

37. STAR CLUSTERS AND ASSOCIATIONS
(AMAS STELLAIRES ET ASSOCIATIONS)

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1. Introduction

During the past three years work on Clusters and Associations has been proceeding with unprecedented vigor. Space limitations, unfortunately, make it impossible to review all of this material in detail. A listing of some of the most important recent review papers is given in section 2. Work in progress or recently published on individual clusters and associations is collected in the tables given in section 3.

2. Reviews

An important conference on Globular Clusters, the proceedings of which are being prepared for publication by Drs. Hanes and Madore, was held in Cambridge England in 1978 August. A detailed review of the dynamical evolution of clusters has been published by Lightman and Shapiro (Rev. Mod. Phys. 50, 437, 1978). Harris and Racine (Ann. Rev. Astr. Ap. 17, 000, 1979) give a detailed discussion of all globular clusters associated with the Milky Way System and of those known in other galaxies.

An atlas of UBV color-magnitude diagrams of open clusters has been published by Davis Philip, Cullen and White (Dudley Observatory Reports No. 11, 1976). A useful compilation of UBV photometry and MK spectral types of cluster stars has been published by Mermilliod (18.153.023) and an up-to-date listing of UBV data is given by Nicolet (Astr. Ap. Suppl. 34, 1, 1978). Completion of a new edition of the Prague/Budapest cluster catalogue is expected before the Montreal General Assembly of the International Astronomical Union.

A review by Westerlund of data on clusters in the Magellanic Clouds will be included in the report of Commission 28. Mrs. Hogg's traditional compilation of data on variable stars in clusters can be found in the report of Commission 27.

3. Compilation of Data

Detailed information on work in progress or recently published is contained in the tables given below. I am deeply indebted to Dr. Raymond White for his assistance with the compilation of Table 1 (Globular Clusters) and to Dr. Gösta Lyngå for his help with the data in Table 2 (Open Clusters). Recent work on young stellar aggregates is summarized in Table 3 (T Associations), Table 4 (R Associations) and Table 5 (OB Associations).

In closing I wish to acknowledge the help of all those members of our commission who wrote me about their unpublished cluster work. Special thanks go to Drs. Barkhatova and Vasilevskij who summarized work on clusters and associations in the Soviet Union and to Dr. Simoda who did the same for cluster work in Japan, and to Diane Crowe for her assistance with the compilation of the data.

The following abbreviations are used in the tables given below:
 abund = chemical abundance(s); astrom = astrometry; c-m = color-magnitude
 (diagram); cl = cluster; d = distance(s); distr = distribution(s); E = color excess
 em = emission; IR = infrared; int = integrated; lf = luminosity function; mem =
 membership; mf = mass function; obs = observations; phot = photometry; pm = proper
 motions; pol = polarization; RG = red giant(s); rv = radial velocity; Sp = spectra;
 str = structure; var = variable; vel = velocity;

TABLE 1. DATA ON GLACTIC GLOBULAR CLUSTERS

NGC	Observer, reference and type of data
104 (47 Tuc)	Cannon (Edinburgh) photographic BV phot Chun and Freeman (1978) BV, c-m Crawford and Snowdon (14.154.013) E, ubvy de Boer and van Albada (18.154.019) ultraviolet obs DaCosta (Hale) str Demarque and McClure (19.153.014) evolution Frogel and Persson (Hale) JHK phot Hesser (1978) abund inhomogenieties Hesser and Hartwick (19.154.027) UBV, c-m Hesser, Hartwick, and McClure (18.154.007) DDO, CN strengths Hesser and Philip (17.131.127) E Lee (19.154.006) UBV, c-m Lloyd Evans (SAAO) UBVR phot of RG Lloyd Evans and Menzies (SAAO) Sp Norris (1978) abund variations Osborn (18.154.002) DDO of RG
288	Alcaino (14.154.002) BV, c-m Lloyd Evans (SAAO) UBVR phot of RG
362	Alcaino (18.154.037) BV, c-m Harris (McMaster) UBV, c-m Frogel and Persson (Hale) JHK phot Lloyd Evans (SAAO) BVI phot RG
1851	Alcaino (18.154.001) BV, c-m Bahcall et al. (19.154.021) central str Bolton and Mallia (19.142.166) X-ray source? Clark, Markert, and Li (14.142.009) var X-ray source Forman and Jones (18.154.009) X-ray source position Johnson et al. (19.154.017) radio and X-ray obs Jones and Forman (17.142.166) X-ray obs van den Bergh (20.154.023) int UBV obs Vidal and Freeman (14.142.040) possible X-ray source Wehlau et al. (1978) var star periods
1904 (M 79)	Alcaino (18.154.036) BV, c-m Goranskij (17.154.027) c-m Johnson et al. (19.154.017) radio and X-ray obs Stetson and Harris (20.154.045) UBV, c-m Troland, Hesser, and Heiles (1978) search for CO
2419	Troland, Hesser, and Heiles (1978) search for CO
2808	Harris (17.154.005) BV, c-m Harris (McMaster) (1978) UBV and DDO, c-m Harris (McMaster) UBV, c-m Lloyd Evans (SAAO) BVI of RG
3201	Alcaino (18.154.029) BV, c-m Lee (19.154.032) BV, c-m Lloyd Evans (SAAO) BVI of RG White et al. (14.031.222) objective prism Sp White (Steward) UBV, DDO, c-m, lf

TABLE 1. DATA ON GLACTIC GLOBULAR CLUSTERS - continued

NGC	Observer, reference and type of data
4147	Canterna (14.154.009) CMT ₁ T ₂ of RG
4590	Alcaino (19.154.042) BV, c-m
(M 68)	Bernard (18.113.012) int UBV
	Corwin (19.154.031) int phot
	Harris (17.154.005) BV, c-m
	Lloyd Evans (SAAO) BVI of RG
4833	Lloyd Evans (SAAO) BVI of RG
5024	Butler (14.122.073) abund of RR var
(M 53)	Canterna (14.154.009) CMT ₁ T ₂ of RG
	Panova (20.154.042) cl centre position
	Rood et al. (1978) radio obs
	Terizan and Conklin (20.154.005) radio obs
5053	Corwin (19.154.031) int phot
	Goldstein and Wade (20.141.160) radio obs
	Sandage, Katem and Johnson (19.154.039) UBV, c-m
	Zhukov and Salitra (20.154.049) UBV, c-m
5139	Bessell and Norris (18.154.013) abund variations
(ω Cen)	Bond (14.154.026) new CH star
	Butler, Dickens, Epps (1978) RR Sp
	Cannon (Edinburgh) BV phot
	DaCosta (Hale) str
	Danziger et al. (17.132.015) reflection nebulosity
	Dickens and Bell (18.154.005) Nitrogen abund
	Freeman and Rogers (14.154.021) abund of RR var
	Frogel and Persson (Hale) JHK
	Geyer and Vogt (1978) membership of RR var
	Glass and Feast (20.154.027) JHK phot of RG
	Hesser et al. (18.154.007) DDO, CN strengths
	Jennens and Helfer (14.153.003) UBVIyz phot of RG
	Le Poole et al. (Leiden) phot of 5000 stars
	Lloyd Evans (19.154.012) VI phot of RG stars
	Lloyd Evans (20.154.030) VI phot of RG
	Lloyd Evans (SAAO) UBVR phot
	Mallia (17.154.011) abund differences among RG
	Mallia (20.154.008) abund
	Manduca, Bell (1978) Ca abund
	Niss et al. (1978) var search
	Norris and Bessell (14.154.021) abund var among RG
	Norris and Bessel (19.154.007) primordial abund var
	Norris (1978) abund variations
	Ogorodnikov et al. (19.154.015) cluster mass
5272	Bahcall and Hausman (19.154.019) star counts
(M 3)	Butler (14.122.073) abund of RR var
	Canterna (14.154.009) CMT ₁ T ₂ of RG
	Christensen (1978) energy distr
	Cohen (17.154.003) mass loss
	Cohen (1978) abund of RG
	Cohen, Frogel and Persson (1978) IR phot
	Coyne and White (Steward) pol RG stars
	Cudworth (Yerkes) pm
	DaCosta and Freeman (17.154.020) dynamical model
	Feibelman (1978) brightness profile
	Kadla (14.154.006) abund theory versus RG obs
	Kadla et al. (14.154.020, 17.154.007) axial ratio
	Kadla et al. (20.154.048) equidensity curves

