PHOTOELECTRIC PHOTOMETRY OPPORTUNITIES
NOVEMBER 1984 - JANUARY 1985

Alan W. Harris
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109

Vincenzo Zappala'
Observatorio Astronomico di Torino
10025 Pino Torinese
Italy

The table below lists asteroids which come to opposition during the months of November 1984 - January, 1985 that represent useful targets for photoelectric photometry observations. Observations are needed because the asteroid has either an unknown or ambiguous rotational period or because the asteroid will be observable at a very low phase angle. The table also includes asteroids which are candidates for a pole determination or are targets for radar observations (see the articles by Zappala' and Knezevic and by Ostro in MPB volume 10, No. 4). The table gives (in order of opposition dates) the asteroid number and name, opposition date, opposition B magnitude, (the V magnitude is about 0.8 brighter), the rotational period (in hours), the estimated lightcurve amplitude (in magnitudes), and the designation PER if observations are needed to determine the rotational period. AMB implies that previous period determinations have given ambiguous results and these alternate periods are listed in the table. PHA indicates observations of the phase curve are desired because the asteroid will be at an unusually low phase angle, POL indicates the asteroid is a pole position candidate, and RAD or an asterisk indicate the asteroid is a planned radar target. Calibrated B or V measurements would be useful. Question marks are used to denote uncertain or unknown values. An outline of recommended observing procedures is given in MPB volume 11, No. 1, page 7. Ephemerides for these asteroids are included in this issue. Some of these asteroids may appear on finding charts prepared by Dr. J.U. Gunter, 1411 N. Mangum St., Durham, NC 27701. These charts are free for a self-addressed stamped envelope.

Asteroid 337 Devosa is included in this list because observations of this object in 1982 by Binzel were not compatible with the 4.610 hour period listed in TRIAD. The very low phase angle (0.02 degree) reached by 735 Marghanna and its favorable opposition are noted in Tholen's article on low phase angle asteroids in this issue. 7 Iris is expected to be at a nearly polar aspect which will yield a very low lightcurve amplitude. This will make observations of the phase curve for this asteroid more useful since significant lightcurve variations will not interfere.

Asteroid	Opp'n Date	Opp'n B Mag	Per	Amp	
337 Devosa	Oct 7	12.2	4.61?	0.2	PER
735 Marghanna	Nov 7	12.2	?	?	PER+PHA
344 Desiderata	Nov 10	12.6	?	?	PER+PHA
751 Faina	Dec 4	12.0	?	?	PER
198 Ampella	Dec 12	11.7	?	?	PER+PHA
7 Iris	Dec 15	7.9	7.135	0.1	PHA+POL*
6 Hebe	Dec 26	9.2	7.274	0.1	POL+RAD
747 Winchester	Dec 28	10.9	8.	0.1	PER+POL*
40 Harmonia	Dec 29	10.5	9.136	0.2	PHA
96 Aegle	Jan 10	12.3	?	?	PER
488 Kreusa	Jan 15	12.2	>28	0.2	PER

PHOTOELECTRIC PHOTOMETRY OPPORTUNITIES

DATE	R.A. (1950) HR	MIN	DEC. DEG	MIN	MAG B	PHASE ANGLE
Minor Planet 6 Hebe						
Nov 1	6	47.9	4	21.	10.06	25.4
11	6	49.6	3	44.	9.90	23.0
21	6	47.9	3	22.	9.73	19.9
Dec 1	6	42.9	3	20.	9.56	16.1
11	6	34.9	3	41.	9.42	12.2
21	6	24.9	4	28.	9.33	8.9
31	6	14.4	5	38.	9.36	8.0
1985 Jan 10	6	4.8	7	6.	9.51	10.2
20	5	57.4	8	45.	9.74	13.6
30	5	52.9	10	28.	9.99	17.0
Feb 9	5	51.7	12	8.	10.24	19.7
Minor Planet 7 Iris						
Nov 1	5	52.0	25	59.	9.00	24.1
11	5	52.0	25	25.	8.72	19.9
21	5	47.6	24	43.	8.44	14.7
Dec 1	5	39.6	23	54.	8.17	8.7
11	5	29.5	22	59.	7.82	2.2
21	5	19.1	22	4.	8.02	4.3
31	5	10.5	21	12.	8.43	10.3
1985 Jan 10	5	5.0	20	30.	8.79	15.5
20	5	3.3	19	60.	9.14	19.7
Minor Planet 40 Harmonia						
Nov 1	6	59.5	21	21.	11.92	23.8
11	7	2.4	21	30.	11.70	21.5
21	7	1.7	21	46.	11.45	18.4
Dec 1	6	57.4	22	11.	11.19	14.4
11	6	49.7	22	41.	10.92	9.7
21	6	39.3	23	15.	10.62	4.4
31	6	27.7	23	47.	10.39	1.2
1985 Jan 10	6	16.4	24	14.	10.80	6.6
20	6	7.0	24	36.	11.09	11.6
30	6	0.7	24	53.	11.37	15.9
Feb 9	5	58.0	25	6.	11.65	19.3
19	5	59.0	25	17.	11.90	21.9
Minor Planet 96 Aegle						
Dec 1	8	6.3	35	4.	13.10	15.3
11	8	2.6	35	16.	12.88	12.8
21	7	55.8	35	25.	12.66	9.7
31	7	46.4	35	25.	12.46	6.6
1985 Jan 10	7	35.4	35	12.	12.30	4.7
20	7	24.0	34	42.	12.37	6.0
30	7	13.8	33	55.	12.53	9.2
Feb 9	7	5.8	32	56.	12.72	12.5
19	7	0.7	31	49.	12.91	15.4
Mar 1	6	58.8	30	38.	13.09	17.9

