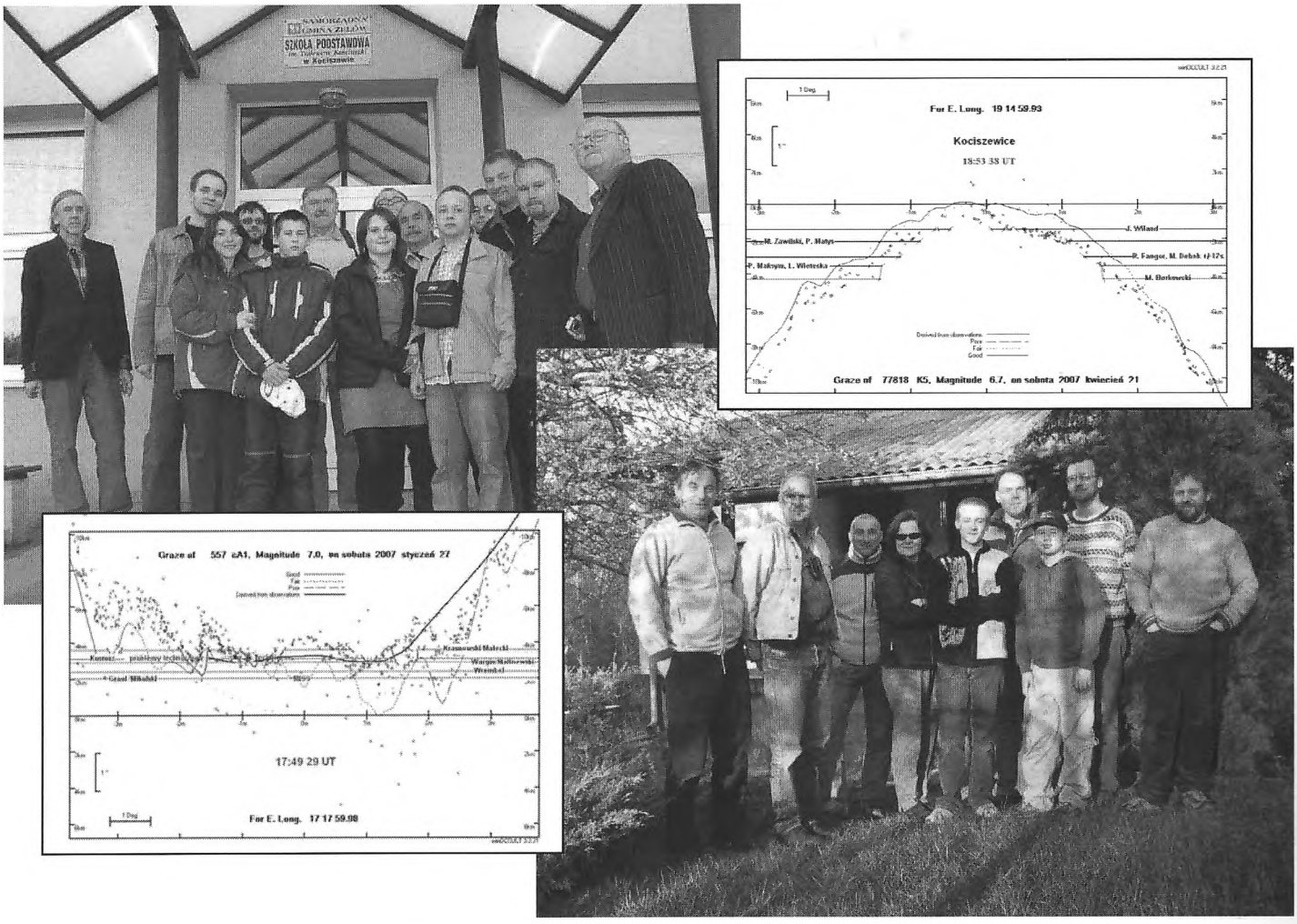
Materiały

Sekcji Obserwacji Pozycji i Zakryć

Polskiego Towarzystwa Miłośników Astronomii

Nr 81 (1/2007)



Brzegówkowy początek roku

Uczestnicy wypraw obserwacyjnych 21 kwietnia

Wydawnictwo dofinansowane ze środków Ministerstwa Nauki i Szkolnictwa Wyższego

Sekcja Obserwacji Pozycji i Zakryć Polskiego Towarzystwa Miłośników Astronomii

(SOPiZ PTMA)
członek
Międzynarodowego Towarzystwa Rejestracji Momentów Zakryć / Sekcja Europejska (International Occultation Timing Association / European Section)

Sekcja istnieje od roku 1979 jako organizacja wewnętrzna Polskiego Towarzystwa Miłośników Astronomii.

Sekcja zajmuje się prowadzeniem prac obserwacyjnych, obliczeniowych i analitycznych w dziedzinie zakryć - zaćmień oraz obserwacji pozycyjnych.

Raz do roku SOPiZ organizuje konferencję poświęconą tematyce zakryć, zagadnień astrometrycznych i innych pokrewnych.

Sekcja wydaje własny biuletyn „Materiały".

Każdy członek Towarzystwa może przystąpić do aktywnej pracy w SOPiZ, stając się jej pełnoprawnym członkiem poprzez wykonywanie cennych obserwacji czy prac obliczeniowo - analitycznych.

Bogate doświadczenie SOPiZ, jej zaangażowanie w prace techniczne, aktywna współpraca analityczna i koordynacyjna z innymi grupami z całego świata spowodowały, że od wielu lat Sekcja cieszy się uznaniem w międzynarodowym środowisku zajmującym się jej dziedziną działalności.

Siedziba SOPiZ PTMA mieści się w Łodzi.
Korespondencję należy kierować na adres:

Sekcja Obserwacji Pozycji i Zakryć PTMA
Planetarium i Obserwatorium Astronomiczne im. Arego Sternfelda
ul. Pomorska 16
91-416 Łódź

Strona internetowa:
www.sopiz-ptma.astronomia.pl

Materiały
SOPiZ PTMA

Wydawca:
Polskie Towarzystwo
Miłośników Astronomii
ul. Miodowa 13/35
31-055 Kraków
+48 012 4223892
www.ptma.astronomia.pl

Redaguje:
Paweł Maksym

Opieka merytoryczna:
dr hab. Marek Zawilski

Adres Redakcji:
SOPiZ PTMA
PiOA im. A. Sternfelda
ul. Pomorska 16
91-416 Łódź
sopiz-ptma@astronomia.pl

Druk:
Piktor – Drukarnia cyfrowa i
wydawnictwo
ul. Inflancka 71
91-848 Łódź

Wydawnictwo dofinansowane ze środków Ministerstwa Nauki i Szkolnictwa Wyższego

Spis Treści

Na pierwszej stronie:
Uczestnicy obserwacji brzegowych dnia 21 kwietnia 2007. Fotografia górna, autorstwa Janusza Wilanda, przedstawia grupę „centrum". Fotografia dolna, którą wykonał Mirosław Krasnowski, to uczestnicy wyprawy „północ". Więcej w podsumowaniu P. Maksyma na stronie 9.

Od redakcji

Szanowny czytelniku.
Trzymasz w ręku pierwszy numer Materiałów SOPiZ PTMA w roku 2007.

Cieszę się, że znów mogę przekazać miłośnikom zakryć, astronomom amatorom wydawnictwo tak bliskie naszym zainteresowaniom.

Dziękuję za listy e-mail oraz te tradycyjne z wyrazami zadowolenia z poziomu edytorskiego jak i zawartości naszego biuletynu.

Dalej rozwijamy współpracę z szerszym gronem miłośników astronomii czego wynikiem są kolejne teksty tym razem pochodzące od redakcji współpracującego z naszym Towarzystwem portalu astronomia.pl.

Liczę, że pomysł drukowania przeglądowych efemeryd dla największych miast w Polsce pomoże w szybkim zorientowaniu się z jakimi zjawiskami będziemy mieli do czynienia w następnym roku. W tym numerze Gdańsk i Kraków.

Na koniec numeru dwie fotografie z marcowego zakrycia Saturna! Następne już w maju... obyśmy mieli dobrą pogodę.

Jak zwykle czekam na artykuły do kolejnych numerów.

Pozdrawiam

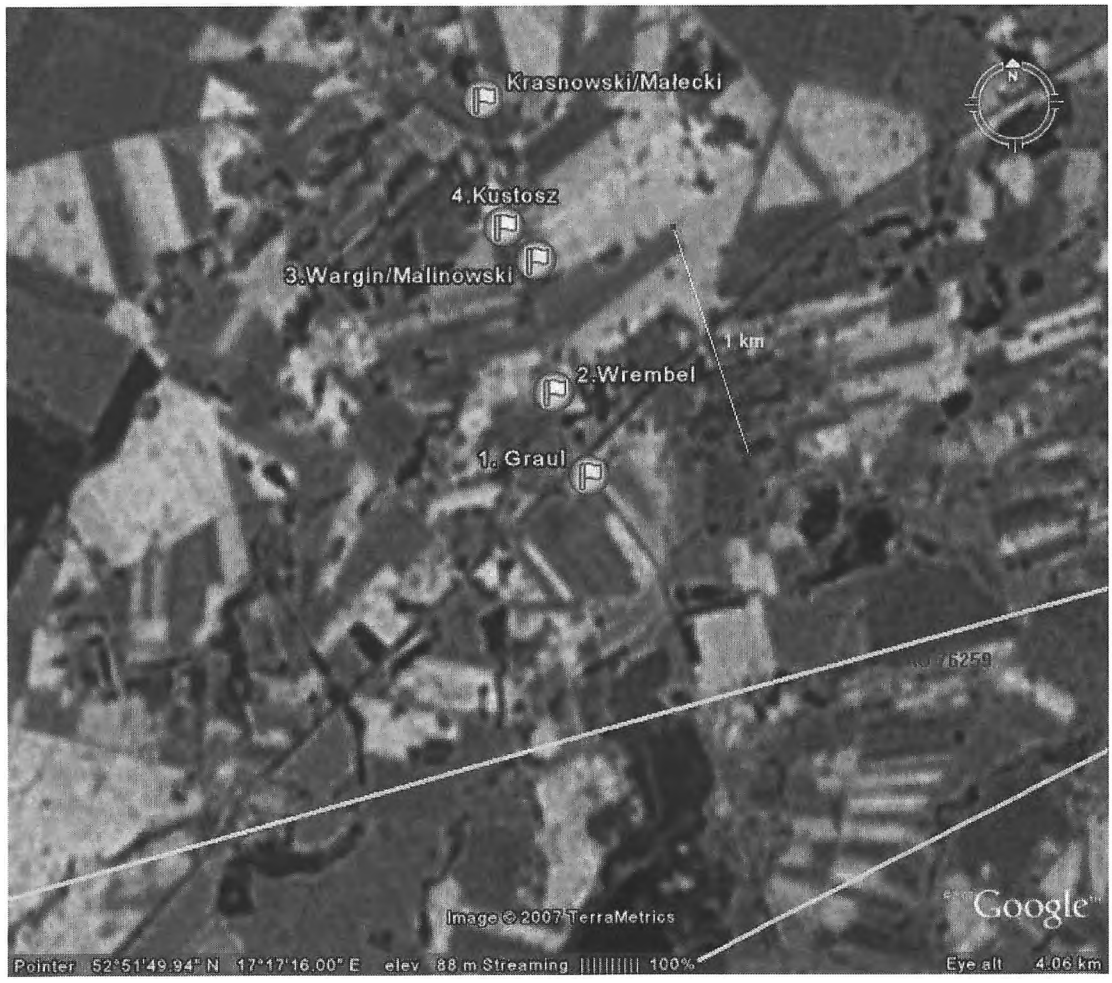
Paweł Maksym
Redaktor Materiałów
Przewodniczący SOPiZ PTMA

