

## REFERENCES

- Arp, H. C. 1966, Atlas of Peculiar Galaxies, (Pasadena: Caltech), also ApJS 14, 1
- Berger, J. & Fringant, A.-M., 1980, A&AS, 39, 39. (Faint Blue obj. catalogue)
- Berger, J. & Fringant, A.-M., 1984, A&AS, 58, 565. (Faint Blue obj. catalogue)
- Bothun, G., Beers, T., Mould, J. & Huchra, J. 1986, ApJ, 308, 510.
- Bothun, G. and Cornell, M. 1990, AJ 99, 1004
- Bothun, G. & Schommer, R. 1982, ApJL 255, L23
- Burakowska, M. & Rudnicki, K. 1974, Acta Cosmologica 2, 7
- Corwin, H. 1992, revised NGC catalog, private communication.
- Cotton, W., Condon, J. & Arbizzani, E. 1999, ApJS 125, 409.
- da Costa, L., Pellegrini, P., Sargent, W. L. W., Tonry, J., Davis, M., Meiksin, A. & Latham, D. 1988, ApJ, 327, 544. (Southern Sky Redshift Survey)
- de Vaucouleurs, G. 1959, in Handbuch der Physik, Bd. LIII, Astrophysik IV: Sternsysteme, ed. S. Flüge, (Berlin: Springer-Verlag), 275.
- de Vaucouleurs, G. 1963, ApJS, 8, 31
- de Vaucouleurs, G. & de Vaucouleurs, A. 1964, Reference Catalogue of Bright Galaxies, (Austin: University of Texas Press)
- de Vaucouleurs, G., de Vaucouleurs, A. & Corwin, H. 1976, Second Reference Catalogue of Bright Galaxies, (Austin: University of Texas Press)
- de Vaucouleurs, G., de Vaucouleurs, A., Corwin, H., Buta, R., Paturel, G. & Fouqué, P. 1991, Third Reference Catalogue of Bright Galaxies, Vols. I-III, (Berlin: Springer-Verlag)
- Dressler, A. 1980, ApJS, 42, 565. (Clusters)
- Dreyer, J. 1888, MmRAS, 49, 1. (NGC)
- Dreyer, J. 1895, MmRAS, 51, 185. (IC1)
- Dreyer, J. 1908, MmRAS, 59, 105. (IC2)
- Fairall, A. 1992, Obs, 112, 286.
- Fairall, A. 1998, Large Scale Structure in the Universe (Cambridge: Cambridge)
- Falco, E.E., Kurtz, M.J., Geller, M.J., Huchra, J.P., Peters, J., Berlind, P., Mink, D.J., Tokarz, S.P., & Elwell, B. 1999, PASP, 111, 438. (The Updated Zwicky Catalog)
- Fisher, K., Huchra, J., Strauss, M., Davis, M., Yahil, A. & Schlegel, D. 1995, ApJS, 100, 69.
- Giovanelli, R. & Haynes, M.P. 1984, AJ, 89, 1.
- Gisler, G. & Friel, E. 1979, Index of Galaxy Spectra, (Tucson: Pachart)
- Hewett, A. & Burbidge, G. 1993, ApJS, 87, 451.
- Huchra, J. 1976, AJ, 81, 952.
- Huchra, J., Davis, M., Latham, D. & Tonry, J. 1983, ApJS, 52, 89.
- Huchra, J., Geller, M., de Lapparent V., & Corwin, H. 1990, ApJS, 72, 433.
- Huchra, J., Geller, M., & Corwin, H. 1995, ApJS, 99, 391.
- Huchra, J., Vogeley, M. and Geller, M. 1999, ApJS, 121, 287.
- Humason, M., Mayall, N. U. & Sandage, A. 1956, AJ, 61, 97.
- Kron, G., & Shane, C. D. 1976, Ap&SS 39, 401.
- Lauberts, A. 1982, The ESO-Uppsala Survey of the ESO(b) Atlas, (Garching: European Southern Observatory)
- Lewis, B. M. 1983, AJ, 88, 1695.
- Nilson, P. 1973, The Uppsala General Catalogue of Galaxies, Ann. Uppsala Astron. Obs. Band 6, Ser. V:A. Vol. 1. (Uppsala: Astronomiska Observatorium)
- Palumbo, G., Tanzella-Nitti, G. & Vettolani, G. 1983, Catalogue of Radial Velocities of Galaxies, (New York: Gordon & Breach)
- Paturel, G., Fouqué, P., Bottinelli, L. & Gougenheim, L. 1989, Catalogue of Principal Galaxies, Obs. Lyon Monographs Vols 1-3 (PGC)