DATE	R.A. (1950) HR	MIN	DEC. DEG	MIN	MAG B	PHASE ANGLE
Minor Planet 198 Ampella						
Nov 1	5	44.2	28	52.	12.54	20.1
11	5	39.8	28	20.	12.31	16.0
21	5	31.8	27	38.	12.08	11.2
Dec 1	5	21.1	26	44.	11.85	5.8
11	5	9.5	25	42.	11.58	1.2
21	4	58.5	24	35.	11.98	5.5
31	4	49.7	23	31.	12.32	10.4
1985 Jan 10	4	44.0	22	35.	12.65	14.6
20	4	41.7	21	50.	12.96	17.9
30	4	42.7	21	17.	13.25	20.4
Minor Planet 337 Devosa						
1984 Oct 2	0	54.9	10	35.	12.22	4.1
12	0	44.2	10	13.	12.10	2.9
22	0	34.0	9	47.	12.38	7.6
Nov 1	0	25.7	9	22.	12.62	12.5
11	0	20.1	9	6.	12.86	16.8
21	0	17.7	9	3.	13.10	20.3
Dec 1	0	18.7	9	15.	13.32	23.0
Minor Planet 344 Desiderata						
1984 Oct 2	3	36.3	15	11.	13.26	15.8
12	3	29.4	15	34.	13.08	12.3
22	3	20.0	15	52.	12.91	8.3
Nov 1	3	8.9	16	5.	12.69	3.9
11	2	57.1	16	15.	12.48	0.6
21	2	45.8	16	22.	12.88	4.9
Dec 1	2	36.2	16	31.	13.19	8.8
11	2	28.8	16	43.	13.45	12.1
Minor Planet 488 Kreusa						
Dec 1	8	18.5	25	8.	13.12	16.7
11	8	18.0	26	5.	12.89	14.2
21	8	14.8	27	12.	12.65	11.0
31	8	8.8	28	25.	12.42	7.4
1985 Jan 10	8	0.8	29	37.	12.17	4.1
20	7	51.7	30	43.	12.14	4.0
30	7	42.6	31	36.	12.34	7.3
Feb 9	7	34.9	32	12.	12.53	11.1
19	7	29.6	32	33.	12.73	14.5
Mar 1	7	27.2	32	39.	12.93	17.3
Minor Planet 735 Marghanna						
1984 Oct 2	3	17.5	11	4.	12.94	20.0
12	3	10.8	12	29.	12.68	15.0
22	3	0.5	13	53.	12.44	9.2
Nov 1	2	48.1	15	12.	12.15	2.9
11	2	35.4	16	25.	12.26	3.3
21	2	24.2	17	31.	12.71	9.0
Dec 1	2	15.9	18	32.	13.09	13.9
Minor Planet 747 Winchester						
Nov 1	6	49.2	1	33.	12.01	26.6
11	6	52.8	1	14.	11.83	24.3
21	6	52.9	1	13.	11.63	21.3
Dec 1	6	49.7	1	36.	11.43	17.6
11	6	43.5	2	27.	11.24	13.6
21	6	35.1	3	48.	11.10	9.8
31	6	25.9	5	34.	11.08	8.0
1985 Jan 10	6	17.3	7	38.	11.24	9.4
20	6	10.6	9	50.	11.50	12.6
30	6	6.7	12	0.	11.81	16.0
Feb 9	6	5.9	14	3.	12.11	18.9
Minor Planet 751 Faina						
Nov 1	5	8.7	15	11.	12.70	16.6
11	5	2.1	16	3.	12.45	12.1
21	4	52.5	17	1.	12.21	7.1
Dec 1	4	41.1	18	4.	11.90	2.1
11	4	29.4	19	8.	12.10	4.5
21	4	19.0	20	12.	12.44	9.4
31	4	11.2	21	14.	12.74	13.9
1985 Jan 10	4	6.6	22	14.	13.04	17.5
20	4	5.7	23	14	13.31	20.4

LOW PHASE ANGLE ASTEROIDS

David J. Tholen
Institute for Astronomy
University of Hawaii
Honolulu, HI 96822

As promised in the last issue, here is a continuation of the list of low phase angle asteroids. This issue's listing has been expanded to include those asteroids reaching phase angles of 0.15 degrees or less; the list, given in Table I, is complete through 1985 January 31 for asteroids up to and including number 3000.

This issue's list is somewhat more deficient in bright asteroids. Do note, however, the excellent apparition of 735 Marghanna, which is predicted to reach a blue magnitude of 11.91 on November 5. Here is an excellent opportunity to add a high-numbered asteroid to your list.

As mentioned in the last issue, the alert reader should realize that at such low phase angles, an asteroid would pass through the earth's penumbra. A quick "back of the envelope" calculation was performed to estimate the amount by which an asteroid's brightness would be diminished. The even more alert reader would have realized that my calculations were defective! To do the calculation, I pulled a couple of numbers off the top of my head: the diameter of the sun (as seen from a distance of 1 AU), which we all know is about 1/2 degree, and the diameter of the earth (also as seen from 1 AU), which I estimated as 8.8 arcsec. The 8.8 figure I recalled is known as the horizontal parallax of the earth. What I failed to recall at the time is that the horizontal parallax refers to the apparent angular radius of an object. Thus I underestimated the angular size of the earth by a factor of two. Curiously, no reader called my attention to this error; come on, MPB readers, wake up! You shouldn't let me get away with such mistakes.

For the record, let's do the calculation right. The horizontal parallaxes of the sun and earth are 959.641 and 8.794 arcsec,