral index: 0.6**Size/arcmin:** 60 × 24
Type: ?

Incorporates the proposed smaller remnant G106.6+2.9.

Radio: Faint extended source, which brighter 'head' to NE.**Point sources:** Pulsar in 'head'.**References:**

Pineault & Joncas 2000, AJ, 120, 3218. DRAO at 408 MHz ($3' . 9 \times 3' . 5 : S = 10.5 \pm 0.3$ Jy) and 1.4 GHz ($1' . 2 \times 1' . 0 : S = 4.9 \pm 0.6$ Jy), plus HI.
 Halpern *et al.* 2001, ApJ, 547, 323. X-ray and radio observations of the 'head'.
 Halpern *et al.* 2001, ApJ, 552, L125. Pulsar detection.
 Kothes *et al.* 2001, ApJ, 560, 236. DRAO at 1.4 GHz, including HI, plus CO and other observations.

G109.1–1.0

CTB 109

RA: 23^h01^m35^s
Dec: +58°53′**1-GHz flux/Jy:** 20
Spectral index: 0.50**Size/arcmin:** 28
Type: S**Radio:** Semicircular shell, with the Molecular cloud S152 is to the immediate W.**X-ray:** Incomplete shell, with pulsar at W edge.**Point sources:** Long period X-ray pulsar.**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, Natur, 291, 132. Optical spectra.
 Downes 1983, MNRAS, 203, 695. Effelsberg 100-m at 2.7 GHz ($4' . 4 : S = 13.0 \pm 1.5$ Jy).
 Sofue *et al.* 1983, PASJ, 35, 447. NRO 45-m at 10.2 GHz ($2' . 7$).
 Hughes *et al.* 1984, ApJ, 283, 147. WSRT at 610 MHz ($20'' : S = 26 \pm 3$ Jy) 1.4 GHz ($10''$), DRAO at 1.4 GHz ($1' \times 1' . 2 : S = 16.8 \pm 2$ Jy) and Algonquin 46-m at 6.5 GHz ($4' . 5 : S = 6.7 \pm 1$ Jy).
 Braun & Strom 1986, A&AS, 63, 345. WSRT HI observations.
 Tatematsu *et al.* 1987, PASJ, 39, 755. NRO 45-m at 10 GHz ($2' . 7$), plus polarization.
 Tatematsu *et al.* 1987, A&A, 184, 279. CO observations of the surroundings ($2' . 7$).
 Hanson *et al.* 1988, A&A, 195, 114. EXOSAT of pulsar.
 Morini *et al.* 1988, ApJ, 333, 777. EXOSAT observations.
 Koyama *et al.* 1989, PASJ, 41, 461. X-ray observations of pulsar.
 Coe *et al.* 1989, MNRAS, 238, 649. IRAS observations of surroundings.
 Green 1989, MNRAS, 238, 737. OH observations.
 Tatematsu *et al.* 1990, ApJ, 351, 157. CO of surroundings, plus X-ray observations.
 Davies & Coe 1991, MNRAS, 249, 313. Optical and IR observations near pulsar.
 Hurford & Fesen 1995, MNRAS, 277, 549. ROSAT imaging.
 Rho & Petre 1997, ApJ, 484, 828. ROSAT observations.
 Parmar *et al.* 1998, A&A, 330, 175. X-ray observations.
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.
 Patel *et al.* 2001, ApJ, 563, L45. Chandra observations of pulsar.
 Kothes *et al.* 2002, ApJ, 576, 169. DRAO at 1.4 GHz ($68'' \times 59''$), including HI, plus CO observations.

G111.7–2.1

Cassiopeia A, 3C461

RA: 23^h23^m26^s**1-GHz flux/Jy:** 2720**Size/arcmin:** 5**Dec:** +58°48′**Spectral index:** 0.77**Type:** S

Presumably the remnant of a late 17th century SN.

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

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

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

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

References:

- Woan & Duffett-Smith 1990, MNRAS, 243, 87. Structure at 81.5 MHz.
 Rees 1990, MNRAS, 243, 637. Flux density decrease at 38 MHz.
 Anderson *et al.* 1991, ApJ, 373, 146. VLA at 1.4 and 5 GHz (1^{''}.3) for spectral variations.
 Reed *et al.* 1995, ApJ, 440, 706. Optical spectra, for 3-d structure.
 Anderson *et al.* 1995, ApJ, 441, 300. VLA at 1.4 GHz and 4.8 GHz (both 1^{''}.3), for polarization studies.
 Anderson & Rudnick 1995, ApJ, 441, 307. VLA at 1.4 GHz and 4.8 GHz, for proper motion studies.
 Predehl & Schmitt 1995, A&A, 293, 889. ROSAT of dust scattered halo.
 Lawrence *et al.* 1995, AJ, 109, 2635. Optical imaging spectroscopy.
 Kassim *et al.* 1995, ApJ, 455, L59. VLA at 74 (25^{''}) and 332 MHz (6^{''}), including spectral index comparisons.
 Anderson & Rudnick 1996, ApJ, 456, 234. VLA for spectral index comparisons.
 Agafanov 1996, A&A, 306, 578. Flux density decrease at 102 MHz.
 Vink *et al.* 1996, A&A, 307, L41. ASCA spectrum.
 Lagage *et al.* 1996, A&A, 315, L273. ISO observations.
 Keohane *et al.* 1996, ApJ, 466, 309. Radio and X-ray comparison.
 Hurford & Fesen 1996, ApJ, 469, 246. Optical spectroscopy and reddening studies.
 Fesen & Gundersen 1996, ApJ, 470, 967. Optical observations of NE ‘jet’.
 Schwarz *et al.* 1997, A&AS, 123, 43. WSRT at 1.4 GHz (30^{''}) for H I absorption.
 Reynoso *et al.* 1997, A&A, 317, 203. VLA at 1.4 GHz (11^{''} × 14^{''}) for H I absorption.
 Dupraz *et al.* 1997, A&A, 324, 683. γ -ray line detection.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.
 Vink *et al.* 1998, A&A, 339, 201. Comparison of ROSAT and Einstein images for expansion studies.
 Keohane *et al.* 1998, ApJ, 503, L175. Deep ROSAT image, and comparison with radio.
 Koralesky *et al.* 1998, ApJ, 505, L27. Comparison of ROSAT and Einstein images for expansion studies.
 Wright *et al.* 1999, ApJ, 518, 284. BIMA at 83 GHz (6^{''}.5 × 6^{''}.2) at 28 GHz, for comparison with other radio images for spectral index studies.
 Arendt *et al.* 1999, ApJ, 521, 234. ISO observations.
 O’Sullivan & Green 1999, MNRAS, 303, 575. Flux density changes at 13.5, 15.5 and 16.5 GHz.
 Agüeros & Green 1999, MNRAS, 305, 957. CLFST at 151 MHz for bulk expansion studies.
 Mason *et al.* 1999, AJ, 118, 2908. Flux density at 32 GHz ($S=194 \pm 5$ Jy).
 Vink *et al.* 1999, A&A, 344, 289. X-ray line and continuum observations.
 Liszt & Lucas 1999, A&A, 347, 258. NRAO 12-m at 86 GHz (72^{''}: $S=101 \pm 3.3$ Jy) and 140 GHz (44^{''}: $S=69.6 \pm 6.3$ Jy), plus CO observations.
 Douvion *et al.* 1999, A&A, 352, L111. ISO observations.
 Hughes *et al.* 2000, ApJ, 528, L109. Chandra observations.
 Reichart & Stephens 2000, ApJ, 537, 904. Flux density changes at 1405 MHz.
 Hwang *et al.* 2000, ApJ, 537, L119. Chandra imaging, including lines.
 Chakrabarty *et al.* 2001, ApJ, 548, 800. Chandra observations, including central compact source.
 Ryan *et al.* 2001, ApJ, 548, 811. Optical limits in compact central source.
 Gotthelf *et al.* 2001, ApJ, 552, L39. Chandra observations, showing outer shock.
 Kaplan *et al.* 2001, ApJ, 558, 270. Search for near-IR counterpart to central source.
 Vink *et al.* 2001, ApJ, 560, L79. BeppoSAX X-ray line observations.
 Fesen 2001, ApJS, 133, 161. Optical imaging and spectroscopy.
 Bleeker *et al.* 2001, A&A, 365, L225. XMM-Newton observations.
 Maccarone *et al.* 2001, A&A, 368, 267. BeppoSAX observations.
 Douvion *et al.* 2001, A&A, 369, 589. ISO observations.
 Aharonian *et al.* 2001, A&A, 370, 112. High energy γ -ray emission detection.
 Gerardy & Fesen 2001, AJ, 121, 2781. IR spectroscopy and imaging.
 Thorstensen *et al.* 2001, AJ, 122, 297. Optical expansion studies.
 Hwang *et al.* 2001, ApJ, 560, L175. Chandra observations of Doppler shifted lines.
 Fesen *et al.* 2001, AJ, 122, 2644. HST observations.
 Willingale *et al.* 2002, A&A, 381, 1039. XMM-Newton observations.
 Mereghetti *et al.* 2002, ApJ, 569, 275. XMM-Newton observations of central source.
 Reynoso & Goss 2002, ApJ, 575, 871. VLA at 5 GHz (6^{''}.4 × 6^{''}.0) for H₂CO absorption studies.
 Dunne *et al.* 2003, Natur, 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.

G114.3+0.3

RA: 23^h37^m00^s
Dec: +61°55′

1-GHz flux/Jy: 6?
Spectral index: 0.3?

Size/arcmin: 90 × 55
Type: S

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

Optical: Faint emission in centre and to S.

Distance: Possible association with HI features suggests 3.0–3.8 kpc.

Point sources: Pulsar near centre of remnant.

References:

Reich & Braunsfurth 1981, A&A, 99, 17. Effelsberg 100-m at 2.7 GHz ($4'.4: S=3.6$ Jy) and $S_{1.4\text{ GHz}}=4.4$ Jy from 1.4 GHz survey data, plus HI from Maryland-Green Bank survey.
 Kulkarni *et al.* 1993, Natur, 362, 135. Pulsar association.
 Fürst *et al.* 1993, A&A, 276, 470. Pulsar association.
 Becker *et al.* 1996, A&A, 306, 464. ROSAT of pulsar.
 Fesen *et al.* 1997, AJ, 113, 767. Optical observations.
 Mavromatakis *et al.* 2002, A&A, 383, 1011. Optical observations.

G116.5+1.1

RA: 23^h53^m40^s
Dec: +63°15′

1-GHz flux/Jy: 11?
Spectral index: 0.8?

Size/arcmin: 80 × 60
Type: S

Radio: Distinct shell, with high polarization.

Distance: Possible association with HI features suggests 3.6–5.2 kpc.

References:

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

G116.9+0.2

RA: 23^h59^m10^s
Dec: +62°26′

1-GHz flux/Jy: 9?
Spectral index: 0.5?

Size/arcmin: 34
Type: S
 CTB 1

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

Radio: Incomplete shell.

Optical: Filaments on sky survey.

X-ray: Centrally brightened, with NE ‘breakout’.

Point sources: Pulsar to NE.

Distance: Possible association with HI features suggests 2.8–4.0 kpc, mean optical velocity suggests 2.7 kpc.

References:

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

G119.5+10.2

CTA 1

RA: 00^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: Compact, central X-/γ-ray source.

References:

Sieber *et al.* 1979, A&A, 74, 361. Effelsberg 100-m at 2.7 GHz (4′.4: $S=23.6 \pm 2.8$ Jy).

Sieber *et al.* 1981, A&A, 103, 393. Effelsberg 100-m at 2.7 GHz and 1.7 GHz (7′.6: $S=31.6 \pm 2.5$ Jy), and 6C at 151 MHz (4′: $S=62.6 \pm 6$ Jy).

Fesen *et al.* 1981, ApJ, 247, 148. Optical, including spectra.

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

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

Simonetti 1992, ApJ, 386, 170. VLA observations of background sources for rotation measure studies.

Pineault *et al.* 1993, AJ, 105, 1060. DRAO at 1.4 GHz (1′: $S=34 \pm 4$ Jy), plus H α and IRAS.

Seward *et al.* 1995, ApJ, 453, 284. ROSAT observations.

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

Slane *et al.* 1997, ApJ, 485, 221. ASCA and ROSAT observations.

Pineault *et al.* 1997, A&A, 324, 1152. DRAO at 408 MHz (3′.5) and 1.4 GHz (1′.0).

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

Brazier *et al.* 1998, MNRAS, 295, 819. Studies of central, compact γ-ray source.

Mavromatakis *et al.* 2000, A&A, 353, 371. Optical imagery.

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

G120.1+1.4

RA: 00^h25^m18^s
Dec: +64°09′

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

Tycho, 3C10, SN1572

Size/arcmin: 8
Type: S

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

Radio: Shell, brightest to the NE.

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

X-ray: Shell, brighter to the NE.

