

Planet	Max	Elon	D	Max	E	RA	Dec	Min	Mag	E	Mag	Min	Dist	D	Min	Dist
6027	1999/06/02	172.9				16h41m	-15	1999/06/02	14.3			1999/06/06	0.871			
2375	1999/06/06	165.1				16h56m	-7	1999/06/04	14.1			1999/06/01	1.589			
1022	1999/06/08	157.2				17h 1m	-0	1999/06/07	13.6			1999/06/06	1.359			
3089	1999/06/11	175.6				17h18m	-18	1999/06/11	13.8			1999/06/13	1.380			
50	1999/06/15	170.7				17h55m	-26	1999/06/15	10.5			1999/06/20	1.053			
6361	1999/06/20	177.4				17h55m	-26	1999/06/20	14.2			1999/06/14	1.106			
1048	1999/06/22	162.3				18h 9m	-41	1999/06/20	12.7			1999/06/17	1.306			
93	1999/06/25	165.1				18h17m	-38	1999/06/25	10.7			1999/06/26	1.372			
1638	1999/06/26	179.3				18h21m	-22	1999/06/26	13.8			1999/06/28	1.223			
381	1999/07/02	171.6				18h39m	-14	1999/07/02	12.2			1999/07/01	1.891			
2510	1999/07/05	179.5				18h54m	-22	1999/07/05	13.6			1999/07/10	0.832			
1703	1999/07/09	179.0				19h12m	-21	1999/07/09	13.6			1999/07/15	0.877			
2316	1999/07/12	177.7				19h25m	-19	1999/07/12	14.5			1999/07/13	1.038			
550	1999/07/14	172.5				19h34m	-14	1999/07/15	11.4			1999/07/18	1.041			
5325	1999/07/14	155.9				19h54m	+0	1999/07/11	14.5			1999/07/08	0.922			
6670	1999/07/14	170.7				19h19m	-13	1999/07/15	13.9			1999/07/21	0.994			
1360	1999/07/15	150.1				19h35m	-51	1999/07/12	13.7			1999/07/09	1.161			
3284	1999/07/15	170.4				19h48m	-30	1999/07/17	14.2			1999/07/29	0.799			
1064	1999/07/20	174.5				19h56m	-15	1999/07/20	12.6			1999/07/20	1.092			
1166	1999/07/23	170.0				20h28m	-29	1999/07/23	13.3			1999/07/22	1.013			
394	1999/07/24	170.7				20h22m	-28	1999/07/25	12.2			1999/07/29	1.205			
63	1999/07/27	175.2				20h00m	+5	1999/07/24	9.6			1999/07/21	1.112			
1044	1999/07/26	173.0				20h31m	-26	1999/07/26	13.4			1999/07/24	1.212			
221	1999/07/28	174.9				20h24m	-14	1999/07/28	11.3			1999/07/30	1.744			
646	1999/08/04	177.7				20h53m	-15	1999/08/04	13.7			1999/08/09	0.853			
7456	1999/08/07	171.4				21h23m	-24	1999/08/07	14.5			1999/08/08	0.846			
599	1999/08/12	147.5				21h37m	-20	1999/08/15	11.2			1999/08/16	1.057			
1925	1999/08/12	173.6				21h37m	-20	1999/08/12	14.3			1999/08/16	1.152			
625	1999/08/13	174.5				21h42m	-19	1999/08/13	12.0			1999/08/14	1.047			
5622	1999/08/13	170.3				21h18m	-5	1999/08/13	14.1			1999/08/13	1.327			
2607	1999/08/14	177.1				21h38m	-17	1999/08/14	14.5			1999/08/16	0.832			
3112	1999/08/14	172.0				21h44m	-22	1999/08/14	14.5			1999/08/12	0.903			
893	1999/08/15	178.3				21h44m	-12	1999/08/15	12.1			1999/08/18	1.703			
999	1999/08/15	161.9				21h12m	+2	1999/08/16	13.5			1999/08/18	1.090			
3813	1999/08/15	179.5				21h39m	-13	1999/08/15	14.2			1999/08/12	0.801			
737	1999/08/18	163.1				21h18m	+1	1999/08/17	10.8			1999/08/16	0.979			
3053	1999/08/20	173.6				22h 7m	-18	1999/08/20	14.3			1999/08/19	0.880			
6648	1999/08/20	179.9				21h57m	-12	1999/08/20	14.5			1999/08/26	0.984			
219	1999/08/21	160.7				21h28m	+5	1999/08/22	11.0			1999/08/24	0.854			
1204	1999/08/21	176.7				22h 4m	-15	1999/08/21	12.3			1999/08/17	0.589			
141	1999/08/27	173.9				22h18m	-4	1999/08/28	10.6			1999/09/02	1.179			
573	1999/08/27	177.4				22h27m	-12	1999/08/27	13.1			1999/08/29	1.726			
747	1999/08/27	166.1				22h52m	-21	1999/08/31	10.7			1999/09/09	1.337			
2717	1999/08/30	178.9				22h32m	-7	1999/08/30	13.2			1999/08/27	0.725			
