

OBSERVATIONS OF MINOR PLANETS IN 1991–1994 AT THE BUCHAREST ASTRONOMICAL OBSERVATORY

MIREL BÎRLAN and GHEORGHE BOCȘA

*Astronomical Institute of the Romanian Academy
5, Cuștitul de Argint str., 75212 Bucharest 28, Romania*

Abstract. The precise positions of asteroids observed at Bucharest Observatory in 1991–1994 period are presented.

Key words. Astrometry, minor planets.

This paper presents the observations of minor planets, obtained in 1991–1994 with a 380/6000 mm astrograph. Astrophotographic plates with a $2^\circ \times 2^\circ$ field were used. The measurements were carried out by means of an ASCORECORD measuring machine. Both Turner's constants and Schlesinger's dependence methods were used for the computation of the normal coordinates of the object.

In Table 1 the observations of minor planets are presented: the date of the observation and the UT values, the right ascension and the declination, the (O–C) values on the ascension respectively the declination and the observer's initials.

Table 2 presents the reference stars used to compute the values for the 1 Ceres, 2 Pallas, 4 Vesta, 6 Hebe, 7 Iris, 11 Parthenope, 39 Laetitia, 148 Gallia, 389 Industria, 532 Herculina asteroids which are selected in the "Establish the fundamental plane of an inertial reference system" program. Table 2 contains the index number (the same as that in Table 1), the BD number from the catalogue for reference stars, the ascension (s), the declination (') and the dependences.

Table 1

No	Date and UT			$\alpha_{1950.0}$	$\delta_{1950.0}$	$(O-C)_\alpha$	$(O-C)_\delta$	O.C.			
1991											
3 JUNO											
			h	m	s	°	'	''	s	''	
1	9.76072	Sep.	19	00	31.67	-10	27	52.6	-0.062	+0.64	GB
2	9.77457	"	19	00	31.72	10	27	57.7	-0.068	+0.69	GB
3	12.77408	"	19	00	52.74	10	46	23.9	-0.040	+0.45	MB
4	12.77784	"	19	00	52.85	-10	46	28.7	-0.042	+0.58	MB
6 HEBE											
5	9.84659	Sep.	22	21	21.52	-20	48	37.2	-0.039	-0.50	MB
6	9.85491	"	22	21	21.20	20	48	44.3	-0.009	-0.91	MB
7	10.81858	"	22	20	43.99	21	01	20.6	-0.058	-0.11	MB
8	10.82689	"	22	20	43.66	-21	01	26.8	-0.050	+0.27	MB
7 IRIS											
9	26.76347	Sep.	22	33	56.01	+2	29	36.0	-0.079	-0.75	GB
10	26.769	"	22	33	55.74	2	29	33.6	-0.095	-0.82	GB
11	27.78740	"	22	33	16.47	2	23	09.6	-0.061	-0.60	GB
12	27.79295	"	22	33	16.24	2	23	07.1	-0.071	-0.45	GB
13	30.81141	"	22	31	29.80	2	04	13.1	-0.045	-0.50	GB
14	30.81834	"	22	31	29.53	2	04	10.7	-0.065	-0.35	GB
15	7.82727	"	22	28	27.07	1	22	13.8	+0.022	+0.18	MB
16	7.83628	"	22	28	26.88	+1	22	10.5	+0.024	-0.13	MB
39 LAETITIA											
17	9.73786	Sep.	18	24	26.58	-15	02	31.3	+0.023	-0.40	GB
18	9.74895	"	18	24	26.86	15	02	34.6	+0.010	-0.30	GB
19	10.74205	"	18	24	55.98	15	07	31.6	+0.026	+0.17	GB
20	10.75314	"	18	24	56.30	-15	07	35.2	+0.028	-0.11	GB
1992											
532 HERCULINA											
21	24.82830	Jun.	16	11	35.32	-6	32	37.7	-0.023	-0.03	GB
22	24.83869	"	16	11	34.93	-6	32	42.3	-0.015	+0.14	GB

