THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 105:343–352, 1996 August

SURVEY FOR EMISSION-LINE GALAXIES: UNIVERSIDAD COMPLUTENSE DE MADRID LIST 2[1]

J. ZAMORANO, J. GALLEGO, M. REGO, A. G. VITORES,[2] AND O. ALONSO
Departamento de Astrofísica, Universidad Complutense, 28040 Madrid, Spain
Received 1995 July; accepted 1995 November 30

ABSTRACT

A low-dispersion objective-prism survey for low-redshift emission-line galaxies (ELGs) is being carried out by the Universidad Complutense de Madrid with the Schmidt telescope at the German-Spanish Observatory of Calar Alto (Almería, Spain). A 4° full-aperture prism, which provides a dispersion of 1950 Å mm^{-1}, and IIIa-F emulsion combination has been used to search for ELGs selected by the presence of Hα emission in their spectra. A compilation of descriptions and positions, along with finding charts, is presented for 103 emission-line objects. This is the second list, which contains objects located in a region of the sky covering 201.4 deg^2 in seven fields near $\alpha = 15^h$ and $\delta = 25°$.
Subject headings: galaxies: Seyfert — surveys

1. INTRODUCTION

The Universidad Complutense de Madrid (UCM) Survey for emission-line objects, which is being carried out at the German-Spanish Observatory of Calar Alto (Spain), has been described in detail by Zamorano et al. (1994, hereafter Paper I, UCM List 1).

The UCM Survey has been initiated with these general objectives: (1) to identify and study new young, low-metallicity galaxies; (2) to carry out the classification and determination of the overall properties and completeness of the sample of emission-line galaxies (ELGs) selected; (3) to determine the spatial distribution and luminosity function of the new galaxy population; (4) to compare our survey with others and to find out differences between the samples obtained with various objective-prism techniques; (5) to study the overall relation between the far-infrared properties and the optical behavior of the star-forming galaxies; (6) to determine the evolutionary status and the different stellar subjacent populations of the objects in order to detect any effect of evolution in the starburst phenomena; and (7) to quantify the properties of the star formation in the local universe.

The Schmidt telescope of the Calar Alto German-Spanish Observatory (Almería, Spain), equipped with a full-aperture objective prism, is being used in this survey. The 80/120 cm f/3 Schmidt telescope and 4° objective prism combination provides a dispersion of 1950 Å mm^{-1} at Hα, and the plate scale is 86″ mm^{-1} (Birkle 1984). By using IIIa-F emulsion, whose sensitivity decays abruptly at 6850 Å, and a RG630 filter, a useful spectral range from 6400 to 6850 Å is selected. Since this bandpass excludes the strong night-sky emission in the blue-visual region, longer exposures can be made without severe plate fogging. This instrumental setup is able to record the Hα emission line for objects up to $z \lesssim 0.04$. The IIIa-F plates were hypersensitized by baking them in an atmosphere of N_2 gas at 65° C for 6 hr prior to exposure.

By careful manual guiding using stars brighter than m_v = 9, and without widening for recording very faint objects, the spectra are generally kept to a width of 0.06 mm. Dispersion runs along the north-south axis. A well-exposed spectrum is about 0.4 mm long. Field coverage is 5.5 × 5.5 deg^2 in plates 24 cm wide. Plates taken with bad seeing or poor guiding were rejected after visual inspection. Quality standards for the plates analyzed were as follows: (1) good seeing (no worse than 3″) and excellent guiding, (2) no cloud interference, (3) no exposure interruption, and (4) telescope near the meridian, i.e., hour angle between 21^h30^m and 2^h30^m.

As in Paper I of this series, we present here the list obtained from the second campaign. Follow-up observations, both spectroscopy and imaging, of the UCM galaxies included in the first two lists have been performed in order to address some of the purposes of the survey. Some results have already been published (Gallego et al. 1994; Rego, Zamorano, & González-Riestra 1989; Rego et al. 1993, 1994; Zamorano et al. 1990, 1992), while others will be published elsewhere (Vitores et al. 1996; Gallego et al. 1996; Alonso-Herrero et al. 1996).

2. RESULTS

The plate field centers, dates of observation, seeing, and number of candidates found are listed in Table 1. The total number of galaxies in Zwicky et al. (1961–1968, Catalog of Galaxies and of Clusters of Galaxies, hereafter CGCG) is also tabulated for each plate. These data, obtained from the Catalogue of Principal Galaxies (Paturel et al. 1989, hereafter PGC), are useful to stress the differences between galaxy populations from field to field. A diagram with the fields surveyed is depicted in Figure 1. These plates were taken during an observing run in 1987 June with dark nights and very transparent atmosphere. Although the overlapping spectra of close objects lying together along a north-south axis could lead to spurious identifications, only a small fraction of cases are found in each field that can be eliminated after inspection of direct images on the Palomar Observatory Sky Survey (POSS) prints in order to identify their nature. There is one object that was left out of UCM

[1] Based on observations collected at the German-Spanish Astronomical Center, Calar Alto, Spain, operated jointly by the Max-Planck-Institut für Astronomie (MPIA), Heidelberg, and the Spanish National Commission for Astronomy. Partly based on observations made with the Isaac Newton Telescope operated on the island of La Palma by the Royal Greenwich Observatory in the Spanish Observatorio del Roque de los Muchachos of the Instituto de Astrofísico de Canarias.

[2] EUIT Industrial Universidad Politécnica, 28012 Madrid, Spain.

TABLE 1

JOURNAL OF OBSERVATIONS

Plate No.	Plate Center RA(1950)	DEC(1950)	Date of Observation	UT	texp (min)	Seeing (arcsec)	CGCGs ($z \leq 0.04$)	ELGs
A228	$12^{h}\,58^{m}.3$	+29° 05'.5	1987 jun 20	$21^{h}52^{m}$	120	1	246	46
A229	$16^{h}\,58^{m}.4$	+28° 47'.9	1987 jun 21	$01^{h}00^{m}$	180	2	29	11
A230	$16^{h}\,05^{m}.8$	+14° 58'.7	1987 jun 21	$22^{h}37^{m}$	150	2	79	4
A231	$16^{h}\,39^{m}.4$	+29° 29'.5	1987 jun 22	$01^{h}25^{m}$	150	2	7	6
A232	$13^{h}\,19^{m}.9$	+28° 21'.2	1987 jun 22	$21^{h}30^{m}$	150	3	47	12
A234	$14^{h}\,41^{m}.4$	+27° 10'.7	1987 jun 23	$22^{h}47^{m}$	150	3	33	24
A236	$16^{h}\,05^{m}.0$	+21° 44'.9	1987 jun 24	$22^{h}26^{m}$	129	3	17	2

List 1 (UCM 0023+1908) because it appears as a pair of stellar objects in the north-south direction. Follow-up spectroscopic observations have confirmed the ELG nature of one of the components.

Plates have been carefully searched by visually scanning with a low-power (10×) binocular microscope in a scanning frame that allowed coverage in a series of horizontal strips 1 cm wide. Each plate was inspected by at least three independent observers. A last review of all objects found provides the final selection, which is checked against the POSS plates. The visual inspection of the plates, although efficient, is rather subjective. A study on the feasibility of automatic detection of ELGs using MAMA (Machine Automatique à Mesurer pour l'Astronomie; Guibert & Moreau 1991) has been started with very promising results (Alonso et al 1995). The automatic procedure will help us to perform objective quality control of the plates and to test the biases of this eye-selected sample.

The candidates were classified according to three parameters. First, the eye estimate of the continuum intensity relative to the plate background was divided into three categories: A for candidates with a marginally present or absent continuum, B for moderate continuum intensity objects, and C for candidates with a very strong, almost saturated continuum. Next in the classification is the estimate of the apparent equivalent width of the emission line. Candidates are designated 1, 2, or 3 according to the contrast of the emission line with respect to the continuum on the plates: the number 1 signifies a low-contrast emission line; and an equivalent width parameter of 3 is reserved for objects that exhibit a highly contrasted emission line, even saturated. Finally, we have used a concentration parameter which is based upon eye estimates of the widths of the spectra, perpendicular to the dispersion. Candidates for which the spectrum is clearly wider than stellar are denoted by "d" (for "diffuse"). No intermediate categories have been used because of the subjective nature of these eye estimates.

Information about the objects of the second list of our survey is presented in Table 2. Column (1) contains the positional UCM designation. Names composed of the values of right ascension and declination are given according to IAU rules; UCM stands for Universidad Complutense de Madrid. Objects are arranged in order of increasing right ascension. Equatorial coordinates for B1950.0 are given in columns (2) and (3). Column (4) con-

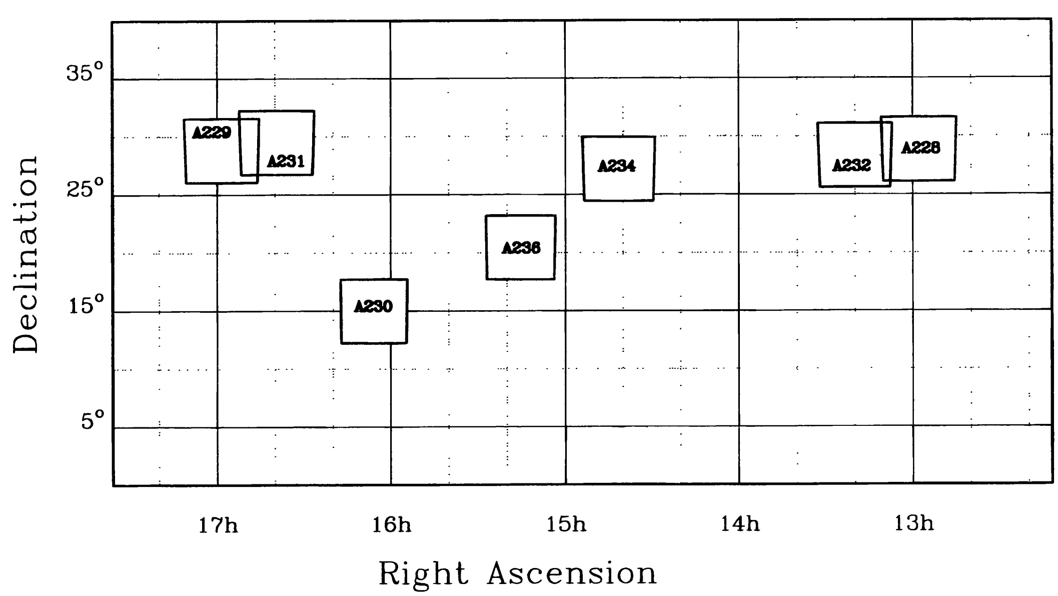

FIG. 1.—Schematic map of the sky showing the fields covered by the UCM survey in the 1987 June campaign and included in the second list. Each plate covers a field of 5°.5 × 5°.5. Field centers are provided in Table 1.