954	1999/09/03	179.5				22h49m	-7	1999/09/03	13.3			1999/08/31	1.671			
4369	1999/09/03	164.1				22h32m	+0	1999/09/05	14.0			1999/09/09	1.019			
169	1999/09/04	177.5				22h57m	-9	1999/09/04	11.4			1999/09/02	1.046			
1689	1999/09/05	172.0				23h11m	-13	1999/09/06	13.8			1999/09/11	1.037			
3408	1999/09/05	176.8				23h 1m	-9	1999/09/05	14.3			1999/09/03	0.824			
6649	1999/09/07	175.2				23h56m	+1	1999/09/07	14.5			1999/08/31	0.938			
8736	1999/09/08	179.8				23h 6m	-5	1999/09/08	14.1			1999/09/08	0.817			
198	1999/09/09	160.9				22h41m	+12	1999/09/09	10.2			1999/09/10	0.919			
422	1999/09/11	175.7				23h21m	-8	1999/09/11	11.7			1999/09/09	0.745			
2065	1999/09/11	176.0				23h10m	-0	1999/09/11	14.5			1999/09/17	1.176			
3105	1999/09/15	172.3				23h47m	-9	1999/09/15	14.4			1999/09/12	0.829			
112	1999/09/16	171.1				23h11m	-1	1999/09/16	11.1			1999/09/16	1.121			
1668	1999/09/16	178.2				23h16m	-4	1999/09/16	14.4			1999/09/14	1.198			
2385	1999/09/16	177.0				23h38m	-5	1999/09/15	14.5			1999/09/13	0.879			
448	1999/09/17	165.5				23h58m	-16	1999/09/16	13.9			1999/09/14	1.616			
1057	1999/09/18	173.5				23h31m	+4	1999/09/18	13.3			1999/09/20	1.184			
1383	1999/09/21	179.8				23h53m	-0	1999/09/21	14.4			1999/09/20	1.489			
81	1999/09/21	179.8				23h53m	-0	1999/09/25	11.0			1999/09/21	1.521			
1519	1999/09/24	174.2				0h11m	-5	1999/09/24	14.2			1999/09/23	1.378			
605	1999/09/25	168.9				23h52m	+11	1999/09/25	13.3			1999/09/23	1.585			
699	1999/09/25	143.7				22h29m	+8	1999/09/14	12.8			1999/09/08	0.644			
57	1999/09/26	173.2				23h59m	+7	1999/09/27	11.0			1999/09/29	1.890			
1236	1999/09/27	159.1				0h37m	-18	1999/09/26	13.6			1999/09/24	0.867			
5951	1999/09/27	167.3				0h16m	-9	1999/09/28	14.5			1999/09/28	0.730			
2786	1999/09/28	178.1				0h22m	+0	1999/09/28	14.2			1999/09/30	1.171			
938	1999/09/30	176.0				0h31m	-0	1999/09/30	14.1			1999/09/27	1.576			
1021	1999/10/05	150.2				1h38m	-21	1999/10/09	11.4			1999/10/12	1.069			
1067	1999/10/05	162.1				0h16m	+21	1999/10/07	14.1			1999/10/08	1.395			
687	1999/10/06	160.8				0h26m	+23	1999/10/07	13.9			1999/10/08	1.012			
2031	1999/10/06	175.9				0h54m	+1	1999/10/06	14.2			1999/10/06	0.853			
85	1999/10/07	176.1				0h41m	+8	1999/10/06	10.1			1999/09/30	1.256			
2557	1999/10/07	178.8				0h53m	+4	1999/10/07	14.1			1999/10/06	0.985			
1325	1999/10/08	179.5				0h52m	+5	1999/10/08	12.8			1999/10/02	0.914			
193	1999/10/09	169.4				0h46m	+16	1999/10/11	11.7			1999/10/19	1.026			
468	1999/10/13	179.4				1h13m	+7	1999/10/13	12.8			1999/10/19	0.552			
604	1999/10/13	179.0				1h11m	+8	1999/10/13	12.2			1999/10/15	1.535			
981	1999/10/14	178.5				1h18m	+6	1999/10/14	13.7			1999/10/09	0.544			
2262	1999/10/15	169.4				1h10m	+18	1999/10/14	14.3			1999/10/07	0.925			
2057	1999/10/16	179.5				1h24m	+9	1999/10/16	14.5			1999/10/17	1.348			
5275	1999/10/17	172.1				1h12m	+16	1999/10/16	14.5			1999/10/06	0.711			
4497	1999/10/17	179.4				2h 0m	-9	1999/10/20	11.1			1999/10/21	0.814			
1130	1999/10/21	179.3				1h40m	+11	1999/10/21	13.5			1999/10/11	0.930			
1294	1999/10/22	166.5				2h 2m	-1	1999/10/22	12.4			1999/10/22	1.073			
1403	1999/10/22	164.5				2h10m	-3	1999/10/19	12.8			1999/10/12	1.042			
1560	1999/10/22	168.3				1h29m	+21	1999/10/22	13.8			1999/10/20	1.122			
42																