Table 1 (continued)

1993

No	Date and UT		$\alpha_{2000.0}$			$\delta_{2000.0}$			$(O-C)_\alpha$	$(O-C)_\delta$	O.C.
1 CERES											
			h	m	s	°	'	''	s	''	
23	11.85165	Oct.	2	16	44.40	+0	00	19.7	-0.068	+0.33	GB
24	11.86065	„	2	16	44.00	+0	00	18.8	-0.026	+0.14	GB
2 PALLAS											
25	3.76738	Sep.	21	40	12.08	+6	15	07.5	-0.008	+0.15	GB
26	3.77915	„	21	40	11.56	6	14	58.9	-0.028	+0.23	GB
27	10.75450	„	21	35	37.41	4	47	59.4	-0.041	-0.68	GB
28	10.76835	„	21	35	36.88	4	47	48.9	-0.052	-0.73	GB
29	13.73385	„	21	33	51.86	4	10	15.2	-0.065	-0.65	GB
30	13.74770	„	21	33	51.38	+4	10	5.6	-0.061	-0.28	GB
4 VESTA											
31	7.82329	Sep.	22	32	37.56	-20	00	39.4	+0.058	-0.64	GB
32	7.83022	„	22	32	37.20	20	00	40.7	+0.074	+0.44	GB
33	10.83310	„	22	30	3.79	20	16	32.8	+0.014	-0.30	GB
34	10.84003	„	22	30	3.50	20	16	34.1	+0.080	+0.53	GB
35	13.81280	„	22	27	39.41	20	30	16.1	+0.058	-0.94	GB
36	13.82388	„	22	27	38.82	20	30	18.4	+0.010	-0.42	GB
37	11.79071	„	22	15	20.08	20	56	42.5	+0.044	-0.34	GB
38	11.80040	„	22	15	20.02	20	56	41.0	+0.025	-0.13	GB
39	13.73227	„	22	15	17.97	20	52	13.3	+0.050	-0.63	GB
40	14.74196	„	22	15	17.97	-20	52	11.9	+0.032	-0.71	GB
11 PARTHENOPE											
41	11.80906	Oct.	1	1	47.47	-1	42	23.9	-0.049	-0.13	GB
42	11.82083	„	1	1	46.83	-1	42	27.6	-0.040	+0.20	GB

Table 1 (continued)

No	Date and UT			$\alpha_{2000.0}$	$\delta_{2000.0}$			$(O-C)_\alpha$	$(O-C)_\delta$	O.C.
80 SAPHO										
43	26.80669	Jul.	18	33	56.84	-7	39	46.2	-0.070	-0.40 GB
44	26.81708	„	18	33	56.36	-7	39	47.4	-0.070	-0.40 GB
148 GALLIA										
45	27.76779	Apr.	11	56	10.15	+23	40	22.3	-0.045	+0.15 GB
46	27.77957	„	11	56	9.91	+23	40	23.0	-0.014	+0.20 GB
389 INDUSTRIA										
47	11.83087	Oct.	1	32	42.19	+22	53	36.5	+0.037	-0.30 GB
48	11.84126	„	1	32	41.61	22	53	33.5	+0.032	-0.43 GB
49	13.75270	„	1	30	57.41	22	44	23.8	-0.004	-0.09 GB
50	13.75962	„	1	30	57.07	+22	44	21.6	+0.042	-0.27 GB
409 ASPASIA										
51	26.83474	Jul.	19	43	34.67	-5	13	34.7	-0.070	+0.00 GB
52	26.84617	„	19	43	34.02	-5	13	35.3	-0.070	+0.00 GB
1994										
48 DORIS										
53	1.77282	Sep.	20	56	55.65	-10	44	7.1	+0.040	+0.10 GB
54	1.78667	„	20	56	55.16	-10	44	11.2	+0.040	-0.10 GB
179 KLYTAEMNESTRA										
55	1.80329	Sep.	21	24	19.03	-2	38	50.4	-0.010	+0.60 GB
56	1.81714	„	21	24	18.39	-2	38	54.1	-0.010	+0.60 GB
216 KLEOPATRA										
57	1.83376	Sep.	23	20	37.52	+14	23	46.4	+0.190	+0.00 GB
58	1.84484	„	23	20	37.13	+14	23	41.7	+0.170	+0.10 GB