TABLE 2

A. UCM Survey List 2

UCM (1)	RA (1950) (2)	DEC (3)	Type (4)	m (5)	size (6)	IRAS (7)	ZWG (8)	other names (9)
1246+2727	12 46 34.8	+27 27 04	A1d	15.5	0.6×0.3			MK657 N4702 M+5−30−091 KUG1246+274
1247+2701	12 47 53.6	+27 01 21	A1d	16.0	0.4×0.2			KUG1247+270
1248+2912	12 48 36.0	+29 12 00	B1d	15.5	0.7×0.5	12485+2911	Z159.091	N4735 M+05−30−104 KUG1248+291
1253+2926	12 53 25.6	+29 26 12	A1		0.2×0.2			
1253+2756	12 53 40.6	+27 56 56	B3	16.2	0.4×0.3		Z160.020	MK53 CG930 KUG1253+279 PB3129 KUV12537+2757
1254+2932	12 54 05.5	+29 32 35	A1	17.1	0.2×0.2			A2 213
1254+2741	12 54 22.3	+27 41 31	A1d		0.5×0.2			
1254+2853	12 54 31.6	+28 53 39	B1		0.6×0.3			
1254+2802	12 54 39.4	+28 02 38	A1d		0.5×0.3			
1254+2740	12 54 59.8	+27 40 30	B2	16.3	0.4×0.3			MK55 KUG1254+276 CG933
1255+2819	12 55 32.7	+28 19 55	A1d	15.9	0.6×0.4			M+05−031−035 CG934 KUG1255+283
1255+3125	12 55 52.6	+31 25 46	B2	15.5	0.6×0.3			WAS064 CG936 M+05−31−033
1255+2734	12 55 53.3	+27 34 52	A2	16.5	0.4×0.3			KUG1255+275
1256+2717	12 56 01.8	+27 17 37	A1		0.3×0.2			PB3168
1256+2732	12 56 10.1	+27 32 06	A2	16.2	0.5×0.4		Z160.064	MK56 CG938 KUG1256+275
1256+2701	12 56 14.5	+27 01 46	A1		0.7×0.2			
1256+2910	12 56 18.6	+29 10 48	A2d		0.6×0.5			
1256+2823	12 56 37.3	+28 23 09	B2	15.7	0.5×0.4	12566+2823	Z160.213	N4858 M+05−31−051 CG942 KUG1256+283
1256+2754	12 56 40.2	+27 54 52	B1	15.1	0.7×0.6		Z160.073	MK58 M+05−31−057 CG943 KUG1256+279
1256+2722	12 56 51.5	+27 22 34	B1		0.4×0.2			
1257+2754	12 57 02.8	+27 54 22	A3	14.9	0.2×0.2			PG1257+279 H4−1 PB3189
1257+2826	12 57 12.6	+28 26 10	A1d		0.3×0.3			
1257+2808	12 57 40.3	+28 08 09	A1	16.1	0.4×0.3		Z160.243	MK60 CG949 KUG1257+281
1258+2754	12 58 08.8	+27 54 27	A2	15.7	0.6×0.4		Z160.086	CG953 KUG1258+279A
1259+2934	12 59 01.4	+29 34 58	B3	13.9	0.3×0.3	12590+2934	Z160.096	N4922B U8135 M+05−31−099 CG956 VV609B
1259+3011	12 59 20.1	+30 11 46	B1d		0.4×0.3			
1259+2755	12 59 43.3	+27 55 03	B2	15.2	0.7×0.5	12596+2755	Z160.106	N4926A M+05−31−107 CG960 KUG1259+279
1300+2907	13 00 01.6	+29 07 38	A3	16.9	0.3×0.2			CG963 PB3241 KUV13000+2908
1300+3136	13 00 01.8	+31 36 29	A1d		0.4×0.4			
1300+2959	13 00 50.1	+29 59 30	A2		0.3×0.2			PB3260
1301+2904	13 01 58.9	+29 04 45	A2	15.3	0.5×0.5		Z160.128	KUG1301+290
1302+2853	13 02 11.9	+28 53 46	B1	16.0	0.4×0.3			CG968 KUG1302+288A KUV13022+2854
1302+3032	13 02 55.8	+30 32 44	A1	16.5	0.4×0.4			MK62 CG971 KUG1302+305 KUV13029+3033 PB3292 BA108
1303+2908	13 03 21.8	+29 08 20	A3d	16.2	0.4×0.3			CG972 PB3295
1304+2808	13 04 12.6	+28 08 25	A1d	15.0	0.9×0.5	13042+2808		M+05−31−132 KUG1304+281
1304+2830	13 04 13.4	+28 30 08	A2		0.2×0.2			
1304+2907	13 04 14.3	+29 07 05	A1d	15.1	0.9×0.5		Z160.139	M+05−31−133 KUG1304+291 CG974 VV841 PB3313
1304+2818	13 04 49.5	+28 18 52	A1d	15.7	0.5×0.5		Z160.141	KUG1304+283
1306+3100	13 06 10.5	+31 00 55	A1d		0.7×0.4			
1306+2938	13 06 53.3	+29 38 03	B2	15.1	0.5×0.4	13068+2938	Z160.151	M+05−31−143 CG980 KUG1306+296
1306+3111	13 06 59.8	+31 11 22	B1d		0.4×0.4			
1307+2910	13 07 24.5	+29 10 25	B1	13.9	1.5×1.2	13073+2910	Z160.152	U08241 N5000 M+05−31−144 VV460
1308+2958	13 08 25.3	+29 58 34	A2d	15.2	0.8×0.6		Z160.155	N5004B IC4210 M+05−31−148
1308+2950	13 08 39.3	+29 50 39	B1	14.6	1.4×0.6	13086+2950	Z160.156	U08259 N5004C M+05−31−150
1309+2937	13 09 53.3	+29 37 05	A1		0.2×0.2			
1310+2736	13 10 09.8	+27 36 40	A1		0.2×0.2			
1310+3027	13 10 48.3	+30 27 25	A1		0.5×0.3			
1312+3040	13 12 46.9	+30 40 07	B1	15.4	0.7×0.4	13127+3040	Z160.170	
1312+2954	13 12 47.6	+29 54 03	A2d		0.6×0.4			
1313+2938	13 13 42.2	+29 38 46	A3	16.1	0.3×0.2			WAS66 CG996 PB3449 TON151
1314+2827	13 14 22.0	+28 27 51	B1	16.3	0.4×0.4			CG1001
1320+2727	13 20 21.7	+27 27 34	A2	17.0	0.3×0.2			CG1019
1321+2648	13 21 02.8	+26 48 17	A1d	15.6	0.7×0.6		Z161.040	M+05−32−012 KUG1321+268
1324+2926	13 24 04.9	+29 26 04	A2	16.4	0.2×0.2			WAS70
1324+2651	13 24 30.1	+26 51 02	C2	15.2	0.6×0.4	13244+2651	Z161.052	MK454 M+05−32−020 KUG1324+268
1325+2955	13 25 02.5	+29 55 29	A1		0.2×0.2			
1330+3011	13 30 26.8	+30 11 27	A1		0.2×0.2			
1331+2900	13 31 26.1	+29 00 34	A3	17.4	0.1×0.1			WAS74
1428+2727	14 28 56.3	+27 27 30	B3d	15.5	0.7×0.4	14289+2727	Z163.071	MK685 M+05−34−061 KUG1428+274
1429+2645	14 29 33.6	+26 45 53	A2		0.2×0.2			
1430+2947	14 30 45.1	+29 47 39	A3	17.0	0.4×0.3	14307+2947		CG1239

TABLE 2—*Continued*

UCM (1)	RA (1950) (2)	DEC (3)	Type (4)	m (5)	size (6)	IRAS (7)	ZWG (8)	other names (9)
1431+2854	14 31 09.7	+28 54 45	C1d	15.4	0.5×0.4		Z163.078	
1431+2702	14 31 32.3	+27 02 24	B3		0.3×0.2			
1431+2947	14 31 39.8	+29 47 17	A1d	18.0	0.3×0.2			CG1240
1431+2814	14 31 53.6	+28 14 30	B2		0.5×0.2			
1432+2645	14 32 49.0	+26 45 45	B1	15.2	0.7×0.5	14328+2645	Z163.085	U9384 IC4461 KUG1432+267 ARP95 VV303 M+05−34−077
1439+2439	14 39 10.1	+24 39 30	B1		0.4×0.3			
1440+2521S	14 40 47.6	+25 21 30	B1	16.0	0.5×0.3	14408+2521		
1440+2511	14 40 48.0	+25 11 21	B1		0.6×0.5			
1440+2521N	14 40 49.4	+25 21 51	B2	15.9	0.5×0.3	14408+2521		U9489
1441+2918	14 41 57.0	+29 18 46	A1d	14.9	0.7×0.6			
1442+2845	14 42 11.0	+28 45 42	C2	14.8	0.8×0.7		Z164.015	IC4497 M+05−35−009
1443+2714	14 43 25.6	+27 14 41	C2	15.3	0.5×0.5	14434+2714	Z164.019	
1443+2844	14 43 46.2	+28 44 07	B2	15.4	0.6×0.4	14437+2844	Z164.021	M+05−35−014
1443+2548	14 43 49.3	+25 48 20	A1d	15.4	0.6×0.5	14438+2548	Z134.030	
1444+2923	14 44 36.8	+29 23 07	B1d		0.5×0.4			
1445+2855	14 45 39.3	+28 55 56	A1		0.3×0.3			
1447+2535	14 47 23.3	+25 35 16	C2	14.3	1.4×1.1		Z134.037	U9544 M+04−35−010
1448+2847	14 48 57.3	+28 47 15	B1d		0.7×0.3			
1449+2844	14 49 10.2	+28 44 07	B1d	15.7	0.6×0.4		Z164.035	
1451+2954	14 51 16.1	+29 54 07	B1d		0.6×0.6			
1452+2754	14 52 12.9	+27 54 14	C2		0.5×0.3			
1506+1922	15 06 05.0	+19 22 57	B2d	14.6	0.6×0.5		Z106.010	M+03−39−008
1513+2012	15 13 33.0	+20 12 24	B3d	15.6	0.6×0.3	15135+2012	Z106.023	
1557+1423	15 57 49.2	+14 23 55	B1		0.4×0.3			
1604+1642	16 04 54.3	+16 42 31	B1		0.5×0.3			
1608+1335	16 08 40.6	+13 35 40	B1		0.2×0.2			
1612+1308	16 12 57.2	+13 08 59	A3		0.2×0.2			
1646+2725	16 46 34.6	+27 25 36	A3		0.2×0.2			
1647+2950	16 47 07.9	+29 50 40	C2d	15.2	0.6×0.6	16471+2950	Z169.004	KUG1647+298
1647+2729	16 47 36.3	+27 29 22	B1	15.6	0.5×0.3		Z169.005	KUG1647+274
1647+2727	16 47 36.6	+27 27 25	B1		0.2×0.2			
1648+2855	16 48 49.3	+28 55 46	C2	15.0	0.5×0.4	16488+2855		MK1108 KUG1648+289
1651+2721	16 51 18.9	+27 21 14	A2d		0.1×0.1			
1651+3017	16 51 41.4	+30 17 22	A3		0.3×0.2			
1653+2644	16 53 08.1	+26 44 29	A1d	14.7	0.9×0.6	16531+2642	Z139.020	MK1111 U10607 M+04−40−007 IC4630 VV852
1654+2812	16 54 51.1	+28 12 53	A1		0.3×0.2			
1655+2755	16 55 16.3	+27 55 34	B1d	15.4	0.8×0.6		Z169.015	N6264 M+05−40−009
1656+2845	16 56 38.9	+28 45 28	B1d		0.6×0.3			
1656+2744	16 56 52.6	+27 44 10	B2		0.3×0.3			
1657+2901	16 57 28.9	+29 01 10	A2	17.0	0.3×0.2			KUG1657+290
1659+2928	16 59 10.5	+29 28 43	C2	16.1	0.7×0.5			MK504 M+05−40−026 KUG1659+294
1701+3131	17 01 21.6	+31 31 39	C2	15.4	0.7×0.5	17013+3131	Z169.035	MK700 U10675 M+05−40−034 VV805 KUG1701+315