Artur Wargin - SOPiZ PTMA, Bydgoszcz

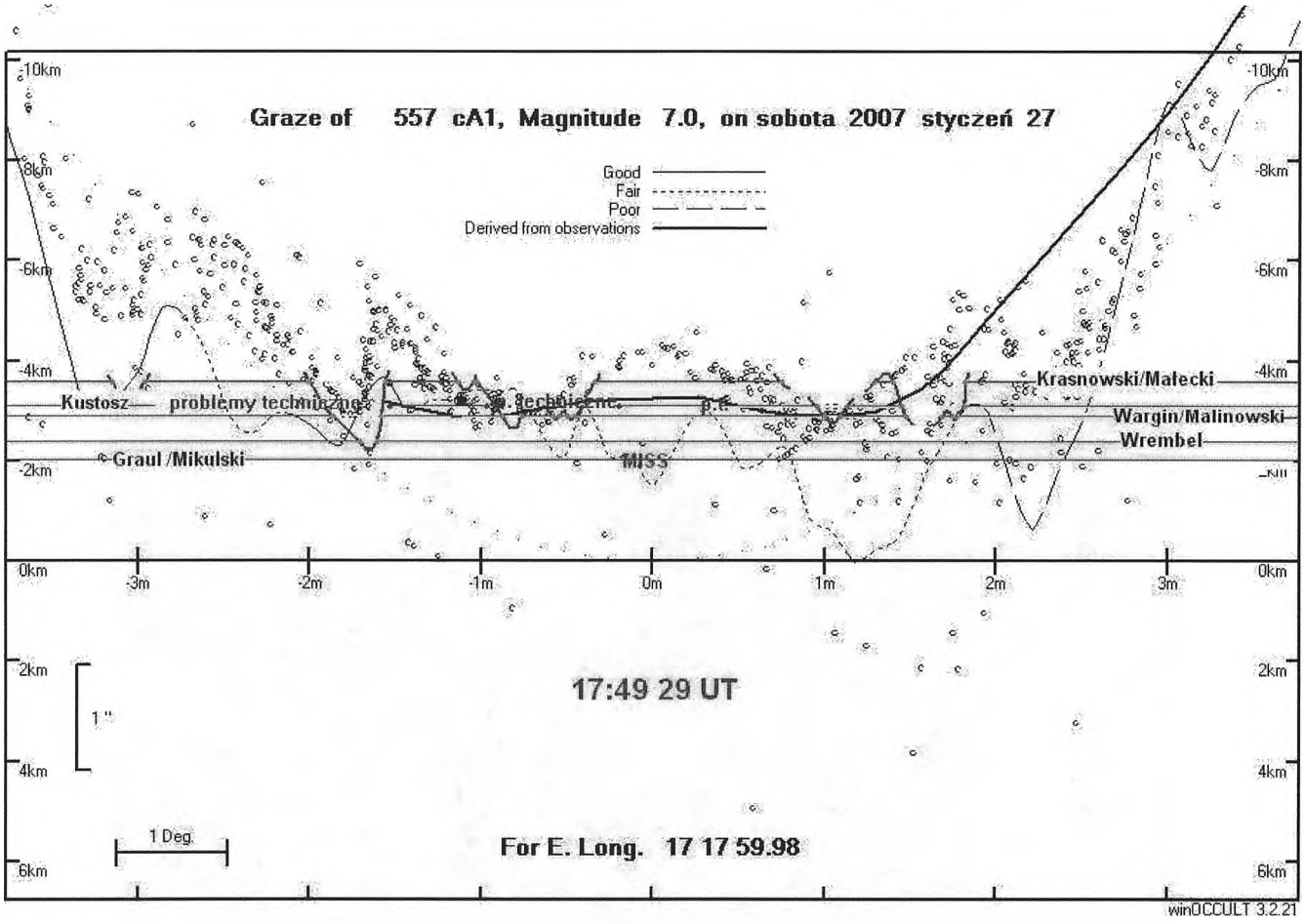
Podwójna Brzegówka

W dniu 27-go stycznia 2007 roku podczas przechodzenia Księżyca przez Plejady, w okolicach Wągrowca miało miejsce przecięcie się granic dwóch brzegówek gwiazd ZC557 oraz SAO76259 o jasnościach odpowiednio 7.0 i 7.4 magnitudo. Zjawiska miały miejsce około 60 stopni nad horyzontem przy fazie Księżyca +70%.
Po perturbacjach pogodowych rozlokowaliśmy się kilka kilometrów na wschód od Wągrowca. Położenie stanowisk zapewniało sensowną obserwację obu brzegówek bez przemieszczania się.

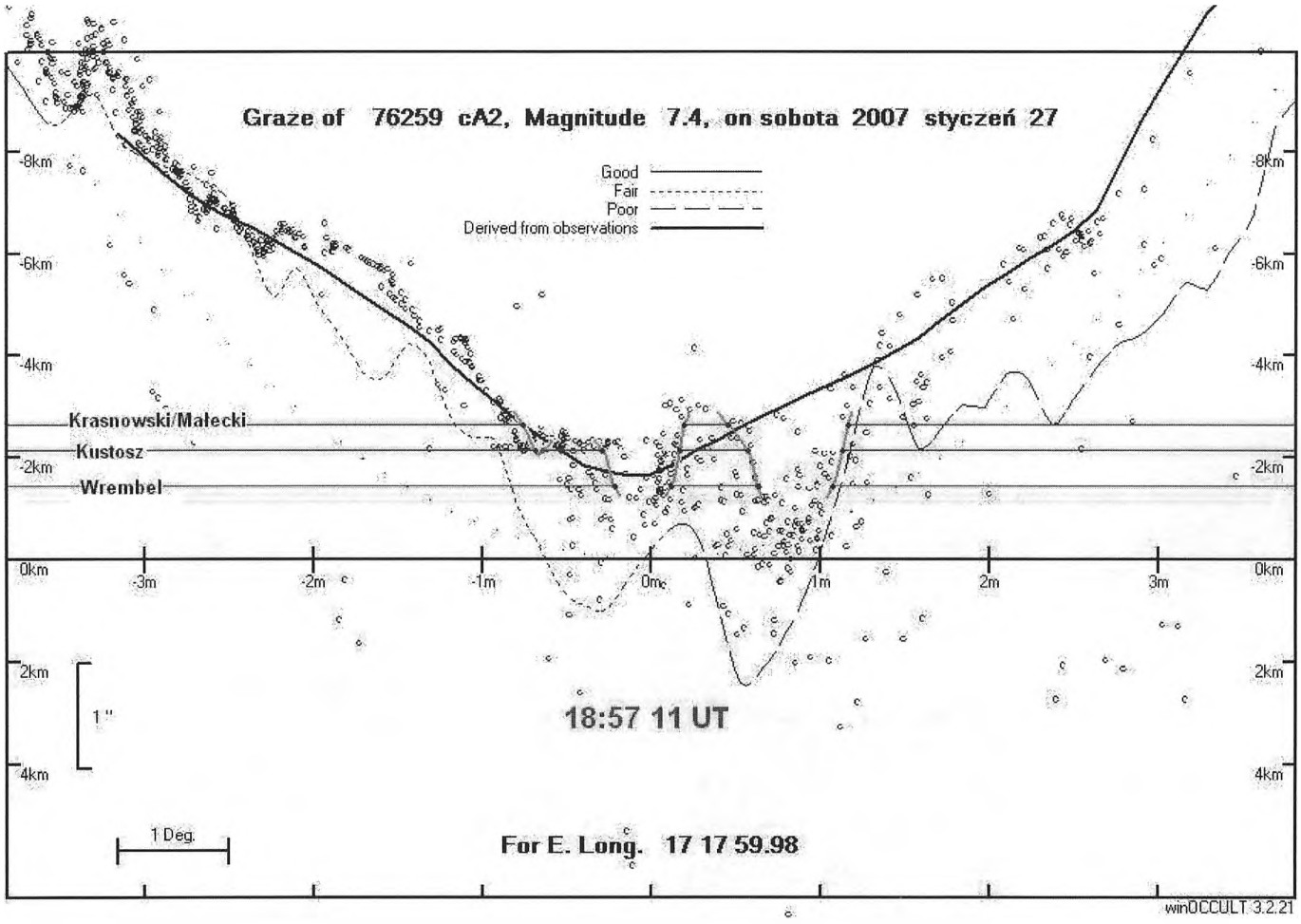
Rozmieszczenie stanowisk wobec obydwu granic:



Pierwszą obserwację przeprowadziliśmy przy idealnej wręcz pogodzie. Poszczególne zjawiska zostały zarejestrowane na wszystkich 5-ciu stanowiskach. Uzyskany z obserwacji profil Księżyca w zestawieniu profilem teoretycznym Widoczny na ryskunku poniżej:



Po odczekaniu około godziny przystąpiliśmy do obserwacji drugiej brzegówki. Tym razem jednak na dwóch stanowiskach, pierwszym i trzecim, dały się we znaki wysokie chmury. Gołym okiem nie było ich w sumie widać jednak przy obserwacji za pomocą kamer CCD objawiały się jako gwałtowne zaświetlenia obrazu uniemożliwiające w praktyce uzyskanie jakichkolwiek pozytywnych wyników. Na trzech pozostałych stanowiskach udało się jednak pewnie zarejestrować cały przebieg zjawiska.
Uzyskane wyniki na ilustracji poniżej.



Uczestnicy ekspedycji:

Stanowisko nr 1 - Romuald Graul, panowie Mikulscy (ojciec i syn)
Stanowisko nr 2 - Artur Wrembel
Stanowisko nr 3 - Artur Wargin, Mariusz Malinowski
Stanowisko nr 4 - Jarosław Kustosz
Stanowisko nr 5 - Mirosław Krasnowski, Jakub Małecki

Serdecznie wszystkim dziękuję za realizacje wspólnego przedsięwzięcia obserwacyjnego i życzę następnych sukcesów.

Krzysztof Czart - Astronomia.pl, Toruń

Odwiedzić planetoidy...

Planetoid jest w Układzie Słonecznym tysiące. Ich orbity mogą być różne, jednak największa liczba tych ciał grupuje się pomiędzy orbitami Marsa i Jowisza, tworząc tzw. pas planetoid. Zdarza się też, że niektóre asteroidy mijają Ziemię w bardzo niewielkiej odległości (jak na warunki kosmiczne, liczbowo mogą to być dziesiątki, czy setki tysięcy kilometrów).

Do tej pory jedynie dwie ziemskie sondy miały bezpośredni kontakt z planetoidami. Sonda NEAR wylądowała na planetoidze Eros, a Hayabusa dotknęła na chwilę powierzchni Itokawy.

NASA zorganizowała spotkanie specjalistów od mechaniki nieba i urządziła Zawody Globalnej Optymizacji Trajektorii. Ideą zawodów było znalezienie jak najlepszej trasy dla wielkiej podróży sondy kosmicznej do badania planetoid. Sonda powinna odwiedzić cztery planetoidy należących do różnych typów tych ciał, w jak najkrótszym czasie i jak najbardziej ekonomicznie. Zadanie nie było proste, bo dla 1000 możliwych do zbadania planetoid mamy aż 41 miliardów kombinacji.

W szranki stanęło 14 zespołów z Europy, Rosji, Chin i Stanów Zjednoczonych. Po czterech tygodniach żmudnych obliczeń każda z grup zaprezentowała swoje najlepsze wyniki. Finałowe spotkanie odbyło się w miejscowości Sedona w Arizonie na przełomie marca i kwietnia.

Najlepszą trajektorię znalazł zespół z Politechniki w Turynie. Grupę stworzyli: dwaj profesorowie Lorenzo Casalino i Guido Colasurdo oraz doktorant Matteo Rosa Sentinella i student Francesco Cacciatore. Zaproponowali trasę, na której wszystkie cztery planetoidy uda się odwiedzić w zaledwie 9 lat.

Teraz czekamy na zorganizowanie przez NASA stosownej misji kosmicznej.

Paweł Maksym - SOPiZ PTMA, Łódź

Brzegowe zakrycie 21 kwietnia

Kociszew - Pobiedziska - Trzęsówka

Dedykowana pamięci prof. Bohdana Paczyńskiego

21 kwietnia Księżyc zakrył brzegowo gwiazdę XZ 77818 o jasności 6,7 mag.
Granica zakrycia w Polsce przebiegała w następujący sposób:

Organizacji ekspedycji podjęły się ośrodki w Bydgoszczy (Artur Wargin), Łodzi (Paweł Maksym) i Króliku Polskim (Wiesław Słotwiński).
Brzegówka zapowiadała się więc okazale, szkoda tylko, że efemerydalny profil Księżyca był mało urozmaicony.