TABLE 1. DATA ON GLACTIC GLOBULAR CLUSTERS - continued

NGC	Observer, reference and type of data
5272 (cont.)	Kanagy, Wyatt (1978) dust Kuzmin, et al. (20.154.047) surface brightness profiles Mould and McElroy (1978) TiO strengths Naumova (17.154.023) mass of cl Pilachowski (1978) IR phot Rood et al. (1978) radio obs Schneps et al. (1978) CO search Simoda and Fukuoka (18.154.043) lf Terzian and Conklin (20.154.005) radio obs Toyama et al. (18.154.015) cl color Troland, Hesser and Heiles (1978) search for CO White (Steward) phot, Sp of RG
5286	Harris, Racine and de Roux (17.154.028) BV, c-m Liller, Lichten (1978a) var stars
5466	Bahcall and Hausman (19.154.019) star counts Buonanno, d'Antona and De Amicis (14.154.038) spatial distr Corwin (19.154.031) int phot
5694	Harris (17.154.005) BV, c-m Harris and Hesser (18.154.025) new rv Harris (McMaster) UBv, c-m
5904 (M 5)	Bahcall and Hausman (19.154.019) star counts Butler (14.122.073) abund of RR var Christensen (1978) absolute sp energy distr Cudworth (Yerkes) pm Feibelman (1978) brightness profile Frogel and Persson (Hale) JHK Kadla (14.154.006) RG abund Kadla et al. (14.154.020, 17.154.007) axial ratio Kadla et al. (20.154.048) equidensity curves Kuzmin et al. (20.154.047) surface phot Lloyd Evans (SAAO) BVRI of RG Pike (1978) electronographic phot Pilachowski (1978) IR Terzian and Conklin (20.154.005) radio obs Toyama et al. (18.154.015) int color Zinn (20.154.026) Sp of RG
5927	Lloyd Evans and Menzies (19.154.001) IR phot White (Steward) UBv, c-m, lf
5986	Harris et al. (17.154.028) BV, c-m Liller, Lichten (1978b) var stars
6093 (M 80)	Bahcall and Hausman (19.154.019) star counts Schnops et al. (1978) CO search
6101	White (Steward) UBv, c-m, lf
6121 (M4)	Alcaino (14.154.001) BV, c-m Butler (14.122.073) abund of RR var Lee (19.154.005) BV, c-m Lloyd Evans (19.154.013) BVI Moshkalev (14.154.007) BV, c-m Phillip (17.154.010) Sp Schneps et al. (1978) CO search
6171 (M 107)	Butler (14.122.073) abund of RR var Lloyd Evans and Menzies (19.154.001) IR phot Lloyd Evans (SAAO) UBvRI of RG Mould and McElroy (1978) TiO strengths Pilachowski (1978) IR

TABLE 1. DATA ON GALACTIC GLOBULAR CLUSTERS - continued

NGC	Observer, reference and type of data
6171 (cont.)	Troland, Hesser and Heiles (1978) search for CO
6205 (M 13)	Bahcall and Hausman (19.154.019) star counts Butler (14.122.073) abund of RR var Christensen (1978) absolute energy distr Cohen (17.154.003) mass loss Cohen (1978) abund of RG Cohen, Frogel and Persson (1978) IR phot Coyne and White (Steward) pol of RG Cudworth (Yerkes) pm Feibelman (1978) brightness profile Goldstein and Wade (20.141.160) radio obs Kadla (14.154.006) RG abund Kadla et al. (14.154.020, 17.154.007) axial ratio Kadla et al. (17.154.024, 18.154.004) c-m Kadla et al. (20.154.048) equidensity curves Kanagy, Wyatt (1978) dust Mould and McElroy (1978) T10 strengths Norris and Zinn (19.154.035) Weak G-band effect Pastukhova (20.154.043) BV, c-m Pilachowski (1978) IR Rusev and Kolotilov (14.114.058) T10 in RG Schneps et al. (1978) CO search Toyama et al. (18.154.015) int color White (Steward) BV phot and Sp of RG
6218 (M 12)	Buonanno et al. (17.154.018) interacting with M 10? Buonanno et al. (1978) star counts Caloi et al. (17.154.031) distr of stars Gratton and Nesci (1978) rv of field stars
6235	Liller (Harvard) BV, c-m
6254 (M 10)	Buonanno et al. (17.154.018) interaction with M 12? Buonanno et al. (1978) star counts Canterna (14.154.009) CMT ₁ T ₂ phot of RG Gratton and Nesci (1978) rv of field stars Harris et al. (17.154.028) BV, c-m Frogel and Persson (Hale) JHK Mould and McElroy (1978) T10 strengths Pilachowski (1978) IR
6256	Alcaino (1978b) BV, c-m Bernard (18.113.012) int UBV
6266 (M 62)	Alcaino (1978a) UBV, c-m
6273 (M 19)	Clement, Hogg (1978) var stars Harris et al. (17.154.028) BV, c-m
6304	Bernard (18.113.012) int UBV phot Hesser (19.154.008) E Hesser and Hartwick (17.154.002) UBV, c-m
6325	Harris (17.154.005) BV, c-m
6341 (M 92)	Auer and Demarque (19.064.032) C and N abund Butler (14.122.073) abund in RR var Canterna (14.154.009) CMT ₁ T ₂ phot of RG Christensen (1978) energy distr Cohen (17.154.003) mass loss Cohen, Frogel and Persson (1978) IR Cudworth (18.154.050) pm

TABLE 1. DATA ON GLACTIC GLOBULAR CLUSTERS - continued

NGC	Observer, reference and type of data
6341 (cont.)	Fukuoka and Simoda (18.154.042) 1f Gratton and Nesci (1978) rv of field stars Kadla (14.154.006) abund theory versus RG obs Kadla et al. (14.154.020, 17.154.007) axial ratio Kuzmin et al. (20.154.047) surface brightness profiles Norris and Zinn (19.154.035) weak G-band effect. Pilachowski (1978) IR phot Rood et al. (1978) radio obs Toyama et al. (18.154.015) int color Troland, Hesser and Heiles (1978) search for CO van den Bergh (14.154.023) 1f
6352	Hesser (19.154.008) E Hesser et al. (18.154.007) CN strengths from DDO phot Lloyd Evans and Menzies (19.154.001) IR phot
6356	Lloyd Evans and Menzies (19.154.001) IR phot
6362	Fourcade (14.154.016) UB, c-m Kukarkin (14.154.018) discussion
6366	Pike (18.154.028) BV, c-m
6388	Lloyd-Evans and Menzies (19.154.001) VI phot
6397	Alcaino (20.154.014) BV, c-m Cannon (Edinburgh) BV phot Clariá and Stock (19.154.009) field stars near cl DaCosta (Hale) str DaCosta et al. (20.154.025) vel dispersion Mallia (20.154.008) abund Norris and Zinn (19.154.035) weak G-band effect
6401	Bernard (18.113.012) int UB phot
6402	Caputo and Castellani (17.154.032) age, evolution and RR var
(M 14)	Caputo and Castellani (17.154.033) distr of stars Demers and Wehlau (Western) BV, c-m
6426	Corwin (19.154.031) int phot
6440	Bahcall and Hausman (18.154.010) density distr Markert et al. (14.142.047) X-ray source Troland, Hesser and Heiles (1978) search for CO van den Bergh (20.154.023) int UB phot
6441	Bahcall and Hausman (18.154.010) density distr Clark et al. (14.142.009) X-ray source Grindlay et al. X-ray position Hesser (19.154.008) E Hesser and Hartwick (17.154.001) UB, c-m Lloyd Evans (SAAO) BVI phot of RG van den Bergh (20.154.023) int UB phot
6517	Harris (17.154.005) BV, c-m
6522	Lloyd Evans and Menzies (19.154.001) VI phot
6528	Fourcade (14.154.017) BV, c-m Kukarkin (14.154.018) discussion Lloyd Evans and Menzies (19.154.001) VI phot van den Bergh and de Roux (20.154.004) field stars
6535	Liller (Harvard) BV, c-m
6553	Lloyd Evans (SAAO) UB phot
6624	Bahcall (17.154.009) star counts Bratolyubova-Tsulukidze et al. (17.154.025) hard X-rays Canizares et al (1978) phot, Sp of core Canizares and Neighbours (14.142.010) X-ray source Clark et al. (18.142.028) X-ray bursts