tains the object classification according to the three-parameter scheme described above. In column (5) the blue magnitudes are listed for previously cataloged galaxies. In column (6) we give object dimensions (major diameter × minor diameter) in minutes of arc. *IRAS* and Zwicky counterparts are given in columns (7) and (8). Finally, in column (9) previous designations are listed. The abbreviations refer to the following catalogs or surveys: A2 = Barbieri & Rosino (1972), ARAK = Arakelian (1975), ARP = Arp (1966), CG = Case Low-Dispersion Northern Sky Survey (Pesch, Sanduleak, & Stephenson 1991, and references therein), IC = Dreyer (1910), KARA = Karachentsev (1971), KAZ = Kazarian (Kazarian & Kazarian 1980), KUG = Kiso (Takase & Miyauchi-Isobe 1993, and references therein), M = MCG (Vorontsov-Velyaminov, Arkipova, & Kranogorskaja 1974, and references therein), MK = Markarian (Markarian 1967; Markarian, Lipovetskii, & Stepanian 1981, and references therein), N = NGC (Dreyer 1888), PB = Palomar-Berger (Berger & Fringant 1984, and references therein, TON = Tonanzintla (Iriarte & Chavira 1957; Chavira 1957), U = UCG (Nilson 1973), WAS = Wasilewski (1983), and Z = CGCG (Zwicky et al. 1961–1968; Zwicky 1971). A brief description of the appearance of the objects in the POSS prints and some additional information are given in the notes to the table. A comprehensive literature search has been made in order to check whether the candidates are objects not previously cataloged and to obtain previous designations for our survey objects. We have used the master list compiled by Dixon & Sonnenborn (1980), the PGC (Paturel et al. 1989), and the NASA/IPAC Extragalactic Database NED).

We include identification charts for all the candidates of the survey in Figure 2 (Plates 18–23). Maps were copied from the Digitized Sky Survey, which is a digitized version of the Palomar Observatory Sky Survey (POSS) E plates

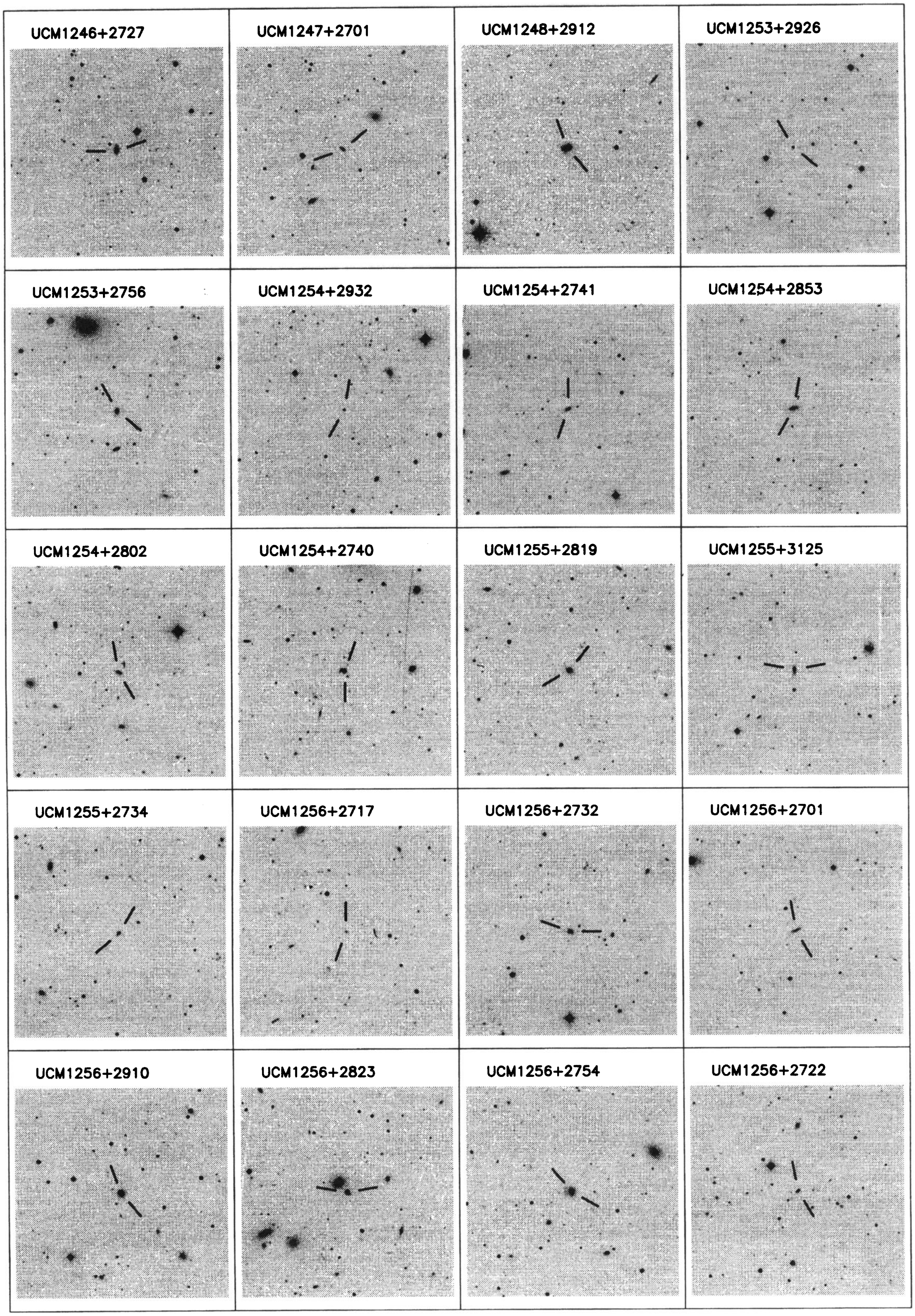

FIG. 2.—Finding charts for the objects found in the survey. North is up and east is to theleft. Each field covers a square 10′ wide.