Trzy dni przed zakryciem brzegowym zmarł wielki przyjaciel astronomów amatorów, **prof. Bohdan Paczński**. Stało się jasne, że jemu będziemy dedykować tę obserwację. Jak się okazało Profesor czuwał nad jej przebiegiem i pogoda była doskonała. Taki widok nieba mogliśmy zobaczyć na krótko przed zakryciem:

(autor J. Wiland)

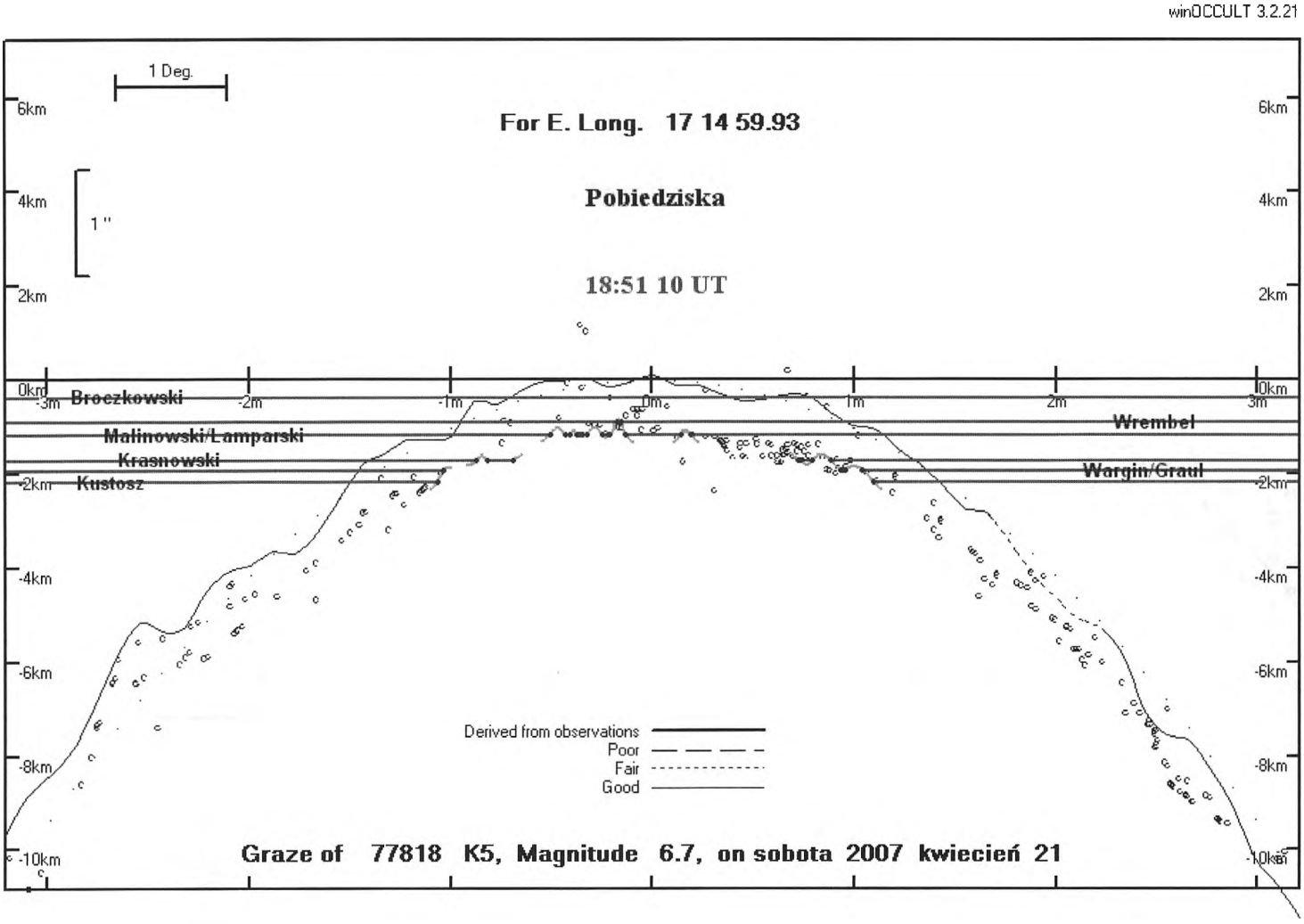
Grupa Północ spotkała się w miejscowości Pobiedziska, obserwatorzy ekspedycji Centralnej bazę mieli w Szkole Podstawowej w Kociszewie a grupa Południe zakotwiczyła w Trzęsówce.

Wszystkie z grup miały wspaniałe warunki pogodowe, staje się już tradycją, że wiosenne brzegówki są udane. Niestety inną tradycją jest też to, że wiosenne brzegówki mają bardzo „nie stabilne" granice. Dotknęło to grupę kolegów na południu i na wszystkich stanowiskach zarejestrowano „miss".

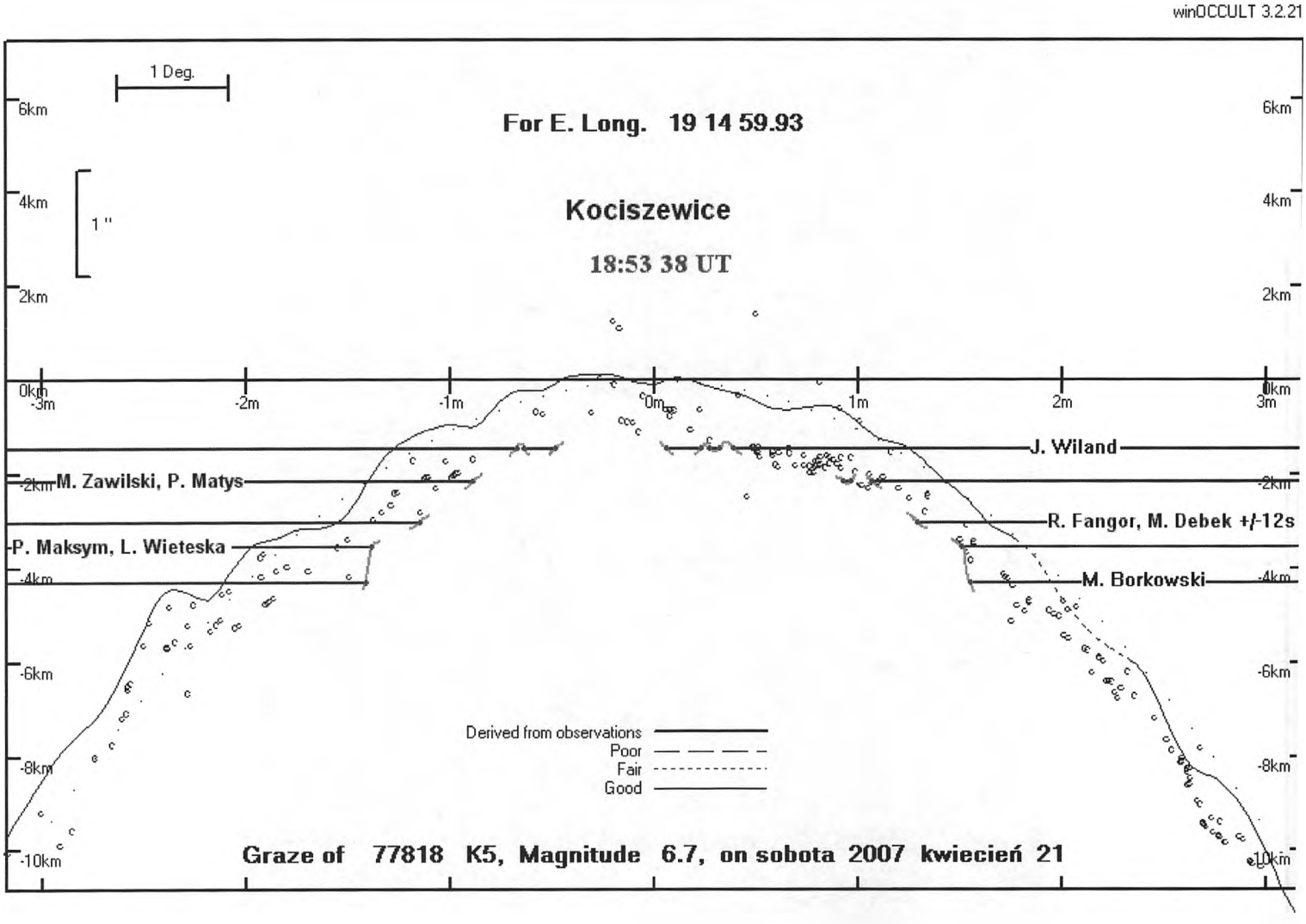
Grupy w Wielkopolsce i w okolicach Łodzi miały więcej szczęścia i zarejestrowały kontakty, które skrupulatnie na profile wprowadził kol. Wargin z Bydgoszczy - koordynator ds. zakryć brzegowych.

Oto wyniki:

POBIEDZISKA - grupa północna
W składzie:
Broczkowski (1), Wrembel (2), Malinowski/Lamparski (3), Krasnowski (4), Wargin/Graul (5), Kustosz (6)



KOCISZEW (na profilu błędnie Kociszewice) - grupa centrum
W składzie:
Wiland(1), Zawilski/Matys (2), Fangor/Dębek (3), Maksym/Wieteska (4), Borkowski (5)



Wyprawy na zakrycie brzegowe 21 kwietnia 2007 przeszły do historii jako kolejne z udanych obserwacji mających miejsce wiosną. Wyniki tradycyjnie zostały przekazane do ILOC (do dr Mitsuru Somy).

Z pewnością nasza obserwacja sprawiła dużą radość profesorowi Paczyńskiemu.

EFEMRYDY ZAKRYĆ GWIAZD PRZEZ KSIĘŻYC W FORMACIE OCCULT.

opr. Paweł Maksym

GDAŃSK

Occultation Predictions for Gdansk in styczen 2008
E.Long. 18 38 59.0 Lat. 54 21 22.0 Alt. 30m. T.dia 100mm. dMag 0.0

y	m	d	h	m	s		No	D	V	ill	Alt	Alt	Az	CA o	PA o	VA o	WA o	Libration L	Libration B	A m/o	B m/o	RV "/sec	Cct o	R.A. (J2000) h	m	s	Dec o	m	s
08	01	12	16	3	20	d	146344	cG5	7.8	17+	49	-10	24	211	57S	100	82	121	-5.7	-0.9	+1.6	-1.5	.314	-46	22	50	31.1	- 6	54	50
		146344 is double : 8.6 8.6 0.25" 70.0																												
08	01	12	18	22	45	d	3357	A2	6.9	18+	50			11	244	38N	15	343	36	-5.9	-1.1	+0.0	+0.9	.371	+43	22	53	27.6	- 5	59	17
08	01	14	19	13	32	D	68	SB9	5.8s	38+	76			27	242	55N	31	0	54	-5.0	-4.0	+0.6	+0.5	.432	+28	24	32	23.8	6	57	20
		68 = 51 Piscium																												
		68 is multiple : 5.6 7.8 0.200" 272.0 : 5.6 9.5 28" 83.0 : 5.6 165" 227.0																												
		68 = NSV 15113, 5.67 +/- 9.00 V , Type E:																												
08	01	15	17	53	38	d	197	cK0	7.0	49+	89			45	210	71S	87	69	108	-4.0	-5.0	+1.4	-0.6	.401	-28	1	21	58.3	12	36	15
		197 is double : 7.8 7.8 0.100" 90.0																												
08	01	17	17	34	21	d	470	WK0	6.8	71+	115			58	163	61N	48	59	64	-1.5	-6.2	+1.0	+1.6	.431	+20	3	14	17.2	22	57	14
		470 is double : 7.0 9.7 44" 36.0																												
08	01	17	18	54	58	d	75832	K0	7.3	72+	116			58	197	74N	61	50	76	-1.6	-6.2	+1.2	+0.7	.445	+10	3	16	57.0	23	7	36
08	01	20	0	1	40	d	840	cK0	6.3	91+	145			43	258	25N	28	348	31	+1.2	-5.5	+1.9	+1.9	.193	+68	5	35	55.5	27	39	44
		840 is double : 7.3 7.3 0.050" 0.0																												
08	01	20	17	45	29	d	994	cF5	6.6	96+	156			43	103	58N	69	109	67	+3.1	-4.8	+0.6	+1.9	.469	+22	6	28	56.4	26	58	3
		994 is double : 6.8 7.7 0.003" 269.0																												
08	01	21	20	56	42	d	1157	A2	6.2	99+	171			56	143	49N	75	97	67	+4.3	-3.5	+1.3	+1.4	.387	+31	7	39	12.0	24	13	21
		Distance of 1157 to Terminator = 6.8 ; to 3km sunlit peak = 1.4																												
08	01	24	0	0	50	r	1415	WA1	6.3	97-	161			50	176	70N	309	311	292	+5.7	-0.2	+1.1	-1.1	.432	+173	9	35	52.9	14	22	47
		1415 is double : 6.3 9.4 41" 83.0																												
08	01	24	21	42	6	r	1516	K5	6.6s	93-	150			31	121	74S	277	307	257	+6.3	+1.2	+0.9	+1.2	.422	-157	10	22	14.2	8	57	52
		1516 = NSV 18388, 6.72 to 6.81 Hp, Type IB																												
08	01	24	23	18	18	R	1525	M2	5.6v	93-	149			40	147	52N	331	350	312	+6.1	+1.3	+0.8	-1.2	.381	+152	10	25	15.2	8	47	5
		1525 = 44 Leonis (DE)																												
		1525 = DE Leo, 5.60 +/- 0.07 V , Type SRB:																												
08	01	25	5	53	59	R	1549	cG8	5.1	92-	146	-7	16	260	85S	290	255	270	+5.4	+2.1	+0.3	-1.8	.508	-169	10	34	48.0	6	57	13
		1549 = 48 Leonis																												
		1549 is double : 6.0 6.0 0.100" 90.0																												
08	01	26	0	44	1	r	1624	F2	6.8	86-	136			37	162	90N	296	306	275	+5.8	+3.0	+1.2	-0.2	.409	-169	11	13	53.0	2	16	7
08	01	26	3	45	8	r	1637	K0	5.9	86-	135			32	216	24N	2	342	340	+5.4	+3.3	-0.1	-2.4	.240	+124	11	18	55.0	1	39	1
		1637 = 76 Leonis																												
08	01	29	3	58	43	R	1944	SK1	5.5	60-	101			20	183	78N	304	302	284	+3.1	+6.6	+1.2	-0.6	.375	+179	13	32	51.6	-15	21	47
		1944 = 75 Virginis																												
		1944 is triple : 5.5 13.5 18.9" 320.0 : 5.5 11.2 80" 110.0																												
08	01	31	5	27	15	r	2164	wK4	6.6	40-	79	-10	12	183	78N	296	295	281	+0.5	+7.6	+1.4	-0.3	.359	+175	15	9	51.3	-23	59	9
		2164 is double : 6.8 12.5 10.3" 201.0																												