Table 2

No	BD	$(\alpha_p)^s$	$(\delta_p)''$	Dependences	
1-2	-10-4904	22.629	44.35	0.010349	0.010110
	-10-4912	20.512	36.44	.186698	.185447
	-10-4918	49.884	34.91	.043847	.045221
	-10-4930	52.496	34.59	.271566	.272689
	-10-4934	23.503	12.25	.487540	.486534
3-4	-10-4918	49.968	33.99	0.283145	0.282661
	-11-4849	19.500	62.81	.236471	.237827
	-10-4931	14.138	17.74	.200104	.198219
	-11-4869	4.865	55.11	.143360	.144196
	-10-4946	14.344	37.91	.136919	.137099
5-6	-22-5897	50.581	61.78	-0.196843	-0.194913
	-21-6207	12.816	52.11	+.057731	+.058379
	-21-6213	48.267	0.59	.454236	.453187
	-21-6214	1.017	14.05	.421114	.419989
	-2215881	31.378	3.91	.263761	.263359
7-8	-22-5897	50.581	51.78	0.187275	0.188238
	-21-6207	12.816	52.11	.281005	.281265
	-21-6213	46.267	0.59	.300064	.299629
	-2215889	52.994	11.33	.053406	.053671
	-21-6226	23.206	25.32	.178250	.177197
9-10	2 4520	23.721	10.93	0.196177	0.196768
	1 4629	36.930	6.09	.051275	.052065
	2 4528	20.439	14.09	.383204	.382658
	1 4634	43.549	55.11	.072350	.072533
	1 4637	24.537	42.35	.296993	.295977
11-12	2 4520	23.721	10.93	0.279808	0.280326
	1 4629	36.930	6.09	.169692	.170267
	2 4528	20.439	14.09	.297213	.296874
	1 4634	43.549	55.11	.104583	.104658
	1 4637	24.537	42.5	.148703	.147875
13-14	1 4623	49.130	43.84	0.220136	0.221198
	1 4626	14.520	4.89	.250585	.251687
	2 4520	23.721	10.93	.172965	.172518
	1 4629	36.930	6.09	.201374	.301047
	1 4631	57.031	9.28	.154939	.153551
15-16	0 4884	47.386	38.82	0.256246	0.258078
	1 4620	48.130	6.67	.472409	.471684
	0 4891	6.204	57.41	.171442	.170693
	0 4892	8.054	46.22	.075199	.075462
	0 4894	7.811	4.71	.024704	.024084

Table 2 (continued)