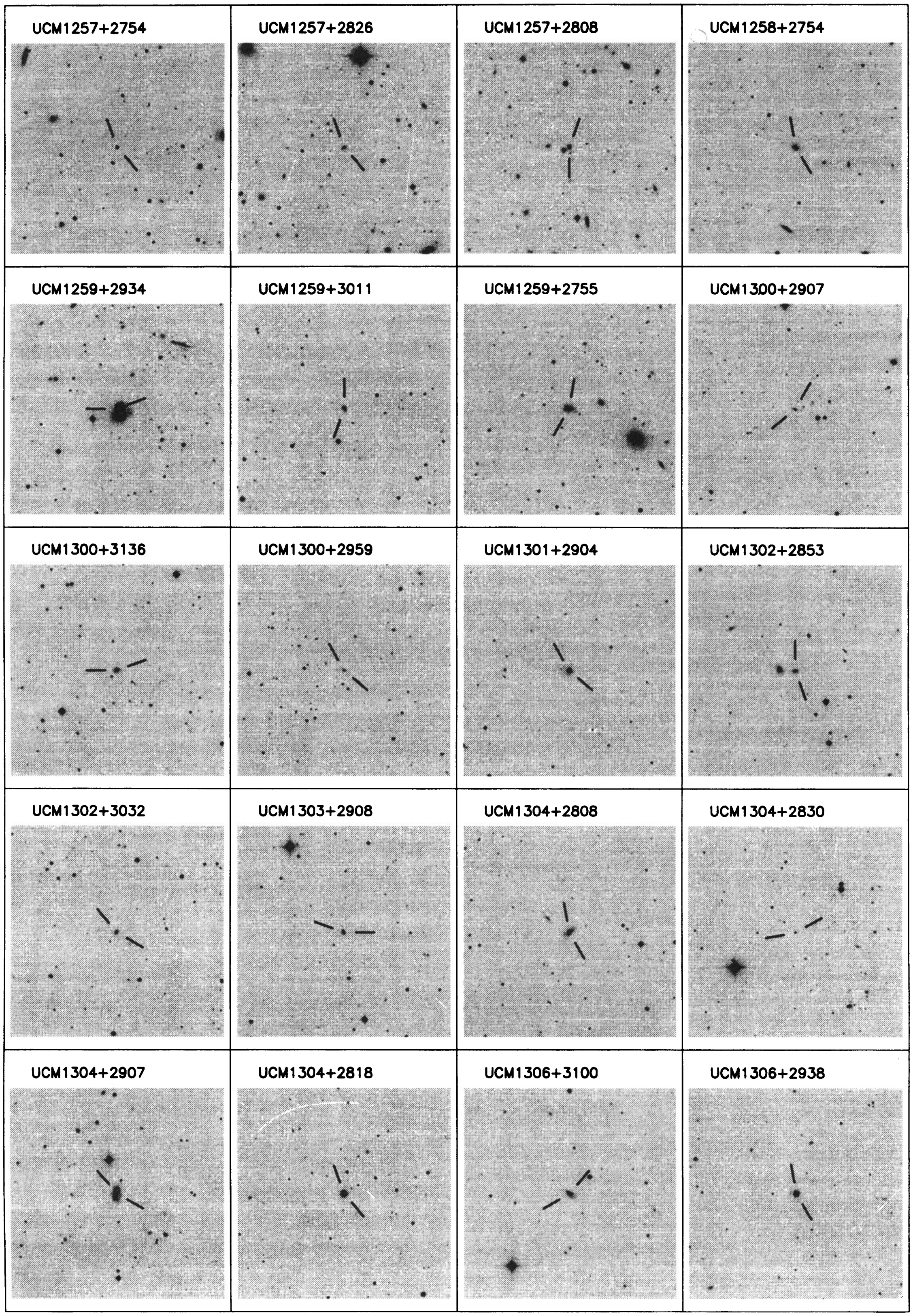

FIG. 2—*Continued*

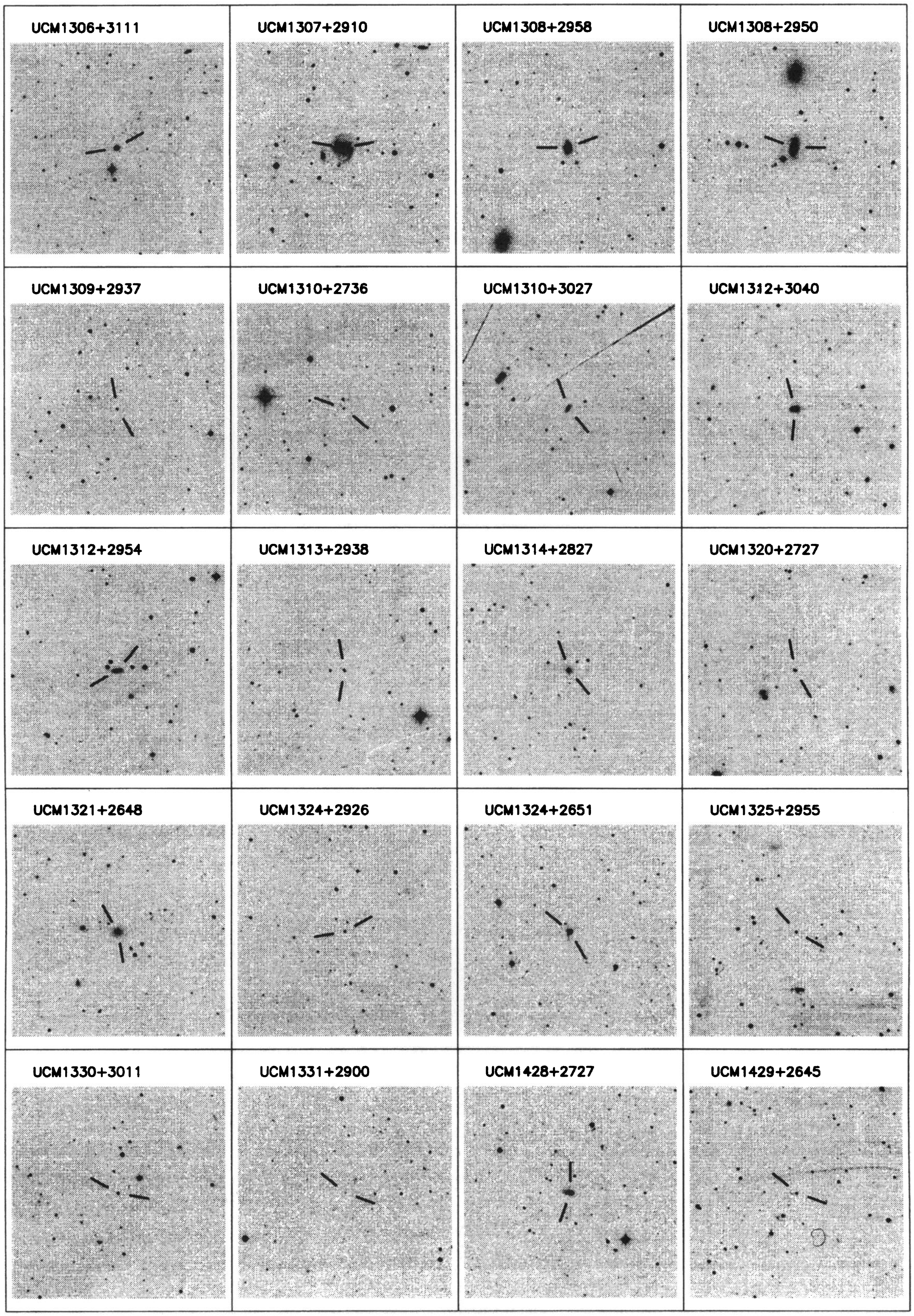

FIG. 2—*Continued*

ZAMORANO et al. (see 105, 346)

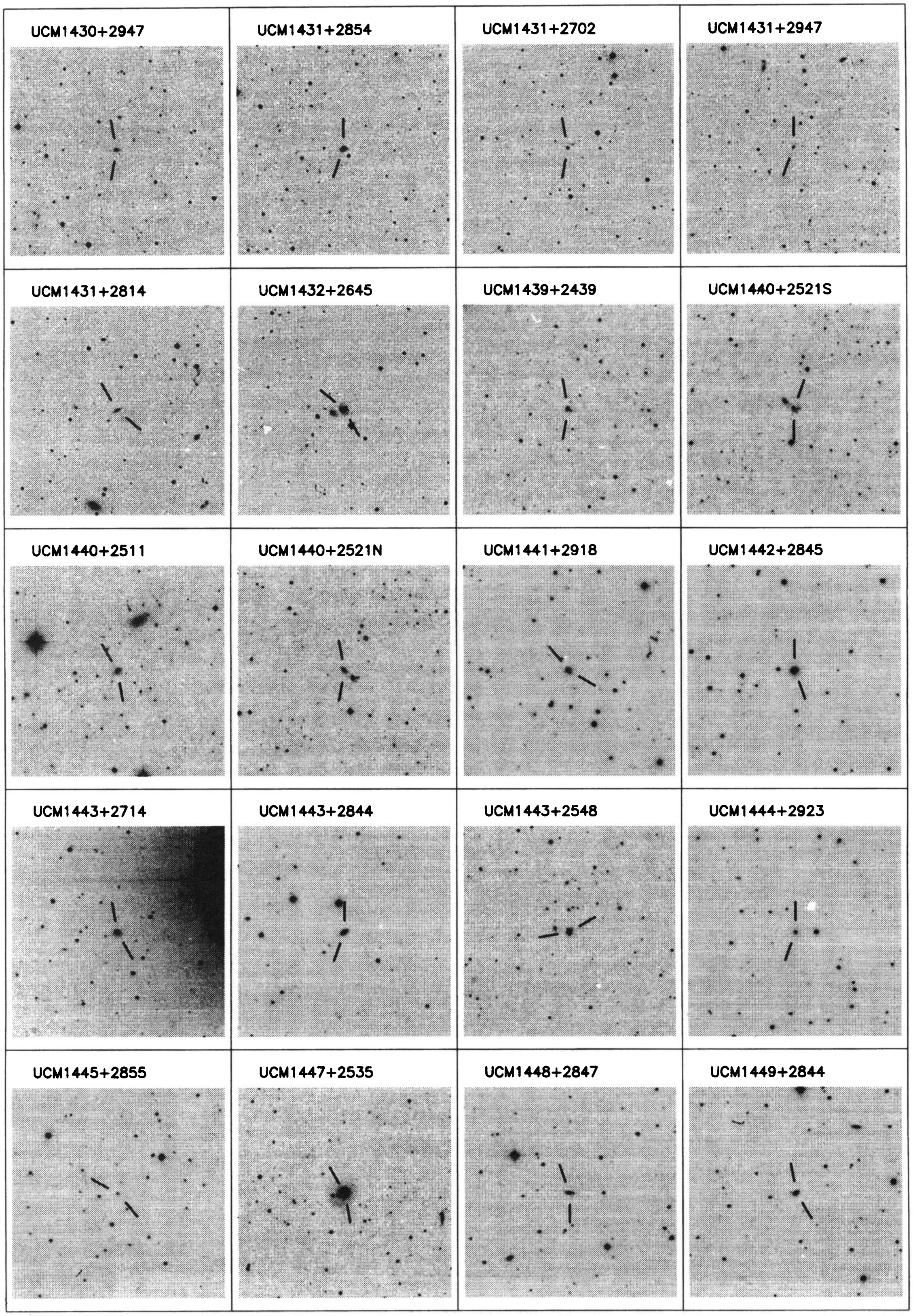

FIG. 2—*Continued*

ZAMORANO et al. (see 105, 346)