Occultation Predictions for Gdansk in luty 2008
E.Long. 18 38 59.0 Lat. 54 21 22.0 Alt. 30m. T.dia 100mm. dMag 0.0

y	m	d	h	m	s		No	D	V	ill	Alt	Alt	Az	CA o	PA o	VA o	WA o	Libration L	Libration B	A m/o	B m/o	RV "/sec	Cct o	R.A. (J2000) h	m	s	Dec o	m	s
Graze of 438cA3 nearby at Lat = +56.22 +0.12(E.Long -18.65), CA = 2.9S																														
			13	17	40	7	Gr	438cA3	6.8	45+	84			52	214																
Closest distance to graze path is 202km at azimuth 348																														
08	02	14	10	37	50	d	537	SB6	3.7s	54+	94	22	17	72	29S	138	176	151	+0.6	-6.0	+0.6	+0.7	.251	-66	3	44	52.5	24	6	48
		537 = Electra = 17 Tauri																												
		537 is triple : 3.9 7.0 0.005" 0.0 : 3.9 7.5 0.196" 117.0																												
		537 = NSV 15755, 3.70 +/- 0.00 V , Type																												

```
Graze of 537SB6 nearby at Lat = +49.48 +0.80(E.Long -18.65), CA = 6.2S
      14 10 40 46 Gr    537SB6  3.7  54+  94  27 16  71
Closest distance to graze path is 340km at azimuth 129
08 02 14 10 50 58 d     541cB8  3.9   54+  94  23 19  74  80S  88 126 101 +0.6 -6.0 +0.0+1.5 .586  -16  3 45 49.6  24 22  4
       541 = Maia = 20 Tauri
       541 is double :   4.4  5.4   0.003"   69.0
08 02 14 21 43 49 d   76472cG8  7.2   58+  99     34 268  69N  59  18  70 +0.1 -6.2 +0.7-0.6 .469  +26  4  8 39.0  25 52 40
     76472 is double :   8.3  8.3   0.050"    0.0
08 02 15 20 51 13 d     773wF8  7.0   69+ 112     51 243  55N  52  16  58 +1.3 -5.9 +1.3+0.3 .360  +40  5 10  3.9  27 33 23
       773 is double :   7.1  8.7  14.0"  352.0
08 02 16 22 44 17 d     958cK1  6.7   80+ 126     44 255  52N  57  17  56 +2.3 -4.9 +1.2-0.3 .353  +45  6 18 20.8  27 12 37
       958 is double :   7.5  7.5   0.050"    0.0
08 02 21  2 12 36 d X117400    10.6   61E 179     31 241 -17S 163 132 144 +4.6 +1.2 +0.1-2.2 .368  -40 10 10 26.9   9 51 45
Graze of X117340 nearby at Lat = +49.22 -1.08(E.Long -18.65), CA = -64.9S
      21  2 16  6 GrX117340    11.0  55E 179     33 245
Closest distance to graze path is 295km at azimuth 239
08 02 21  2 16 54 D X 15316SF8  9.8   54E 179     30 242  69U 109  77  90 +4.6 +1.2 +0.7-1.7 .468  +14 10 11 16.2  10  0 40
   X 15316 is triple :  10.2 10.4   73"  186.0 :   9.5 10.7  340"  203.0
08 02 21  2 17 19 d X117424M   11.0   53E 179     30 242  84U 137 105 118 +4.6 +1.2 +0.4-1.9 .468  -14 10 11  0.0   9 54  7
   X117424 is triple :  10.3 10.7  134"   53.0 :  11.0 11.2  152"  196.0
08 02 21  2 18  6 d X117435M   11.2   52E 179     30 242  78U 129  97 110 +4.6 +1.2 +0.5-1.9 .480   -6 10 11  7.3   9 55 27
   X117435 is triple :  10.7 10.3  134"  233.0 :  10.7  9.5  340"   23.0
08 02 21  2 19  7 r X117340    11.0   50E 179     30 243 -88N 236 205 218 +4.6 +1.2 +1.8-0.8 .197 -114 10  9 26.2   9 56 25
08 02 21  2 25  1 d X117451    11.0   40E 179     29 244  67U 118  85  99 +4.6 +1.2 +0.6-1.8 .483   +5 10 11 25.7   9 56 16
08 02 21  2 39 23 d X117480    10.9   18E 179     28 247  44U  89  56  70 +4.6 +1.3 +0.8-1.6 .413  +33 10 11 57.2  10  0  0
08 02 21  2 51 46 d X117472    10.9    4E 179     26 250  73U 145 111 126 +4.6 +1.3 +0.2-2.0 .458  -23 10 11 51.7   9 43 39
08 02 21  3  0 27 r X117400    10.6    0E 179     24 252  98U 261 227 242 +4.5 +1.3 +0.8-1.6 .385 -140 10 10 26.9   9 51 45
08 02 21  3 14 11 d X117522    10.8    0E 179     23 254  45U  94  59  75 +4.5 +1.3 +0.5-1.7 .449  +28 10 12 57.5   9 49 25
08 02 21  3 17 33 D X117525    10.0    0E 179     22 255  55U 106  71  87 +4.5 +1.3 +0.4-1.8 .490  +16 10 13  1.3   9 45 20
08 02 21  3 17 58 R X 15316SF8  9.8    0E 179     22 256  62U 316 280 297 +4.5 +1.3 +0.2-1.9 .497 +166 10 11 16.2  10  0 40
   X 15316 is triple :  10.2 10.4   73"  186.0 :   9.5 10.7  340"  203.0
08 02 21  3 18  2 r X117424M   11.0    0E 179     22 256  76U 287 252 268 +4.5 +1.3 +0.4-1.8 .497 -166 10 11  0.0   9 54  7
   X117424 is triple :  10.3 10.7  134"   53.0 :  11.0 11.2  152"  196.0
08 02 21  3 20 19 r X117435M   11.2    0E 179     22 256  71U 295 260 276 +4.5 +1.3 +0.3-1.8 .510 -174 10 11  7.3   9 55 27
   X117435 is triple :  10.7 10.3  134"  233.0 :  10.7  9.5  340"   23.0
08 02 21  3 27  6 r X117451    11.0    0E 179     21 258  60U 306 271 287 +4.5 +1.3 +0.2-1.9 .514 +175 10 11 25.7   9 56 16
08 02 21  3 30  6 D X117536 K5  9.9    0E 179     20 258  77U 132  97 113 +4.5 +1.4 +0.2-1.9 .505  -12 10 13  9.5   9 35 44
08 02 21  3 31 22 r X117480    10.9    0E 179     20 259  39U 334 299 315 +4.5 +1.4 +0.0-2.1 .435 +147 10 11 57.2  10  0  0
08 02 21  3 44 34 D  118172     9.4    0E 179     18 261  89U 136 100 117 +4.5 +1.4 +0.1-1.9 .503  -16 10 13 33.1   9 31  5
08 02 21  3 47 40 r X117472    10.9    0E 179     18 262  67U 278 242 259 +4.5 +1.4 +0.3-1.7 .485 -157 10 11 51.7   9 43 39
08 02 21  4  7 26 r X117522    10.8   11E 179     15 266  40U 327 291 308 +4.5 +1.4 +0.0-2.0 .474 +152 10 12 57.5   9 49 25
08 02 21  4  9 17 D X 15370 K0  9.9   14E 179     15 266 -44S 151 115 132 +4.5 +1.4 +0.0-2.0 .460  -31 10 14  5.8   9 22  2
08 02 21  4 14 26 D X 15388 F5  9.8   20E 179     14 267  95U  80  44  61 +4.5 +1.4 +0.3-1.6 .419  +39 10 14 47.4   9 36 59
08 02 21  4 14 55 R X117525    10.0   21E 179     14 267  49U 315 279 296 +4.5 +1.4 +0.0-1.9 .520 +164 10 13  1.3   9 45 20
08 02 21  4 27 23 R X117536 K5  9.9   41E 179     12 270  71U 288 251 269 +4.5 +1.4 +0.1-1.8 .536 -168 10 13  9.5   9 35 44
08 02 21  4 40  3 R  118172     9.4   63E 179 -11 10 272  83U 283 247 264 +4.5 +1.5 +0.0-1.7 .533 -164 10 13 33.1   9 31  5
08 02 21  4 40 38 D  118183 F5  8.0   64E 179 -11 10 272 -64S 160 124 141 +4.5 +1.5 -0.2-2.0 .418  -41 10 14 57.5   9 12 40
08 02 21  4 49 33 d X117677    11.1   78E 179 -10  9 274  41S  52  16  33 +4.5 +1.5 +0.4-1.3 .227  +66 10 15 43.4   9 34 33
08 02 21  4 54 35 d X117649    11.2   86E 179  -9  8 274 -81S 173 136 153 +4.5 +1.5 -0.3-2.1 .330  -54 10 15 11.8   9  8  7
08 02 21  4 57 17 R X 15370 K0  9.9   89E 179  -9  8 275  -4N 267 231 248 +4.5 +1.5 +0.0-1.6 .483 -149 10 14  5.8   9 22  2
08 02 22  4 30  9 R    1599cK1  4.8   99- 167     13 258  77S 291 256 270 +4.4 +3.0 +0.3-1.8 .500 -170 11  0 33.6   3 37  3
       1599 = 58 Leonis
       1599 is double :   4.8         0.200"   35.0
08 02 22 21 56 31 R    1685cG9  4.3   96- 158     28 140  69S 280 302 258 +4.9 +3.7 +1.2+0.9 .391 -155 11 36 56.9 - 0 49 25
       1685 = upsilon Leonis
       1685 is double :   4.5  9.0   0.100"  195.0
08 02 29  5  6 20 d    2383 B0  2.8   49-  89  -5  7 184 -65S 123 121 115 -2.0 +7.5 +1.5-0.4 .323  -25 16 35 53.0 -28 12 58
       2383 = tau Scorpii

Occultation Predictions for Gdansk in marzec 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
```

```
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o    o    o   L    B   m/o m/o "/sec   o  h  m   s    o  m  s
08 03 09 18 43 30 d  109530DF0  8.2    5+  27      6 278  44S 106  70 128 -3.4 -4.6 -0.1-2.1 .460  -40  0 54 45.1   9 25 44
    109530 is double :   8.1  9.2   3.1"  300.0
08 03 11 18 30 55 d   75558 A0  7.7   20+  54     31 262  46S 114  75 131 -0.5 -6.1 +0.4-2.4 .408  -39  2 45 47.8  20 41 34
08 03 12 17 54 18 D     538cB8  5.7   31+  67 -11 47 243  69N  54  19  67 +1.0 -6.3 +1.1+0.1 .429  +26  3 45  9.7  24 50 21
       538 = 18 Tauri
       538 is double :   6.4  6.4   0.050"    0.0
08 03 12 18  3 22 D     539SB6  4.3   31+  67     46 245  21S 145 109 158 +1.0 -6.3 +0.5-4.9 .203  -65  3 45 12.5  24 28  2
       539 = Taygeta = 19 Tauri
       539 is multiple :             0.000"  348.0 :   4.6  6.1   0.012"    0.0 :   4.3  8.1   71"  329.0
08 03 12 18 14 41 D     542 B8  5.8   31+  67     45 248  41S 124  87 137 +1.0 -6.3 +0.7-2.7 .349  -44  3 45 54.5  24 33 16
       542 = Asterope = 21 Tauri
Graze of 539SB6 nearby at Lat = +52.61 -0.14(E.Long -18.65), CA = -5.1S
      12 18 19 44 Gr    539SB6  4.3  31+  67     44 251
Closest distance to graze path is 189km at azimuth 193
08 03 12 18 22 19 D     543cA0  6.4   31+  67     44 250  31S 134  97 147 +1.0 -6.3 +0.6-3.4 .294  -53  3 46  2.9  24 31 40
       543 is double :   7.3  7.3   0.100"    0.0
08 03 12 18 32 12 r     539SB6  4.3   31+  67     42 253 -30S 196 158 209 +1.0 -6.3 +1.4+2.7 .209 -115  3 45 12.5  24 28  2
       539 = Taygeta = 19 Tauri
       539 is multiple :             0.000"  348.0 :   4.6  6.1   0.012"    0.0 :   4.3  8.1   71"  329.0
08 03 12 18 57  0 d     548cB9  6.8   31+  68     39 258  13S 153 114 166 +0.9 -6.3 -0.2-6.1 .165  -71  3 46 59.4  24 31 12
       548 is double :   6.8        0.200"    4.0
08 03 12 19 19 16 D     555 K5  6.4   31+  68     36 263  58N  44   4  57 +0.9 -6.3 +0.9+0.0 .407  +38  3 48  6.5  24 59 18
08 03 12 20 56 32 d     571cA2  6.8   32+  69     23 282  26N  12 333  24 +0.9 -6.2 +1.5+2.3 .178  +72  3 51 25.3  25  9 47