TABLE 1. DATA ON GLACTIC GLOBULAR CLUSTERS - continued

NGC	Observer, reference and type of data
6624 (cont.)	Clark et al. (19.154.036) X-ray bursts Føj et al (N.E.) (19.154.003) optical, IR, and X-ray obs Grindlay et al. (17.142.081) X-ray bursts Grindlay et al. (19.154.018) X-ray obs Harvel and Martins (19.154.020) phot of core Liller and Carney (1978) BV, c-m Liller and Liller (18.154.006) BV, c-m Lloyd Evans (SAAO) UBV phot Rood et al. (1978) radio obs Troland et al (1978) search for CO van den Bergh (20.154.023) int UBV phot
6637 (M 69)	Frogel and Persson (Hale) JHK phot Harris (20.154.033) BV, c-m Lloyd Evans (SAAO) UBV phot
6638	Bernard (18.113.012) int UBV phot
6656 (M 22)	Alcaino (20.154.013) BV, c-m Butler (14.122.073) abund of RR var Canterna (14.154.009) CMT ₁ T ₂ phot of RG Frogel and Persson (Hale) JHK phot Harris and Hesser (DAO) strong CN stars Hesser (19.154.008) E Hesser et al. (18.154.007) CN from DDO obs Lloyd Evans (1978) BV, c-m, mem problem Lloyd Evans (SAAO) UBVR phot of RG Lloyd Evans (1978) mem Mallia (20.154.009) abund Manduca and Bell (1978) Ca abund McClure and Norris (20.154.019) CN and CH anomlies Philip and Goodman (14.113.047) finding charts Schneps et al. (1978) CO search Wehlau and Hogg (1978) var stars
6681 (M 70)	Harris (17.154.005) BV, c-m
6712	Butler (14.122.073) abund from RR var Cominsky et al. (19.142.003) X-ray obs Lloyd Evans and Menzies (19.154.001) IR Lloyd Evans (SAAO) Sp of RG Mould and McElroy (1978) TiO strengths van den Bergh (20.154.023) int UBV phot
6715 (M 54)	Harris (17.154.005) BV, c-m
6723	Lloyd Evans (SAAO) UBVR phot Lloyd Evans and Menzies (19.154.001) IR phot
6752	Cannon (Edinburgh) BV phot Carney (Harvard) BV, c-m DaCosta (Hale) str Lloyd Evans (SAAO) BVI phot of RG Mallia (20.154.009) abund Newell and Sadler (1978) blue horizontal branch Richer (1978) white dwarfs?
6779 (M 56)	Harris, Olzsewski and Schommer (Hale) c-m
6809 (M 55)	Alcaino (14.154.025) BV, c-m Harris (17.154.005) BV, c-m Lee (19.154.041) BV, c-m

TABLE 1. DATA ON GLACTIC GLOBULAR CLUSTERS - continued

NGC	Observer, reference and type of data
6809 (cont.)	Lloyd Evans and Menzies (Horrocks) Sp
6838 (M 71)	Butler (14.122.073) abund Canterna (14.154.009) CMT ₁ T ₂ phot of RG Cudworth (17.153.007) BV, c-m Gratton and Nesci (1978) rv of field stars Hesser et al. (18.154.007) CN strengths from DDO phot Mould and McElroy (1978) TiO strengths Pilachowski (1978) IR phot
6864 (M 75)	Harris (17.154.005) BV, c-m
6934	Corwin (19.154.031) int phot
7006	Canterna (14.154.009) CMT ₁ T ₂ phot of RG Corwin (19.154.031) int phot Frogel and Persson (Hale) JHK phot Rood et al. (1978) radio obs
7078 (M 15)	Aurière et al. (1978) search for [O III] Bahcall et al. (14.154.028) star counts Bahcall and Hausman (19.154.019) star counts Butler (14.122.073) abund from RR var Christensen (1978) energy distr Clark et al. (14.142.009) X-ray source var Cudworth (18.154.023) pm Feibelman (1978) brightness profile Frogel and Persson (Hale) JHK phot Kadla (14.154.006) abund Kadla et al. (14.154.020, 17.154.009) axial ratio Kadla and Spasova (17.154.012) distr of RG Kadla et al. (20.154.048) equidensity curves Kanagy and Wyatt (1978) dust Klein (18.154.038) search for thermal em Kolkhidashvili (19.154.037) density distr Kuzmin et al. (20.154.047) surface brightness profiles Leroy, Aurière and Laques (18.154.034) map of center Mironov and Cherepashchuk (18.154.039) phot around cl Mochnecki and Walker (1978) BVR phot Newell, Da Costa and Norris (18.154.014) massive central object Newell and O'Neil (1978) surface brightness distr Norris and Zinn (19.154.035) weak G-band effect. Rood et al. (1978) radio obs Sandage and Katem (19.113.046) UBV Schneps et al. (1978) CO search Terzian and Conklin (20.154.005) radio obs Troland, Hesser and Heiles (1978) search for CO White (Steward) BV phot of RG
7089 (M 2)	Bahcall and Hausman (19.154.019) star counts Butler (14.122.073) abund from RR var Cudworth (Yerkes) pm Harris (17.154.005) BV, c-m Kuzmin et al. (20.154.047) surface brightness profiles. Rood et al. (1978) radio obs Terzian and Conklin (20.154.006) radio obs
7099 (M 30)	Alcaino (1978c) BV, c-m Bahcall and Hausman (19.154.019) star counts Butler (14.122.073) abund from RR var.