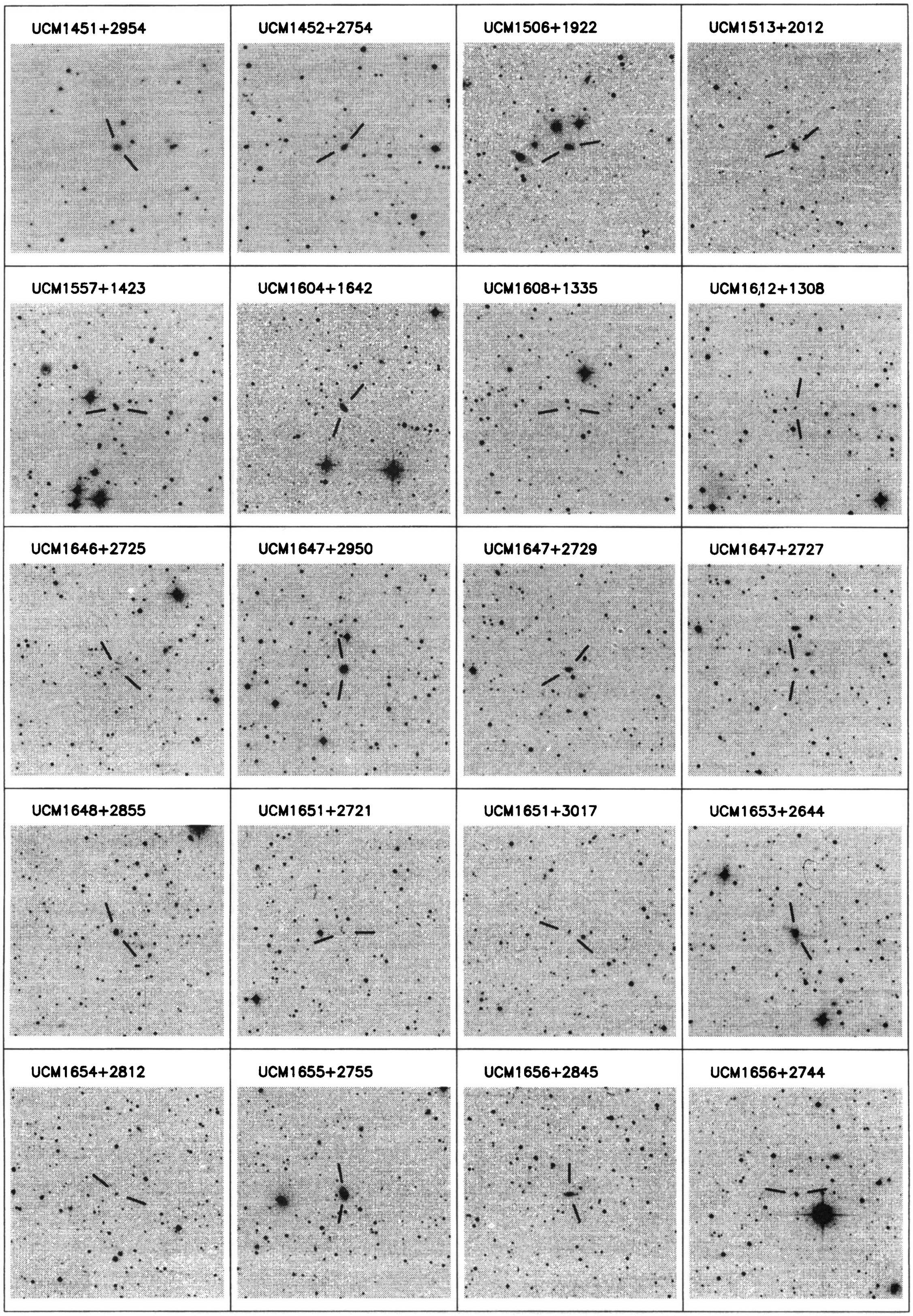

FIG. 2—*Continued*

ZAMORANO et al. (see 105, 346)

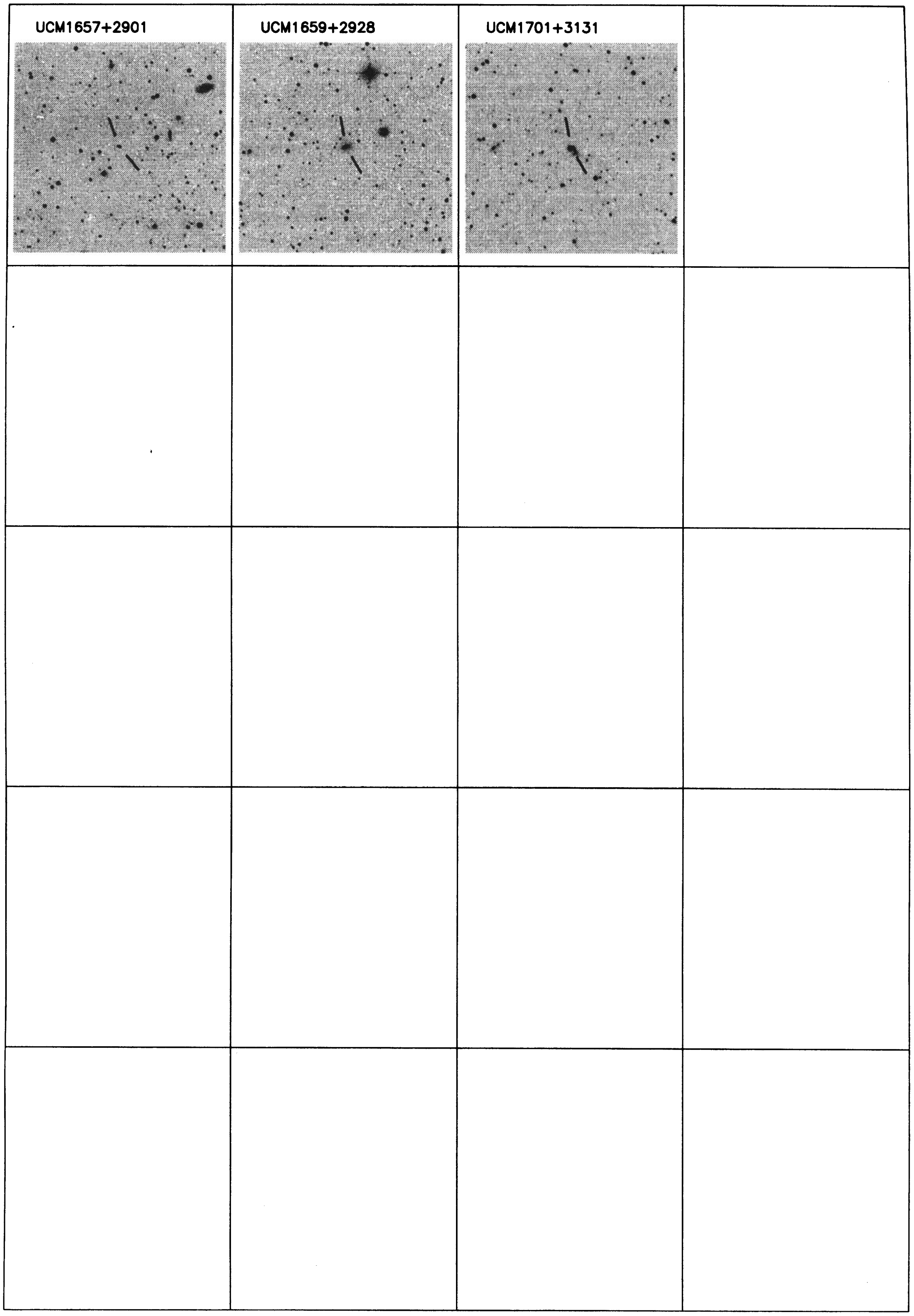

FIG. 2—*Continued*

TABLE 2—*Continued*

B. NOTES ON INDIVIDUAL OBJECTS

1246+2727 irregular shape.
1247+2701 almost edge-on spiral.
1248+2912 almost face-on barred spiral.
1253+2926 stellar-like appearance.
1253+2756 oval.
1254+2932 stellar-like appearance.
1254+2741 spiral.
1254+2853 spiral with bright nucleus.
1254+2802 diffuse oval.
1254+2740 diffuse oval, western member of Mk55 pair.
1255+2819 diffuse with a knot at S.
1255+3125 almost edge-on spiral, bright nucleus.
1255+2734 irregular shape.
1256+2717 diffuse oval.
1256+2732 spiral with bright nucleus.
1256+2701 clumpy irregular.
1256+2910 face-on spiral.
1256+2823 diffuse oval at SW of elliptical N4860.
1256+2754 spiral with bright nucleus.
1256+2722 spiral.
1257+2754 compact.
1257+2826 compact with a star at SE.
1257+2808 compact sourrounded by two galaxies.
1258+2754 distorted spiral.
1259+2934 distorted spiral. N member of system. Sy2.
1259+3011 spiral with bright nucleus.
1259+2755 asymmetrical spiral.
1300+2907 distorted spiral.
1300+3136 diffuse oval.
1300+2959 oval.
1301+2904 almost face-on spiral.
1302+2853 oval.
1302+3032 diffuse oval.
1303+2908 clumpy irregular.
1304+2808 spiral with extended nucleus.
1304+2830 compact.
1304+2907 clumpy irregular.
1304+2818 face-on spiral.
1306+3100 distorted spiral.
1306+2938 diffuse oval.
1306+3111 oval.
1307+2910 face-on barred spiral.
1308+2958 spiral.
1308+2950 barred spiral.
1309+2937 stellar-like appearance.
1310+2736 compact.
1310+3027 spiral with bright nucleus.
1312+3040 ringed spiral.
1312+2954 almost edge-on spiral.
1313+2938 oval with extension to the NE.
1314+2827 diffuse spheroidal.
1320+2727 diffuse oval.
1321+2648 almost face-on spiral.
1324+2926 compact.
1324+2651 two nuclei. A tail pointing to S.
1325+2955 stellar-like appearance.
1330+3011 compact oval.
1331+2900 compact oval.
1428+2727 distorted spiral with knots at S.
1429+2645 compact.
1430+2947 oval with bright nucleus.
1431+2854 diffuse spiral.
1431+2702 compact.
1431+2947 diffuse elongated.
1431+2814 almost edge-on spiral.
1432+2645 barred spiral.
1439+2439 spheroidal with a companion at SW.
1440+2521S southern spiral of a pair.
1440+2511 spiral with bright nucleus.
1440+2521N northern spiral of a pair.
1441+2918 spiral.
1442+2845 spheroidal.
1443+2714 spiral with bright nucleus. Sy2.
1443+2844 spiral with several knots.
1443+2548 spiral.
1444+2923 compact spheroidal.
1445+2855 compact oval.
1447+2535 face-on spiral with knots.
1448+2847 edge-on spiral.
1449+2844 spiral.
1451+2954 oval diffuse.
1452+2754 spiral.
1506+1922 spiral with bright nucleus.
1513+2012 distorted spiral.
1557+1423 oval with a field star at NE.
1604+1642 spiral.
1608+1335 stellar appearance.
1612+1308 compact oval.
1646+2725 very elongated.
1647+2950 oval diffuse.
1647+2729 oval diffuse.
1647+2727 spheroidal. Elongated companion at W.
1648+2855 diffuse spheroidal.
1651+2721 stellar appearance.
1651+3017 oval with a field star at the NW.
1653+2644 distorted spiral.
1654+2812 elongated.
1655+2755 barred spiral. Sy2.
1656+2845 almost edge-on spiral.
1656+2744 oval with bright nucleus.
1657+2901 oval.
1659+2928 barred spiral with bright nucleus. Sy1.
1701+3131 spiral with a tail ponting to SW. Sy2.