- Paturel, G., Petit, C., Kogoshvili, N., Dubois, P., Bottinelli, L., Fouqué, P., Garnier, R. & Gouguenheim, L. 1991, *A&AS*, 91, 371.
- Rood, H. 1982, *ApJS*, 49, 111.
- Sandage, A. 1978, *AJ*, 83, 904.
- Sandage, A. & Tammann, G. 1981, *A Revised Shapley-Ames Catalogue of Bright Galaxies* (Washington: Carnegie Institution of Washington)
- Sinnott, R. 1988, *The complete new general catalogue and index catalogues of nebulae and stars clusters by J.L.E. Dreyer* (Cambridge: Sky Publishing) (NGC 2000.0)
- Spellman, K., Madore, B. & Helou, G. 1989, *PASP*, 101, 360.
- Sulentic, J. & Tift, W. 1973, *The Revised New General Catalogue of Astronomical Objects* (Tucson: University of Arizona Press)
- Thomson, M. J. 1991, *QJRAS*, 32, 17.
- Thomson, M. J. 1992, *QJRAS*, 33, 59.
- Tift, W. G. 1990, *ApJS*, 73, 603.
- Tully, R. B. & Fisher, R. F. 1987, *Catalogue of Nearby Galaxies* (Cambridge: Cambridge University Press)
- Vorontsov-Velyaminov, B.A. 1959, *Atlas and Catalog of Interacting Galaxies*, Sternberg Institute, Moscow State University.
- Vorontsov-Velyaminov, B. A., Krasnogorska, A. & Aripova, V. 1962-68, *Morphological Catalogue of Galaxies* (Moscow: Moscow State University)
- Vorontsov-Velyaminov, B.A. 1977, *A&AS*, 28, 1.
- Zwicky, F. 1971, *Catalogue of Selected Compact Galaxies and of Post-Eruptive Galaxies* (Guemligen: Zwicky)
- Zwicky, F., Sargent, W. L. W. & Kowal, C. 1975, *AJ*, 80, 545.
- Zwicky, F., Herzog, E., Wild, P., Karpowicz, M. & Kowal, C. 1961-68, *Catalogue of Galaxies & of Clusters of Galaxies* (Pasadena: California Institute of Technology)

**Table 1**  
**FORMAT FOR ZCAT**

| NAME          | A20      | COL | 1 - 20         |
|---------------|----------|-----|----------------|
| RA(HR)        | I2       |     | 21 - 22 (2000) |
| RA(MIN)       | I2       |     | 23 - 24        |
| RA(SEC)       | F5.2     |     | 25 - 29        |
| DECSIGN       | A1       |     | 30             |
| DEC(DEG)      | I2       |     | 31 - 32        |
| DEC(MIN)      | I2       |     | 33 - 34        |
| DEC(SEC)      | F4.1     |     | 35 - 38        |
| B MAG         | F5.2     |     | 39 - 43        |
| V(HELIO) or Z | I7/F7.4  |     | 44 - 50        |
| V ERR         | I3       |     | 51 - 53        |
| B SOURCE      | A1       |     | 54             |
| V SOURCE      | I2       |     | 55 - 56        |
| + more        | I2       |     | 57 - 58        |
| T TYPE        | I2       |     | 59 - 60        |
| BAR TYPE      | A1       |     | 61             |
| LUM CLASS     | I1       |     | 62             |
| STRUCT        | A1       |     | 63             |
| D1(MIN)       | F4.1     |     | 64 - 67        |
| D2(MIN)       | F4.1     |     | 68 - 72        |
| BT mag        | F6.2     |     | 73 - 78        |
| UGC or ESO #  | I6/I5,A1 |     | 79 - 84        |
| D (Mpc) *     | F4.2     |     | 85 - 88        |
| space         |          |     | 89             |
| RA(HR)        | I2       |     | 90 - 91 (1950) |
| RA(MIN)       | I2       |     | 92 - 93        |
| RA(SEC)       | F5.2     |     | 94 - 98        |
| DECSIGN       | A1       |     | 99             |
| DEC(DEG)      | I2       |     | 100 - 101      |
| DEC(MIN)      | I2       |     | 102 - 103      |
| DEC(SEC)      | F4.1     |     | 104 - 107      |

**Table 1** — *continued*

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|            |       |           |
|------------|-------|-----------|
| space      | A1    | 108       |
| RFN        | A1,I5 | 109 - 114 |
| FLAG       | A1    | 115       |
| COMMENTS   | A78   | 116 - 193 |
| ZCAT INDEX |       |           |

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\* DISTANCE in Mpc from velocity independent distance measures. Note that since these numbers are somewhat(!) uncertain, the catalogue is not complete & may be out of date at any time!

\*\* INDEX is the ZCAT index number for the galaxy. This number is located at the end of the line.