TABLE 1. DATA ON GLACTIC GLOBULAR CLUSTERS - continued

NGC	Observer, reference and type of data
IC 4499	Fourcade, Laborde and Aria (14.154.015) BV, c-m Kukarkin (14.154.018) discussion
Pal 2	Corwin (19.154.031) int phot
Pal 5	Sandage and Hartwick (20.154.003) UBV, c-m
Pal 12	Harris and Canterna (Washington) BV, c-m Harris (1978) abund
E 1	Lauberts (18.153.021)
E 2	Lauberts (18.153.021)
E 3	Lauberts (18.153.021) Demers, van den Bergh (DAO) UBV, c-m

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TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS

Cluster Name	Observer, and type of data*
Be 58	Balázs (Budapest) pm, UBV Frolov (20.153.035) pm, mem, BV, E, age
Blanco 1 (ζ Sc1)	Perry, Walter, Crawford (1978) ubvy d, E, age
NGC 129	Balázs (Budapest) pm, UBV Efremov (1978) Cepheid age Frolov (14.153.009) lf, mf Frolov (14.153.037) BV, pm, mem, DL Cas member Schmidt (17.122.003) non-var in Cepheid strip
NGC 225	Carrasco, Strom, Strom (14.131.198) pol Osborn, Clariá (Porto Alegre) DDO of RG Vardanyan (17.141.628) IR stars
NGC 188	Danilov (18.151.001) dynamical evolution Jennens, Helfer (14.153.003) UBVIyz, d, E, abund McClure, Twarog (19.153.017) BV, mass loss Osborn, Clariá (Porto Alegre) DDO of RG Patenaude (1978) age Saio et al. (20.065.057) age, abund Simoda, Mano, Morioka (Tokyo) c-m Twarog (1978) d, age, abund
NGC 457	Schild (1978) energy distr Uzbek (1976, 1978) pm
NGC 559	Gubissich (14.153.001) RGU, d, E Jennens, Helfer (14.153.003) UBVIyz, d, E, abund Pauls (19.125.050) relations to SN remnant
NGC 581	Osborn, Clariá (Porto Alegre) DDO of RG Sagar, Joshi (1978a) UBV, d, E, age, lf Schild (1978) energy distr
Tr 1	Joshi, Sagar (20.153.027) UBV, E, d, age Sagar, Joshi (1978c) lf gap
NGC 609	Janes (Boston) c-m
NGC 637	Grubissich (14.153.001) RGU, d, E
NGC 654	Joshi, Pandey, Sagar (Naini Tal) UBV Samson (18.131.142) pol, magnetic fields Stone (19.153.010) pm, mem, d, E Vardanyan (17.141.628) IR stars
NGC 663	Schild (1978) energy distr Uzbek (1976, 1978) pm van den Bergh, de Roux (1978) UBV, d, E
Cr 463	Townsend (14.153.031) UBV, d, E, age
NGC 752	Janes (1978) DDO, d, E, abund Jennens, Helfer (14.153.003) UBVIyz, d, E, abund Mayor, Mermilliod (Geneva) rv Osborn, Clariá (Porto Alegre) DDO of RG Patenaude (1978) age Philip et al. (20.153.002) age
Stock 2 NGC 869) (h Per)	Osborn, Clariá (Porto Alegre) DDO of RG Nissen (18.114.115) abund (He) Schild (1978) energy distr. Turner (20.112.025) Cepheid member?
Be 63	Balázs (Budapest) UBV, pm Efremov (1978) Cepheid age

* Clusters are listed in order of increasing RA.

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 884 (χ Per)	Nissen (18.114.115) abund (He) Schild (1978) energy distr Turner (20.112.025) Cepheid member?
Stock 6	Efremov (1978) Cepheid age Patenaude (1978) age
Tombaugh 4 IC 1805	Balázs (Budapest) UB V , pm Joshi, Sagar (Naini Tal) Geneva phot Schid (1978) energy distr Vandanyan (17.141.628) IR stars
Czernik 8 NGC 957	Turner (20.112.025) Cepheid member? Schild (1978) energy distr
King 4 Tr 2	Turner (20.112.025) Cepheid member? Joshi, Pandey, Sagar (Naini Tal) UB V Osborn, Clariá (Porto Alegre) DDO of RG Schild (1978) energy distr
NGC 1039 (M 34)	Abt, Levato (20.153.025) Sp Cester et al. (20.153.018) UB V , d, age Ianna, McAlister (14.153.011) pm Hartoog (19.116.009) rot vel Ap Stars Uzbek (1976, 1978) pm
NGC 1245	Barkhatova, Zakharova (Ural) UB V , lf, str, age Jennens, Helfer (14.153.003) UB V iyz, d, E, abund
Mel 20 (α Per)	Markkanen (19.156.021) pol, UB V β , mag field, str Mermilliod (18.153.029) lf, gap Mermilliod (Geneva) rv compilation Molnar, Stephens, Mallama (1978) UV phot, rot Patenaude (1978) age Slovak (1978) δ Sct var
NGC 1342	Janes (1978) DDO, d, E, abund Jennens, Helfer (14.153.003) UB V iyz, d, E, abund Mayor, Mermilliod (Geneva) rv
M 45 (Pleiades)	Abt, Levato (1978) Sp, pec stars Bettis (19.153.016) duplicity Chavushyan, Garibdzhanyan (17.122.031) UB V flare stars Crawford, Perry (17.153.026) uvby β , d, E Iriarte, Erro (14.122.216) Sp flare stars Markkanen (19.151.031) UB V , pol Mayor, Mermilliod (Geneva) red dwarfs McNamara (17.153.019) uvby Mermilliod (18.153.029) lf gap Mermilliod (Geneva) rv compilation Parsamyan (18.122.146, 19.122.047) flare stars Patenaude (1978) age Pearse, Hill (14.1253.041) rv, binary frequency van Leeuwen, Pels (Leiden) phot and astrom of new members van Leeuwen, Bastiaansen (Leiden) phot and astrom of new members van Leeuwen (Leiden) phot dyn interpretation Vasilevskis et al. (Lick) internal motions Yuan, Waxman (19.151.031) kinematic age
NGC 1502 IC 361	Osborn, Clariá (Porto Alegre) DDO of RG Janes (Boston) c-m Piccirillo, Stein (1978) UB V , c-m, d
Be 11	Moffat, Jackson, FitzGerald (Montreal) c-m

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 1545 (Hyades)	Osborn, Clariá (Porto Alegre) DDO of RG Anthony-Twarog, Demarque (19.153.022) d age Artyukhina, Kholopov (14.112.013) pm, mem Bettis (19.153.016) duplicity Boesgaard et al. (19.153.018) Beryllium abund Carpenter, Corbin, Schmidt (14.153.010) d, motions, distr. Dabrowski (18.153.025) binary frequency Darvins (Lund) Sp Flower (1978b) d Foy (18.153.031) abund Henry et al. (19.153.023) K-line phot, abund Klemola et al. (14.11.001) trig parallaxes Griffin, Gunn (1978) binaries McAlister (20.153.001) d Mendoza (18.113.033) α and λ phot Mermilliod (Geneva) rv comilation Morris, Hill, Luyten (18.112.004) pm Murray, Harvey (19.153.032) d Olsen (18.080.002) abund Patenaude (1978) age Pels, Oort, Pels-Kluyver (14.153.025) pm, mem, lf, distr Philip et al. (20.153.023) age Uppgren (1978) VRI, d, mem Wickes (17.153.005) binary orbits Weis, Uppgren (19.153.039, 20.153.034) BVRI, mem Weis, Uppgren (Van Vleck) BVRI Yuan, Waxman (19.151.031) kinematic age
NGC 1624	Moffat, Jackson, FitzGerald (Montreal) phot, Sp
NGC 1647	Efremov (1978) Cepheid age Mayor, Mermilliod (Geneva) rv Pişmiş, Bozkurt (20.153.010) star counts, d, lf
NGC 1662	Janes (1978) DDO, d, E, abund Mayor, Mermilliod (Geneva) rv
NGC 1664	Osborn, Clariá (Porto Alegre) DDO of RG Mayor, Mermilliod (Geneva) rv
NGC 1778	Osborn, Clariá (Porto Alegre) DDO of RG Joshi, Sagar, Pandey (14.153.042) UBV, d, age Joshi, Sagar (Naini Tal) Geneva phot Mayor, Mermilliod (Geneva) rv Sagar, Joshi (18.153.041) stellar evolution Sagar, Joshi (1978c) lf gap
NGC 1817	Harris, Harris (20.153.006, 20.153.016) d, E, age, abund
An (Bok)	Philip et al. (20.153.023) age
NGC 1907	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund
NGC 1912	Balázs (Budapest) UBV, pm Jennens, Helfer (14.153.003) UBVIyz, d, E, abund Mayor, Mermilliod (Geneva) rv
NGC 1931	Moffat, Jackson, FitzGerald (Montreal) phot, Sp
Cr 69 (Orion cl)	Canell, Ianna (19.112.009) pm, expansion Levato, Abt (18.114.162) Sp McNamara (18.153.003) pm, mem, vel dispersion McNamara (18.153.034) UBVIJKL, Sp, age range Mermilliod (18.153.029) lf gap Parmasyan (18.122.146) flare stars