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

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

References:

- Duin & Strom 1975, A&A, 39, 33. WSRT at 610 MHz ($57'' \times 64''$) and 5 GHz ($7'' \times 8''$).
 Klein *et al.* 1979, A&A, 76, 120. Effelsberg 100-m at 10.7 GHz ($1'.2: S=13.1 \pm 0.8$ Jy), plus review of flux densities.
 Strom *et al.* 1982, MNRAS, 200, 473. WSRT at 1415 MHz ($27'' \times 31''$) from 1971 and 1979, for expansion.
 Dickel *et al.* 1982, ApJ, 257, 145. Comparison of Radio, X-ray and Optical.
 Reid *et al.* 1982, ApJ, 261, 485. Einstein observations.
 Seward *et al.* 1983, ApJ, 266, 287. Einstein observations.
 Tan & Gull 1985, MNRAS, 216, 949. 5km at 2.7 GHz ($4''$) from 1980 and 1983, and One-Mile Telescope at 1.4 GHz ($23''$) from 1965 and 1980, for expansion.
 Albinson *et al.* 1986, MNRAS, 219, 427. HI observations.
 Green & Gull 1987, MNRAS, 224, 1055. VLA HI absorption observations towards central radio source.
 Smith *et al.* 1988, ApJ, 325, 288. EXOSAT spectrum and image (smoothed to $13''$).
 Dickel *et al.* 1991, AJ, 101, 2151. VLA at 1.4 and 5 GHz ($1''.5$).
 Wood *et al.* 1992, AJ, 103, 1338. VLA at 5 GHz ($1''.5$) polarization studies.
 Fink *et al.* 1994, A&A, 283, 635. X-ray spectra.
 Vancura *et al.* 1995, ApJ, 441, 680. X-ray spectra and ROSAT image.
 Predehl & Schmitt 1995, A&A, 293, 889. ROSAT of dust scattered halo.
 Schwarz *et al.* 1995, A&A, 299, 193. WSRT and Effelsberg 100-m at 1.4 GHz ($50''$), and VLA at 1.4 GHz ($13''$), for neutral hydrogen studies.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Hwang & Gotthelf 1997, ApJ, 475, 665. ASCA observations.
 Reynoso *et al.* 1997, ApJ, 491, 816. VLA at 1.4 GHz ($1''.4 \times 1''.5$) from 1984 and 1994 for expansion studies.
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Reynoso *et al.* 1999, AJ, 117, 1827. VLA at 1.4 GHz ($13''$), for HI studies.
 Katz-Stone *et al.* 2000, ApJ, 529, 453. VLA at 333 MHz and 1.4 GHz ($9''.5 \times 7''.7$), for spectral index studies.
 Ghavamian *et al.* 2000, ApJ, 535, 266. Optical observations of shock precursors.
 Hughes 2000, ApJ, 545, L53. ROSAT X-ray expansion.
 Decourchelle *et al.* 2001, A&A, 365, L218. XMM-Newton observations.
 Ghavamian *et al.* 2001, ApJ, 547, 995. Optical spectroscopy.
 Douvion *et al.* 2001, A&A, 373, 281. ISO observations.
 Aharonian *et al.* 2001, A&A, 373, 292. Upper limit on high energy γ -rays.
 Hwang *et al.* 2002, ApJ, 581, 1101. Chandra observations.

G126.2+1.6

RA: 01^h22^m00^s
Dec: +64°15′

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

Size/arcmin: 70
Type: S?

Radio: Poorly defined shell.

Optical: Filaments detected.

References:

- Reich *et al.* 1979, A&A, 78, L13. Effelsberg 100-m at 1.4 GHz ($9': S=6.8 \pm 0.7$ Jy) and 2.7 GHz ($4'.4: S=3.9 \pm 0.4$ Jy).
 Blair *et al.* 1980, ApJ, 242, 592. Optical detection and spectra.
 Rosado 1982, RMxAA, 5, 127. Optical spectra.
 Fesen *et al.* 1983, ApJS, 51, 337. Deep [OIII] imagery.
 Fürst *et al.* 1984, A&A, 133, 11. Effelsberg 100-m at 2.7 GHz ($4'.4$) and 4.8 GHz ($2'.6$).
 Joncas *et al.* 1989, A&A, 219, 303. DRAO at 408 MHz ($3'.5 \times 3'.9: S=12 \pm 2.5$ Jy) and part at 1.4 GHz ($1'.1 \times 1'.0$), plus review of flux densities.
 Xilouris *et al.* 1993, A&A, 270, 393. Optical imaging.
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14'.5: S=6.1 \pm 1.6$ Jy).

G127.1+0.5			R5
RA: 01 ^h 28 ^m 20 ^s	1-GHz flux/Jy: 13	Size/arcmin: 45	
Dec: +63°10′	Spectral index: 0.6	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 NGC559.

References:

Caswell 1977, MNRAS, 181, 789. Half-Mile Telescope at 1.42 GHz ($3'.5 \times 3'.9$), plus other observations of central source.
 Salter *et al.* 1978, A&A, 66, 77. Effelsberg 100-m at 2.7 GHz ($4'.4$), plus 5 and 8.7 GHz of the central source.
 Pauls 1977, A&A, 59, L13. Effelsberg 100-m at 1.4 GHz ($9' : S = 8 \pm 1$ Jy).
 Reich *et al.* 1979, A&A, 78, L13. Effelsberg 100-m at 1.4 GHz ($9' : S = 10.8 \pm 1.3$ Jy).
 Pauls *et al.* 1982, A&A, 112, 120. WSRT at 610 MHz ($56'' \times 62''$) and H α absorption to the point source with the VLA.
 Geldzahler & Shaffer 1982, ApJ, 260, L69. Observations of central source.
 Fürst *et al.* 1984, A&A, 133, 11. Effelsberg 100-m at 2.7 GHz ($4'.4$) and 4.8 GHz ($2'.6$).
 Goss & van Gorkom 1984, JApA, 5, 425. WSRT H α absorption of central source.
 Joncas *et al.* 1989, A&A, 219, 303. DRAO at 408 MHz ($3'.5 \times 3'.9 : S = 17.9 \pm 2.0$ Jy) and 1.4 GHz ($1'.13 \times 1'.0 : S = 10.1 \pm 0.8$ Jy), plus review of flux densities.
 Xilouris *et al.* 1993, A&A, 270, 393. Optical imaging.
 Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.
 Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14'.5 : S = 14.6 \pm 0.8$ Jy).

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

This is the remnant of the SN of AD1181.

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

Optical: Faint filaments.

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

Point sources: Central pulsar.

Distance: H α absorption indicates 3.2 kpc.

References:

Green *et al.* 1975, A&A, 44, 187. Effelsberg 100-m at 15.0 GHz ($58'' : S = 26.7 \pm 0.5$ Jy).
 Wilson & Weiler 1976, A&A, 49, 357. WSRT at 610 MHz ($58'' \times 64''$), 1.4 GHz ($24'' \times 27''$) and 5 GHz ($7'' \times 8''$).
 van den Bergh 1978, ApJ, 220, L9. Optical observations.
 Becker *et al.* 1982, ApJ, 255, 557. X-ray observations.
 Green & Gull 1982, Natur, 299, 606. H α absorption distance.
 Fesen 1983, ApJ, 270, L53. Optical spectra.
 Reynolds & Aller 1985, AJ, 90, 2312. VLA at 1.4 GHz ($2'$), for limits of shell.
 Davelaar *et al.* 1986, ApJ, 300, L59. EXOSAT spectrum.
 Green 1986, MNRAS, 218, 533. CLFST at 151 MHz ($1'.2 \times 1'.3 : S = 36 \pm 4$ Jy), 5km at 2.7 GHz ($4''$), plus Einstein observations for limit on shell.
 Green 1987, MNRAS, 225, 11P. Flux density increase at 408 MHz.
 Morsi & Reich 1987, A&AS, 69, 533. Effelsberg 100-m at 32 GHz ($26''.5 : S = 24.2 \pm 1.4$ Jy).
 Reynolds & Aller 1988, ApJ, 327, 845. VLA at 1.4 ($2''.4$) and 4.9 GHz ($2''.5$).
 Salter *et al.* 1989, ApJ, 338, 171. NRAO 12-m at 84.2 GHz ($90'' : S = 15.0 \pm 2.0$ Jy), plus review of flux densities.
 Asaoka & Koyama 1990, PASJ, 42, 625. Ginga X-ray spectrum.
 Green & Scheuer 1992, MNRAS, 258, 833. IRAS upper limits.
 Roberts *et al.* 1993, A&A, 274, 427. H α absorption.
 Wallace *et al.* 1994, A&A, 286, 565. H α 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 studies, and comparison with earlier observations for expansion studies.
 Bocchino *et al.* 2001, A&A, 369, 1078. XMM-Newton observations.
 Murray *et al.* 2002, ApJ, 568, 226. Chandra pulsar detection.
 Camilo *et al.* 2002, ApJ, 571, L41. Pulsar detection in radio.
 Slane *et al.* 2002, ApJ, 571, L45. Chandra observations.

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.

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

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

Read 1981, MNRAS, 194, 863. 6C at 151 MHz (4'.4) and Half-Mile Telescope at 1.4 GHz (2') showing H_I shell.

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

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

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

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

Routledge *et al.* 1991, A&A, 247, 529. DRAO at 1.4 GHz ($1'.0 \times 1'.1$) for H_I, plus CO observations.

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

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

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

Reich *et al.* 2003, A&A, 408, 961. Effelsberg 100-m at 863 MHz ($14'.5 : S = 51.5 \pm 3.5$ Jy).

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.

X-ray: Faint shell.

References:

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

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

G160.9+2.6			HB9
RA: 05 ^h 01 ^m 00 ^s	1-GHz flux/Jy: 110	Size/arcmin: 140 × 120	
Dec: +46°40′	Spectral index: 0.6	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 H α absorption to nearby point source.

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

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

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

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

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

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

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

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

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

G166.0+4.3			VRO 42.05.01
RA: 05 ^h 26 ^m 30 ^s	1-GHz flux/Jy: 7?	Size/arcmin: 55 × 35	
Dec: +42°56′	Spectral index: 0.4?	Type: S	

Radio: Two arcs of strikingly different radii.

Optical: Nearly complete ring.

X-ray: Predominantly in SW.

Distance: H α indicates 4.5 kpc.

References:

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

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

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

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

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

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

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

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

Braun & Strom 1986, A&AS, 63, 345. WSRT H α Observations.

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

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.

G166.2+2.5

OA 184

RA: 05^h19^m00^s**1-GHz flux/Jy:** 11**Size/arcmin:** 90 × 70**Dec:** +41°55′**Spectral index:** 0.5**Type:** S**Radio:** Large, faint shell.**Optical:** Nearly complete ring.**Distance:** HI indicates 8 ± 2 kpc.**References:**Willis 1973, A&A, 26, 237. NRAO 300-ft at 2.7 GHz ($5' : S = 6.0 \pm 2.2$ Jy).

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

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

Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.Routledge *et al.* 1986, MNRAS, 221, 809. DRAO at 1.4 GHz ($1' \times 1'.4 : S = 9.0 \pm 0.5$ Jy) including HI, plus review of flux densities.Kim *et al.* 1988, AJ, 96, 704. VLA of background sources for magnetic field structure of the remnant.

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

Lorimer *et al.* 1998, A&A, 331, 1002. Pulsar search.**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.**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.**References:**van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.Sofue *et al.* 1980, PASJ, 32, 1. Effelsberg 100-m at 5 GHz (2'.6) of parts.Kundu *et al.* 1980, A&A, 92, 225. Effelsberg 100-m at 2.7 GHz ($5'.5 : S = 34.9 \pm 4$ Jy) and 1.6 GHz ($10' : S = 60.2 \pm 6$ Jy).Angerhofer & Kundu 1981, AJ, 86, 1003. Arecibo at 430 MHz ($9' : S = 97 \pm 20$ Jy).Fürst *et al.* 1982, A&A, 115, 428. Observations of compact radio sources near the remnant.Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.

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

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

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

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

G182.4+4.3**RA:** 06^h08^m10^s**Dec:** +29°00′**1-GHz flux/Jy:** 1.2**Spectral index:** 0.4**Size/arcmin:** 50**Type:** S**Radio:** Incomplete shell.**References:**

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

G184.6–5.8

Crab Nebula, 3C144, SN1054

RA: 05^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 polarized filaments, diffuse synchrotron emission, with ‘jet’ faintly visible.

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

Point sources: Pulsar powering the remnant.

Distance: Proper motions and radial velocities give 2 kpc.