produced by the Space Telescope Science Institute (STScI). These images were also used to derive object dimensions, which were obtained by fitting an ellipse to the points with density 3 σ over the background. Using the polynomial coefficients for the astrometric solution that appears in the headers of the individual image files, accurate coordinates of the objects were obtained with an accuracy of 1″. This procedure is by far more precise than that employed to find the positions of the candidates of the first list. (Paper I), where uncertainties of 10″–20″ were typical for new objects. This is

TABLE 3

UCM Survey List 1 Coordinates

UCM Name	RA (1950) h m s	DEC ° ′ ″	UCM Name	RA (1950) h m s	DEC ° ′ ″	UCM Name	RA (1950) h m s	DEC ° ′ ″
0000+2140	00 00 35.7	+21 40 57	0054+2337	00 54 38.8	+23 37 11	2304+1640	23 04 26.2	+16 40 02
0001+2024	00 01 34.6	+20 23 37	0056+0044	00 56 21.5	+00 44 07	2305+1621	23 04 59.9	+16 21 24
0003+2200	00 03 03.7	+22 00 15	0056+0043	00 56 30.2	+00 43 53	2306+1703	23 06 22.8	+17 03 34
0003+2215	00 03 18.0	+22 15 27	0119+2156	01 19 01.2	+21 56 54	2306+1947	23 07 03.2	+19 47 44
0003+1955	00 03 45.3	+19 55 29	0121+2137	01 21 53.6	+21 37 23	2307+2118	23 07 21.4	+21 19 01
0005+1802	00 05 55.6	+18 02 45	0129+2109	01 29 32.2	+21 09 12	2310+1800	23 10 09.8	+18 00 19
0006+2332	00 06 20.0	+23 32 22	0130+2505	01 30 33.4	+25 06 14	2312+2204	23 12 19.9	+22 04 03
0009+2038[a]	00 09 49.9	+20 38 28	0134+2258	01 34 25.7	+22 57 56	2312+2500	23 12 43.8	+25 00 34
0012+2123[b]	00 12 30.3	+21 23 15	0135+2242	01 35 13.6	+22 42 04	2313+1842	23 13 09.7	+18 41 55
0013+1944	00 13 14.6	+19 42 08	0138+2016	01 37 58.3	+20 15 58	2313+2516	23 13 33.1	+25 17 01
0014+1829	00 14 39.9	+18 29 38	0138+2047	01 38 14.8	+20 47 33	2315+1923	23 15 31.1	+19 23 32
0014+1748	00 14 48.5	+17 48 24	0138+2216	01 38 15.6	+22 16 48	2315+1658	23 15 44.1	+16 58 32
0015+2212	00 15 31.8	+22 12 05	0139+2226	01 39 10.9	+22 26 18	2316+2457	23 16 10.5	+24 57 35
0017+1942	00 17 21.7	+19 42 13	0141+2220	01 41 32.5	+22 20 05	2316+2459	23 16 12.5	+24 59 29
0017+2148	00 17 50.3	+21 48 41	0142+2137	01 42 04.7	+21 37 55	2316+2028	23 16 58.6	+20 28 26
0019+2045	00 18 53.0	+20 46 24	0142+2441	01 42 22.4	+24 40 34	2317+2356	23 17 37.3	+23 56 50
0018+2218	00 18 57.5	+22 18 57	0145+2519	01 44 59.8	+25 19 30	2319+2234	23 19 50.4	+22 34 12
0018+2216	00 18 57.3	+22 15 55	0147+2309	01 47 55.8	+23 09 07	2319+2243	23 19 51.9	+22 44 14
0019+2201	00 19 12.4	+22 01 29	0148+2124	01 48 18.5	+21 23 53	2320+2036	23 20 34.9	+20 36 05
0022+2049	00 22 07.4	+20 49 28	0150+2032	01 50 55.9	+20 32 58	2320+2428	23 20 53.2	+24 28 33
0023+1908	00 23 26.9	+19 08 34	0150+2056	01 51 00.0	+20 56 30	2321+2149	23 21 38.8	+21 49 40
0034+2119	00 34 05.3	+21 19 57	0152+2039	01 52 05.0	+20 38 35	2321+2506	23 21 57.4	+25 06 39
0036+2007	00 36 19.0	+20 07 22	0155+2507	01 55 41.1	+25 06 57	2322+2204	23 22 40.9	+22 04 59
0037+2226	00 37 32.3	+22 26 29	0155+2223	01 55 42.3	+22 23 37	2322+2218	23 22 54.1	+22 18 11
0038+0235	00 38 17.4	+02 34 04	0156+2410	01 56 27.2	+24 10 28	2323+2047	23 23 15.0	+20 47 37
0038+2259	00 38 30.3	+22 59 21	0157+2324	01 57 06.4	+23 24 09	2323+2252	23 23 56.7	+22 51 49
0038+2302	00 38 45.7	+23 02 10	0157+2413	01 57 30.3	+24 13 55	2324+2448	23 24 10.8	+24 48 19
0039+0054	00 39 12.2	+00 54 12	0157+2102	01 57 45.7	+21 02 44	2325+2318	23 25 11.9	+23 18 49
0040+0257	00 40 02.9	+02 57 57	0159+2327	01 59 00.8	+23 26 56	2325+2208	23 25 58.0	+22 08 45
0040+2312	00 40 10.0	+23 12 58	0158+2354	01 59 00.5	+23 54 44	2326+2435	23 26 19.1	+24 35 54
0040+0220	00 40 15.6	+02 20 24	2238+2308	22 38 51.6	+23 08 44	2327+2154	23 27 37.2	+21 54 41
0040−0023	00 40 54.1	−00 23 58	2239+2402	22 39 05.9	+24 02 41	2327+2515	23 27 40.4	+25 15 27
0041+0134	00 41 22.1	+01 34 37	2239+1959	22 39 30.4	+19 59 59	2327+1956	23 27 59.7	+19 56 25
0043+0245	00 43 09.9	+02 45 25	2241+2431	22 41 02.3	+24 31 15	2328+2109	23 28 27.9	+21 09 57
0043+2440	00 43 27.9	+24 42 06	2244+2049	22 44 06.5	+20 49 11	2329+2447	23 29 08.6	+24 47 37
0043−0159	00 43 32.1	−01 59 45	2249+2149	22 49 32.1	+21 49 08	2329+2427	23 29 18.6	+24 27 32
0044+2246	00 44 40.1	+22 46 34	2250+2427	22 50 10.0	+24 27 52	2329+2500	23 29 23.8	+25 01 09
0045−0157	00 44 59.0	−01 57 42	2251+2352	22 51 18.9	+23 52 14	2329+2511	23 29 36.1	+25 12 09
0045+2256	00 45 04.2	+22 56 24	2251+2405	22 51 54.1	+24 04 44	2331+2214	23 31 50.0	+22 14 02
0045+2206	00 45 17.2	+22 06 02	2253+2219	22 53 05.4	+22 20 00	2333+2248	23 33 02.9	+22 48 20
0047+2051	00 47 16.0	+20 51 09	2253+2453	22 53 18.8	+24 53 26	2333+2241	23 33 17.1	+22 41 04
0047+2413	00 47 32.8	+24 13 32	2255+1930N	22 55 08.8	+19 31 23	2333+2359	23 33 35.7	+23 59 22
0047−0213	00 47 32.1	−02 13 24	2255+1930S	22 55 07.9	+19 30 54	2334+2134	23 34 07.6	+21 34 18
0047+2414	00 47 45.3	+24 14 54	2255+1926	22 55 16.7	+19 26 03	2344+2157	23 44 29.3	+21 57 12
0049−0006	00 49 13.6	−00 06 37	2255+1654	22 55 26.2	+16 54 02	2346+2011	23 46 51.3	+20 11 08
0049+0017	00 49 15.6	+00 17 35	2256+2002	22 56 22.8	+20 01 49	2348+2407	23 48 53.2	+24 07 31
0049−0045	00 49 26.1	−00 45 29	2257+2438	22 57 07.4	+24 39 00	2351+2321	23 51 06.8	+23 21 16
0049+0013	00 49 50.7	+00 13 25	2257+1606	22 57 50.5	+16 06 53	2352+2040	23 52 02.0	+20 40 55
0050+0005	00 50 24.0	+00 05 52	2258+1920	22 58 39.5	+19 20 25	2352+2230	23 52 29.5	+22 29 45
0050+2114	00 50 54.8	+21 14 32	2300+2014	23 00 49.6	+20 15 00	2353+2027	23 53 12.4	+20 27 21
0051+2430	00 51 14.5	+24 30 05	2302+2053W[c]	23 02 56.1	+20 53 29	2354+2232	23 53 59.9	+22 30 50
0053+2352	00 53 08.2	+23 52 38	2302+2053E	23 02 59.8	+20 53 29	2357+2440	23 57 10.2	+24 40 10
0053−0049	00 53 14.8	−00 49 15	2303+1856	23 03 07.6	+18 56 19	2357+2241	23 57 12.7	+22 41 44
0054−0133	00 54 05.6	−01 33 55	2303+1702	23 03 25.2	+17 02 02			

[a] Previous designation 0009+2024.
[b] Previous designation 0012+2109.
[c] 2302+2053 W and E, previously known as 2302+2053 and 2303+2053.

why new coordinates have been derived for objects in that list. Table 3 presents the results.

3. DISCUSSION

The UCM survey has found up to now 264 candidates in 17 fields (471.4 deg^2). The overall density (candidates per square degree) is around 0.56, i.e., 6 times that of the Markarian survey (Mazarella & Balzano 1986). Nearly half of the sample (138 candiates) are galaxies that do not appear in any published catalog. In Paper I some comparisons were made between the samples detected with different surveys and that obtained by us. In particular, comparisons were made with surveys carried out in the blue region, such as the University of Michigan survey (MacAlpine, Smith, & Lewis 1977) and the Markarian Survey. The conclusions obtained when comparing these surveys with the UCM survey do not change when the new UCM fields surveyed are added to the comparison. The same is true for the comparison between UCM and *IRAS* samples (see also Gallego 1992; Rego et al. 1993).

3.1. *Comparison with the CGCG*

As stressed by Kinman (1984), it is of interest to note the ratio of galaxies with emission to the total number of galaxies in the field. The CGCG contains 1289 galaxies in the same area, 801 of which are galaxies with known redshift $z \leq 0.04$. Only 93 UCM candidates (35% of the sample) are galaxies cataloged by Zwicky.