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 1960	Mermilliod (18.153.029) 1f gap
Be 21	Christian (19.153.038) UB, d, abund Christian, Janes (1978) UB, d, E, abund
NGC 2099 (M 37)	Archemashvili (17.153.008) 1f Janes (1978) DDO, d, E, abund Jennens, Helfer (14.153.003) UB, d, E, abund Pismis, Bozkurt (20.153.010) star counts, d, 1f
NGC 2158	Hawarden (14.153.006) distr Janes (1978) DDO, UB, d, E, abund McNamara, Sanders (18.153.013) pm, mem
NGC 2169	Abt (20.153.024) Sp, d, E Joshi, Sagar (Naini Tal) Geneva phot Mermilliod (18.153.029) 1f gap Perry, Lee, Barnes (1978) uvby β , Sp, rv, d, E, age Sagar (17.153.017) UB, d, E, age Sagar, Joshi (18.153.041) stellar evolution van Rensbergen et al. (1978) Sp
NGC 2168	Balázs (Budapest) UB, pm Mayor, Mermilliod (Geneva) rv Osborn, Clariá (Porto Alegre) DDO of RG
NGC 2204	Hawarden (14.153.006) distr Hawarden (17.153.001) UB, d, E, age, abund
Bochum 1	Moffat, Jackson, FitzGerald (Montreal) phot, Sp
NGC 2232	Clariá (Porto Alegre) UB, DDO of RG Mermilliod (18.153.029) 1f gap
NGC 2243	Hawarden (14.153.028) d, E, age, abund Norris, Hawarden (1978) DDO, abund van den Bergh (19.153.025) UB, d, abund
NGC 2244	Heiser (20.153.033) uvby β , E, d, age
NGC 2251	Mayor, Mermilliod (Geneva) rv van Rensbergen et al. (1978) Sp
Tr 5	Kalinowski (14.153.034) d, E, star counts
NGC 2264	Clariá (Porto Alegre) DDO of RG Joshi, Pandey Sagar (Naini Tal) UB Koch et al. (1978) binary McMillan (20.131.039) dust Mermilliod (18.153.029) 1f gap Rydgren (1977) BV, IR excess Rydgren (Troy) Ha em stars Warner, Strom, Strom (19.153.013) IR excess Young (1978) BV, Sp, E
Dolidze 24	Moffat, Jackson, FitzGerald (Montreal) phot, Sp
Dolidze 25	Moffat, Jackson, FitzGerald (Montreal) phot, Sp
NGC 2287	Clariá (Porto Alegre) UB, DDO of RG Feinstein et al. (1978) UB, d, E, age, DDO of RG Hartoog (17.153.016) Sp Levato, Maloroda (La Plata) Sp Mayor, Mermilliod (Geneva) rv Patenaude (1978) age van Rensbergen et al. (1978) Sp
Bochum 2	Moffat, Jackson, Fitzgerald (Montreal) phot, Sp
NGC 2281	Barkhatova, Zakharova, Sipachev (Ural) UB, 1f, str, age Hartoog (19.116.009) rot vel of Ap stars Mayor, Mermilliod (Geneva) rv

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 2281 (cont.)	Patenaude (1978) age Yoshizawa (1978) UBV, pm, mem, lf
NGC 2287	van Rensbergen et al. (1978) Sp
NGC 2301	Mayor, Mermilliod (Geneva) rv Osborn, Clariá (Porto Alegre) DDO of RG van Rensbergen et al. (1978) Sp
NGC 2323	Balázs (Budapest) UBV Mayor, Mermilliod (Geneva) rv Osborn, Clariá (Porto Alegre) DDO of RG
NGC 2324	Ghezloun et al. (10.153.029) mem, str, var
NGC 2335	Clariá (Porto Alegre) UBV, DDO of RG
NGC 2343	Clariá (Porto Alegre) UBV, DDO of RG
CR 132	Clariá (1977) UBVB, d, E, age, two groups
CR 135	Clariá (Porto Alegre) UBV, pm
NGC 2360	Osborn, Clariá (Porto Alegre) DDO of RG Patenaude (1978) age
NGC 2362	Lloyd Evans (Cape) UBVI, rv, mem Lohmann (20.153.028) lf, mass, radius, vel Mermilliod (18.153.029) lf gap
Cr 140	Clariá, Rosenzweig (1978) UBVB, d, E, age Clariá (Porto Alegre) ubvyB Williams (1978) UBV, d, age
NGC 2383	Osborn, Clariá (Porto Alegre) DDO
Mel 66	Anthony-Twarog, McClure, Twarog (1978) age, abund Hawarden (14.153.006) distr Hawarden (17.153.002) UBV, d, E, age, abund Hawarden (1978) BV, giant branch Williams (1978) UBV, d, age
Rup 20	Clariá (Porto Alegre) UBV, DDO of RG
Bochum 6	Moffat, Jackson, FitzGerald (Montreal) phot, Sp
NGC 2422	Hartoog (17.153.016) Sp Mermilliod (18.153.029) lf gap van Rensbergen et al. (1978) Sp
NGC 2423	Hassan (18.153.012) d, E, age
Mel 71	Hassan (18.153.011) UBV, d, E, age
NGC 2420	Demarque, McClure (19.153.014) abund McClure et al. (1978) BV phot, age Osborn, Clariá (18.153.030) DDO, abund Paparó (1977) UBV, str Patenaude (1978) age Salukvadze (19.153.028) str
Bochum 15	Jackson, FitzGerald, Moffat (20.152.002) UBV, d, E
NGC 2439	Pişmiş, Bozkurt (20.153.010) star counts, d, lf
Rup 31	Clariá (Porto Alegre) UBV
NGC 2451	Clariá (Porto Alegre) UBV, DDO of RG Hartoog (17.153.016) Sp Hartwick, Hesser (1978) search for blue stars Levato, Malaroda (14.153.032) Sp
NGC 2477	Hawarden (14.153.006) distr Hesser, Smith (DAO) Sp, rot vel, E, abund Patenaude (1978) age Philip et al (20.153.023) age
Haffner 18	FitzGerald, Moffat (18.153.001) UBV, d Pişmiş, Moreno (18.131.551) association with nebula