References:

- Velusamy 1984, *Natur*, 308, 251. VLA at 1.4 GHz, radio detection of ‘jet’.
- Harnden & Seward 1984, *ApJ*, 283, 279. X-ray observations.
- Velusamy 1985, *MNRAS*, 212, 359. VLA at 1.4 GHz (15”).
- Aller & Reynolds 1985, *ApJ*, 293, L73. Flux density decrease.
- Fesen & Gull 1986, *ApJ*, 306, 259. Deep [OIII] imagery of ‘jet’.
- Marcelin *et al.* 1990, *A&A*, 228, 471. Optical of ‘jet’.
- Fesen & Blair 1990, *ApJ*, 351, L45. Optical identification of dust in filaments.
- Hester *et al.* 1990, *ApJ*, 357, 539. Optical and IR images.
- Graham *et al.* 1990, *ApJ*, 352, 172. IR spectroscopy and imaging.
- Hickson & van den Bergh 1990, *ApJ*, 365, 224. Optical polarization.
- Bietenholz & Kronberg 1990, *ApJ*, 357, L13. VLA at 1.4 GHz (1”.8).
- MacAlpine & Uomoto 1991, *AJ*, 102, 218. Photometry.
- Michel *et al.* 1991, *ApJ*, 368, 463. Optical photometry.
- Bietenholz *et al.* 1991, *ApJ*, 373, L59. VLA at multiple epochs for expansion studies.
- Hennessy *et al.* 1992, *ApJ*, 395, L13. UV imagery.
- Fesen *et al.* 1992, *ApJ*, 399, 599. Optical studies of ‘dark bays’.
- Blair *et al.* 1992, *ApJ*, 399, 611. Far UV observations.
- Bietenholz & Kronberg 1992, *ApJ*, 393, 206. VLA at 1.5 and 5 GHz (1”.8) and 1.5 and 14 GHz (6”.5) for spectral studies.
- Strom & Greidanus 1992, *Natur*, 358, 654. IRAS observations.
- Fesen & Staker 1993, *MNRAS*, 263, 69. [OIII] imaging of ‘jet’, and proper motion studies.
- Kassim *et al.* 1993, *AJ*, 106, 2218. VLA at 74 MHz (20”).
- Véron-Cetty & Woltjer 1993, *A&A*, 270, 370. Continuum and [OIII] photometry.
- Murdin 1994, *MNRAS*, 269, 89. Deep H α plates and spectroscopy of halo.
- Wallace *et al.* 1994, *A&A*, 286, 565. HI of surroundings.
- MacAlpine *et al.* 1994, *ApJ*, 432, L131. Prominent optical knots.
- Rudy *et al.* 1994, *ApJ*, 426, 646. IR spectroscopy.
- Tanimori *et al.* 1994, *ApJ*, 429, L61. γ -rays from pulsar.
- Predehl & Schmitt 1995, *A&A*, 293, 889. ROSAT of dust scattered halo.
- Lawrence *et al.* 1995, *AJ*, 109, 2635. Optical imaging spectroscopy.
- Frail *et al.* 1995, *ApJ*, 454, L129. VLA at 333 MHz (20”) for limits on shell.
- MacAlpine *et al.* 1996, *ApJ*, 463, 650. Optical spectroscopy of N and S rich filaments.
- Nasuti *et al.* 1996, *A&A*, 314, 849. Spectrophotometry of pulsar.
- Bietenholz *et al.* 1997, *ApJ*, 490, 291. Comparison of VLA observations at 74 MHz, 327 MHz, 1.5 GHz and 5 GHz for spectral index studies.
- Blair *et al.* 1997, *ApJS*, 109, 473. HST imaging.
- van der Meulen *et al.* 1998, *A&A*, 330, 321. 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-Newton observations.
- Douvion *et al.* 2001, *A&A*, 373, 281. ISO observations.
- Bietenholz *et al.* 2001, *ApJ*, 560, 254. Multi-epoch VLA observations, showing variations near the pulsar.
- 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.
- Green 2002, in *NSSR*, p153. Sub-mm observations.
- Atkins *et al.* 2003, *ApJ*, 595, 803. High energy γ -ray observations.

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, with nebula and compact source.**Point sources:** Compact X-ray source in S.**Distance:** Mean optical velocity suggests 0.7–1.5 kpc, association with S249 gives 1.5–2 kpc.**References:**

- Duin & van der Laan 1975, A&A, 40, 111. WSRT at 610 MHz ($1' \times 2'.5$), 1415 MHz ($24'' \times 63''$), and part at 5 GHz ($12'' \times 31''$).
 Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.
 Fesen 1984, ApJ, 281, 658. Optical of filament to far NE.
 Erickson & Mahoney 1985, ApJ, 290, 596. TPT at 4 frequencies between 31 and 74 MHz ($13' \times 11'$ to $5'.4 \times 4'.7$), plus review of flux densities.
 Braun & Strom 1986, A&A, 164, 193. WSRT at 327 MHz ($72'' \times 185''$) and 1.4 GHz ($17'' \times 43''$), plus H α and IRAS.
 Green 1986, MNRAS, 221, 473. CLFST at 151 MHz ($1'.2 \times 3'.1$) and Half-Mile Telescope at 1.4 GHz ($2'.1 \times 5'.4$).
 Mufson *et al.* 1986, AJ, 92, 1349. Radio, IR, optical, UV and X-ray comparison, including VLA at 1.6 GHz ($3''.8 \times 3''.3$ and $40''$).
 Brown *et al.* 1988, ApJ, 334, 852. [Fex] optical imaging.
 Dickel *et al.* 1989, AJ, 98, 1363. VLA at 1.4 GHz ($1''.1 \times 1''.2$) of NE.
 Petre *et al.* 1988, ApJ, 335, 215. Einstein and other X-ray observations.
 Burton *et al.* 1990, ApJ, 355, 197. IR observations of shocked O $_2$.
 Sauvageot *et al.* 1990, A&A, 232, 203. [Fex] and [FexIV] imaging.
 Moorhouse *et al.* 1991, MNRAS, 253, 662. Observations of shocked molecular H $_2$.
 Wood *et al.* 1991, AJ, 102, 224. VLA at 5 GHz ($3''.6 \times 3''.8$) of northeast, including polarization.
 Teske 1991, ApJ, 383, 233. [Fex] and [FexIV] imaging.
 Wang & Scoville 1992, ApJ, 386, 158. Observations of shocked molecular species.
 Wang *et al.* 1992, PASJ, 44, 303. Ginga X-ray observations.
 Turner *et al.* 1992, ApJ, 399, 114. Observations of shocked molecular species.
 Dickman *et al.* 1992, ApJ, 400, 203. Observations of shocked molecular species.
 Inoue *et al.* 1993, PASJ, 45, 539. Observations of shocked molecular H $_2$.
 van Dishoeck *et al.* 1993, A&A, 279, 541. Observations of shocked molecular species.
 Asaoka & Aschenbach 1994, A&A, 284, 573. X-ray, including possible overlapping remnant.
 Tauber *et al.* 1994, ApJ, 421, 570. Observations of shocked molecular species.
 Richter *et al.* 1995, ApJ, 454, 277. Observations of shocked molecular H $_2$.
 Esposito *et al.* 1996, ApJ, 461, 820. Associated γ -ray emission.
 Frail *et al.* 1996, AJ, 111, 1651. OH maser emission.
 Keohane *et al.* 1997, ApJ, 484, 350. ASCA observations.
 Claussen *et al.* 1997, ApJ, 489, 143. VLA of associated OH masers.
 Claussen *et al.* 1997, ApJ, 522, 349. High resolution observations of OH masers.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.
 Seta *et al.* 1998, ApJ, 505, 286. CO observations of surroundings.
 Oliva *et al.* 1999, A&A, 341, L75. ISO observations.
 Cesarsky *et al.* 1999, A&A, 348, 945. ISO observations of shocked molecular H $_2$.
 Bocchino & Bykov 2000, A&A, 362, L29. BeppoSAX observations.
 Rho *et al.* 2001, ApJ, 547, 885. ISAO and 2Mass IR spectroscopy and imaging.
 Olbert *et al.* 2001, ApJ, 554, L205. Chandra of compact X-ray source and surrounding nebula.
 Bocchino & Bykov 2001, A&A, 376, 248. XMM-Newton of compact X-ray source and surrounding nebula.
 Roberts *et al.* 2001, ApJS, 133, 451. ASCA observations.
 Kawasaki *et al.* 2002, ApJ, 572, 897. ASCA observations.
 Bocchino & Bykov 2003, A&A, 400, 203. XMM-Newton 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.

G192.8–1.1

RA: 06^h09^m20^s
Dec: +17°20′

1-GHz flux/Jy: 20?
Spectral index: 0.6?

PKS 0607+17

Size/arcmin: 78
Type: S

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

Radio: In complex region.

Optical: Encompasses S261 and S254–258.

References:

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

G205.5+0.5

RA: 06^h39^m00^s
Dec: +06°30′

1-GHz flux/Jy: 160
Spectral index: 0.5

Monoceros Nebula

Size/arcmin: 220
Type: S

Radio: In complex region, parts may be HII regions.

Optical: Large ring, near Rosette nebula.

X-ray: Possibly detected.

Distance: Mean optical velocity suggests 0.8 kpc, low frequency radio absorption suggests 1.6 kpc.

References:

Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz ($9′$).
 Velusamy & Kundu 1974, A&A, 32, 375. NRAO 300-ft at 2.7 GHz ($5′$), part only.
 Dickel & DeNoyer 1975, AJ, 80, 437. Arecibo at 111 MHz ($1′ : S = 462 \pm 180$ Jy) and $S_{610 \text{ MHz}} = 245$ Jy.
 Davies *et al.* 1978, A&AS, 31, 271. Deep optical plates.
 Lozinskaya 1981, SvAL, 7, 17. Mean optical velocity.
 Graham *et al.* 1982, A&A, 109, 145. Effelsberg 100-m at 2.7 GHz ($4′.4 : S = 97.6 \pm 12.5$ Jy), plus review of flux densities.
 Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.
 Leahy *et al.* 1986, MNRAS, 220, 501. Einstein observations.
 Odegard 1986, ApJ, 301, 813. TPT at 20.6, 25.6 and 30.9 MHz ($24′, 19′$ and $16′$).
 Esposito *et al.* 1996, ApJ, 461, 820. Possible associated γ -ray emission.
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.
 Oliver *et al.* 1996, A&A, 315, 578. CO observations of some of surroundings.
 Jaffe *et al.* 1997, ApJ, 484, L129. γ -ray detection.

G206.9+2.3

RA: 06^h48^m40^s
Dec: +06°26′

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

PKS 0646+06

Size/arcmin: 60 × 40
Type: S?

Radio: Diffuse source near the Monoceros Nebula.

Optical: Filaments detected.

X-ray: Possibly detected.

References:

Davies & Meaburn 1978, A&A, 69, 443. Optical.
 Nousek *et al.* 1981, ApJ, 248, 152. HEAO-1 X-ray limit.
 Graham *et al.* 1982, A&A, 109, 145. Effelsberg 100-m at 2.7 GHz ($4′.4 : S = 4.1 \pm 0.6$ Jy), plus review of flux densities.
 Rosado 1982, RMxAA, 5, 127. Optical.
 Fesen *et al.* 1985, ApJ, 292, 29. Optical spectra.
 Leahy *et al.* 1986, MNRAS, 220, 501. Einstein observations.
 Odegard 1986, ApJ, 301, 813. TPT at 20.6, 25.6 and 30.9 MHz ($24′, 19′$ and $16′$).
 Biggs & Lyne 1996, MNRAS, 282, 691. Pulsar search.

G260.4–3.4

RA: 08^h22^m10^s
Dec: –43°00′

1-GHz flux/Jy: 130
Spectral index: 0.5

Puppis A, MSH 08–44

Size/arcmin: 60 × 50
Type: S

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

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

Optical: Nebulosity and wisps.

X-ray: Brightest to the E.

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

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

References:

- Green 1971, AuJPh, 24, 773. Molonglo at 408 MHz ($3' : S = 198 \pm 20$ Jy).
 Goudis & Meaburn 1978, A&A, 62, 283. H α +NII optical image.
 Winkler *et al.* 1981, ApJ, 245, 574. X-ray spectroscopy of O lines.
 Winkler *et al.* 1981, ApJ, 245, L27. X-ray spectrum.
 Petre *et al.* 1982, ApJ, 258, 22. Einstein observations.
 Milne *et al.* 1983, MNRAS, 204, 237. FIRST at 1415 MHz ($50''$), large scale emission missing.
 Teske & Petre 1987, ApJ, 318, 370. Coronal optical line emission.
 Dubner & Arnal 1988, A&AS, 75, 363. HI and CO observations of surroundings.
 Arendt *et al.* 1990, ApJ, 350, 266. MOST at 843 MHz ($44'' \times 65''$), with large scale emission added, plus IR, optical and X-ray observations.
 Dubner *et al.* 1991, AJ, 101, 1466. VLA at 327 MHz ($43'' \times 73''$) and 1.5 GHz ($43'' \times 77''$).
 Arendt *et al.* 1991, ApJ, 368, 474. IR observations.
 Milne *et al.* 1993, MNRAS, 261, 366. Parkes 64-m at 4.75 ($4'.5 : S = 59 \pm 5$ Jy) and 8.4 GHz ($3' : S = 38 \pm 4$ Jy), plus polarization.
 Berthiaume *et al.* 1994, ApJ, 425, 132. X-ray spectroscopy.
 Sutherland & Dopita 1995, ApJ, 439, 365. Spectrophotometry.
 Reynoso *et al.* 1995, AJ, 110, 318. VLA at 1.4 GHz ($90''$) including neutral hydrogen.
 Blair *et al.* 1995, ApJ, 454, L35. Far UV spectroscopy.
 Petre *et al.* 1996, ApJ, 465, L43. ROSAT of central source.
 Bock *et al.* 1998, AJ, 116, 1886. MOST at 843 MHz ($43'' \times 60''$).
 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.

G261.9+5.5

RA: 09^h04^m20^s
Dec: –38°42′

1-GHz flux/Jy: 10?
Spectral index: 0.4?

Size/arcmin: 40 × 30
Type: S

Radio: Faint shell with little limb brightening.

References:

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

G263.9–3.3

RA: 08^h34^m00^s
Dec: –45°50′

1-GHz flux/Jy: 1750
Spectral index: varies

Vela (XYZ)

Size/arcmin: 255
Type: C

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

Radio: Large shell, with flatter spectrum component (Vela X), and pulsar nebula.