In Table 4 we show the results of a study of the ratio of Zwicky galaxies found with emission, obtained when the whole sample of UCM galaxies is considered. We have noticed that we derived a wrong value for the fraction of CGCG galaxies in the field covered by List 1 because of a fault in the selection procedure of the CGCG galaxies. These final results should be compared with those obtained by Kinman (1984) from a sample of CGCG galaxies in a 30 deg^2 field near NGC 1023. He derived a ratio of galaxies with emission to the total number 24% (with the fraction rapidly dropping for fainter galaxies). The data have been extracted from NED and restricted to CGCG galaxies with known redshift $z \leq 0.04$. This table contains, for the Kinman survey, for our survey, for plate A228 (which contains the Coma Cluster of galaxies), and for the UCM survey when this region is not considered (field galaxies), the number of CGCG galaxies found in emission, the total number of CGCG galaxies, and the fraction of CGCG galaxies found as ELGs by our survey. For comparison purposes, the galaxies have been separated in the magnitude intervals used by Kinman (1984).

The UCM Survey finds about 15% of the CGCG galaxies, in the 471.4 deg^2 surveyed, to be ELGs, when galaxies outside the Coma Cluster are considered. While this fraction is very dependent on the magnitude interval for the Kinman survey, we have found an almost constant ratio. The Kinman survey was based on plates taken at 400 Å mm^{-1}, and the spectra are 5 times more dispersed than those registered in our plates. Since the spectra are spread out, the emission-line visibility improves for the brightest galaxies with the penalty of a brighter limiting magnitude. Moss & Whittle (1993) found 77 out of 201 (38%) of Zwicky galaxies with Hα emission, when surveying galaxies belonging to clusters. Since these authors considered only spiral galaxies, it is not a surprise that this ratio was higher than the value obtained by Kinman with the same instrumentation.

Plate A228 has been separated in order to find any possible difference in this fraction when surveying a cluster of galaxies. The fraction is significantly lower (7%) than the value derived for field galaxies (15%). It is interesting to note the paucity of bright galaxies with emission found by us in plate A228: only 3% of those with $m_z < 15.0$, but 9% for $m_z \geq 15.0$. To explore this problem further, we have used the data of Doi et al. (1995), who have made a catalog of galaxies in the Coma Cluster using automated surface photometry. The percentages of late-type galaxies in the Coma Cluster for galaxies brighter and fainter than 15.0 are 42% and 48%, respectively. This rules out possible explanations based on the absence of disk galaxies or on the morphological distribution of magnitudes. The spirals that are located within a radius of 1° from the cluster center are severely depleted in H I with respect to the outer spirals (Bothun, Schommer, & Sullivan 1984). Since the ELGs should be gas rich, the existence in the Coma Cluster of such a strong radial gradient in H I content of its spiral galaxies could be the cause of this low fraction of ELGs. This hypothesis is supported by the result that UCM galaxies in the Coma Cluster are less clustered that the spirals of this cluster (Gallego et al. 1996).

On the other hand, plate A228 contains 46 UCM candidates. These UCM objects, which were not cataloged by Zwicky, are, on average, fainter than CGCG galaxies, because our survey is deeper than the Zwicky one. Using our photometric data in the Gunn-Thuan r band (Vitores et al. 1995), mean values of $r = 14.7 \pm 0.7$ and $r = 15.9 \pm 0.7$ are found for 15 UCM objects that are CGCG galaxies and for 26 UCM galaxies not cataloged by Zwicky, respectively.

We conclude that our survey is losing an important fraction of bright and well-known galaxies whose low-resolution spectra appear saturated in the prism plates. Our survey is more biased toward fainter galaxies than that carried out by Kinman. Although the comparison has been made with the Zwicky catalog as reference and our survey has a fainter limiting magnitude, from the sample of the UCM survey, a smaller ratio has been found in a cluster environment (7%) than in the field (15%) for the galaxies with emission.

3.2. *Comparison with the KUG Survey*

The KUG survey (Kiso ultraviolet-excess galaxies) has found up to now 8162 galaxies in 170 fields covering some 5100 deg^2, yielding a number density of 1.8 KUGs per square degree (Takase & Miyauchi-Isobe 1993). Our survey has covered some fields in common with the KUG survey. In order to perform a comparison, we have restricted our discussion to the six fields that completely overlap with ours. The results are summarized in Table 5. For each field listed in the first column, the total number of CGCG galaxies is given in column (2), the numbers of KUGs and

TABLE 4

FRACTION OF CGCG GALAXIES FOUND WITH EMISSION

Magnitude interval	Kinman Survey			UCM List 1&2			Plate A228 (Coma Cluster)			UCM List 1&2 without A228		
<13.0	5	6	(83%)	1	19	(5%)	0	3	(0%)	1	16	(6%)
13.0-13.9	4	8	(50%)	7	72	(10%)	2	14	(14%)	5	58	(9%)
14.0-14.9	8	22	(36%)	23	183	(13%)	0	48	(0%)	23	135	(17%)
15.0-15.6	7	44	(16%)	46	353	(18%)	8	112	(7%)	38	241	(16%)
>15.6	2	30	(7%)	17	121	(14%)	6	50	(12%)	11	71	(16%)
total	26	110	(24%)	94	748	(13%)	16	227	(7%)	78	521	(15%)

TABLE 5
COMPARISON WITH THE KUGs SURVEY

Plate	CGCG	KUG (MK)	UCM (MK)	KUG UCM
A194	72	44 (1)	34 (3)	6
A197	41	60 (1)	14 (1)	4
A200	42	26 (3)	12 (2)	4
A205	70	22 (1)	21 (1)	2
A228	253	101 (5)	46 (7)	20
A232	63	36 (3)	12 (1)	1
total	541	289 (14)	139 (15)	37

UCM galaxies are listed in columns (3) and (4), respectively, and the number of KUGs that are also UCM galaxies is given in column (5). In columns (4) and (5) the number of galaxies that are also Markarian is given in parentheses and can be used to stress the difference in steepness and composition between Markarian and UCM or KUG samples. The summary, tabulated in the last row, shows some interesting results. The mean surface density of the whole KUG survey is 3 times that of the UCM survey. However, the KUGs in these fields outnumber the UCM galaxies only by a factor of 2. This local difference in density should be ascribed to the spatial distribution of galaxies in this region of the sky; i.e., a greater fraction of low-redshift galaxies. It is worth remembering that a color survey such as KUG is not limited by redshift as the UCM is. We expect that a fraction of the KUGs have a redshift that prevents detection by us. For comparison, Comte et al. (1994) found 25% of KUGs with $z > 0.04$ (34 out of 136) in a different region of the sky. The number of common galaxies is rather small: 37 out of 139 UCM galaxies, i.e., 27%. This points to a difference in the population derived from both surveys. A detailed comparison has been made using the spectroscopic observations of our whole sample and the published spectroscopic data on KUGs (Comte et al. 1994) confirming this result (Gallego et al. 1996).

The relationship expected between the KUG UV-excess parameter and the equivalent width of Hα in the UCM galaxies has been found to have values similar to those quoted by Comte et al. (1994). The median EW(Hα) is 47, 61, and 96 Å for low (L), medium (M), and high (H) UV-excess KUGs, respectively. We note, however, the existence of two outliers: UCM 2258+1920 classified as L in the Kiso survey, with EW(Hα) = 176 Å, and UCM 0003+1955 with EW(Hα) = 348 Å and classified as M. The first outlier is a typical case of a galaxy easily recovered by our survey and difficult to find with surveys looking for UV-excess or blue lines, i.e., high extinction ($E_{B-V} = 0.35$) and EW(Hβ) $\sim$ 10 Å. The explanation for the high value of EW(Hα) found in the second galaxy is straightforward: it is Mrk 335, a well-known Seyfert 1.

3.3. *Comparison with the Case Survey*

A similar result is obtained when comparing our survey with the Case Low-Dispersion Northern Sky Survey (Pesch et al., and references therein). A small portion of Plate A234 and a region of Plates A228 and A232 are covered by the Case list of Paper XIII (Stephenson, Pesch, & MacConnell 1992) and Paper XI (Sanduleak & Pesch 1990), respectively. A search in NED yields 56 CG objects, 17 of them also found by our survey, which in total selects 33 ELGs in the common region in field A228. It should be remembered that the Case survey detects galaxies with UV-excess spectra and/or blue lines. In the original lists of Case, 37 of the 39 galaxies not detected by our survey are classified as "mb" (moderately) without apparent lines, and only two have suspected emission lines. It is difficult to know which fraction of these "mb" Case galaxies really do have emission lines in their spectra. Salzer et al. (1995) present spectroscopic observations for blue and/or emission-line galaxies from the Case survey. Using their data, it is found that there are only five of the 63 Case galaxies classified as "mb" without lines that show spectra with EW(Hβ) > 10 Å. From this result we expect that most of the Case galaxies not detected by us are star-forming galaxies with a very low level of activity. We have measured high values for the equivalent width of the Hα + [N II] blend of CGs that are also UCM galaxies, ranging from 45 to 353 Å, with a mean value of 108 Å.

It is interesting to note that the Case survey seems to be able to select some galaxies with low-excitation spectra. Some authors (Salzer 1989) claim that these galaxies can be recovered by a blue objective-prism survey by the presence of the [O II] 3727 Å line or by their blue continua. Weistrop & Downes (1991) selected all galaxies with $m_B \leq 16$ for which emission lines were detected on the objective-prism spectra from the third Case list. The follow-up spectroscopic observations showed that 11 out of 32 ELGs exhibit low-excitation spectra (see, for instance, the spectrum of CG 279 in Fig. 1*b* of their paper). As they did not list the fluxes for [O II] 3727 Å, we assume that this line is very weak for these galaxies and that they have been detected by their blue color. The Case survey selects blue galaxies as those that they find to display continua shortward of 4000 Å much more strongly than are seen in an average galactic spectrum, and one out of every 10 field galaxies on their plates meets this definition. Moreover, in the third Case list these galaxies are classified as "mb" or moderately blue continuum and without lines, and only CG 220 has been classified as "w?," indicating the uncertainty of the presence of the [O II] 3737 Å line. Our results support the conclusions of Salzer et al. (1995), who conclude that the dual selection method is better able to detect galaxies at lower levels of activity than most previous surveys.