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
Haffner 19	FitzGerald, Moffat (18.153.001) UB _V , d
NGC 2482	Pis̄mis, Moreno (18.131.551) association with nebula Clariá (Porto Alegre) UB _V , DDO of RG
Tr 9	Pis̄mis, Bozkurt (20.153.010) star counts, d, 1f Osborn, Clariá (Porto Alegre) DDO of RG Pis̄mis, Bozkurt (20.153.010) star counts, d, 1f
NGC 2483	Havlen (18.153.002) UB _V β, no cluster
NGC 2489	Clariá (Porto Alegre) UB _V , DDO of RG
NGC 2516	Giesecking (Bonn) Sp, rv Hartoog (17.153.016) Sp Hartwick, Hesser (1978) search for blue stars King (Sydney) pm Mermilliod (18.153.029) 1f gap Snowden (14.153.030) uvbyβ, d, E, age Snowden (17.153.027) numbering
Rup 44	FitzGerald, Moffat (18.153.001) UB _V , d
NGC 2506	van Altena (Yale) pm
Rup 46	Clariá (Porto Alegre) UB _V , DDO pf RG
NGC 2527	Clariá (Porto Alegre) UB _V , DDO of RG Dodd et al. (20.153.020) UB _V , d, age
NGC 2533	Havlen (17.153.021) UB _V β, d, E, BN Pup not member
NGC 2547	Clariá (Porto Alegre) UB _V , DDO, pm Hartoog (17.153.016) Sp
NGC 2539	Clariá (Porto Alegre) UB _V , DDO of RG Joshi, Pandey, Sagar (Naini Tal) UB _V Mayor, Merilliod (Geneva) rv Pis̄mis, Bozkurt (20.153.010) star counts, d, 1f
NGC 2546	Clariá (Porto Alegre) UB _V , DDO of RG
NGC 2548	Clariá (Porto Alegre) UB _V , DDO of RG Meyer, Merilliod (Geneva) rv
NGC 2571	Clariá (18.153.005) UB _V β, DDO, d, age
Pis 4	Clariá (Porto Alegre) DDO of RG
NGC 2632 (Praesepe)	Bettis (19.153.016) duplicity Dabrowski (18.153.025) binary frequency Henry et al. (19.153.023) K-line phot, abund Janes (1978) DDO, d, E, abund Levato, Malaroda (La Plata) Sp Mayor, Merilliod (Geneva) red dwarf Mermilliod (Geneva) rv compilation Osborn, Clariá (Porto Alegre) DDO of RG Parsamyan (18.122.146) flare stars Philip et al. (20.153.023) age Weiss, Upgren (Van Vleck) BVRI Zykov (14.153.022) pm
IC 2391	Dravins (Lund) Sp Mermilliod (18.153.029) 1f gap Philip et al. (20.153.023) age
NGC 2660	Hesser (DAO) DDO of RG
NGC 2669	Osborn, Clariá (Porto Alegre) DDO of RG
NGC 2682 (M 67)	Balázs (Budapest) UB _V , pm Cohen et al. (1978) IR phot Föy (18.153.031) analysis red giant Griffin (18.153.032) analysis red giant Hoag (19.153.005) faint blue objects in field

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 2682 (cont.)	McNamara, Sanders (18.153.013) pm, mem McNamara, Sanders (1978) mass, vel dispersion Morgan, Eggleton (1978) binary mf Patenaude (1978) age Sanders (19.153.001) pm, mem Taylor (1978) phot, E, abund Tinsley, Gunn (17.115.015) lf, evolution Tinsley, King (18.153.033) distr. evolved stars Twarog (1978) abund, age, d Uzbek (1976, 1978) pm
NGC 2818	Connolly (20.113.031) BV
Pis 11	Moffat, FitzGerald (1977) UBV, d, E, supergiant Moffat, Knoechel (Montreal) pol
Pis 13	Clariá (Porto Alegre) UBV
NGC 2972	Osborn, Clariá (Porto Alegre) DDO of RG
Rup 79	Harris, van den Bergh (18.122.011) Cepheid CS Vel mem
NGC 3033	Osborn, Clariá (Porto Alegre) DDO of RG
NGC 3105	FitzGerald et al. (19.153.030) d, E
NGC 3114	Clariá (Porto Alegre) UBV, DDO of RG Levato, Malaroda (14.153.027) Sp
NGC 3228	Hartoog (17.153.016) Sp
NGC 3247	Grubisich (20.153.008) RGU, d, age
IC 2581	Tejedor (19.153.043) RGU, d, E, age Turner (1978) E
NGC 3293	Clariá (Porto Alegre) UBV, DDO of RG Forte (La Plata) RI, H α em, OB stars Marraco (La Plata) BV pol
NGC 3324	Clariá (19.153.003) UBVB β , d, E, age
vdBH 99	Levato, Malaroda (La Plata) Sp, Vsini
Cr 228	Feinstein, Marraco, Forte (La Plata) UBV, d, E, age Forte (La Plata) RI, H α em, OB stars Herbst (18.153.008) VRI, Sp, d, E Levato, Malaroda (La Plata) Sp Marraco, Forte (La Plata) BV, pol
IC 2602	Mermilliod (18.153.029) lf gap
Tr 14	Forte (La Plata) RI, H α em, OB stars Marraco (La Plata) BV, pol
Tr 15	Feinstein (La Plata) UBVRI
Tr 16	Feinstein (La Plata) RI Forte (La Plata) H α em, OB stars Herbst (18.153.008) VRI, Sp, d, E Levato, Malaroda (La Plata) Sp Marraco (La Plata) BV, pol
Rup 92	Steppe (19.153.004) RGU, d, E
Tr 17	Steppe (19.153.004) RGU, d, E
Rup 93	Steppe (19.153.004) RGU, d, E
NGC 3532	Fernandez, Salgado (Montevideo) UBV, Sp Hartoog (17.153.016) Sp King (Sydney) pm
NGC 3572	Steppe (19.153.004) RGU, d, E
Hogg 10	Clariá (17.155.026) UBVB β
Cr 240	Clariá (17.155.026) UBVB β
Tr 18	Steppe (19.153.004) RGU, d, E Kumar (19.125.057) supernova remnant?

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 3590	Clariá (17.155.026) UBVB
Stock 13	Steppe (19.153.004) RGU, d, E
NGC 3603	Steppe (19.153.004) RGU, d, E van den Bergh (1978) UBV, d, E
NGC 3680	Walborn (1977) interstellar lines Osborn, Clariá (Porto Alegre) DDO of RG
NGC 3766	Patenaude (1978) age Patenaude (1978) age
IC 2944	Yilmaz (18.153.010) RGU, d, E, age Ardeberg, Maurice (19.113.025, 19.152.002, 1978) UBV, Sp, rv, E, mem Forte (La Plata) RI, H α em, OB stars Marraco (La Plata) BV pol
Rup 97	van den Bergh et al. (18.153.007) UBV, d, E, age, SV Cru not mem
Rup 98	Osborn, Clariá (Porto Alegre) DDO of RG
NGC 4103	King (Sydney) pm
Mel 111 (Coma)	Abt, Levato (19.114.041) Sp Henry, Hesser (1978) K-line phot Mayor, Mermilliod (Geneva) red dwarfs Mermilliod (Geneva) rv compilation Philip et al. (20.153.023) age Weis, Upgren (Van Vleck) BVRI
NGC 4463	Osborn, Clariá (Porto Alegre) DDO of RG
Harvard 6	Janes (Boston) c-m
Rup 106	Janes (Boston) c-m
NGC 4609	Clariá (Porto Alegre) UBV and DDO of RG Mermilliod (18.153.029) lf gap
NGC 4755	Jakate (1978) search for var Perry et al. (18.153.020) UBV, d, E, age
Stock 16	Fenkart et al. (20.153.021) d, E, age
Loden 807	Hidayat, Wiramihardja (1978) BV, d
NGC 5138	Clariá (Porto Alegre) UBV, UBV and DDO of RG
Basel 18	Fenkart et al. (20.153.021) d, E, age
Hogg 16	Fenkart et al. (20.153.021) d, E, age
Cr 272	Fenkart et al. (20.153.021) d, E, age
NGC 5168	Fenkart et al. (20.153.021) d, E, age Osborn, Clariá (Porto Alegre) DDO of RG
Tr 21	Kumar (19.125.057) relation to SN remnant
NGC 5281	Osborn, Clariá (Porto Alegre) DDO of RG
NGC 5316	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund
An 1353-40	Williams et al. (20.153.003) UBV, d
NGC 5367	Williams et al. (20.153.003) UBV, d
NGC 5460	Clariá (Porto Alegre) UBV and DDO of RG
NGC 5617	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund Lohmann (17.153.018) mem, density, stellar vel
Pis 19	Lohmann (17.153.018) star counts
NGC 5662	Osborn, Clariá (Porto Alegre) DDO of RG
Cr 285 (UMa)	Wielen (1978) pm, vel dispersion Levato and Abt (1978) Sp
NGC 5822	Clariá (Porto Alegre) UBV, DDO of RG Hartwick, Hesser (1978) search for blue stars Jennens, Helfer (14.153.003) UBVIyz, d, E, abund van Altena (Yale) pm
NGC 5823	Janes (Boston) c-m Jennens, Helfer (14.153.003) UBVIyz, d, E, abund