**Table 2****BASIC RADIAL VELOCITY SOURCES**

(detailed listing can be found in ZSOURCE)

- 
- 
- 00 = Blank 2ND REF CAT, de Vaucouleurs *et al.*
  - 01 Sandage & Tammann
  - 02 Tully & Fisher (Nearby Galaxy Catalog)
  - 03 Huchra-KPNO, (including Markaryan list)
  - 04 Rubin, Ford, Kinmann
  - 05 Other Russian ( Byurakan, Alma-Alta, SAO)
  - 06 Arecibo 21 cm — Salpeter *et al.* , Giovanelli & Haynes
  - 07 Martin
  - 08 German 21cm (Bonn)
  - 09 NRAO, VLA 21cm
  - 10 CTIO
  - 11 KPNO
  - 12 ESO (continued in 55)
  - 13 HCO — M. Davis
  - 14 E. Turner
  - 15 Steward Observatory — Tift, Gregory
  - 16 Rood, Chincarini, Kinter, Dickel
  - 17 AAT + Mt. Stromlo, FLAIR 6DF, 2DF
  - 18 SAO - 6-meter Karachentsev, Kopylov
  - 19 Texas — McDonald Observatory
  - 20 Mt. Wilson — HMS, Rudnicki, Zwicky
  - 21 Lick
  - 22 French 21cm - Nancy
  - 23 British Optical - I.N.T., Herschel Telescope
  - 24 Palomar — Hale, Mayer & Oschin telescopes
  - 25 Australian 21cm — Parkes, ACTA, ...
  - 26 Dutch 21cm
  - 27 Mt. Hopkins — CfA Redshift Survey, MMT
  - 28 British 21cm (Jodrell Bank, etc.)
  - 29 Argentina
  - 30 Thuan, Seitzer, Knapp (21-cm dwarf surveys)
  - 31 South Africa — SAAO - Fairall
  - 32 Arecibo — Sullivan, Bothun, Schommer
  - 33 H.J. Rood — NSSDC Catalog
  - 34 Ohio + Penn State
  - 35 Other Optical (eg. Calar Alto, Wise, Tartu, OHP, ...) (continued in 64)
  - 36 Las Campanas (100", 40"), Other Southern
  - 37 Palumbo, *et al.* (Catalogue of Redshifts)
  - 38 ESO-21cm Catalog
  - 39 Brazil — Southern Survey, L. daCosta
  - 40 MIT-Dartmouth-Michigan Surveys (McGraw Hill)
  - 41 Hawaii - CFHT, etc.
  - 42 Dartmouth — Century Survey
  - 43 Davis & Strauss IRAS Sources (Published)
  - 44 Hewitt & Burbidge QSO Catalog
  - 45 Keck (continued in 66)
  - 46 Redshiftless entries (discoveries, companions...)
  - 47 QDOT survey references
  - 48 \*Master file data (ORS)
  - 49 Bothun, Mould, published velocities; priv. comm.
  - 50 Velocities in IAU Circulars (continued in 58)
  - 51 Las Campanas Redshift Survey, LCRS
  - 52 ARC Telescope, Apache Point, NM
  - 53 Very Large Array 21-cm, Socorro, NM
  - 54 China (Beijing)
  - 55 ESO (continued from 12)
  - 56 HST (NICMOS, STIS, FOS ...)
  - 57 NED and internal NED Sources
  - 58 Velocities in IAU Circulars, continued
  - 59 SDSS
  - 60 6DF, Flash
  - 61 Chandra (ACIS-S ...)
  - 62 Canary Islands Observatories
  - 63 Other Radio
  - 64 Other Optical (continued)
- 
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**Table 2** — *continued*

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|    |                                                        |
|----|--------------------------------------------------------|
| 65 | ROSAT                                                  |
| 66 | Keck (continued from 45)                               |
| 67 | Compilation of catalogues or multiple telescopes       |
| 68 | Mt Hopkins (continued from 27)                         |
| 69 | Velocities in IAU Circulars (continued from 58)        |
| -9 | = SAAO, Menzies; Fairall, Vettolani & DaCosta          |
| -8 | = Dartmouth, not yet published                         |
| -7 | = CFA, not yet published (Generic; various authors)    |
| -6 | = Brazil (L. da Costa) not yet published               |
| -5 | = Davis & Strauss (IRAS Sources)                       |
| -4 | = Bothun, Mould not yet published (Palomar, Arecibo)   |
| -3 | = CFA, not yet published (Forman & Jones)              |
| -2 | = CFA, not yet published MMT Observations (JPH)        |
| -1 | = CFA, not yet published Tillnghast Observations (JPH) |