       571 is double :   7.1  9.1   0.000"    0.0
Graze of 571cA2 nearby at Lat = +55.54 -0.39(E.Long -18.65), CA = 8.1N
      12 21  3 23 Gr    571cA2  6.8  32+  69     22 283
Closest distance to graze path is 108km at azimuth 35
08 03 12 21  9 52 d     574cG0  6.8   32+  69     21 284  36N  22 343  34 +0.9 -6.2 +0.9+0.8 .265  +63  3 52 11.4  25  9 47
       574 is double :   7.6  7.6   0.100"   90.0
Graze of 574cG0 nearby at Lat = +57.33 -0.41(E.Long -18.65), CA = 7.9N
      12 21 18 36 Gr    574cG0  6.8  32+  69     20 285
Closest distance to graze path is 263km at azimuth 37
08 03 14 18 10 25 D     890cA0  4.6s  53+  94     61 209  56N  56  37  58 +3.5 -5.3 +1.5+0.9 .341  +39  5 53 19.6  27 36 44
       890 = 136 Tauri
       890 is double :   4.8  6.3   0.050"  270.0
       890 = NSV 02696,   4.50 to  4.61 V ,  Type
08 03 14 19 54 37 d   77753 G2  7.2   54+  95     50 244  80S 100  64 102 +3.3 -5.2 +0.9-1.4 .472   -2  5 57  5.6  27 19  0
08 03 14 21 15 43 d     906cK1  6.6   55+  95     39 263  87N  87  46  88 +3.2 -5.1 +0.6-1.4 .501  +13  6  0  6.0  27 16 20
       906 is double :   7.3  8.3   0.038"  153.0
08 03 15 19 33 22 D    1061SF8  6.2s  65+ 107     58 217  54N  60  37  56 +4.2 -4.2 +1.7+0.6 .313  +45  6 58 47.4  26  4 52
      1061 is triple :   6.1        0.50"  158.0 :   6.1 12.1   29"   34.0
      1061 = NSV 17256,   6.10 +/- 0.02 V ,  Type VAR:
08 03 15 19 49 27 d    1062cB8  6.4   65+ 108     56 223  84N  90  64  86 +4.2 -4.2 +1.3-0.8 .430  +16  6 59 27.9  25 54 51
      1062 is double :   6.4        0.100"   69.0
08 03 15 21 32 26 d    1068 A2  7.1   66+ 108     43 252  26S 161 123 156 +4.0 -4.0 -0.2-3.2 .296  -53  7  2  7.2  25 25 32
08 03 16 22 50 52 d    1215 K0  6.8   76+ 122     38 255  44S 149 111 138 +4.5 -2.6 +0.0-2.3 .410  -35  8  3 50.5  22  4 15
08 03 17  0 57 37 D    1224 G2  5.3   77+ 123     20 280  13S 180 142 170 +4.5 -2.3 -1.0-2.6 .214  -68  8  7 45.9  21 34 55
      1224 = mu Cancri
08 03 17 17 47 55 d    1322 A2  6.4   84+ 132  -9 47 133  82S 114 141 100 +5.5 -1.6 +1.1+0.2 .432   -1  8 50 45.1  18 49 56
08 03 20 17 58  7 d    1635cM0  5.2   99+ 169  -9 17 112  76S 116 149  94 +5.2 +3.0 +0.5+0.8 .469   +6 11 17 17.4   2  0 38
      1635 = 75 Leonis
      Distance of    1635 to Terminator = 17.6 ; to 3km sunlit peak = 7.6
      1635 is double :   5.8  6.6   0.044"    0.0
08 03 20 19  8 36 d    1637 K0  5.9   99+ 169     26 128  55S 135 163 114 +5.1 +3.1 +0.7+0.0 .433  -12 11 18 55.0   1 39  1
      1637 = 76 Leonis
      Distance of    1637 to Terminator = 11.7 ; to 3km sunlit peak = 3.9

Occultation Predictions for Gdansk in kwiecien 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o    o    o   L    B   m/o m/o "/sec   o  h  m   s    o  m  s
```

```
08 04 07 19  1  5 d     357 F7  8.2    4+  22      8 292  51S 100  65 118 -1.5 -5.8 -0.3-1.6 .583  -25  2 26 14.1  18 54 19
08 04 08 20 37  7 d     513cK0  7.3   10+  37      7 301  85S  76  43  90 +0.5 -5.9 -0.3-1.0 .661   +7  3 32  0.6  23 38 50
      513 is double :   8.7  8.7   0.100"   90.0
08 04 11 22 47 52 d    1046cF8  7.0   40+  79     16 292  77N  82  44  78 +4.9 -3.8 -0.1-1.3 .569  +23  6 51  0.4  25 45 37
      1046 is double :   7.8  7.8   0.100"   57.0
08 04 11 23  9  1 d    1049 A2  6.8   41+  79     13 296  86N  91  55  87 +4.9 -3.8 -0.2-1.3 .614  +13  6 51 58.2  25 39 47
08 04 12  0 22 27 d    1055 G0  5.7s  41+  80      4 309  71S 114  84 110 +5.0 -3.7 -0.6-1.2 .657  -11  6 55 18.7  25 22 33
      1055 = 37 Geminorum
      1055 = NSV 17225,   5.73 +/- 0.02 V ,  Type VAR:
08 04 12 19 54 23 d   79657 K5  7.4   50+  90     46 243  78S 112  77 103 +5.7 -2.9 +0.7-1.7 .479   +1  7 44 32.1  23 20 43
08 04 12 21 49 59 d    1178SG2  6.3s  51+  91     30 269  64N  75  35  66 +5.6 -2.7 +0.6-1.3 .431  +37  7 48 33.6  23  8 28
      1178 is multiple :   6.1  6.6   0.27"   33.3 :   6.3 13.5   4.1"   34.0 :   6.3 12.0   67"   25.0
      1178 = NSV 17606,   6.18 +/- 0.00 V ,  Type VAR:
08 04 13 19 15 58 d    1293SK0  6.8s  61+ 103     52 212  79N  94  75  81 +6.2 -1.5 +1.4-0.8 .400  +24  8 39 50.7  19 32 27
      1293 is multiple :   6.8  9.9   0.49"  225.7 :   6.7  9.7   0.50"  232.0 :   6.7  6.9   92"   62.0
      1293 = NSV 04171,   6.52 to  6.61 V ,  Type
08 04 13 19 19 20 d    1294SA0  7.3s  61+ 103     52 213  73N  88  69  75 +6.2 -1.5 +1.4-0.7 .384  +29  8 39 56.5  19 33 11
      1294 is multiple :   6.9 11.9   1.20"  291.0 :   6.9  7.2   45"  157.0 :   6.9  6.7   92"  242.0
      1294 = NSV 04175,   7.32 +/- 0.00 V ,  Type
08 04 13 19 38 33 d    1297cA9  6.8s  61+ 103     50 219  76S 119  96 106 +6.2 -1.5 +0.9-1.6 .444   -1  8 40 20.1  19 20 56
      1297 is double :   6.7        0.100"  160.0
      1297 = NSV 17953,   6.78 +/- 0.00 V ,  Type DSCT:
08 04 13 19 38 55 D    1299WA*  6.3   61+ 103     50 219  60N  75  52  62 +6.2 -1.5 +1.6-0.4 .325  +43  8 40 27.0  19 32 41
      1299 is double :   6.3  7.4  135"  250.0
Graze of 1298SK0 nearby at Lat = +52.49 -0.68(E.Long -18.65), CA = 13.6N
      13 19 57 17 Gr   1298SK0  6.4  61+ 103     50 227
Closest distance to graze path is 138km at azimuth 228
08 04 13 20 15 30 g    1303 A6  6.8v  61+ 103     46 231  13N  28 359  15 +6.1 -1.4 +0.1-2.6 .340 +137  8 40 56.3  19 34 49
      1303 = EP Cnc,   6.76 +/- 0.03 V ,  Type DSCTC
Graze of 1303 A6 nearby at Lat = +54.29 -0.71(E.Long -18.65), CA = 13.1N
      13 20 15 36 Gr   1303 A6  6.8  61+ 103     46 231
Closest distance to graze path is 4km at azimuth 231
08 04 13 22 24 57 d    1312 F2  6.8   62+ 104     29 262  83N  98  60  85 +6.0 -1.2 +0.4-1.7 .490  +19  8 45 29.6  18 49  3
Graze of 1516 K5 nearby at Lat = +51.24 -0.86(E.Long -18.65), CA = 16.1N
      15 20 45 11 Gr   1516 K5  6.6  81+ 128     45 207
Closest distance to graze path is 203km at azimuth 234

Occultation Predictions for Gdansk in maj 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o  h  m   s    o  m  s
08 05 10 12 32 16 D Mars        1.3   33+  70  48 42 113  45N  57  92  46 +7.2 -2.1 +0.8+3.2 .295  +49  8 11 22.8  21 47 20
   Duration of Partial Stage for Disk = 18.3 secs
08 05 10 13 18 29 R Mars        1.3   33+  70  43 48 126 -35N 337   8 326 +7.2 -2.1 +1.1-2.0 .284 +131  8 11 22.8  21 47 20
   Duration of Partial Stage for Disk = 19.0 secs
08 05 10 19 53 30 d    1261WA5  7.3   35+  73  -9 34 257  69S 125  87 113 +6.6 -1.5 +0.3-1.9 .516   -9  8 24 49.2  20  9 11
      1261 is double :   7.3  8.7   38"  191.0
Graze of 1385 A1 nearby at Lat = +49.47 -0.95(E.Long -18.65), CA = 11.4N
      11 21 30 56 Gr   1385 A1  6.6  47+  86     24 266
Closest distance to graze path is 306km at azimuth 236
08 05 12 19 21 10 D    1486dK4  4.4   57+  98  -6 40 217  69S 131 110 112 +7.2 +1.5 +0.8-1.7 .434   -7 10  7 54.3   9 59 51
      1486 = 31 Leonis = A Leonis
      1486 is double :   4.3 13.6   8.1"   42.0
08 05 12 20 40 36 d  118138 M3  7.1s  57+  98     32 239  42S 159 129 140 +7.0 +1.7 +0.2-2.2 .376  -36 10  9 31.5   9 35 35
    118138 = NSV 18340,   7.13 to  7.22 Hp,  Type SRB
Graze of 1599cK1 nearby at Lat = +54.87 -1.02(E.Long -18.65), CA = 8.5N
      13 23 18 26 Gr   1599cK1  4.8  68+ 111     11 260
Closest distance to graze path is 28km at azimuth 61
08 05 13 23 19 25 G    1599cK1  4.8   68+ 111     11 260   9N  30 355   9 +6.5 +3.3 +1.1-1.0 .166  +70 11  0 33.6   3 37  3
      1599 = 58 Leonis
      1599 is double :   4.8        0.200"   35.0
08 05 27  1 24  5 r    3177cA9  5.9   61- 103  -7 13 139  71N 270 293 287 -7.3 +0.7 +1.1+1.4 .375 +153 21 43  4.4 -14 23 59
```

```
      3177 = 44 Capricorni
      3177 is double :   6.8  6.8   0.100"   90.0

Occultation Predictions for Gdansk in czerwiec 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time    P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o  h  m   s     o  m  s
08 06 24 23 27  5 r    3380cK0  5.9   66- 109 -12 12 116  67N 270 302 292 -6.9 -1.9 +0.7+1.7 .414 +150 23  1 31.7 - 4 42 41
      3380 is double :   7.0  7.0   0.100"   90.0
08 06 30  8 18  0 r     541cB8  3.9   11-  39  48 60 190  38S 211 205 225 -2.6 -6.1 +1.0+2.2 .337 -136  3 45 49.6  24 22  4
       541 = Maia = 20 Tauri
       541 is double :   4.4  5.4   0.003"   69.0

Occultation Predictions for Gdansk in lipiec 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time    P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o  h  m   s     o  m  s
08 07 28 23 33 35 r     780cG5  6.8   16-  47      6  52  43S 222 253 228 -0.3 -5.0 -0.7+1.5 .520 -139  5 12 21.5  26 27 17
       780 is double :   7.6  7.6   0.050"    0.0

Occultation Predictions for Gdansk in sierpien 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time    P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o  h  m   s     o  m  s