Table 1. Observing circumstances for 503 Evelyn

Date	R. A. (2000)	Decl.	Delta	r	Phase	Ecl. long.	lat.
1996 10 25.8	04 07 23	+18 23 12	1.512	2.421	12.1	63.37	-2.50
1996 10 30.8	04 04 14	+18 22 48	1.477	2.412	10.1	62.64	-2.36
1996 11 07.8	03 57 56	+18 20 12	1.432	2.401	6.4	61.16	-2.11
1996 11 08.8	03 57 04	+18 19 42	1.427	2.399	5.9	60.96	-2.08
1997 01 09.8	03 17 33	+18 41 46	1.637	2.316	21.0	51.93	0.45
1997 01 15.8	03 19 09	+18 59 59	1.695	2.310	22.4	52.38	0.65
1997 01 16.8	03 19 31	+19 03 10	1.705	2.309	22.6	52.47	0.68
1997 01 19.8	03 20 50	+19 13 53	1.736	2.306	23.1	52.82	0.77
1997 01 24.8	03 23 36	+19 33 03	1.789	2.301	23.9	53.53	0.92
1997 01 30.8	03 27 50	+19 58 19	1.854	2.295	24.7	54.60	1.08
1997 01 31.8	03 28 38	+20 02 44	1.865	2.294	24.8	54.80	1.10
1997 02 03.8	03 31 11	+20 16 18	1.898	2.291	25.0	55.44	1.18
1997 02 05.8	03 33 01	+20 25 36	1.921	2.289	25.2	55.89	1.22