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\*\*\* Velocities from negative sources are for internal use only, no publication of this data is allowed without the express consent of the owners. External tape copies of ZCAT will not contain these velocities, but will indicate the source designation. Scientists interested in individual velocities from these sources should contact JPH or the individuals named above. \*\*\*

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**Table 3**  
**PHOTOMETRY & MAGNITUDE SOURCES**

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0 = Blank B(0) 1ST Reference Catalogue  
 1 Zwicky Catalogue  
 2 Corrected Shapley-Ames  
 3 Tully & Fisher  
 4 J. Graham  
 5 Markaryan, other Russian estimates  
 6 BT - 2ND Reference Catalogue  
 7 MCG (Vorontsov-Velyaminov))  
 8 CCD Blue  
 9 Observers' eye estimates (blue)  
 A Corrected Blue magnitudes from the RC3  
 B Photoelectric or Photographic blue  
 C Eye estimates from the Case Low dispersion survey  
 D Dartmouth Red instrumental  
 d PDS mags calibrated to Kron-Cousins Red  
 G STScI Guide Star Catalogue (V or J)  
 g Gunn green magnitude  
 H Zwicky Mag for multiple systems split by JPH  
 I CCD I  
 i I 814-band (AB)  
 J Photographic J, IIIa-J  
 j B<sub>j</sub> magnitude (2dF,...)  
 L SSRS2 Magnitude from L. DaCosta (approx BT)  
 P PCG magnitude  
 r Gunn red magnitude  
 R Photographic or Photoelectric R, IIIa-F, O-98 or 103aE  
 S SDSS r mag  
 v Dressler's eye estimate (visual)  
 V Photographic or Photoelectric V  
 W CCD V

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Photographic magnitudes from sources B, G, H, V, J & R are calibrated to a standard photometric system via PDS or other microdensitometer scans.

**Table 4**  
**MORPHOLOGICAL TYPES IN ZCAT\***

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|    |                                                  |
|----|--------------------------------------------------|
| -9 | QSO/AGN                                          |
| -7 | Unclassified Elliptical                          |
| -6 | Compact Elliptical                               |
| -5 | E, and dwarf E                                   |
| -4 | E/SO                                             |
| -3 | L-, SO-                                          |
| -2 | L, SO                                            |
| -1 | L+, SO+                                          |
| 0  | SO/a, SO-a                                       |
| 1  | Sa                                               |
| 2  | Sab                                              |
| 3  | Sb                                               |
| 4  | Sbc                                              |
| 5  | Sc                                               |
| 6  | Scd                                              |
| 7  | Sd                                               |
| 8  | Sdm                                              |
| 9  | Sm, Magellanic Spiral                            |
| 10 | Im, Irr I, Magellanic Irregular, Dwarf Irregular |
| 11 | BCG, Compact Irregular, Extragalactic HII Region |
| 12 | Extragalactic HI cloud (no galaxy visible)       |
| 15 | Peculiar, Unclassifiable                         |
| 16 | Irr II                                           |
| 19 | Unclassified galaxy                              |
| 20 | S..., Sc-Irr, Unclassified Spiral                |
| 23 | Lyman $\alpha$ cloud                             |
| 24 | Open Star Cluster                                |
| 25 | Plate Flaw, Star, etc. misclassified as galaxy!  |
| 26 | T Tauri star (from IRAS Surveys)                 |
| 27 | Globular Cluster                                 |
| 30 | Planetary Nebula                                 |
| 31 | Dark Cloud (no object visible on POSS)           |
| 32 | HII region in external galaxy                    |
| 33 | Reflection Nebulosity                            |
| 35 | HI cloud / High Velocity Clouds (HVC)            |
| 40 | Part of a galaxy                                 |
| 50 | Unclassified artifact (i.e. look into it more)   |
| 51 | No object at coordinates                         |
| 52 | Artifact due to bright star (diff. spike)        |
| 53 | Meteor streak                                    |
| 54 | HII region in Milky Way                          |

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Numerical Coding of T Types (after RC1 & RC2)



**Table 4 — continued**  
**MORPHOLOGICAL TYPES IN ZCAT**

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Bar Types (B)

A A, unbarred  
X X, AB, mixed type  
B B, Barred

Peculiarities (P)

D = Double or Multiple  
P = Peculiar  
R = Outer Ring  
r = Inner Ring  
s = S-shaped  
t = Mixed (Inner ring/S-shaped)  
T = Pseudo outer ring  
/ = Spindle

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Luminosity Classes (L) (for Spirals & Irregulars)

|          |          |
|----------|----------|
| 1 I      | 6 III-IV |
| 2 I-II   | 7 IV     |
| 3 II     | 8 IV-V   |
| 4 II-III | 9 V      |
| 5 III    |          |

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Numerical Coding of additional type info (after RC1 & RC2)