Optical: Filaments.

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

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

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

References:

- Milne 1968, AuJPh, 21, 201. Parkes 64-m at various frequencies, including 408 MHz (48′ : $S = 2300 \pm 300$ Jy), 635 MHz (31′ : $S = 2360 \pm 300$ Jy), 1410 MHz (14′ : $S = 1640 \pm 300$ Jy) and 2650 MHz (7′.5 : $S = 1400 \pm 250$ Jy), plus discussion of the distance.
- van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.
- Dopita *et al.* 1977, ApJ, 214, 179. Optical spectroscopy.
- Hearn *et al.* 1980, ApJ, 235, L67. X-ray map.
- Milne 1980, A&A, 81, 293. Maps of Vela X with Parkes 64-m at 1.66, 2.7 and 5 GHz (12′, 8′.4 and 4′.4).
- Weiler & Panagia 1980, A&A, 90, 269. Clarify notation of this region and review previous observations.
- Kahn *et al.* 1985, ApJ, 299, 821. Einstein observations.
- Harnden *et al.* 1985, ApJ, 299, 828. Einstein observations of Vela X and pulsar.
- 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.
- Raymond *et al.* 1991, ApJ, 383, 226. UV spectroscopy.
- Willmore *et al.* 1992, MNRAS, 254, 139. Hard X-ray observations.
- Dubner *et al.* 1992, A&AS, 96, 505. Argentine 30-m at 1.4 GHz (30′) of surrounding HI.
- Oberlack *et al.* 1994, ApJS, 92, 433. γ -ray observations.
- Bocchino *et al.* 1994, ApJ, 437, 209. ROSAT observations of NE.
- Aschenbach *et al.* 1995, Natur, 373, 587. ROSAT of X-ray extensions.
- Strom *et al.* 1995, Natur, 373, 590. Radio of X-ray extensions.
- Markwardt & Ögelman 1995, Natur, 375, 40. X-ray jet from pulsar.
- Jenkins & Wallerstein 1995, ApJ, 440, 227. Optical absorption of associated neutral carbon cloud.
- Milne 1995, MNRAS, 277, 1435. Parkes 64-m at 8.4 GHz (3′), including polarization, of Vela X.
- 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).
- de Jager *et al.* 1996, ApJ, 460, 729. γ -ray detection.
- 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.
- Plucinsky *et al.* 2002, in NSSR, p407. Chandra observations of E edge.
- 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.

G266.2–1.2

RA: 08^h52^m00^s
Dec: –46°20′

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

Size/arcmin: 120
Type: S

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

Radio: Incomplete shell, confused by the Vela SNR.

Optical: Nebulosity offset to NE.

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

Point sources: Central X-ray source, with optical nebula.

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

References:

Aschenbach 1998, *Natur*, 396, 141. ROSAT identification.
 Iyudin *et al.* 1998, *Natur*, 396, 142. 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 nearby 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.

G272.2–3.2

RA: 09^h06^m50^s
Dec: –52°07′

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

Size/arcmin: 15?
Type: S?

Radio: Diffuse shell.

X-ray: Centrally brightened.

Optical: Detected.

References:

Greiner *et al.* 1994, *A&A*, 286, L35. ROSAT observations, plus optical.
 Duncan *et al.* 1997, *MNRAS*, 289, 97. Parkes 64-m at 1.4 GHz (18′ : $S = 0.38 \pm 0.09$ Jy) 2.4 GHz (10′.6 : $S = 0.25 \pm 0.04$ Jy) and 4.8 GHz (5′.7 : $S = 0.17 \pm 0.02$ Jy), MOST at 843 MHz (45′ × 70′ : $S = 0.45 \pm 0.10$ Jy), and ATCA at 2.4 GHz (37′ × 52′), plus ROSAT observations.
 Harrus *et al.* 2001, *ApJ*, 552, 614. ASCA and ROSAT observations, plus review of earlier observations.

G279.0+1.1

RA: 09^h57^m40^s
Dec: –53°15′

1-GHz flux/Jy: 30?
Spectral index: 0.6?

Size/arcmin: 95
Type: S

Radio: Faint, incomplete shell.

Point sources: Pulsar nearby.

References:

Woermann & Jonas 1988, *MNRAS*, 234, 971. Hartesbeesthoek 26-m at 1.6 (30′ : $S = 25.2 \pm 4$ Jy) and 2.3 GHz (20′ : $S = 20.7 \pm 3$ Jy).
 Duncan *et al.* 1995, *MNRAS*, 277, 319. Parkes 64-m at 1.4 (18′ : $S = 28 \pm 3$ Jy) and 2.4 GHz (11′ : $S = 20 \pm 2$ Jy), including polarization.
 Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43′ × 53′) of part.
 Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m OH observations.

G284.3–1.8

RA: 10^h18^m15^s
Dec: –59°00′

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

MSH 10–53

Size/arcmin: 24?
Type: S

Has been called G284.2–1.8.

Radio: Incomplete, poorly defined shell.

Point sources: Pulsar nearby.

References:

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

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

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

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

G286.5–1.2

RA: 10^h35^m40^s
Dec: –59°42′

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

Size/arcmin: 26 × 6
Type: S?

Radio: Double, elongated arc.

References:

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

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

G289.7–0.3

RA: 11^h01^m15^s
Dec: –60°18′

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

Size/arcmin: 18 × 14
Type: S

Radio: Incomplete shell.

Point sources: Compact radio source near centre.

References:

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

G290.1–0.8

RA: 11^h03^m05^s
Dec: –60°56′

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

MSH 11–61A

Size/arcmin: 19 × 14
Type: S

Radio: Elongated, clumpy shell.

Optical: Filaments detected.

X-ray: Centrally brightened.

Point sources: Pulsar nearby.

References:

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

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

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

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

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

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

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

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

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

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

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

Slane *et al.* 2002, ApJ, 564, 284. ASCA observations.

G291.0–0.1

(MSH 11–62)

RA: 11^h11^m54^s
Dec: –60°38′**1-GHz flux/Jy:** 16
Spectral index: 0.29**Size/arcmin:** 15 × 13
Type: C**Radio:** Centrally brightened core, with surrounding arcs.**X-ray:** Centrally brightened.**Point sources:** Central compact X-ray source.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Roger *et al.* 1986, MNRAS, 219, 815. MOST at 843 MHz (43″ × 50″ : $S = 17.2 \pm 1.0$ Jy), and Parkes 64-m at 5 and 8.4 GHz (4′.6 and 3′ : $S = 10.4 \pm 0.4$ Jy and 9′.1 ± 0.2), with polarization.
 Wilson 1986, ApJ, 302, 718. Einstein observations.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ : $S = 12.7$ Jy).
 Harrus *et al.* 1998, ApJ, 499, 273. ASCA observations.

G292.0+1.8

MSH 11–54

RA: 11^h24^m36^s
Dec: –59°16′**1-GHz flux/Jy:** 15
Spectral index: 0.4**Size/arcmin:** 12 × 8
Type: C**Radio:** Centrally brightened source surrounded by a plateau of faint emission.**Optical:** Oxygen rich.**X-ray:** Ring of emission, with diffuse central nebula and pulsar.**Point sources:** Central pulsar.**Distance:** HI absorption implies 6.2 ± 0.9 kpc.**References:**

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Goss *et al.* 1979, MNRAS, 188, 357. Optical spectra.
 Lockhart *et al.* 1977, MNRAS, 179, 147. Fleurs at 1415 MHz (50″ : $S = 13.0$ Jy).
 Clark *et al.* 1980, MNRAS, 193, 129. X-ray spectrum.
 Tuohy *et al.* 1982, ApJ, 260, L65. Einstein observations.
 Dopita & Tuohy 1984, ApJ, 282, 135. Optical spectra.
 Braun *et al.* 1986, A&A, 162, 259. MOST at 843 MHz (0′.8) and IRAS.
 Hughes & Singh 1994, ApJ, 422, 126. EXOSAT spectrum.
 Sutherland & Dopita 1995, ApJ, 439, 365. Spectrophotometry.
 Hughes *et al.* 2001, ApJ, 559, L153. Chandra observations, including central nebula.
 Camilo *et al.* 2002, ApJ, 567, L71. Pulsar detection.
 Park *et al.* 2002, ApJ, 564, L39. Chandra observations.
 Gonzalez & Safi-Harb 2003, ApJ, 583, L91. Chandra observations.
 Hughes *et al.* 2003, ApJ, 591, L139. Chandra observations of pulsar.
 Gaensler & Wallace 2003, ApJ, 594, 326. ATCA at 1.4, 2.3 and 5.2 GHz (9″.6 × 8″.0, 7″.2 × 6″.2 and 5″.5 × 4″.8 : $S = 11.9 \pm 0.1, 11.4 \pm 0.1$ and 8.8 ± 0.1), plus HI observations.

G292.2–0.5**RA:** 11^h19^m20^s
Dec: –61°28′**1-GHz flux/Jy:** ??
Spectral index: 0.6?**Size/arcmin:** 20 × 15
Type: S**Radio:** Shell.**X-ray:** Detected.**Point sources:** Central, young pulsar.**References:**

Camilo *et al.* 2000, ApJ, 541, 367. Pulsar detection.
 Crawford *et al.* 2001, ApJ, 554, 152. ATCA at 1.4 GHz (29″ × 25″ : $S = 5.6 \times 0.3$ Jy) and 2.5 GHz (21″ × 20″).
 Pivovarov *et al.* 2001, ApJ, 554, 161. ROSAT and ASCA observations.
 Gonzalez & Safi-Harb 2003, ApJ, 591, L143. Chandra observations of pulsar.

G293.8+0.6

RA: 11^h35^m00^s
Dec: –60°54′

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

Size/arcmin: 20
Type: C

Radio: Central source, with faint extended plateau.

References:

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

G294.1–0.0

RA: 11^h36^m10^s
Dec: –61°38′

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

Size/arcmin: 40
Type: S

Radio: Faint shell.

References:

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

G296.1–0.5

RA: 11^h51^m10^s
Dec: –62°34′

1-GHz flux/Jy: 8?
Spectral index: 0.6?

Size/arcmin: 37 × 25
Type: S

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

Radio: Irregular shell, with nearby HII regions.

Optical: Detected.

X-ray: Detected.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : $S=6.9$ Jy) and Parkes 64-m at 5 GHz (4′ : $S > 0.74$) poor 5-GHz map (of G296.1–0.7).
 Longmore *et al.* 1977, MNRAS, 181, 541. Optical spectra.
 van den Bergh 1978, ApJS, 38, 119. Optical.
 Markert *et al.* 1981, ApJ, 248, L17. Einstein observations.
 Caswell & Barnes 1983, ApJ, 271, L55. Molonglo at 408 MHz (3′ : $S=12.4$ Jy).
 Bignami *et al.* 1986, ApJ, 302, 606. EXOSAT and Einstein observations.
 Hwang & Markert 1994, ApJ, 431, 819. ROSAT observations.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : $S > 2.4$).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G296.5+10.0

RA: 12^h09^m40^s
Dec: –52°25′

1-GHz flux/Jy: 48
Spectral index: 0.5

PKS 1209–51/52

Size/arcmin: 90 × 65
Type: S

Has been called G296.5+9.7.

Radio: Shell with two bright limbs.

Optical: Detected.

X-ray: Incomplete shell, with central pulsar.

Point sources: Central pulsar.

References:

Irvine & Irvine 1974, ApJ, 192, L111. Optical.
 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 H_I.
 Kellett *et al.* 1987, MNRAS, 225, 199. EXOSAT of the west of the remnant, including the compact source.
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 56″).
 Matsui *et al.* 1988, ApJ, 329, 838. Einstein observations, including compact source.
 Roger *et al.* 1988, ApJ, 332, 940. MOST at 843 MHz (44″ × 56″).
 Bignami *et al.* 1992, ApJ, 389, L67. Optical in vicinity of X-ray source.
 Milne & Haynes 1994, MNRAS, 270, 106. Parkes 64-m at 2.4 GHz (8′.3 : S = 33 ± 3 Jy), 4.8 GHz (4′.5 : S = 23.3 ± 3 Jy) and 8.4 GHz (3′.0 : 18.8 ± 3), including polarization and review of flux densities.
 Mereghetti *et al.* 1996, ApJ, 464, 842. Radio, optical and X-ray observations of central source.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.
 Vasisht *et al.* 1997, ApJ, 476, L43. ASCA observations of neutron star.
 Zavlin *et al.* 1998, A&A, 331, 821. ROSAT and ASCA observations of neutron star.
 Giacani *et al.* 2000, AJ, 119, 281. ATCA at 1.4 GHz (2′.7 × 4′.0) for H_I studies.
 Zavlin *et al.* 2000, ApJ, 540, L25. Chandra observations of central pulsar.

G296.8–0.3

RA: 11^h58^m30^s
Dec: –62°35′

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

1156–62

Size/arcmin: 20 × 14
Type: S

Radio: Shell, brighter to the NW.

Distance: H_I absorption gives 9.6 ± 0.6 kpc.

X-ray: Detected.

References:

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

G298.5–0.3

RA: 12^h12^m40^s
Dec: –62°52′

1-GHz flux/Jy: 5?
Spectral index: 0.4?

Size/arcmin: 5?
Type: ?

Radio: Not well resolved, may be part of a larger ring?