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 5823 (cont.)	Schnur (19.113.030) UBV near cluster
Pis 20	Lyngå (Lund) uvby β
Pis 21	Moffat, FitzGerald (19.115.002) UBV, d, E,
Moffat 1	Moffat (18.064.021) M3Ia mem, dust envelope
NGC 6025	Kilambi (14.153.039) uvby, UBV, d, E, age, lf Mermilliod (18.153.029) lf gap Robertson (20.112.019) pm
Lyngå 7	Lyngå (Lund) uvby β
NGC 6067	Clariá (Porto Alegre) UBV, DDO of RG Efremov (1978) Cepheid age Jennens, Helfer (14.153.033) UBVIyz, d, E, abund Lohmann (20.153.026) d, lf Warren (19.122.030) GU Nor mem
NGC 6087	Efremov (1978) Cepheid age
NGC 6193	Herbst, Halven (1977) UBVR1, d, E, age
NGC 6200	FitzGerald et al. (19.153.036) UBV, Sp, d, E,
NGC 6204	Lyngå (Lund) uvby β
Westerlund 1	Koorneef (19.153.011) IR
NGC 6231	Garrison (1978) Sp Levato, Malaroda (La Plata) Sp Nissen (18.114.115, 18.152.003) abund (He) Patenaude (1978) age
Lyngå 14	Forte (La Plata) RI, Ha em, OB stars Marraco (La Plata) BV, pol
NGC 6242	Clariá (Porto Alegre) UBV, DDO of RG
NGC 6250	Herbst (20.153.019) UBVR1, Sp, d, E, age
NGC 6259	Janes (Boston) c-m
NGC 6281	Bolten, Herbst (18.142.050) d, E, X-ray source Clariá (Porto Alegre) UBV, DDO, of RG
NGC 6322	Lyngå (Lund) uvby β
Halven-Moffat	Halven, Moffat (19.153.029) UBV, d, E, WR and Of
IC 4651	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund Patenaude (1978) age
NGC 6383	FitzGerald et al. (20.153.013, 1978) UBV, Sp, d, E age Lloyd Evans (1978) UBV, T Tauri stars Lyngå (Lund) uvby β Thé (Amsterdam) phot, circumstellar matter
Tr 27	Moffat, et al. (19.153.026) UBV, Sp, d, E, mem van Genderen, The (1978) Cepheid member?
NGC 6405 (M 6)	Lohmann (18.153.035) star counts
IC 4665	Abt, Levato (14.153.038) Sp Crampton, Hill, Fisher (17.153.011) rv, binaries Mermilliod (18.153.029) lf gap Patenaude(1978) age
NGC 6475	Hartoog (19.116.009) rotational vel of Ap Henry, Hesser (1978) K-line phot Patenaude (1978) age Snowden (17.153.020) uvby β , d, E, age Snowden (17.153.026) numbering
NGC 6523	Lyngå (Lund) uvby β
NGC 6531	Lyngå (Lund) uvby β
NGC 6530	Cudworth (17.153.007) BV

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 6530 (cont.)	Kilambi (19.153.008, 19.153.027, 20.153.015) UBV, E, age, var Sagar, Joshi (1978b) UBV, d, E, age, lf
Cr 367	Clariá (Porto Alegre) UBV
NGC 6583	Lloyd Evans (Cape) UBV, T Tauri stars
NGC 6604	Forbes, DuPuy (1978) UBV, d, age
NGC 6611	Carrasco, Strom, Strom (14.131.198) pol Feinstein (La Plata) UBVR Joshi, Pandey, Sagar (Naini Tal) UBV Thé (Amsterdam) phot
NGC 6618	Ogura, Ishida (17.113.022) UBV, d
NGC 6633	Cudworth (17.153.007) BV Levato, Abt (10.153.004) Sp Mayor, Mermilliod (Geneva) Schmidt (17.153.009) uvby β , d, E Uzbek (1976, 1978) pm
IC 4725 (M 25)	Efremov (1978) Cepheid age Schmidt (20.153.022) uvby β , d, E van den Bergh (1978b) UBV, d, E
NGC 6649	Efremov (1978) Cepheid age Flower (1978a) Cepheid Madore et al. (1978) Cepheid
IC 4756	McNamara, Sanders (198.153.013) pm mem Schmidt (1978) uvby β , d, E
Tr 34	Mayor, Mermilliod (Geneva) rv
NGC 6694	Uzbek (1976, 1978) pm
NGC 6704	Forbes, DuPuy (1978) UBV, d, age
NGC 6705	Harris, Harris (1978) UBV, DDO, E McNamara, Sanders (18.153.013, 19.153.009) pm, mem, mass McNamara, Sanders, Pratt (19.153.002) pm, mem Uzbek (1976, 1978) pm
NGC 6709	Latypov (20.112.015) pm Mayor, Mermilliod (Geneva) rv Osborn, Clariá (Porto Alegre) DDO of RG Schild (1978) energy distr
NGC 6755	Uzbek (1976, 1978) pm
Cr 399	Osborn, Clariá (Porto Alegre) DDO of RG
NGC 6811	Barkhatova et al. (1978) UBV, lf, str, age Mayor, Mermilliod (Geneva) rv
NGC 6819	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund
NGC 6823	Turner (DDO) E
NGC 6834	Vardanyan (17.141.628) IR stars
NGC 6866	Balázs (Budapest) UBV, pm
NGC 6871	Schild (1978) energy distr Vardanyan (17.141.628) IR stars
Bicurankan 2	DuPuy, Zukauskas (18.153.014) UBV, d, E, age
NGC 6882	Balázs (Budapest) UBV, pm
NGC 6885	Balázs (Budapest) UBV, pm
IC 4966	Osborn, Clariá (Porto Alegre) DDO of RG Sudzius, Straizys (18.131.231) UBXYZV, E Vardanyan (17.141.628) IR stars
NGC 6910	Crawford, Barnes, Hill (20.153.005) uvby β , d, E
NGC 6913	Crawford, Barnes, Hill (20.153.005) uvby β , d, E Raznik (14.153.023) var Raznik (10.153.032) UBV