On the other hand, there are 15 UCMs without a CG counterpart. As expected, most of them have low-excitation spectra with absent or very weak lines in the blue part of the spectrum (Case plates have a spectral range from ~3300 to ~5350 Å). However, we have found six ELGs that have [O II] 3727 Å, Hβ, or [O III] 4959, 5007 Å lines with equivalent widths in excess of 20 Å. We cannot find any explanation of why these objects have not been found by the Case survey. Two of them have very bright blue lines and a rather weak continuum: UCM 1304+2830, a compact H II galaxy, and UCM 1257+2754, a planetary nebula. Since only three of them are KUGs, this leaves 12 out of the 33 UCM galaxies (i.e., 36%) without a CG or KUG counterpart. An important conclusion can be drawn from the previous discussion: a significant fraction of low-ionization star-forming galaxies are not selected by the objective-prism surveys carried out in the blue, neither by the [O II] 3727 Å emission line nor by their blue colors.

It is well established that surveys based on different techniques select samples of ELGs that are not identical. With the results presented here, it is clear that only an objective-prism survey that selects galaxies by the presence of emission lines, both in the blue and Hα and blue or UV-excess color, will yield a less biased sample of ELGs. The prototype of this kind of survey is the Second Byurakan Spectral Sky Survey (SBS) (Markarian, Stepanian, & Erastova 1987), which observes each field in three colors: blue and UV region (IIIa-J + 1°5 prism), green region (IIIa-J + GG495 + 3° prism), and red spectral range (IIIa-F + RG2 + 4° prism).

4. SUMMARY

In this paper we have presented the UCM survey List 2. A compilation of descriptions and positions is presented for 103 suspected emission-line objects. The second list covers 201.4 deg^2 in seven fields. The total number of UCM candidates, considering the two published lists, amounts to 264 candidates found in 17 fields covering 471.4 deg^2. The overall density (candidates per square degree) is 0.56, i.e., 6 times that of the Markarian survey.

Nearly half of the sample (138 candidates) are galaxies that do not appear in any published catalog. Only 93 UCM candidates (35% of the sample) are galaxies cataloged by Zwicky. On the other hand, the fraction of CGCG galaxies found with emission by the UCM survey is 15% for field galaxies with known redshift $z \leq 0.04$. We are not claiming that this is the actual fraction of galaxies with emission lines in their spectra. It should be noted that our survey is also limited by the total flux and the equivalent width of the Hα + [N II] blend (~20 Å), the red magnitude (continuum flux around Hα), and surface brightness. This is why we are losing an important fraction of bright CGCG galaxies whose spectra appear saturated on the PO plates. Some other CGCG galaxies have EW(Hα + [N II] ≤ 20 Å, and their low-resolution spectra will appear without noticeable emission lines on the prism plates. These galaxies are easily selected by the survey of Kinman, who employed a PO setup that provided spectra 5 times more dispersed. However, the limiting magnitude of our survey is fainter than that of Kinman, and most of our galaxies are selected from those not classified by Zwicky (65%).

Using the Zwicky catalog as a reference, from the sample of the UCM survey a smaller ratio has been found in the Coma Cluster (7%) than in the field (15%) for the galaxies with emission. This means that the fraction of emission-line galaxies in this cluster environment is around half that of the field. The density of UCM galaxies in Plate A228, covering the Coma Cluster, is ~1.5 ELGs per square degree, while this number reduces to ~0.5 for the remainder of the survey (field galaxies). This result is not surprising because of the high density of galaxies of any kind in the cluster. However, the relative number of UCM and CGCG galaxies with $z \leq 0.04$ in both regions is 0.4 (five CGCG galaxies for each UCM galaxy) for the field and 0.2 for the Coma Cluster. We have again obtained a factor of 2 between the fraction of emission-line galaxies in the field and a cluster environment.

We have shown that our survey is complementary to other surveys carried out with different techniques. In particular, the UCM survey is able to find new emission-line objects in areas covered by other surveys, including those with dual selection methods, i.e., UV-excess and blue emission-line, such as the Kiso and the Case Low-Dispersion Northern Sky surveys. This means that each field should be surveyed with different techniques to recover a more representative and less biased sample of ELGs.

It is our great pleasure to express thanks for the friendly assistance and observing support received from the Calar Alto Observatory staff especially from Kurt Birkle. A merged copy of the KUG catalog (Vols. 1–17) was kindly provided by Nagako Miyauichi-Isobe in computer-readable format. Thanks to Jessica Rosenberg for sending us a preprint with the data for galaxies from List 1 and 2 of the Case survey. We also express our thanks to our colleagues at the Departamento de Astrofísica for their encouraging support and many fruitful discussions. We wish to thank the anonymous referee for useful comments that improved this paper.

The finding charts were copied from The Digitized Sky Survey. The images are based on photographic data obtained using the Oschin Schmidt telescope on Palomar Mountain. The Palomar Observatory Sky Survey was funded by the National Geographic Society. The Oschin Schmidt telescope is operated by the California Institute of Astronomy and the Palomar Observatory. The Digitized Sky Survey was produced at the Space Telescope Science Institute (STScI) under US Government grant NAG W-2166.

This research has made use of the NASA/IPAC Extragalactic Database (NED), which is operated by the Jet Propulsion Laboratory, Caltech, under contract with the National Aeronautics and Space Administration.

This work was supported in part by the Spanish Programa Sectorial de Promoción General del Conocimiento under grant PB93-456.

REFERENCES

Alonso, O., Zamorano, J., Regom M., & Gallego, J. 1995, A&A, 113, 399
Alonso-Herrero, A., Aragón-Salamanca, A., Zamorano, J., & Rego, M. 1996, MNRAS, 278, 412
Arakelian, M. A. 1975, Soob. Byurakan Obs., 47, 1
Arp, H. C. 1966, Atlas of Peculiar Galaxies (Pasadena: Caltech)
Barbieri, C., & Rosino, L. 1972, Ap&SS, 16, 324
Berger, J., & Fringant, A.-M. 1984, A&AS, 58, 565
Birkle, K. 1984, in IAU Colloq. 78, Astronomy with Schmidt-Type Telescopes, ed. M. Capaccioli (Dordrecht: Reidel), 203
Bothun, G. D., Schommer, R. A., & Sulivan III, W. T. 1984, AJ, 89, 466
Chavira, E. 1957, Bol. Obs. Tonantzintla Tacubaya, 2, 18, 3
Comte, G., Augarde, R., Chalabaev, A., Kunth, D., & Maehara, H. 1994, A&A, 285, 1
Dixon, R. S., & Sonnenborn, G. 1980, A Master List of Nonstellar Optical Astronomical Objects (Columbus: Ohio State Univ. Press)
Dreyer, J. L. E. 1988, MmRAS, 49, 1
———. 1910, MmRAS, 59, 105
Doi, M., Fukugita, M., Okamura, S., & Tarusawa, K. 1995, ApJS, 97, 77
Gallego, J., Zamorano, J., Rego, M., Alonso, O., & Vitores, A. G. 1996, A&A, in press
Gallego, J., Zamorano, J., Rego, M., & Vitores, A. G. 1994, A&A, 290, 705
Guibert, J., & Moreau, O. 1991, Messenger, 64, 69
Iriarte, B., & Chavira, E. 1957, Bol. Obs. Tonantzintla Tacubaya, 2, 16, 3
Karachentsev, I. D. 1972, A Catalogue of Isolated Pairs of Galaxies in the Northern Hemisphere, Astrofiz. Issled., 7, 3
Kazarian, M. A., & Kazarian, E. S. 1980, Astrofizika, 16, 17
Kinman, T. D. 1984, in IAU Colloq. 78, Astronomy with Schmidt-Type Telescopes, ed. M. Capaccioli (Dordrecht: Reidel), 409
MacAlpine, G. M., Smith, S. B., & Lewis, D. W. 1977, ApJS, 34, 95
Markarian, B. E. 1967, Astrofizika, 3, 55
Markarian, B. E., Lipovetskii, V. A., & Stepanian, J. A. 1981, Astrofizika, 17, 619
Markarian, B. E., Stepanian, J. A., & Erastova, L. K. 1987, in IAU Symp. 121, Observational Evidence of Activity in Galaxies, ed. E. Ye. Khachikian, K. J. Fricke, & J. Melnick (Dordrecht: Reidel), 25
Mazarella, J. M., & Balzano, V. A. 1986, ApJS, 62, 751

Moss, C., & Whittle, M. 1993, ApJ, 407, L17
Nilson, P. 1973, Uppsala General Catalogue of Galaxies (Uppsala Astron. Obs. Ann., Vol. 6)
Paturel, G., Fouqué, P., Bottinelli, L., & Gouguenheim, L. 1989, A&AS, 80, 299
Pesch, P., Sanduleak, N., & Stephenson, C. B. 1991, ApJS, 76, 1043
Rego, M., Cordero, M., Zamorano, J., & Gallego, J. 1993, AJ, 105, 427
Rego, M., Zamorano, J., Gallego, J., & Vitores, A. G. 1994, A&A, 281, 348
Rego, M., Zamorano, J., & González-Riestra, R. 1989, A&A, 79, 443
Salzer, J. J. 1989, ApJ, 347, 152
Salzer, J. J., Moody, J. W., Rosenberg, J. L., Gregory, S. A., & Newberry, M. V. 1995, AJ, 109, 2376
Sanduleak, N., & Pesch, P. 1990, ApJS, 72, 291
Stephenson, C. B., Pesch, P., & MacConnell, D. J. 1992, ApJS, 82, 471
Takase, B., & Miyauchi-Isobe, N. 1993, Publ. Natl. Astron. Obs. Japan, 3, 169
Vitores, A. G., Zamorano, J., Rego, M., Alonso, O., & Gallego, J. 1996, A&A, in press
Vorontsov-Velyaminov, B. A., Arkipova, V. P., & Kranogorskaja, A. A. 1974, Morphological Catalogue of Galaxies, Vol. 5, (Moscow: Moscow State Univ.)
Wasilewski, A. J. 1983, ApJ, 272, 68
Weistrop, D., & Downes, R. A. 1991, AJ, 102, 1680
Zamorano, J., Gallego, J., Rego, M., Vitores, A. G., & González-Riestra, R. 1992, AJ, 104, 1000
Zamorano, J., Rego, M., Gallego, J., Vitores, A. G., González-Riestra, R., & Rodríguez-Caderot, G. 1994, ApJS, 95, 387 (Paper I)
Zamorano, J., Rego, M., González-Riestra, R., Rodríguez-Caderot, G. 1990, Ap&SS, 170, 353
Zwicky, F. 1971, Catalogue of Selected Compact Galaxies and of Post-eruptive Galaxies (Gümligen: F. Zwicky)
Zwicky, F., Herzog, E., Wild, B., Karpowicz, M., & Kowal, C. T. 1961–1968, Catalogue of Galaxies and of Clusters of Galaxies (Pasadena: Caltech)