References:

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

G298.6–0.0

RA: 12^h13^m41^s
Dec: –62°37′

1-GHz flux/Jy: 5?
Spectral index: 0.3

Size/arcmin: 12 × 9
Type: S

Has been called G298.6–0.1.

Radio: Incomplete shell, in complex region.

References:

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

G299.2–2.9

RA: 12^h15^m13^s
Dec: –65°30′

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

Size/arcmin: 18 × 11
Type: S

Radio: Faint source.

X-ray: Centrally brightened.

Optical: Filaments in W.

References:

Busser *et al.* 1996, A&A, 310, L1. ROSAT detection, plus optical studies.
 Slane *et al.* 1996, ApJ, 465, 840. Einstein, IRAS and radio observations.
 Bai & Wang 2000, ApJ, 539, 760. ASCA observations.

G299.6–0.5

RA: 12^h21^m45^s
Dec: –63°09′

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

Size/arcmin: 13
Type: S

Radio: Faint shell, brightest to E.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=1.1 Jy).

G301.4–1.0

RA: 12^h37^m55^s
Dec: –63°49′

1-GHz flux/Jy: 2.1?
Spectral index: ?

Size/arcmin: 37 × 23
Type: S

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

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=2.3 Jy).

G302.3+0.7

RA: 12^h45^m55^s
Dec: –62°08′

1-GHz flux/Jy: 5?
Spectral index: 0.4?

Size/arcmin: 17
Type: S

Radio: Distorted shell, in complex region, with possibly associated filament.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=7.5 Jy) and Parkes 64-m at 5 GHz (4′ : S=3.0 Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ : S=3.2 Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

G304.6+0.1

Kes 17

RA: 13^h05^m59^s
Dec: –62°42′

1-GHz flux/Jy: 14
Spectral index: 0.5

Size/arcmin: 8
Type: S

Radio: Incomplete shell.

Distance: Possible limit of > 9.7 kpc from HI absorption.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 : S=6.9 Jy).
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=18 Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

G308.1–0.7

RA: 13^h37^m37^s
Dec: –63°04′

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

Size/arcmin: 13
Type: S

Radio: Faint shell.

References:

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

G308.8–0.1

RA: 13^h42^m30^s
Dec: –62°23′

1-GHz flux/Jy: 15?
Spectral index: 0.4?

Size/arcmin: 30 × 20?
Type: C?

Incorporates previous catalogued remnant G308.7+0.0.

Radio: Bright ridge in north, and arc to south.

Point sources: Pulsar near centre of remnant.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=16.7 Jy) and Parkes 64-m at 5 GHz (4′ : S=7.0 Jy).
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 : S=6.5 Jy).
 Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz (50″).
 Wilson 1986, ApJ, 302, 718. Lack of detection with Einstein.
 Caswell *et al.* 1992, ApJ, 399, L151. MOST at 843 MHz (43″ × 49″).
 Kaspi *et al.* 1992, ApJ, 399, L155. Pulsar observations.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G309.2–0.6

RA: 13^h46^m31^s
Dec: –62°54′

1-GHz flux/Jy: 7?
Spectral index: 0.4?

Size/arcmin: 15 × 12
Type: S

Has been called G309.2–0.7.

Radio: Distorted shell.

X-ray: Extended emission, with central source.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=10.0 Jy) and Parkes 64-m at 5 GHz (4′ : S=3.9 Jy).
 Caswell *et al.* 1981, MNRAS, 195, 89. FIRST at 1415 MHz (1′.5).
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 50″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 48″ : S=6 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Gaensler *et al.* 1998, MNRAS, 299, 812. ATCA at 1.3 GHz (24″ × 23″ : S=5.2 ± 0.2 Jy).
 Rakowski *et al.* 2001, ApJ, 548, 258. ASCA and ROSAT observations.

G309.8+0.0

RA: 13^h50^m30^s
Dec: –62°05′

1-GHz flux/Jy: 17
Spectral index: 0.5

Size/arcmin: 25 × 19
Type: S

Radio: Distorted shell.

Point sources: Steep radio spectrum source near the centre of the remnant.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : $S=26.4$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=7.4$ Jy).
 Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz (1′).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ : $S > 8.8$).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G310.6–0.3

RA: 13^h58^m00^s
Dec: –62°09′

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

Kes 20B
Size/arcmin: 8
Type: S

Radio: Asymmetric shell.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ : $S=5.4$ Jy).

G310.8–0.4

RA: 14^h00^m00^s
Dec: –62°17′

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

Kes 20A
Size/arcmin: 12
Type: S

Radio: Arc in E, in complex region.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ : $S=6.9$ Jy).

G311.5–0.3

RA: 14^h05^m38^s
Dec: –61°58′

1-GHz flux/Jy: 3?
Spectral index: 0.5

Size/arcmin: 5
Type: S

Radio: Shell, not well resolved.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Caswell & Barnes 1985, MNRAS, 216, 753. Molonglo at 408 MHz (3′).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 49″ : $S=2.9$ Jy).

G312.4–0.4**RA:** 14^h13^m00^s**Dec:** –61°44′**1-GHz flux/Jy:** 45**Spectral index:** 0.36**Size/arcmin:** 38**Type:** S**Radio:** Irregular, incomplete shell.**Point sources:** Nearby γ -ray sources and pulsars.**X-ray:** Weak emission in W.**Distance:** HI absorption suggests > 6 kpc and possibly > 14 kpc.**References:**Caswell & Barnes 1985, MNRAS, 216, 753. Molonglo at 408 MHz ($3' : S=56$ Jy).Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 49'' : S > 19$), plus Parkes 64-m at 4.5 GHz ($S=30 \pm 2$ Jy) and 8.55 GHz ($S=17 \pm 4$ Jy).Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.Case & Bhattacharya 1998, ApJ, 521, 246. Nearby γ -ray sources.Roberts *et al.* 1999, ApJ, 515, 712. MOST at 843 MHz ($43'' \times 49''$).Doherty *et al.* 2003, MNRAS, 339, 1048. ATCA at 1.4 GHz ($25''$) plus HI absorption, and Chandra observations.**G312.5–3.0****RA:** 14^h21^m00^s**Dec:** –64°12′**1-GHz flux/Jy:** 3.5?**Spectral index:** ?**Size/arcmin:** 18 \times 20**Type:** S**Radio:** Distorted shell.**References:**Kane & Vaughan 2003, MNRAS, 344, 625. ATCA at 1.4 GHz ($129'' \times 116''$) and 2.4 GHz ($75'' \times 67''$).

G315.4–2.3

RA: 14^h43^m00^s
Dec: –62°30′

1-GHz flux/Jy: 49
Spectral index: 0.6

RCW 86, MSH 14–63

Size/arcmin: 42
Type: S

Possibly the remnant of the SN of AD185?

Radio: Shell, brightest to the SW.

Optical: Bright, radiative filaments, with some faint Balmer dominated filaments.

X-ray: Partial shell, with thermal and non-thermal emission.

Point sources: Several X-ray sources.

Distance: Possible association with OB stars suggests 2.5 kpc.

References:

van den Bergh *et al.* 1973, ApJS, 26, 19. Optical.
 Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : S = 86 Jy) and Parkes 64-m at 5 GHz (4′ : S = 18.2 Jy).
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
 Winkler 1978, ApJ, 221, 220. X-ray detection.
 Leibowitz & Danziger 1983, MNRAS, 204, 273. Optical spectra.
 Pisarski *et al.* 1984, ApJ, 277, 710. Einstein observations
 Nugent *et al.* 1984, ApJ, 284, 612. X-ray spectrum.
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 50″).
 Long & Blair 1990, ApJ, 358, L13. Balmer dominated optical filaments.
 Greidanus & Strom 1990, A&A, 240, 385. IRAS observations.
 Kaastra *et al.* 1992, A&A, 264, 654. Ginga X-ray spectra.
 Strom 1994, MNRAS, 268, L5. Historical association
 Chin & Huang 1994, Natur, 371, 398. Questioning of historical association.
 Schaefer 1995, AJ, 110, 1793. Questioning of historical association.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 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.
 Vink *et al.* 2002, in NSSR, p271. XMM-Newton observations.
 Gvaramadze & Vikhlinin 2003, A&A, 401, 625. Chandra point source search.
 Sollerman *et al.* 2003, A&A, 407, 249. Optical spectroscopy.

G315.4–0.3

RA: 14^h35^m55^s
Dec: –60°36′

1-GHz flux/Jy: 8
Spectral index: 0.4

Size/arcmin: 24 × 13
Type: ?

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

References:

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

G315.9–0.0

RA: 14^h38^m25^s
Dec: –60°11′

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

Size/arcmin: 25 × 14
Type: S

Has been called G315.8–0.0.

Radio: Faint, distorted shell, with steep-spectrum ‘jet’?

References:

Kesteven *et al.* 1987, AuJPh, 40, 855. MOST at 843 MHz (44″ × 50″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S=0.9 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m and ATCA OH observations.

G316.3–0.0

RA: 14^h41^m30^s
Dec: –60°00′

1-GHz flux/Jy: 20?
Spectral index: 0.4

(MSH 14–57)
Size/arcmin: 29 × 14
Type: S

Radio: Distorted shell, with possible ‘blowout’.

X-ray: Detected.

Distance: HI absorption data suggests > 7.2 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4 : S=16.7 Jy).
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 51″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S=20 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

G317.3–0.2

RA: 14^h49^m40^s
Dec: –59°46′

1-GHz flux/Jy: 4.7?
Spectral index: ?

Size/arcmin: 11
Type: S

Radio: Incomplete shell.

References:

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

G318.2+0.1

RA: 14^h54^m50^s
Dec: –59°04′

1-GHz flux/Jy: >3.9?
Spectral index: ?

Size/arcmin: 40 × 35
Type: S

Radio: Faint shell, with central HII region.

X-ray: Sources within remnant.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S>4.3).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Bocchino *et al.* 2001, A&A, 367, 629. BeppoSAX and ROSAT observations.

G318.9+0.4

RA: 14^h58^m30^s
Dec: –58°29′

1-GHz flux/Jy: 4?
Spectral index: 0.2?

Size/arcmin: 30 × 14
Type: C

May not be a SNR?

Radio: Complex arcs, with off-centre core.

References:

Whiteoak 1990, *Natur*, 347, 157. MOST at 843 MHz (43'' × 51'').
 Whiteoak 1993, *ApJ*, 415, 701. MOST at 843 MHz (43'' × 51'' : $S = 4.8 \pm 0.6$ Jy), Parkes 64-m at 4.5 GHz (4'.7 : $S = 3.7 \pm 0.2$ Jy) and 8.4 GHz (2'.8 : $S = 3.0 \pm 0.4$ Jy) including polarization, and ATCA at 1.4 GHz and 4.8 GHz (11'' × 13'') of core.
 Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43'' × 50'' : $S = 4.8$ Jy).
 Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m OH observations.

G320.4–1.2

RA: 15^h14^m30^s
Dec: –59°08′

1-GHz flux/Jy: 60?
Spectral index: 0.4

MSH 15–52, RCW 89

Size/arcmin: 35
Type: C

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

Radio: Ragged shell.

Optical: RCW 89 is the H α emitting region to the NW.

X-ray: Partial shell, central nebula and pulsar and possible ‘jet’.

Point sources: Radio and X-ray pulsar, with wind nebula.

Distance: HI absorption indicates 5.2 kpc.

References:

Caswell *et al.* 1975, *A&A*, 45, 239. Parkes HI absorption.
 Dickel & Milne 1976, *AuPh*, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8'.4) and 5 GHz (4'.4).
 Dopita *et al.* 1977, *ApJ*, 214, 179. Optical spectra.
 Caswell *et al.* 1981, *MNRAS*, 195, 89. FIRST at 1415 MHz (50'').
 Seward & Harnden 1982, *ApJ*, 256, L45. X-ray of pulsar.
 Manchester *et al.* 1982, *ApJ*, 262, L31. Radio of pulsar.
 Seward *et al.* 1983, *ApJ*, 267, 698. X-ray, Optical and IR.
 van den Bergh & Kamper, 1984, *ApJ*, 280, L51. Optical expansion.
 Seward *et al.* 1984, *ApJ*, 281, 650. X-ray observations of pulsar and nebulosity.
 Lortet *et al.* 1987, *A&A*, 180, 65. Optical observations.
 Trussoni *et al.* 1990, *A&A*, 234, 403. EXOSAT observations.
 Asaoka & Koyama 1990, *PASJ*, 42, 625. Ginga X-ray spectrum.
 Arendt 1991, *AJ*, 101, 2160. IRAS observations, including compact source.
 Milne *et al.* 1993, *MNRAS*, 264, 853. Parkes 64-m at 4.8 GHz (4'.5 : $S = 37 \pm 7$ Jy) and 8.4 GHz (3'.0 : $S = 24 \pm 4$ Jy), including polarization and review of flux densities.
 Strom 1994, *MNRAS*, 268, L5. Historical association.
 Chin & Huang 1994, *Natur*, 371, 398. Questioning of historical association.
 Matz *et al.* 1994, *ApJ*, 434, 288. X-ray observations of pulsar.
 Schaefer 1995, *AJ*, 110, 1793. Questioning of historical association.
 Du Plessis *et al.* 1995, *ApJ*, 453, 746. Hartesbeesthoek 26-m at 2.3, 5 and 8.5 GHz ($S = 42, 35.6, 14.5$ Jy).
 Greiveldinger *et al.* 1995, *ApJ*, 454, 855. ROSAT observations.
 Trussoni *et al.* 1996, *A&A*, 306, 581. ROSAT observations.
 Tamura *et al.* 1996, *PASJ*, 48, L33. ASCA observations.
 Whiteoak & Green 1996, *A&AS*, 118, 329. MOST at 843 MHz (43'' × 50'' : $S = 62$ Jy).
 Green *et al.* 1997, *AJ*, 114, 2058. Parkes 64-m OH observations.
 Marsden *et al.* 1997, *ApJ*, 491, L39. X-ray spectroscopy.
 Brazier & Becker 1997, *MNRAS*, 284, 335. ROSAT observations.
 Gaensler *et al.* 1999, *MNRAS*, 305, 724. ATCA at 1.4 GHz (24'' × 21''), plus HI observations, and 5.3 GHz (15'' × 10'').
 Sako *et al.* 2000, *ApJ*, 537, 422. Possible high energy γ -ray detection of pulsar.
 Mineo *et al.* 2001, *A&A*, 380, 695. BeppoSAX observations.
 Gaensler *et al.* 2002, *ApJ*, 569, 878. Chandra observations of pulsar and nebula.
 Dubner *et al.* 2002, *AJ*, 123, 337. ATCA at 1.4 GHz (4'.0 × 2'.7), plus HI observations.