08 08 16 19 58 23 r X241702    11.2   79E 179     13 138 -78S 201 225 219 -4.6 +0.3 +0.7+1.8 .320 -138 21 43 56.0 -14 18 29
08 08 16 20  0 42 r X180390D   11.0   76E 179     13 139 -58N 245 268 263 -4.6 +0.3 +1.0+1.5 .429 +177 21 43 24.8 -14 10 10
   X180390 is double :  11.0 10.5   1.90"  113.0
08 08 16 20  0 45 r X 50751SG0 10.5   76E 179     13 139 -58N 245 268 263 -4.6 +0.3 +1.0+1.5 .429 +177 21 43 24.9 -14 10 11
   X 50751 is triple :  10.5 11.0   1.90"  293.0    8.0 12.0  11.5"   36.0
08 08 16 20  1 32 d X 50799    10.3   75E 179     13 138  95U  56  79  73 -4.6 +0.3 +0.9+1.6 .428   +7 21 45 16.0 -13 54 46
08 08 16 20  6  2 r X241707    11.1   69E 179     13 140 -89S 210 233 228 -4.6 +0.3 +0.8+1.7 .363 -148 21 43 59.1 -14 15 56
08 08 16 20  8 30 r X 50763    10.7   65E 179     14 140 -69N 232 255 250 -4.6 +0.3 +1.0+1.5 .421 -170 21 43 44.5 -14 11 34
08 08 16 20 21 14 d X180520    10.8   49E 179     15 143 101U  31  52  49 -4.7 +0.3 +0.8+1.6 .365  +31 21 45 27.1 -13 46 16
08 08 16 20 28  1 R  164613 F8  9.6   40E 179     16 145 -20N 274 294 292 -4.7 +0.3 +1.3+1.2 .354 +147 21 44  1.4 -13 57  1
08 08 16 20 38 32 D  164626WK3  8.7   30E 179     17 147  68N 358  17  16 -4.7 +0.2 +0.3+2.0 .191  +63 21 45 18.4 -13 40 33
    164626 is double :   8.5 11.9   27"  224.0
08 08 16 20 48 54 D  164628 G1  8.9   22E 180     18 149  69N 353  11  11 -4.7 +0.2 +0.0+2.1 .157  +68 21 45 28.7 -13 38 31
08 08 16 20 55  7 R  164622 G5  9.5   18E 180     18 151  97U 251 268 269 -4.7 +0.2 +1.2+1.2 .409 +169 21 44 46.0 -13 57 36
08 08 16 21 12 27 R  164626WK3  8.7   15E 180     19 155  35S 303 317 321 -4.8 +0.2 +2.2+0.3 .188 +117 21 45 18.4 -13 40 33
    164626 is double :   8.5 11.9   27"  224.0
08 08 16 21 14  0 r X 50799    10.3   15E 180     19 156  84U 246 261 264 -4.8 +0.2 +1.2+1.1 .411 +173 21 45 16.0 -13 54 46
08 08 16 21 17 25 R  164628 G1  8.9   15E 180     19 156  43S 307 321 325 -4.8 +0.2 +2.5+0.1 .155 +112 21 45 28.7 -13 38 31
08 08 16 21 25 13 r X180520    10.8   18E 180     20 158  93U 270 282 288 -4.8 +0.2 +1.5+0.8 .357 +150 21 45 27.1 -13 46 16
08 08 16 21 27 45 D X 50845 F5 10.0   19E 180     20 159  59N  14  27  32 -4.8 +0.2 +0.6+1.5 .292  +45 21 46 50.1 -13 30 42
08 08 16 21 28  3 d X180661    10.7   19E 180     20 158  83U  86  99 104 -4.8 +0.2 +1.5+0.8 .368  -27 21 47 38.2 -13 44 32
08 08 16 21 35  6 D  164649 K0  9.8   23E 180     20 160  40N  26  37  44 -4.8 +0.2 +0.8+1.3 .346  +33 21 47 12.6 -13 30 10
08 08 16 22 19 39 D X 50872 G5 10.1   74E 180     22 172   8N  13  18  31 -4.9 +0.1 +0.5+1.3 .295  +44 21 48  3.9 -13 19 19
08 08 16 22 21 40 R X 50845 F5 10.0   77E 180     22 173  82S 282 287 300 -4.9 +0.1 +1.9+0.1 .290 +135 21 46 50.1 -13 30 42
08 08 16 22 26 10 d X180730    11.2   82E 180     22 173 -23N  40  44  58 -5.0 +0.1 +1.0+0.9 .390  +18 21 48 39.5 -13 21  3
08 08 23  2 41 32 r     438cA3  6.8   60- 102  -8 56 156  19S 182 196 198 -2.4 -6.3 -0.2+4.5 .191 -115  2 58 53.1  21 37  4
       438 is double :   7.3  7.6   0.50"  272.1
Graze of 539SB6 nearby at Lat = +55.94 +0.97(E.Long -18.65), CA = 2.6N
      23 20 46 12 Gr    539SB6  4.3  51-  91      8  57
Closest distance to graze path is 88km at azimuth 300
08 08 23 20 48 39 R     539SB6  4.3   51-  91      7  58  13N 334   7 347 -1.3 -5.8 +0.8-0.3 .126 +101  3 45 12.5  24 28  2
       539 = Taygeta = 19 Tauri
       539 is multiple :             0.000"  348.0 :   4.6  6.1   0.012"    0.0 :   4.3  8.1   71"  329.0
08 08 23 20 52 16 d Pleiade C   3.0   51-  91      7  58 -51S 116 149 129 -1.3 -5.8 -0.2+1.0 .497  -41  2  7 46.0  18  1 46
   Duration of Partial Stage for Disk = 478 mins
08 08 23 20 52 53 R     537SB6  3.7s  51-  91      8  59  75S 243 276 256 -1.3 -5.8 -0.5+1.4 .643 -168  3 44 52.5  24  6 48
```

```
      537 = Electra = 17 Tauri
      537 is triple :   3.9  7.0   0.005"    0.0 :   3.9  7.5   0.196"  117.0
      537 = NSV 15755,   3.70 +/- 0.00 V ,  Type
08 08 23 20 53 48 r     536cB7  5.5   51-  91      8  59  67N 280 314 294 -1.3 -5.8 -0.3+1.2 .591 +154  3 44 48.2  24 17 22
      536 = Celaeno = 16 Tauri
      536 is double :   5.7  7.7   0.100"   90.0
08 08 23 21  7 10 d     552SB7  2.9s  51-  91      9  61 -37S 131 165 144 -1.2 -5.8 +0.0+0.9 .364  -56  3 47 29.1  24  6 18
      552 = Alcyone = eta Tauri
      552 is multiple :        1.5   0.031"  207.1 :   3.0  4.6   0.031"  207.1 :   2.8  6.2  117"  290.0
      552 = NSV 15775,   2.87 +/- 0.00 V ,  Type VAR:
08 08 23 21 15 49 R     541cB8  3.9   51-  91     11  63  64N 283 318 296 -1.2 -5.8 -0.2+1.2 .564 +151  3 45 49.6  24 22  4
      541 = Maia = 20 Tauri
      541 is double :   4.4  5.4   0.003"   69.0
08 08 23 21 29 29 R Pleiade C   3.0   51-  91     12  65  45S 213 248 226 -1.2 -5.8 -0.6+1.7 .481 -139  2  7 46.0  18  1 46
   Duration of Partial Stage for Disk = 494 mins
08 08 23 21 34 50 r     549SA0  6.3   51-  91     13  66  37S 204 240 217 -1.2 -5.8 -0.7+1.9 .416 -131  3 47 21.0  24  6 59
      549 is multiple :             0.000"  109.9 :   7.1  8.2   0.001"  205.0 :   6.2  8.7   74"  306.0
08 08 23 21 34 54 R     552SB7  2.9s  51-  91     13  66  30S 198 233 211 -1.2 -5.8 -0.8+2.0 .355 -124  3 47 29.1  24  6 18
      552 = Alcyone = eta Tauri
      552 is multiple :        1.5   0.031"  207.1 :   3.0  4.6   0.031"  207.1 :   2.8  6.2  117"  290.0
      552 = NSV 15775,   2.87 +/- 0.00 V ,  Type VAR:
08 08 23 22 32 22 r     562SB9  6.6   50-  90     21  77  68S 236 274 248 -1.1 -5.8 -0.2+1.8 .574 -163  3 49 21.8  24 22 51
      562 is triple :   7.3  7.4   0.100"  134.0 :   6.5  7.5   87"  309.0
08 08 25  2 22 21 r     750SG2  6.9   37-  75 -11 46 109  51S 226 265 233 +0.1 -5.4 +0.4+2.4 .412 -146  5  1 44.3  26 40 16
      750 is triple :   7.0  9.0   0.30"  349.0 :   6.7  8.2   78"  160.0
08 08 26  1 15 24 r      912 B8  7.0   27-  62     28  82  52S 234 275 235 +1.4 -4.4 -0.1+2.2 .474 -147  6  3 33.9  26 31 45
08 08 26  2 22 14 r    77960 G8  7.7   26-  62 -11 37  95  44S 227 267 227 +1.4 -4.4 +0.1+2.6 .396 -139  6  6 24.1  26 31 32
08 08 26  2 46 51 r    77974 K0  7.5   26-  61  -8 40 100  77S 260 300 260 +1.4 -4.4 +0.6+1.6 .504 -171  6  7  2.7  26 40 16
08 08 26  2 54 29 r     926cB9  7.1   26-  61  -7 42 102  79S 262 302 263 +1.4 -4.4 +0.6+1.6 .503 -173  6  7 20.0  26 40 56
      926 is double :   7.0        0.100"  343.0
08 08 27  1  3  7 R    79054dK8  6.9   17-  49     16  70  86N 282 320 277 +2.5 -3.1 +0.0+1.2 .598 +172  7  6 11.6  24 51 37
     79054 is double :   7.1 11.1   9.8"   63.0
Graze of 1224 G2 nearby at Lat = +54.30 +0.42(E.Long -18.65), CA = 2.5N
      28  0 59 27 Gr    1224 G2  5.3   9-  36      5  60
Closest distance to graze path is 5km at azimuth 145
08 08 28  0 59 30 G     1224 G2  5.3    9-  36      5  60   2N  11  44   1 +3.6 -1.6 +0.7-1.5 .231 +111  8  7 45.9  21 34 55
      1224 = mu Cancri

Occultation Predictions for Gdansk in wrzesien 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s     o  m  s
08 09 20  2 54 35 d     541cB8  3.9   73- 118     60 189 -41S 124 118 137 -0.5 -6.1 +1.7-1.9 .298  -48  3 45 49.6  24 22  4
      541 = Maia = 20 Tauri
      541 is double :   4.4  5.4   0.003"   69.0
08 09 20  3  7 49 R     536cB7  5.5   73- 118     59 196  37S 202 192 215 -0.5 -6.1 +1.0+3.0 .262 -126  3 44 48.2  24 17 22
      536 = Celaeno = 16 Tauri
      536 is double :   5.7  7.7   0.100"   90.0
08 09 20  3 33 20 r   76152cB9  7.2s  73- 118  -9 58 206  37S 201 185 215 -0.6 -6.1 +1.1+2.9 .257 -125  3 45 37.8  24 20  8
     76152 is double :   7.4  9.0   0.200"  359.0
     76152 = NSV 15762,   7.17 +/- 0.00 V ,  Type VAR:
08 09 20  3 39 14 R     539SB6  4.3   73- 118  -8 58 209  76S 241 223 254 -0.6 -6.1 +1.3+0.5 .431 -164  3 45 12.5  24 28  2
      539 = Taygeta = 19 Tauri
      539 is multiple :             0.000"  348.0 :   4.6  6.1   0.012"    0.0 :   4.3  8.1   71"  329.0
08 09 20  3 43 36 R     541cB8  3.9   73- 117  -7 57 210  44S 209 190 222 -0.6 -6.1 +1.1+2.2 .300 -132  3 45 49.6  24 22  4
      541 = Maia = 20 Tauri
      541 is double :   4.4  5.4   0.003"   69.0
08 09 20  4  3 21 R     542 B8  5.8   73- 117  -4 56 218  86S 252 228 265 -0.6 -6.1 +1.3-0.1 .450 -174  3 45 54.5  24 33 16
      542 = Asterope = 21 Tauri
08 09 20  4  6  1 r     543cA0  6.4   73- 117  -4 56 219  80S 245 221 258 -0.6 -6.1 +1.2+0.2 .441 -167  3 46  2.9  24 31 40
      543 is double :   7.3  7.3   0.100"    0.0
08 09 21 21 34 33 r     849cG9  6.5   53-  94     15  65  77S 255 291 258 +2.2 -4.5 -0.3+1.5 .613 -170  5 38 57.4  26 37  5
```

```
      849 is double :   7.3  7.3   0.100"   90.0
08 09 23  0 32 12 r   78778cK0  6.8v  40-  79     30  87  85N 281 321 277 +3.3 -3.4 +0.4+1.2 .532 +172  6 49 43.2  25 29  4
     78778 is double :   7.7  8.4   0.25"   69.0
     78778 = QU Gem,   6.88 to  7.06 Hp,  Type LB:
Graze of 1049 A2 nearby at Lat = +56.50 +0.29(E.Long -18.65), CA = 1.5N
      23  1  0 28 Gr   1049 A2  6.8  40-  79     34  94
Closest distance to graze path is 210km at azimuth 332
08 09 23  1 10 54 r    1049 A2  6.8   40-  78     35  94  27N 339  19 335 +3.3 -3.4 +1.4-1.7 .217 +115  6 51 58.2  25 39 47
08 09 23  2  0 51 r    78827 A*  7.4   40-  78     42 105  70S 256 295 252 +3.2 -3.4 +0.7+1.8 .461 -161  6 53  6.2  25 18 41
08 09 23  3  3 55 R    1055 G0  5.7s  39-  78     50 122  84N 282 315 278 +3.2 -3.3 +1.1+0.7 .459 +176  6 55 18.7  25 22 33
      1055 = 37 Geminorum
      1055 = NSV 17225,   5.73 +/- 0.02 V ,  Type VAR:
08 09 24  1 48 54 r    1187 K0  7.1   29-  65     30  93  90N 282 321 273 +4.1 -1.9 +0.5+1.2 .516 +179  7 53  1.0  22 20  4
08 09 24 23 45  8 R    1310SK0  3.9   20-  53      2  62  62S 257 290 244 +4.8 -0.4 -0.5+1.6 .549 -153  8 44 41.1  18  9 16
      1310 = Asellus Australis = Delta Cancri
      1310 is triple :   3.9        0.100"  166.0 :   3.9 12.2   39"   90.0
08 09 25  2 13  6 R    1321cG5  6.9   19-  52     22  90  64N 312 350 298 +4.8 -0.3 +0.5+0.4 .478 +155  8 50 40.4  18  0 12
      1321 is double :   7.5  7.6   0.22"   83.6
08 09 25  2 45  6 r   98173 G5  8.0   19-  52     27  96  78S 274 311 259 +4.8 -0.3 +0.5+1.5 .492 -165  8 51 29.7  17 45 15
Graze of 1327 F2 nearby at Lat = +56.78 +0.05(E.Long -18.65), CA = 3.8S
      25  3 17 39 Gr   1327 F2  6.9  19-  51 -12 30 105
Closest distance to graze path is 268km at azimuth 355
08 09 25  3 57  9 r   98204 A0  7.2   19-  51  -7 36 112  76S 272 307 258 +4.8 -0.3 +0.8+1.4 .449 -161  8 53 50.7  17 32 42
Graze of 1331 *6 nearby at Lat = +52.96 -0.05(E.Long -18.65), CA = 6.1S
      25  4 22 23 Gr   1331 *6  6.3  18-  51  -3 40 118
Closest distance to graze path is 155km at azimuth 185

Occultation Predictions for Gdansk in pazdziernik 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o  h  m   s    o  m  s
08 10 09 20 22 20 d    3086 B9  6.2   73+ 117     15 206  84N  66  51  82 -6.0 +1.0 +1.1-0.4 .413   -7 21  7 44.7 -17 27 21
08 10 11 19 24 16 d    3334 A0  6.4   89+ 141     28 168  65S  95 102 116 -6.4 -1.8 +1.7+0.3 .329  -40 22 43 14.3 - 6 57 47
08 10 15 19 26 45 r     317 F5  6.4   98- 166     33 107  48S 192 228 211 -2.4 -5.7 -0.2+2.5 .346 -129  2  9 23.1  17 13 27
      Distance of     317 to Terminator = 15.9 ; to 3km sunlit peak = 6.5
08 10 18  0  4 58 R     647WB9  5.4s  86- 136     58 146  68S 235 256 245 +1.0 -5.5 +1.0+1.7 .434 -157  4 22 34.9  25 37 46
       647 = chi Tauri
       647 is double :   5.4  8.4  19.6"   25.0
       647 = NSV 15957,   5.34 to  5.39 Hp,  Type
08 10 19  1 54 52 r     833 B5  7.1   76- 122     62 165  43N 312 322 316 +2.5 -4.7 +1.4-1.6 .331 +137  5 32 27.6  26 58 54
08 10 19  4 12 25 R     844SB9  5.8S  76- 121 -11 57 225  48N 308 281 311 +2.3 -4.6 +0.9-2.1 .392 +147  5 37  8.9  26 55 28
       844 is triple :   6.5  6.6   1.10"  324.0 :   5.7 10.5  178"  300.0
       844 = NSV 02426,   3.50 to  5.78 B ,  Type
08 10 19  4 12 26 r X 75950D    6.6   76- 121 -11 57 225  48N 308 280 311 +2.3 -4.6 +0.9-2.1 .392 +147  5 37  8.9  26 55 27
   X 75950 is double :   6.6  6.5   1.10"  144.0
08 10 19  5  8  8 r     849cG9  6.5   75- 120  -3 50 242  75S 251 215 254 +2.3 -4.5 +1.2-0.5 .438 -154  5 38 57.4  26 37  5
       849 is double :   7.3  7.3   0.100"   90.0
08 10 20  4 25 25 r   78653wM0  7.4   65- 107  -9 59 204  73S 257 241 254 +3.7 -3.3 +1.5+0.1 .406 -154  6 42 12.0  25 28  7
     78653 is double :   7.8 11.8  19.0"   92.0
08 10 21  2 46 37 R    1161 K5  5.9   54-  95     53 139  62N 308 332 299 +5.0 -2.0 +1.2-0.6 .414 +158  7 40 58.5  23  1  7
08 10 21  3 23 21 r   79621 K0  7.4   54-  94     56 152  65N 305 322 296 +4.9 -2.0 +1.2-0.7 .421 +163  7 42  5.1  22 55 44
08 10 21 23 18  8 r    1276 K0  6.5   44-  83     16  79  20S 214 252 202 +5.9 -0.6 -0.8+5.0 .191 -110  8 31 41.3  18 59 16
08 10 22  5 13 41 d    1310SK0  3.9   42-  81  -3 54 175 -86S 109 112  96 +5.5 -0.3 +1.3-0.5 .430   +8  8 44 41.1  18  9 16
      1310 = Asellus Australis = Delta Cancri
      1310 is triple :   3.9        0.100"  166.0 :   3.9 12.2   39"   90.0
08 10 22  6 25 31 r    1310SK0  3.9   41-  80   7 52 203  70N 306 292 292 +5.4 -0.1 +1.0-1.5 .441 +172  8 44 41.1  18  9 16
      1310 = Asellus Australis = Delta Cancri
      1310 is triple :   3.9        0.100"  166.0 :   3.9 12.2   39"   90.0
08 10 23  0  8 14 r    1396 K2  6.8s  33-  70     12  82  53N 325   2 308 +6.4 +1.0 +0.3+0.0 .450 +145  9 26 56.7  14 18 11
      1396 = NSV 04490,   7.70 to  8.20 P ,  Type
08 10 26  4 32 17 R    1727 F2  6.9    7-  32 -10 14 119  77S 274 305 252 +6.2 +5.2 +0.7+1.5 .417 -152 11 58  6.8 - 4 22 14
```

```
      Distance of     562 to Terminator = 10.6 ; to 3km sunlit peak = 3.3
       562 is triple :   7.3  7.4   0.100"  134.0 :   6.5  7.5   87"  309.0
08 11 14 23 27 14 r     750SG2  6.9   95- 155     61 160  27N 319 332 326 +1.2 -4.9 +1.6-2.2 .273 +125  5  1 44.3  26 40 16
      Distance of     750 to Terminator = 19.5 ; to 3km sunlit peak = 8.3
       750 is triple :   7.0  9.0   0.31"  351.0 :   6.7  8.2   78"  160.0
08 11 15  1 34  1 r     762cB5  6.6   95- 155     58 216  87S 254 231 260 +1.1 -4.9 +1.3-0.1 .463 -164  5  5 53.4  26 25 48
       762 is double :   6.8  8.2   0.076"  327.0
08 11 15  4 22 40 r     780cG5  6.8   95- 153     38 263  76N 272 232 278 +1.0 -4.7 +0.5-1.4 .553 -178  5 12 21.5  26 27 17
       780 is double :   7.6  7.6   0.050"    0.0
08 11 15 18 44 37 R     900cB1  4.8   90- 144     18  71  52S 228 266 230 +3.2 -3.8 -0.4+2.0 .494 -141  5 57 59.7  25 57 14
       900 = 139 Tauri
       900 is double :   5.6  5.6   0.060"  221.0
08 11 16 22 22 10 R    1092 F5  5.9   81- 128     38 101  82N 284 323 278 +5.0 -2.4 +0.7+1.0 .517 +174  7 12 26.4  24  7 43
      1092 = 48 Geminorum
08 11 18  2 28  4 r   80131 K0  7.2   69- 113     54 159  43N 330 342 318 +6.1 -0.6 +0.9-1.8 .359 +143  8 22  3.9  19 57 33
08 11 19  1 19 21 R    1375 K1  5.4   59- 100     39 124  69S 266 297 251 +7.1 +1.0 +1.1+1.5 .410 -152  9 15 13.9  14 56 29
      1375 = pi Cancri
08 11 22  4 16 41 r    1703 K0  7.7   26-  62     27 143  70N 311 332 289 +7.3 +5.3 +0.8-0.1 .427 +173 11 46 19.5 - 3  0  9

Occultation Predictions for Gdansk in grudzien 2008
E.Long.   18 38 59.0   Lat.  54 21 22.0   Alt. 30m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration    A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s       No  D       V   ill     Alt Alt Az   o    o   o   o   L     B   m/o m/o "/sec   o   h  m   s     o  m  s
08 12 01 16 12 52 D Venus       -4.1   13+  43      5 214  85S  88  67  97 -3.7 +2.9 +1.3-1.4 .327  -23 19 38 36.1 -23 55 56
   Duration of Partial Stage for Disk = 46 secs
08 12 06 21 53 50 D    3494 A7  4.5   60+ 101     14 253  37N  14 340  37 -8.7 -4.3 +0.2+1.1 .345  +46 23 42  2.8   1 46 48
      3494 = lambda Piscium
08 12 08 16  4 53 d     177 F5  6.9   78+ 124     37 127  27N   7  36  29 -7.0 -5.5 -0.1+2.5 .310  +51  1 12 19.1  12 16 55
08 12 11 19 49 28 D     647WB9  5.4s  99+ 167     54 132  65N  74 103  84 -1.9 -5.4 +1.0+1.3 .503   +4  4 22 34.9  25 37 46
       647 = chi Tauri
      Distance of     647 to Terminator = 19.3 ; to 3km sunlit peak = 8.7
       647 is double :   5.4  8.4  19.6"   25.0
       647 = NSV 15957,   5.34 to  5.39 Hp,  Type
08 12 13 21 25 30 d   1030WA3  3.1s  98- 162     49 120 -73S 104 138 101 +2.7 -2.9 +1.0+0.6 .502   -8  6 43 55.9  25  7 52
      1030 = Mebsuta = epsilon Geminorum
      1030 is double :   2.9  9.2  111"   94.0
      1030 = NSV 03183,   2.97 to  3.09 V ,  Type
08 12 13 22 32 28 R   1030WA3  3.1s  98- 162     57 143  87N 271 294 268 +2.7 -2.9 +1.2+0.6 .482 -172  6 43 55.9  25  7 52
      1030 = Mebsuta = epsilon Geminorum
      1030 is double :   2.9  9.2  111"   94.0
      1030 = NSV 03183,   2.97 to  3.09 V ,  Type
08 12 14  6 24 35 r    1070 G5  5.2v  96- 158  -5 18 286  47N 316 278 311 +2.5 -2.1 -0.4-1.8 .566 +150  7  2 24.8  24 12 56
      1070 = omega Geminorum
      1070 = ome Gem,   5.14 +/- 0.086V ,  Type CEP:
08 12 14 19 45 24 r    1167 K0  6.3   93- 149     25  86  48N 320 359 312 +4.7 -1.4 +0.6+0.1 .443 +140  7 43 22.2  22 23 58
08 12 16 22 50  9 R    1439 K4  5.7   75- 120     27 108  17N   4  38 346 +7.5 +2.1 +0.5-3.9 .190 +112  9 46 23.3  11 48 36
      1439 = 18 Leonis
08 12 16 23 45 41 r    1441cA7  6.4   75- 120     34 122  52N 329 359 311 +7.5 +2.2 +0.7-0.7 .409 +148  9 47 26.0  11 34  5
      1441 is double :   6.4        0.130"   19.8
08 12 18  2 58 46 R    1565MK3  6.2   64- 106     40 166  57N 326 334 306 +7.9 +4.0 +0.8-1.1 .406 +158 10 43 20.9   4 44 52
      1565 is triple :   5.7  6.8   6.7"  240.0 :   5.7  7.9  334"  210.0
```