No	BD	$(\alpha_i)^*$	$(\delta_i)''$	Dependences	
17-18	-15-4965	45.795	55.77	0.157403	0.156880
	-14-5044	16.029	25.32	.274611	.273365
	-15-4972	39.240	19.78	.114593	.115391
	-14-5065	15.320	11.26	.287454	.287138
	-15-4982	25.879	59.14	.165938	.167226
19-20	-15-4965	45.795	55.77	0.098672	0.098071
	-14-5044	16.029	25.32	.155637	.154273
	-15-4972	39.240	19.79	.187286	.188182
	-14-5065	15.320	11.26	.264060	.263700
	-15-4982	25.879	59.14	.294345	.295774
21-22	-6-4377	20.089	4.11	0.213139	0.213789
	-5-4254	15.359	56.64	.239434	.239337
	-7-4230	32.437	53.85	.162543	.163534
	-6-4393	47.032	20.50	.168198	.167909
	-5-4267	21.444	1.00	.216686	.215431
23-23	-0-0336	43.050	35.55	0.152210	0.153101
	-1-0307	13.152	52.85	.128012	.128848
	-0-0338	38.335	40.87	.222278	.222466
	-1-0311	19.190	31.11	.163099	.162848
	-0-0345	41.514	54.02	.334401	.332737
25-26	5 4831	48.182	10.95	0.106449	0.108678
	6 4868	58.932	25.96	.077545	.077900
	6 4878	48.969	13.71	.197881	.196569
	5 4841	5.705	5.66	.269397	.270066
	5 4847	43.702	15.08	.348729	.346786
27-28	3 4575	11.067	47.37	0.168670	0.170501
	4 4701	35.900	5.01	.172569	.171682
	3 4581	47.409	29.97	.205539	.207403
	4 4705	18.515	36.77	.202240	.200457
	3 4588	5.909	59.06	.250982	.249958
29-30	3 4570	38.579	6.23	0.039674	0.040874
	3 4572	8.549	3.37	.050991	.053487
	3 4577	22.048	13.94	.287993	.285402
	3 4578	36.746	10.05	.217563	.218668
	3 4581	47.409	29.97	.403779	.401569
31-32	-20-6439	42.516	4.40	0.098737	0.099416
	-20-6441	36.985	21.80	.244490	.245254
	-20-6442	11.737	8.22	.082042	.081994
	-21-6248	58.268	40.15	.361169	.360881
	-20-6453	33.015	56.72	.213561	.212455

Table 2 (continued)

No	BD	$(\alpha_i)^*$	$(\delta_i)''$	Dependences	
33-34	-21-6221	0.931	40.25	0.211939	0.212382
	-20-6431	20.222	43.69	.167310	.167487
	-21-6241	22.974	13.13	.260651	.260842
	-20-6445	46.430	6.17	.147861	.147865
	-21-6248	58.268	40.15	.212239	.211865
35-36	-21-6221	0.931	40.25	0.349610	0.351567
	-20-6431	20.222	43.69	.214223	.214659
	-21-6230	30.650	51.30	.274254	.274819
	-20-6439	42.516	4.40	.046092	.044422
	-21-6241	22.974	13.13	.115820	.114532
37-38	-21-6175	46.699	25.41	0.004560	0.004746
	-21-6178	38.952	19.72	.096919	.097141
	-22-5867	56.126	18.06	.250922	.250593
	-21-6185	11.976	28.78	.265527	.265809
	-21-6188	9.021	18.42	.382072	.381712
39-40	-21-6175	46.699	25.41	-0.005056	-0.005045
	-21-6178	38.952	19.72	+0.128226	+0.128444
	-22-5867	56.126	18.06	.185342	.185013
	-21-6185	11.976	28.78	.337970	.338266
	-21-6188	9.021	18.42	.353519	.353322
41-42	-2-0136	3.672	8.43	0.160997	0.163225
	-2-0137	5.470	29.44	.315737	.316281
	-2-0148	25.442	28.05	.111079	.111662
	-2-0154	25.756	43.18	.271700	.269537
	-2-0155	55.475	16.35	.140486	.139294
45-46	24 2405	34.277	39.60	0.349011	0.349742
	24 2407	2.883	24.80	.287224	.287466
	25 2439	54.988	9.86	.153410	.153520
	24 2414	16.544	19.21	.169672	.169207
	24 2416	5.939	21.56	.040684	.040064
47-48	22 0236	41.178	34.06	+0.099327	+0.100311
	22 0238	48.684	26.09	-0.011457	-0.010875
	21 0200	6.816	53.63	+0.198115	+0.199065
	22 0246	28.705	25.80	.276933	.275641
	21 0211	0.128	1.76	.437082	.435858
49-50	22 0236	41.178	34.06	0.277585	0.278170
	22 0238	48.684	26.09	.089981	.090235
	21 0200	6.816	53.63	.372071	.372704
	22 0246	28.705	25.80	.043505	.042735
	21 0211	0.128	1.76	.216859	.216155

Received on 10 April, 1995