G320.6–1.6

RA: 15^h17^m50^s
Dec: –59°16′

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

Size/arcmin: 60 × 30
Type: S

Radio: Faint shell, overlapping G320.4–1.2 in W.

References:

Milne *et al.* 1993, MNRAS, 264, 853. Parkes 64-m at 4.8 GHz (4′.5) and 8.4 GHz (3′.0), including polarization.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 50″ : S > 9.3).

G321.9–1.1

RA: 15^h23^m45^s
Dec: –58°13′

1-GHz flux/Jy: >3.4?
Spectral index: ?

Size/arcmin: 28
Type: S

Radio: Faint shell.

References:

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

G321.9–0.3

RA: 15^h20^m40^s
Dec: –57°34′

1-GHz flux/Jy: 13
Spectral index: 0.3

Size/arcmin: 31 × 23
Type: S

Radio: Shell brighter to the W, with Cir X-1 to N.

Point sources: Compact, probably thermal source at S edge.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 18.3 Jy) and Parkes 64-m at 5 GHz (4′ : S = 7.8 Jy).
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 52″).
 Stewart *et al.* 1993, MNRAS, 261, 593. ATCA at 1.5 GHz (21″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 51″ : S > 8.3).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Mignami *et al.* 2002, A&A, 386, 487. HST proper motion study of Cir X-1.

G322.5–0.1

RA: 15^h23^m23^s
Dec: –57°06′

1-GHz flux/Jy: 1.5
Spectral index: 0.4

Size/arcmin: 15
Type: C

Radio: Shell with central extended source.

Point sources: PN Pe 2-8 within boundary.

References:

Whiteoak 1992, MNRAS, 256, 121. MOST at 843 MHz (43″ × 51″ : S = 2.0 ± 0.3 Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 51″ : S = 1.7 Jy), plus Parks 64-m at 4.5 GHz (= 0.89 ± 0.13).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G323.5+0.1

RA: 15^h28^m42^s
Dec: –56°21′

1-GHz flux/Jy: 3?
Spectral index: 0.4?

Size/arcmin: 13
Type: S

Radio: Distorted shell, confused with thermal emission.

Point sources: Compact, probably thermal source near centre.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 4.2 Jy) and Parkes 64-m at 5 GHz (4′ : S = 1.5 Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 52″ : S = 4.2 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G326.3–1.8**RA:** 15^h53^m00^s**Dec:** –56°10′**1-GHz flux/Jy:** 145
Spectral index: varies

MSH 15–56

Size/arcmin: 38**Type:** C

Has been called G326.2–1.7.

Radio: Shell, with elongated, flat-spectrum core.**Optical:** Emission around the shell.**X-ray:** Shell, with central extended emission.**References:**Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′: $S=180$ Jy).Caswell *et al.* 1975, A&A, 45, 239. Parkes 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″ × 53″).

Milne *et al.* 1989, PASAu, 8, 187. MOST at 843 MHz (43″ × 52″: $S=153\pm 40$ Jy), and Parkes 64-m at 8.4 GHz (3′: $S=68\pm 5$ Jy), including polarization.

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

Kassim *et al.* 1993, ApJ, 419, 733. ROSAT image.Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 52″: $S>130$).Rosado *et al.* 1996, A&A, 315, 243. Optical kinematics.Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.Dickel *et al.* 2000, ApJ, 543, 840. ATCA at 1.34 GHz (8″.5 × 6″.4: $S>60$ Jy), 4.80 GHz (3″.8: $S=25$ Jy for core only) and 8.64 GHz (3″.2: $S=15$ Jy for core only).**G327.1–1.1****RA:** 15^h54^m25^s**Dec:** –55°09′**1-GHz flux/Jy:** 7?**Spectral index:** ?**Size/arcmin:** 18**Type:** C**Radio:** Shell, with off-centre core.**X-ray:** Diffuse, with core.**References:**Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8′.4: $S=10\pm 15\%$ Jy).Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′: $S=10.6$ Jy) and Parkes 64-m at 5 GHz (4′: $S=4.3$ Jy).

Lamb & Markert 1981, ApJ, 244, 94. Einstein observations.

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 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.

G327.4+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 ($44'' \times 55''$).

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

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz ($43'' \times 53'' : S=25$ Jy).

Seward *et al.* 1996, ApJ, 471, 887. ROSAT observations.

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

McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz ($2'.0 \times 1'.8$), plus HI.

Enoguchi *et al.* 2002, PASJ, 54, 229. ASCA 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 ($43'' \times 54'' : S=2.1$ Jy).

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

McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz ($2'.0 \times 1'.8$), plus HI.

G327.6+14.6

SN1006, PKS 1459–41

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

This is the remnant of the SN of AD1006.

Radio: Shell, with two bright arcs.

Optical: Filaments to the NW, with broad H α component.

X-ray: Thermal shell, with non-thermal limb-brightened arcs.

Point sources: The background Schweizer–Middleditch star is near the middle of the remnant.

Distance: Optical spectra and proper motion indicate 2.2 ± 0.1 kpc.

References:

- van den Bergh 1976, ApJ, 208, L17. Optical.
 Dickel & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8'.4) and 5 GHz (4'.4).
 Becker *et al.* 1980, ApJ, 240, L33. X-ray spectroscopy.
 Schweizer & Middleditch 1980, ApJ, 241, 1039. Possible stellar remnant.
 Pye *et al.* 1981, MNRAS, 194, 569. Einstein observations.
 Caswell *et al.* 1983, MNRAS, 204, 921. FIRST at 1415 MHz (77").
 Reynolds & Gilmore 1986, AJ, 92, 1138. VLA at 1.37 and 1.67 GHz (16" \times 20").
 Kirshner *et al.* 1987, ApJ, 315, L135. Broad H α optical component.
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44" \times 66").
 Fesen *et al.* 1988, ApJ, 327, 164. UV absorption spectra of the Schweizer–Middleditch star.
 Roger *et al.* 1988, ApJ, 332, 940. MOST at 843 MHz (44" \times 66" : $S = 17.5 \pm 1.5$ Jy).
 Long *et al.* 1988, ApJ, 333, 749. Optical proper motion for distance.
 Jones & Pye 1989, MNRAS, 238, 567. EXOSAT observations.
 Leahy *et al.* 1991, ApJ, 374, 218. HEAO-1 X-ray spectra.
 Wu *et al.* 1993, ApJ, 416, 247. UV spectra.
 Reynolds & Gilmore 1993, AJ, 106, 272. VLA at 1.37 and 1.67 GHz (24"), including polarization.
 Moffett *et al.* 1993, AJ, 106, 1566. VLA at 1.37 and 1.67 GHz (10" \times 14"), for proper motion studies.
 Ozaki *et al.* 1994, PASJ, 46, 367. X-ray observations.
 Raymond *et al.* 1995, ApJ, 454, L31. Far UV spectroscopy.
 Koyama *et al.* 1995, Natur, 378, 255. ASCA observations.
 Willingale *et al.* 1996, MNRAS, 278, 749. ROSAT observations.
 Blair *et al.* 1996, ApJ, 468, 871. Optical absorption studies.
 Laming *et al.* 1996, ApJ, 472, 267. Modelling of optical spectra, including distance.
 Wu *et al.* 1997, ApJ, 477, L53. Far UV absorption spectra of the Schweizer–Middleditch star.
 Winkler & Long 1997, ApJ, 486, L137. UV absorption spectra of background quasar.
 Winkler & Long 1997, ApJ, 491, 829. ROSAT and optical images.
 Tanimori *et al.* 1998, ApJ, 497, L25. γ -ray detection.
 Vink *et al.* 2000, A&A, 354, 931. X-ray spectroscopy.
 Burleigh *et al.* 2000, A&A, 356, 585. Optical spectroscopy of the Schweizer–Middleditch star.
 Allen *et al.* 2001, ApJ, 558, 739. ASCA, ROSAT and other X-ray observations.
 Dubner *et al.* 2002, A&A, 387, 1047. ATCA at 1.4 GHz (4'.7 \times 3'.0) for H α , plus CO observations.
 Ghavamian *et al.* 2002, ApJ, 572, 888. Optical of filaments in NW.
 Sollerman *et al.* 2003, A&A, 407, 249. Optical spectroscopy.
 Winkler *et al.* 2003, ApJ, 585, 324. Optical proper motion studies.
 Vink *et al.* 2003, ApJ, 587, L31. Chandra observations.
 Bamba *et al.* 2003, ApJ, 589, 827. Chandra observations of NE.

G328.4+0.2

RA: 15^h55^m30^s
Dec: –53°17′

1-GHz flux/Jy: 15
Spectral index: 0.12

(MSH 15–57)

Size/arcmin: 5
Type: F

Radio: Amorphous emission, with central bar.

X-ray: Detected at high energies.

Distance: HI absorption indicates at least 17.4 ± 0.9 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz (50′′).
 Wilson 1986, ApJ, 302, 718. Lack of detection with Einstein.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43′′ × 54′′ : S = 15 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Gaensler *et al.* 2000, ApJ, 542, 380. ATCA at 1.4 GHz (19′′.5 × 16′′.5 : S = 14.3 ± 0.1 Jy) and 4.5 GHz (2′′.0 × 1′′.5 : S = 12.5 ± 0.2 Jy).
 Hughes *et al.* 2000, ApJ, 542, 386. ASCA observations.
 McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

G329.7+0.4

RA: 16^h01^m20^s
Dec: –52°18′

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

Size/arcmin: 40 × 33
Type: S

Radio: Diffuse shell, in complex region.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43′′ × 53′′ : S > 38).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

G330.0+15.0

RA: 15^h10^m00^s
Dec: –40°00′

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

Lupus Loop
Size/arcmin: 180?
Type: S

Radio: Low surface brightness loop with HI shell.

X-ray: Detected.

References:

Milne 1971, AuJPh, 24, 757. Parkes 64-m at 408 MHz (48′), 635 MHz (31′) and 1410 MHz (15′).
 Milne & Dickel 1974, AuJPh, 27, 549. Parkes 64-m at 2.7 GHz (8′.4 : S = 120 ± 30% Jy).
 Toor 1980, A&A, 85, 184. X-ray image and spectrum.
 Colomb & Dubner 1982, A&A, 112, 141. Argentine 30-m dish at 1.42 GHz (30′), HI observations.
 Leahy *et al.* 1991, ApJ, 374, 218. HEAO-1 X-ray spectra.
 Ozaki *et al.* 1994, PASJ, 46, 367. X-ray observations.

G330.2+1.0

RA: 16^h01^m06^s
Dec: –51°34′

1-GHz flux/Jy: 5?
Spectral index: 0.3

Size/arcmin: 11
Type: S?

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

Distance: HI absorption indicates at least 4.9 kpc.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S = 8.6 Jy) and Parkes 64-m at 5 GHz (4′ : S = 4.0 Jy).
 Caswell *et al.* 1983, MNRAS, 204, 915. FIRST at 1415 MHz (52′′ × 47′′), and MOST at 843 MHz (43′′ × 55′′).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43′′ × 55′′ : S = 4.7 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

G332.0+0.2

RA: 16^h13^m17^s
Dec: –50°53′

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

Size/arcmin: 12
Type: S

Radio: Incomplete shell.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 57″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 55″ : S=8.9 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 McClure-Griffiths *et al.* 2001, ApJ, 551, 394. ATCA and Parks 64-m at 1.4 GHz (2′.0 × 1′.8), plus HI.

G332.4–0.4

RA: 16^h17^m33^s
Dec: –51°02′

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

RCW 103
Size/arcmin: 10
Type: S

Radio: Shell, brightest to the S.

Optical: Filaments correspond well to the radio shell, brightest in SE.

X-ray: Detected, with point source near centre.

Point sources: Central, variable X-ray source, and nearby pulsar.