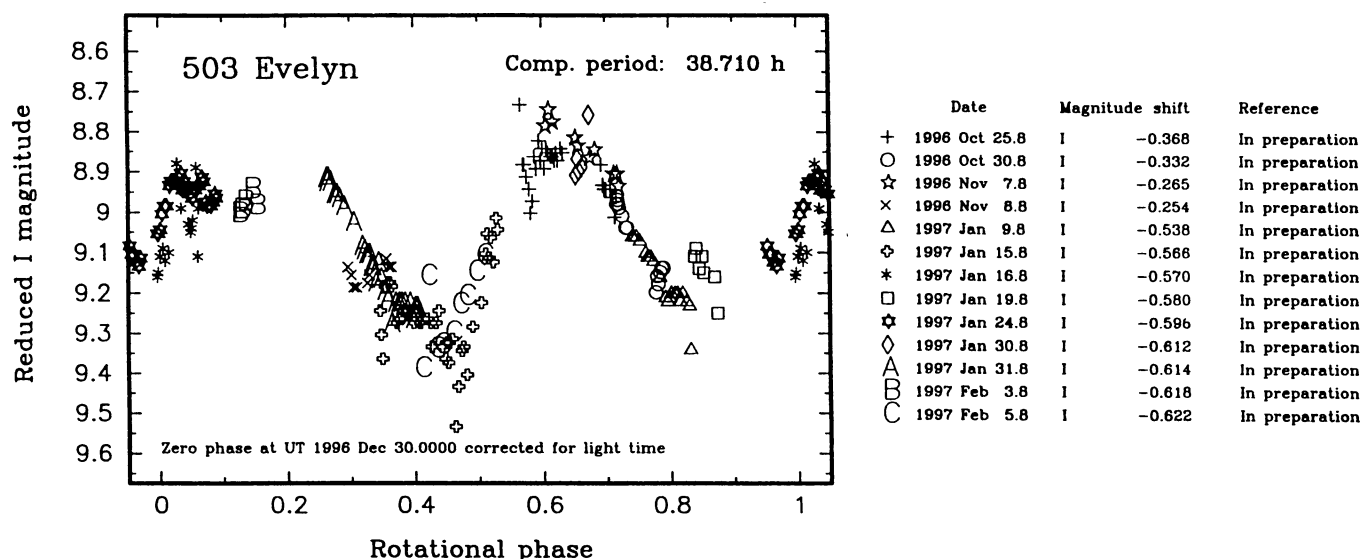


Figure 1. Best fit lightcurve solution for 503 Evelyn is found to be 38.710 hours. The V-I magnitude is 0.77 ± 0.05 .

CLOSE APPROACHES OF MINOR PLANETS TO NAKED EYE STARS IN 1999

Edwin Goffin
Aartselaarstraat 14
B-2660 Hoboken (Antwerpen)
Belgium
goffin@twi.agfa.be

(Received: 6 May)

A list is presented of approaches of minor planets brighter than magnitude 14 to naked eye stars. This may be helpful in finding some faint minor planets.

The accompanying table lists close approaches of minor planets to stars during 1999 where:

- The event takes place more than 30° from the Sun.
- The minor planet is brighter than visual magnitude 14.
- The star is brighter than magnitude 6.
- The minimum angular separation is smaller than $120''$.

This list can be helpful in locating some otherwise faint minor planets. By carefully drawing the star field around the predicted position down to the magnitude of the minor planet and comparing it to the situation some time later, one can detect the intruder by its apparent motion.

The information contained in the list is divided into 5 groups:

1. Date: gives the date and time in U.T. of the closest geocentric approach. All subsequent data pertain to this instant.
2. Closest approach: the two columns give the position of the minor planet with respect to the star:
 - the minimum geocentric distance in seconds of arc
 - the position angle in degrees, measured from north over east
3. Minor planet: gives information about the minor planet:
 - number and name
 - visual magnitude
 - apparent motion in seconds of arc per hour
 - parallax in seconds of arc