TABLE 2. DATA ON INDIVIDUAL OPEN CLUSTERS - continued

Cluster Name	Observer, and type of data
NGC 6913 (cont.)	Schild (1978) energy distr Vardanyan (17.141.628) IR stars
NGC 6939	Hawarden (14.153.006) distr
NGC 6940	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund Latypov (20.112.017) pm Mayor, Mermilliod (Geneva) rv
NGC 7000	Parmasyan (18.122.146) flare stars
NGC 7044	Janes (Boston) c-m
NGC 7062	Cudworth (17.153.007) BV
NGC 7092	Abt, Levato (18.153.004) Sp, d Balázs (Budapest) UBVI, pm Kilkenny et al. (14.153.002) β , d, age
Tr 37	Garrison, Kormendy (19.156.006) Sp, UBVI, d
IC 1396	Giesekeing (17.123.023) var stars
NGC 7128	Vardanyan (17.141.628) IR stars
NGC 7142	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund
IC 5146	Samson (18.131.142) pol, magnetic fields
NGC 7160	Barkhatova et al. (Ural) UBVI, lf, str, age Schild (1978) energy distr van Altena, De Greave (Yale) mem
NGC 7209	Balázs (Budapest) UBVI, pm Mayor, Mermilliod (Geneva) rv Osborn, Claria (Porto Alegre) DDO of RG
NGC 7243	Balázs (Budapest) UBVI, pm Mermilliod (18.153.029) lf gap
NGC 7261	Jennens, Helfer (14.153.003) UBVIyz, d, E, abund
Be 94	Wramdemark (1978) UBVI β , d, E
NGC 7380	McMillan (18.131.268) pol is in foreground Schild (1978) energy distr
NGC 7419	Moffat (Montreal) detailed study Vardanyan, Akverdyan (14.153.040) IR phot
An cl	Pfleiderer et al. (1977) str
Mark 50	Crampton (14.153.013) d, rv, WR star
NGC 7654	Osborn, Claria (Porto Alegre) DDO of RG Schild (1978) energy distr Schmidt (20.153.02) uvby β , d, E
NGC 7762	Zakharova (Ural) UBVI, lf, str, age
NGC 7788	Balázs (Budapest) UBVI, pm Frolov (10.153.035) pm, BV, mem, E, age
NGC 7789	Balázs (Budapest) UBVI, pm Clariá (1978) UBVI, E, abund Hawarden (14.153.006) distr Janes (19.153.019) DDO, UBVI, d, E, CN strength Jennens, Helfer (14.153.003) UBVIyz, d, E, abund
Frolov 1	Balázs (Budapest) UBVI, pm Frolov (20.153.035) pm, BV, mem, E, age
NGC 7790	Balázs (Budapest) UBVI, pm Efremov (1978) Cepheid age Frolov (20.153.035) pm, BV, mem, E, age

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TABLE 3. T ASSOCIATIONS

Name	Observer, and type of data*
Cyg T1	Filin (14.132.002) var stars
Cep T2	Suyarkova (17.122.083) var stars
Tau T1	Nurmanova (17.122.070) UBV plot Zakirov (17.152.005) duplicity Slutskij (17.152.006) absorption
Tau T2	Nurmanova (17.122.070) UBV plot Zakirov (17.152.005) duplicity Slutskij (17.152.006) absorption
Tau T3	Nurmanova (17.122.070) UBV plot Zakirov (17.152.005) duplicity Slutskij (17.152.006) absorption
Ori T1	Zakirov (17.152.005) duplicity
Ori T2	Zakirov (17.152.005) duplicity
CrA T1	Glass, Penston (14.113.002) JHKL phot Kardopolov, Filipev (20.152.010) phot Zakirov (18.152.014) wide pairs
Sco T1	Filin, Satyvoldiev (17.122.082) var stars Petrov, Satyvoldiev (17.122.088) colors of var stars

*Listed in order of increasing galactic longitude.

TABLE 4. R ASSOCIATIONS

Name	Observer, and type of data*
Sgr R1	Herbst (14.155.002) d, E
Cyg R1	Herbst (14.152.001) total to selective absorption
(vdB 130)	Herbst (14.155.002) d, E
Cep R1	Herbst (14.155.002) d, E
Cep R2	Herbst (14.155.002) d, E
Cas R1	Herbst (14.155.002) d, E
Cam R1	Herbst (14.155.002) d, E
Per R1	Herbst (14.155.002) d, E
Tau R1	Herbst (14.155.002) d, E
Tau R2	Herbst (14.155.002) d, E
Tau - Ori R1	Herbst (14.155.002) d, E
Ori R1/R2	Herbst (14.155.002) d, E
Mon R1	Herbst (14.155.002) d, E
	Herbst, Warner (Minnesota) UBVR1JKL
Mon R2	Herbst (14.155.002) d, E
	Herbst, Racine (18.152.015) UBV phot, Sp, d, age
CMa R1	Herbst (14.155.002) d, E
	Herbst, Assousa (20.125.003) supernova, star formation
	Herbst et al. (1978) phot, Sp, age
	Reynolds, Ogden (1978) expansion
	Williams, et al. (18.152.004) JKL phot
Ca Ma R2	Herbst (14.155.002) d, E
Pup R3	Herbst (14.155.002) d, E
Pup R2	Herbst (14.155.002) d, E
Pup R1	Herbst (14.155.002) d, E
Vel R1	Herbst (14.155.002) d, E
Vel R2	Herbst (14.155.002) d, E
	Herbst (14.152.005) Sp, E, d, age
	Williams et al. (19.152.004) JHKL phot
Vel R3	Herbst (14.152.002) total to selective absorption
	Herbst (14.155.002) d, E
Car R1	Herbst (14.152.001) total to selective absorption
	Herbst (14.155.002) d, E
Car R2	Herbst (14.155.002) d, E
Cen R2	Herbst (14.152.001) total to selective absorption
	Herbst (14.155.002) d, E
Cen R3	Herbst (14.155.002) d, E
Cen R1	Herbst (14.155.002) d, E
Cir R1	Herbst (14.155.002) d, E
Cir R2	Herbst (14.155.002) d, E
Ara R1	Herbst (14.152.002) total to selective absorption
	Herbst (14.155.002) d, E
	Herbst, Havlen (20.152.009) UBVR1 phot
Sco R2	Herbst (14.155.002) d, E
Sco R3	Herbst (14.155.002) d, E
Sco R4	Herbst (14.155.002) d, E
Sco R5	Herbst (14.155.002) d, E
Sco R6	Herbst (14.155.002) d, E
Sco R1	Herbst (14.155.002) d, E
Sco R7	Herbst (14.155.002) d, E

* Listed in order of increasing galactic longitude.

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TABLE 5. OB ASSOCIATIONS

Name	Observer, and type of data*
Cyg OB3	Akhundova (19.152.003) rv
Cyg OB2	Akhundova et al. (19.152.003) rv Huchtmeier, Wendker (19.152.006) hydrogen content Kleinmann et al. (1978) IR spectroscopy McMillan, Tapia (18.131.253) pol McMillan, Tapia (19.131.067) pol Stoeger (19.152.007) pol Treanor (19.152.008) pol Voelcker, Elsasser (14.152.002) stars and interstellar medium Voelcker (14.113,014) IR phot
Lac OB1	Crawford, Warren (19.152.001) uvby, E, d Guetter (18.152.019) Sp, d Levato, Abt (17.152.010) Sp
Cep OB3	Assousa et al. (20.152.006) supernova, star formation Felli et al. (1978) thermal radio em
Cep OB4	Cohen, Kuhl (18.152.012) stellar ages
Per OB1	Dzērvitis (18.152.016) red supergiants Gahm, Holtqvist (18.115.015) red supergiants
Per OB2	Duboshin et al. (18.152.001) dynamical evolution Guetter (20.152.001) Sp, E, d
Ori OB1	Abt, Levato (1977) MK types Cowie, Sonaila, York (Princeton) gas expansion Guetter (18.152.007) Sp, d Hartwick, Hesser (1978) search for faint blue stars Levato, Malaroda (La Plata) faint star MK types Warren (18.152.008) cross identifications Warren, Hesser (19.152.010) UBv, uvby phot Warren, Hesser (19.152.011) E, d Warren, Hesser (1978) subgroups
CMa OB1	Clariá (Porto Alegre) uvby H phot, E Herbst et al. (20.115.012) carbon star Reynolds, Ogden (1978) expansion
Pup OB2	Havlen (17.152.002) UBv, H phot
Car OB1	Forte (1978) UBvRI, Sp, E
Ara OB1	Herbst, Havlen (20.152.009) UBvRI phot
Sco OB2	Rajamohan (18.152.017) rotation, line strengths
Sco OB4	Antalová (18.152.002) VBLU phot, E, d

* Listed in order of increasing galactic longitude.

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