Distance: HI absorption indicates 3.3 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Tuohy & Garmire 1980, ApJ, 239, L107. Einstein detection of X-ray point source.
 Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz (50″).
 Lamb & Markert 1981, ApJ, 244, 94. Einstein observations.
 Ruiz 1983, AJ, 88, 1210. Optical spectra.
 Tuohy *et al.* 1983, ApJ, 268, 778. X-ray observations.
 Leibowitz & Danziger 1983, MNRAS, 204, 273. Optical spectra.
 Nugent *et al.* 1984, ApJ, 284, 612. X-ray spectrum (and Einstein image from Tuohy, private communication).
 Meaburn & Allen 1986, MNRAS, 222, 593. Optical spectra.
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 57″).
 Oliva *et al.* 1990, A&A, 240, 453. IR spectroscopy.
 Dickel *et al.* 1996, AJ, 111, 340. ATCA at 1.36 (8″) and 2.37 GHz (4″.5″), including polarization.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 55″ : S=34 Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.
 Gotthelf *et al.* 1997, ApJ, 487, L175. ASCA observations of compact X-ray source.
 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.

G332.4+0.1

RA: 16^h15^m20^s
Dec: –50°42′

1-GHz flux/Jy: 26
Spectral index: 0.5

MSH 16–51, Kes 32
Size/arcmin: 15
Type: S

Has been called G332.4+0.2.

Radio: Distorted shell, with thermal jet and plume adjacent.

Point sources: Pulsar nearby.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Roger *et al.* 1985, Natur, 316, 44. MOST at 843 MHz (44″ × 57″).
 Caraveo 1993, ApJ, 415, L111. Nearby pulsar.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 56″ : S=29 Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.
 Brinkmann *et al.* 1999, A&A, 346, 599. ROSAT image of remnant and nearby pulsar.

G335.2+0.1

RA: 16^h27^m45^s
Dec: –48°47′

1-GHz flux/Jy: 16
Spectral index: 0.5

Size/arcmin: 21
Type: S

Radio: Well defined shell.

Point sources: Old pulsar within remnant boundary.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′: $S=27.1$ Jy) and Parkes 64-m at 5 GHz (4′: $S=8.6$ Jy).
 Kaspi *et al.* 1996, AJ, 111, 2028. Pulsar observations.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 57″: $S=16$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G336.7+0.5

RA: 16^h32^m11^s
Dec: –47°19′

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

Size/arcmin: 14 × 10
Type: S

Radio: Irregular shell.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 60″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 58″: $S=6.1$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G337.0–0.1

RA: 16^h35^m57^s
Dec: –47°36′

1-GHz flux/Jy: 1.5
Spectral index: 0.6?

(CTB 33)
Size/arcmin: 1.5
Type: S

This entry refers to a small (1′.5) SNR, not the larger previously catalogued G337.0–0.1.

Radio: Shell, in a complex region.

Distance: Association with CTB 33 gives 11 kpc.

Point sources: Associated with a soft gamma repeater.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 58″: $S=21$ Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.
 Sarma *et al.* 1997, ApJ, 483, 335. ATCA at 1.4 GHz (12″) including HI, and 8.9 GHz (13″ × 15″) for recombination lines, clarifying extent of the remnant.
 Woods *et al.* 1999, ApJ, 519, L139. Soft gamma repeater observations.
 Hurley *et al.* 2000, ApJ, 528, L21. ASCA observations of soft gamma repeater.
 Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.

G337.2–0.7

RA: 16^h39^m28^s
Dec: –47°51′

1-GHz flux/Jy: 2?
Spectral index: 0.7

Size/arcmin: 6
Type: S

Radio: Shell, not well resolved.

X-ray: Extended emission.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′: $S=3.8$ Jy) and Parkes 64-m at 5 GHz (4′: $S=0.70$ Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 58″: $S=2.0$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Rakowski *et al.* 2001, ApJ, 548, 258. ASCA and ROSAT observations.

G337.3+1.0

Kes 40

RA: 16^h32^m39^s
Dec: –46°36′

1-GHz flux/Jy: 16
Spectral index: 0.55

Size/arcmin: 15 × 12
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).
 Dicke & Milne 1976, AuJPh, 29, 435. Comparison of earlier Parkes 64-m maps at 2.7 GHz (8′.4) and 5 GHz (4′.4).
 Kesteven & Caswell 1987, A&A, 183, 118. MOST at 843 MHz (44″ × 61″).
 Milne *et al.* 1989, PASAu, 8, 187. MOST at 843 MHz (43″ × 59″ : $S=14.8 \pm 3.0$ Jy), and Parkes 64-m at 8.4 GHz (3′ : $S=5.1 \pm 0.6$ Jy), including polarization.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ : $S=20$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G337.8–0.1

Kes 41

RA: 16^h39^m01^s
Dec: –46°59′

1-GHz flux/Jy: 18
Spectral index: 0.5

Size/arcmin: 9 × 6
Type: S

Radio: Distorted shell.

Distance: HI absorption suggests > 9.3 kpc.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ : $S=18$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA detection of compact OH emission.

G338.1+0.4

RA: 16^h37^m59^s
Dec: –46°24′

1-GHz flux/Jy: 4?
Spectral index: 0.4

Size/arcmin: 15?
Type: S

Radio: Arc in NE, merging with thermal emission in S.

Optical: Detected.

X-ray: Detected.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Zealey *et al.* 1979, A&AS, 38, 39. Optical detection.
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ : $S=3.8$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

G338.3–0.0

RA: 16^h41^m00^s
Dec: –46°34′

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

Size/arcmin: 8
Type: S

Radio: Irregular shell, in complex region.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ : $S=7.4$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G338.5+0.1

RA: 16^h41^m09^s
Dec: –46°19′

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

Size/arcmin: 9
Type: ?

Radio: Circle of non-thermal emission in complex region, not well defined.

References:

Shaver & Goss 1970, AuJPA, 14, 133. Molonglo at 408 MHz (3′) and Parkes 64-m at 5 GHz (4′).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 59″ : S=13 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G340.4+0.4

RA: 16^h46^m31^s
Dec: –44°39′

1-GHz flux/Jy: 5
Spectral index: 0.4

Size/arcmin: 10 × 7
Type: S

Radio: Distorted shell, elongated east–west.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=8.2 Jy) and Parkes 64-m at 5 GHz (4′ : S=2.9 Jy).
 Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″).
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 330 MHz (75″ × 48″ : S=9.2 ± 0.9 Jy) and 1.4 GHz (27″ × 9″ : S=3.6 ± 0.1 Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 61″ : S=5.9 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G340.6+0.3

RA: 16^h47^m41^s
Dec: –44°34′

1-GHz flux/Jy: 5?
Spectral index: 0.4?

Size/arcmin: 6
Type: S

Radio: Incomplete shell.

Optical: Possible associated filaments.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=7.0 Jy) and Parkes 64-m at 5 GHz (4′ : S=2.8 Jy).
 Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″).
 Zealey *et al.* 1979, A&AS, 38, 39. Optical.
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 330 MHz (75″ × 48″ : S=9.2 ± 0.9 Jy) and 1.4 GHz (27″ × 9″ : S=5.8 ± 0.1 Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 61″ : S=4.5 Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

G341.2+0.9

RA: 16^h47^m35^s
Dec: –43°47′

1-GHz flux/Jy: 1.5?
Spectral index: 0.6?

Size/arcmin: 16 × 22
Type: C

Radio: Incomplete shell, with extension to SW.

Point sources: Pulsar in W, with wind nebula.

References:

Frail *et al.* 1994, ApJ, 437, 781. VLA at 330 MHz (54″ × 116″ : S=3.0 ± 0.1 Jy) and 1.4 GHz (21″ × 25″ : S=12.5 ± 0.05 Jy).
 Giacani *et al.* 2001, AJ, 121, 3133. VLA at 1.4 and 4.9 GHz (25″) of pulsar wind nebula.

G341.9–0.3

RA: 16^h55^m01^s
Dec: –44°01′

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

Size/arcmin: 7
Type: S

Radio: Incomplete shell, brightest to NE.

References:

Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : $S=7.4$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=1.7$ Jy).
 Caswell & Clark 1975, AuJPA, 37, 57. Molonglo at 408 MHz and Parkes 64-m at 5 GHz images.
 Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″), revision of previous flux densities.
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz (35″ × 11″ : $S=2.2 \pm 0.1$ Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 62″ : $S=2.7$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

G342.0–0.2

RA: 16^h54^m50^s
Dec: –43°53′

1-GHz flux/Jy: 3.5?
Spectral index: 0.4?

Size/arcmin: 12 × 9
Type: S

Radio: Distorted shell.

References:

Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (50″), estimate $S_{408 \text{ MHz}}=5$ Jy, $S_{5 \text{ GHz}}=2$ Jy from previous maps.
 Dubner *et al.* 1996, AJ, 111, 1304. VLA at 1.4 GHz (35″ × 11″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 62″ : $S=3.5$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

G342.1+0.9

RA: 16^h50^m43^s
Dec: –43°04′

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

Size/arcmin: 10 × 9
Type: S

Radio: Incomplete shell.

References:

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

G343.0–6.0

RA: 17^h25^m00^s
Dec: –46°30′

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

Size/arcmin: 250
Type: S

Radio: Faint, poorly defined.

Optical: Filamentary shell.

References:

Walker & Zealey 2001, MNRAS, 325, 287. Optical observations, and review of earlier observations.
 Welsh *et al.* 2003, A&A, 403, 605. Optical spectroscopy.

G343.1–2.3

RA: 17^h08^m00^s
Dec: –44°16′

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

Size/arcmin: 32?
Type: C?

Radio: Incomplete shell?

X-ray: Pulsar wind nebula.

Point sources: Pulsar near edge, with wind nebula.

References:

McAdam *et al.* 1993, Natur, 361, 516. MOST at 843 MHz (smoothed to 2′).
 Frail *et al.* 1994, ApJ, 437, 781. VLA at 330 MHz (56″ × 111″ : $S=10.6$ Jy) and 1.4 GHz (22″ × 27″) near pulsar.
 Becker *et al.* 1995, A&A, 298, 528. ROSAT of pulsar, and limit for remnant.
 Giacani *et al.* 2001, AJ, 121, 3133. VLA at 1.4, 4.9 and 8.5 GHz (25″) of pulsar wind nebula.
 Gotthelf *et al.* 2002, ApJ, 567, L125. Pulsar x-ray detection.
 Dodson & Golap 2002, MNRAS, 334, L1. ATCA at 1.4 GHz (70″ × 47″) including polarisation, and Chandra observations of pulsar nebula.

G343.1–0.7

RA: 17^h00^m25^s
Dec: –43°14′

1-GHz flux/Jy: 7.8
Spectral index: 0.55

Size/arcmin: 27 × 21
Type: S

Radio: Shell, with smaller thermal shell adjacent.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 63″ : $S=8.5 \pm 0.6$), plus Parkes 64-m at 4.5 GHz ($S=3.9 \pm 0.6$ Jy) and 8.55 GHz ($S=2.4 \pm 0.5$ Jy)
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

G344.7–0.1

RA: 17^h03^m51^s
Dec: –41°42′

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

Size/arcmin: 10
Type: C?

Radio: Aysmmetric shell, with possible core.

X-ray: Detected.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : $S=4.7$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=1.3$ Jy).
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (30″ × 43″ : $S=1.7 \pm 0.1$ Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 65″ : $S=2.5$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

G345.7–0.2

RA: 17^h07^m20^s
Dec: –40°53′

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

Size/arcmin: 6
Type: S

Radio: Poorly defined diffuse shell.

Point sources: Old pulsar nearby.

References:

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

G346.6–0.2

RA: 17^h10^m19^s
Dec: –40°11′

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

Size/arcmin: 8
Type: S

Radio: Irregular shell.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : $S=14.9$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=4.3$ Jy).
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (31″ × 43″ : $S=8.1 \pm 0.9$ Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 67″ : $S=8.7$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA detection of compact OH emission.

G347.3–0.5

RA: 17^h13^m50^s
Dec: –39°45′

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

Size/arcmin: 65 × 55
Type: S?

Radio: Faint emission.

X-ray: Non-thermal, limb-brightened to W, with central source.

Point sources: Central X-ray source.

Distance: Association with molecular clouds, and HII region, suggests 1 kpc or 6 kpc.

References:

Koyama *et al.* 1997, PASJ, 49, L7. ASCA of NW.
 Slane *et al.* 1999, ApJ, 525, 357. ASCA and other observations.
 Muraishi *et al.* 2000, A&A, 354, L57. High energy γ -ray detection.
 Butt *et al.* 2001, ApJ, 562, L167. Associated γ -ray emission.
 Ellison *et al.* 2001, ApJ, 563, 191. ATCA at 1.4 GHz (46″ × 36″), and ASCA observations.
 Enomoto *et al.* 2002, Natur, 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-Newton and other X-ray observations of central source.
 Fukui *et al.* 2003, PASJ, 55, L61. CO observations of surroundings.

G348.5–0.0

RA: 17^h15^m26^s
Dec: –38°28′

1-GHz flux/Jy: 10?
Spectral index: 0.4?

Size/arcmin: 10?
Type: S?

Radio: Arc, overlapping G348.5+0.1.

References:

Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz (46″ × 53″), 1.4 GHz (18″ × 33″) and part at 5 GHz (2″.5 × 3″.9).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 69″ : $S=10.2$ Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.
 Koralesky *et al.* 1998, AJ, 116, 1323. VLA search for OH emission.

G348.5+0.1

RA: 17^h14^m06^s
Dec: –38°32′

1-GHz flux/Jy: 72
Spectral index: 0.3

CTB 37A

Size/arcmin: 15
Type: S

Radio: Shell, poorly define to S and W, overlapping G348.5–0.0 in E.

Distance: HI absorption indicates 10.2±3.5 kpc.

References:

Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′:S=97 Jy).
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4:S=43 Jy).
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz (0′.8:S>50) and Parkes 64-m at 14.7 GHz (2′.2:S=18±5 Jy).
 Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz (20″×45″).
 Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz (46″×53″), 1.4 GHz (18″×33″) and part at 5 GHz (2″.5×3″.9).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″×69″:S=71 Jy).
 Brogan *et al.* 2000, ApJ, 537, 875. VLA at 1.7 GHz for OH Zeeman splitting.
 Reynoso & Mangum 2000, ApJ, 545, 874. CO observations.

G348.7+0.3

RA: 17^h13^m55^s
Dec: –38°11′

1-GHz flux/Jy: 26
Spectral index: 0.3

CTB 37B

Size/arcmin: 17?
Type: S

Radio: Incomplete shell with faint eastern extensions.

Distance: HI absorption indicates 10.2±3.5 kpc.

References:

Clark *et al.* 1975, AuJPA, 37, 75. Molonglo at 408 MHz (3′:S=34 Jy).
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4:S=32 Jy).
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Milne *et al.* 1979, MNRAS, 188, 437. FIRST at 1415 MHz (0′.8:S>20) and Parkes 64-m at 14.7 GHz (2′.2:S=8±3 Jy).
 Downes 1984, MNRAS, 210, 845. VLA at 1465 MHz (20″×45″).
 Kassim *et al.* 1991, ApJ, 374, 212. VLA at 333 MHz (46″×53″).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″×69″:S=33 Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant.

G349.2–0.1

RA: 17^h17^m15^s
Dec: –38°04′

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

Size/arcmin: 9×6
Type: S

Radio: Elongated shell, adjacent to bright HII region.

References:

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

G349.7+0.2

RA: 17^h17^m59^s
Dec: –37°26′

1-GHz flux/Jy: 20
Spectral index: 0.5

Size/arcmin: 2.5 × 2
Type: S

Radio: Incomplete clumpy shell, with enhancement to the S.

Distance: HI absorption indicates 18.3 ± 4.6 kpc, association with OH features gives 22 kpc.

X-ray: Irregular shell.

References:

Becker & Kundu 1975, AJ, 80, 679. NRAO 140-ft at 10.6 GHz (3′).
 Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz (3′ : $S=31.0$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=9.1$ Jy), no maps.
 Caswell *et al.* 1975, A&A, 45, 239. Parkes HI absorption.
 Shaver *et al.* 1985, Natur, 313, 113. VLA at 1.4 GHz (3″.4 × 14″.5).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 71″ : $S=22$ Jy).
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.
 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.

G350.0–2.0

RA: 17^h27^m50^s
Dec: –38°32′

1-GHz flux/Jy: 26
Spectral index: 0.4

Size/arcmin: 45
Type: S

Incorporates the previously catalogued G350.0–1.8 in the NW.

Radio: Shell, brightest in NW.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : $S=49.5$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=13.6$ Jy).
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz (4′.4).
 Gaensler 1998, ApJ, 493, 781. VLA and Parkes 64-m at 1.4 GHz (18″ × 21″ : $S=22.3 \pm 0.3$ Jy), clarifying extent of remnant.

G351.2+0.1

RA: 17^h22^m27^s
Dec: –36°11′

1-GHz flux/Jy: 5?
Spectral index: 0.4

Size/arcmin: 7
Type: C?

Has been called G351.3+0.2.

Radio: Distorted shell, with possible flat-spectrum core.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : $S=8.1$ Jy) and Parkes 64-m at 5 GHz (4′ : $S=3.1$ Jy).
 Caswell *et al.* 1984, PASAu, 5, 227. MOST at 843 MHz (43″ × 77″).
 Becker & Helfand 1988, AJ, 95, 883. VLA at 5 GHz (15″), and at 15 GHz of core.
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (32″ × 36″ : $S=4.8 \pm 0.2$ Jy).
 Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 73″ : $S=5.5$ Jy).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G351.7+0.8

RA: 17^h21^m00^s
Dec: –35°27′

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

Size/arcmin: 18 × 14
Type: S

Radio: Elongated shell, adjacent to bright HII region.

Point sources: Pulsar nearby.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 74″ : $S=11$ Jy).

G351.9–0.9

RA: 17^h28^m52^s
Dec: –36°16′

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

Size/arcmin: 12 × 9
Type: S

Radio: Asymmetric shell.

References:

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

G352.7–0.1

RA: 17^h27^m40^s
Dec: –35°07′

1-GHz flux/Jy: 4
Spectral index: 0.6

Size/arcmin: 8 × 6
Type: S

Radio: Distorted shell.

X-ray: Detected.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=9.6 Jy) and Parkes 64-m at 5 GHz (4′ : S=2.3 Jy).

Caswell *et al.* 1983, MNRAS, 203, 595. FIRST at 1415 MHz (1′.1).

Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (34″ : S=3.4 ± 0.4 Jy).

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 75″ : S=4.4 Jy).

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

Kinugasa *et al.* 1998, PASJ, 50, 249. ASCA observations.

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

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

G353.9–2.0

RA: 17^h38^m55^s
Dec: –35°11′

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

Size/arcmin: 13
Type: S

Radio: Shell, with central double source.

References:

Green 2001, MNRAS, 326, 283. VLA at 327 MHz (3′.0 × 2′.7) and 1.4 GHz (42″ × 36″), plus 8.4 GHz (8″.4 × 6″.1) of central source only.

G354.1+0.1

RA: 17^h30^m28^s
Dec: –33°46′

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

Size/arcmin: 15 × 3?
Type: C?

Is this a SNR?

Radio: Elongated N–S.

Point sources: Pulsar at S tip.

References:

Frail *et al.* 1994, ApJ, 437, 781. VLA at 330 MHz (47″ × 99″) and 1.4 GHz (8″.8 × 21″).

G354.8–0.8

RA: 17^h36^m00^s
Dec: –33°42′

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

Size/arcmin: 19
Type: S

Radio: Distorted shell.

References:

Whiteoak & Green 1996, A&AS, 118, 329. MOST at 843 MHz (43″ × 78″ : S=3.1 Jy).

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

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

G355.6–0.0

RA: 17^h35^m16^s
Dec: –32°38′

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

Size/arcmin: 8 × 6
Type: S

Radio: Well defined shell.

X-ray: Detected.

References:

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 80″ : S=2.6 Jy).
 Sugizaki *et al.* 2001, ApJS, 134, 77. ASCA survey observations.

G355.9–2.5

RA: 17^h45^m53^s
Dec: –33°43′

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

Size/arcmin: 13
Type: S

Radio: Distorted shell, brightest to SE.

References:

Clark *et al.* 1975, AuJPA, 37, 1. Molonglo at 408 MHz (3′ : S=12.3 Jy) and Parkes 64-m at 5 GHz (4′ : S=3.4 Jy).
 Caswell *et al.* 1984, PASAu, 5, 227. MOST at 843 MHz (43″ × 77″).
 Dubner *et al.* 1993, AJ, 105, 2251. VLA at 1.47 GHz (32″ × 34″ : S=5.0 ± 0.3 Jy).
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 77″).
 Green *et al.* 1997, AJ, 114, 2058. Parkes 64-m OH observations.

G356.2+4.5

RA: 17^h19^m00^s
Dec: –29°40′

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

Size/arcmin: 25
Type: S

Radio: Faint shell.

References:

Bhatnagar 2000, MNRAS, 317, 453. GMRT at 327 MHz (3′ × 1′.5 : S=8.1 ± 1.7 Jy), and NVSS at 1.4 GHz.

G356.3–0.3

RA: 17^h37^m56^s
Dec: –32°16′

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

Size/arcmin: 11 × 7
Type: S

Radio: Elongated shell, brighter in N.

References:

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 81″ : S=2.6 Jy).
 Bhatnagar 2002, MNRAS, 332, 1. GMRT at 327 MHz (1.7′ × 0.8′ : S=5.7 ± 0.2).

G356.3–1.5

RA: 17^h42^m35^s
Dec: –32°52′

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

Size/arcmin: 20 × 15
Type: S

Radio: Double arc.

References:

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 79″ : S=2.8 Jy).

G357.7–0.1

RA: 17^h40^m29^s
Dec: –30°58′

1-GHz flux/Jy: 37
Spectral index: 0.4

MSH 17–39

Size/arcmin: 8 × 3?
Type: ?

Has been suggested that this is not a SNR.

Radio: Multiple arcs and filaments, with compact HII region at W edge.

X-ray: Detected.

Distance: HI absorption suggests beyond Galactic Centre.

References:

Caswell *et al.* 1975, AuJPA, 37, 39. Molonglo at 408 MHz ($3'$: $S=54.2$ Jy) and Parkes 64-m at 5 GHz ($4'$: $S=18.5$ Jy).
 Milne & Dickel 1975, AuJPh, 28, 209. Parkes 64-m at 5 GHz ($4'$: $S=14.6$ Jy).
 Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz ($2'.6$).
 Caswell *et al.* 1980, MNRAS, 190, 881. FIRST at 1415 MHz ($50''$).
 Weiler & Panagia 1980, A&A, 90, 269. Effelsberg 100-m at 9 GHz ($1'.5$) (private communication from Baker).
 Shaver *et al.* 1985, Natur, 313, 113. VLA at 1.4 GHz ($3''.8 \times 10''.9$) and 5 GHz ($12'' \times 26''$).
 Becker & Helfand 1985, Natur, 313, 115. VLA at 1.4 GHz and 5 GHz.
 Helfand & Becker 1985, Natur, 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, PASAu, 8, 184. MOST at 843 MHz ($43'' \times 83''$).
 Gray 1994, MNRAS, 270, 836. 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 polarization.
 Frail *et al.* 1996, AJ, 111, 1651. OH emission near remnant, including masers.
 Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz ($43'' \times 24''$).
 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.

G357.7+0.3

RA: 17^h38^m35^s
Dec: –30°44′

1-GHz flux/Jy: 10
Spectral index: 0.4?

Size/arcmin: 24
Type: S

Radio: Non-thermal shell in complex region.

References:

Reich & Fürst 1984, A&AS, 57, 165. Effelsberg 100-m at 2.7 GHz ($4'.3$: $S=7 \pm 1.5$ Jy), $S_{5\text{ GHz}}=5.5 \pm 1.5$ Jy from surveys.
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz ($43'' \times 84''$).
 Yusef-Zadeh *et al.* 1999, ApJ, 527, 172. VLA of nearby OH masers.

G358.0+3.8

RA: 17^h26^m00^s
Dec: –28°36′

1-GHz flux/Jy: 1.5?
Spectral index: ?

Size/arcmin: 38
Type: S

Radio: Faint shell.

References:

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

G359.0–0.9

RA: 17^h46^m50^s
Dec: –30° 16′

1-GHz flux/Jy: 23
Spectral index: 0.5

Size/arcmin: 23
Type: S

Radio: Incomplete shell.

X-ray: Partial shell.

References:

Reich *et al.* 1988, in SNRISM, p293. Summary of parameters.
 Reich *et al.* 1990, A&AS, 85, 633. Effelsberg 100-m at 2.7 GHz (4′.3).
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 86″).
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43″ × 24″).
 Bamba *et al.* 2000, PASJ, 52, 259. ASCA observations.

G359.1–0.5

RA: 17^h45^m30^s
Dec: –29° 57′

1-GHz flux/Jy: 14
Spectral index: 0.4?

Size/arcmin: 24
Type: S

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

X-ray: Centrally brightened.

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

References:

Downes *et al.* 1979, A&AS, 35, 1. From observations by Altenhoff *et al.* 1979, A&AS, 35, 23. Effelsberg 100-m at 4.9 GHz (2′.6: $S=13$ Jy).
 Reich & Fürst 1984, A&AS, 57, 165. Effelsberg 100-m at 2.7 GHz (4′.3: $S=10 \pm 1.5$ Jy) and 4.8 GHz (2′.4: $S=8.1 \pm 0.5$ Jy).
 Uchida *et al.* 1992, ApJ, 398, 128. VLA at 1.5 GHz (11″ × 10″), and observations of nearby molecular material.
 Uchida *et al.* 1992, AJ, 104, 1533. VLA at 1.4 GHz.
 Gray 1994, MNRAS, 270, 836. MOST at 843 MHz (43″ × 86″).
 Yusef-Zadeh *et al.* 1995, Sci, 270, 1801. VLA at 1.4 GHz (33″ × 31″), and 1.7 GHz for OH survey.
 LaRosa *et al.* 2000, AJ, 119, 207. VLA at 333 MHz (43″ × 24″).
 Bamba *et al.* 2000, PASJ, 52, 259. ASCA observations.
 Lazendic *et al.* 2002, MNRAS, 331, 537. Observations of shocked molecular gas where the ‘snake’ crosses the remnant.

G359.1+0.9

RA: 17^h39^m36^s
Dec: –29° 11′

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

Size/arcmin: 12 × 11
Type: S

Radio: Shell, brightest in E.

References:

Gray 1994, MNRAS, 270, 847. MOST at 843 MHz (43″ × 88″: $S=4.3$ Jy).