KRAKÓW

Occultation Predictions for Krakow in styczen 2008
E.Long. 19 56 13.0 Lat. 50 3 42.0 Alt. 100m. T.dia 100mm. dMag 0.0

y m d h m s	day	Time	P	Star	Sp	Mag V	% ill	Elon	Alt	Sun Alt	Az	Moon	CA o	PA o	VA o	WA o	Libration L	B	A m/o	B m/o	RV "/sec	Cct o	R.A. (J2000) h m s	Dec o m s
08 01 11 16 5 12 r				3222cF2		7.4	10+	37	-10	17	223	5S	156	129	175	-5.9	+0.6	-3.5	+8.1	.079	-100	22 1 5.1	-13 1 39
3222 is double : 7.9 7.9 0.100" 90.0																								
08 01 12 16 16 6 d				146344cG5		7.8	18+	49	-11	26	217	35S	122	99	143	-5.8	-0.9	+3.0	-4.0	.161	-69	22 50 31.1	- 6 54 50
146344 is double : 8.6 8.6 0.25" 70.0																								
Graze of 146344cG5 nearby at Lat = +48.58 +0.48(E.Long -19.94), CA = 13.7S																								
12 16 28 43 Gr				146344cG5		7.8	18+	50			26	221												
Closest distance to graze path is 133km at azimuth 144																								
08 01 12 18 20 29 d				3357 A2		6.9	18+	50			12	245	56N	32	356	54	-5.9	-1.2	+0.2	+0.3	.456	+25	22 53 27.6	- 5 59 17
08 01 14 19 13 11 D				68SB9		5.8s	38+	76			28	245	71N	47	11	69	-5.0	-4.1	+0.7	+0.0	.472	+12	24 32 23.8	6 57 20
68 = 51 Piscium																								
68 is multiple : 5.6 7.8 0.200" 272.0 : 5.6 9.5 28" 83.0 : 5.6 165" 227.0																								
68 = NSV 15113, 5.67 +/- 9.00 V , Type E:																								
08 01 15 18 0 8 d				197cK0		7.0	49+	89			48	216	54S	104	81	125	-4.0	-5.1	+1.8	-1.6	.313	-45	1 21 58.3	12 36 15
197 is double : 7.8 7.8 0.100" 90.0																								
08 01 17 17 29 36 d				470WK0		6.8	71+	115			62	160	75N	62	75	77	-1.5	-6.2	+1.3	+1.3	.444	+5	3 14 17.2	22 57 14
470 is double : 7.0 9.7 44" 36.0																								
08 01 17 18 54 44 d				75832 K0		7.3	72+	116			62	202	88N	75	60	90	-1.6	-6.3	+1.5	+0.2	.436	-5	3 16 57.0	23 7 36
08 01 19 24 0 1 d				840cK0		6.3	91+	145			43	263	43N	47	0	50	+1.1	-5.5	+1.4	+0.3	.321	+51	5 35 55.5	27 39 44
840 is double : 7.3 7.3 0.050" 0.0																								
08 01 20 17 38 57 d				994cF5		6.6	96+	156			44	99	72N	83	128	81	+3.2	-4.9	+0.7	+1.5	.493	+8	6 28 56.4	26 58 3
994 is double : 6.8 7.7 0.003" 269.0																								
08 01 21 20 54 9 d				1157 A2		6.2	99+	171			59	140	64N	90	117	82	+4.3	-3.6	+1.5	+0.7	.420	+16	7 39 12.0	24 13 21
Distance of 1157 to Terminator = 9.7 ; to 3km sunlit peak = 2.8																								
08 01 24 0 6 43 r				1415WA1		6.3	97-	161			54	180	79N	300	300	283	+5.7	-0.2	+1.3	-1.0	.423	-177	9 35 52.9	14 22 47
1415 is double : 6.3 9.4 41" 83.0																								
08 01 24 21 36 50 r				1516 K5		6.6s	93-	150			33	119	58S	261	296	242	+6.3	+1.1	+1.2	+1.9	.349	-141	10 22 14.2	8 57 52
1516 = NSV 18388, 6.72 to 6.81 Hp, Type IB																								
08 01 24 23 23 56 R				1525 M2		5.6v	93-	149			45	149	64N	320	340	300	+6.1	+1.3	+1.0	-0.9	.404	+165	10 25 15.2	8 47 5
1525 = 44 Leonis (DE)																								
1525 = DE Leo, 5.60 +/- 0.07 V , Type SRB:																								
08 01 25 6 2 4 r				1549cG8		5.1	92-	146	-4	15	263	84S	288	248	268	+5.3	+2.1	+0.3	-1.8	.509	-167	10 34 48.0	6 57 13
1549 = 48 Leonis																								
1549 is double : 6.0 6.0 0.100" 90.0																								
08 01 26 0 46 36 r				1624 F2		6.8	86-	136			41	164	82S	288	298	266	+5.8	+3.0	+1.6	-0.1	.380	-160	11 13 53.0	2 16 7
08 01 26 2 29 2 R				1635cM0		5.2	86-	136			41	197	13N	13	3	352	+5.5	+3.2	-0.8	-3.5	.171	+115	11 17 17.4	2 0 38
1635 = 75 Leonis																								
Distance of 1635 to Terminator = 19.6 ; to 3km sunlit peak = 6.3																								
1635 is double : 5.8 6.6 0.044" 0.0																								
08 01 26 3 55 38 r				1637 K0		5.9	86-	135			34	222	28N	357	332	336	+5.3	+3.3	+0.0	-2.5	.267	+129	11 18 55.0	1 39 1
1637 = 76 Leonis																								
08 01 29 4 3 14 R				1944SK1		5.5	60-	101			25	186	82N	301	297	281	+3.1	+6.6	+1.5	-0.7	.362	-177	13 32 51.6	-15 21 47
1944 = 75 Virginis																								
1944 is triple : 5.5 13.5 18.9" 320.0 : 5.5 11.2 80" 110.0																								
08 01 31 5 30 56 r				2164wK4		6.6	40-	79	-7	16	185	80N	294	291	279	+0.4	+7.6	+1.6	-0.5	.347	+178	15 9 51.3	-23 59 9
2164 is double : 6.8 12.5 10.3" 201.0																								

Occultation Predictions for Krakow in luty 2008
E.Long. 19 56 13.0 Lat. 50 3 42.0 Alt. 100m. T.dia 100mm. dMag 0.0

y m d h m s	day	Time	P	Star	Sp	Mag V	% ill	Elon	Alt	Sun Alt	Az	Moon	CA o	PA o	VA o	WA o	Libration L	B	A m/o	B m/o	RV "/sec	Cct o	R.A. (J2000) h m s	Dec o m s
08 02 14 10 41 23 m				537SB6		3.7s	54+	94		27	17	72	6S	161	204	174	+0.7	-6.0	-0.2	+1.8	.551	-158	3 44 52.5	24 6 48

```
      537 = Electra = 17 Tauri
      537 is triple :   3.9  7.0   0.005"    0.0 :   3.9  7.5   0.196"  117.0
      537 = NSV 15755,   3.70 +/- 0.00 V ,  Type
Graze of 537SB6 nearby at Lat = +50.52 +0.83(E.Long -19.94), CA = 6.2S
     14 10 42  6 Gr    537SB6  3.7  54+  94  26 17  73
Closest distance to graze path is 31km at azimuth 307
08 02 14 10 44 58 d     541cB8  3.9   54+  94  27 17  73  74S  93 136 106 +0.7 -6.0 +0.0+1.3 .568  -22  3 45 49.6  24 22  4
      541 = Maia = 20 Tauri
      541 is double :   4.4  5.4   0.003"   69.0
08 02 14 21 48  2 d   76472cG8  7.2   58+  99     33 272  80N  70  25  81 +0.0 -6.3 +0.6-0.9 .501  +16  4  8 39.0  25 52 40
    76472 is double :   8.3  8.3   0.050"    0.0
08 02 15 18 32 50 d     756 F0  6.6   68+ 111     67 196  21N  17   5  23 +1.5 -6.0 +1.5+5.9 .151  +69  5  4 38.0  27 41 46
08 02 15 20 53  0 d     773wF8  7.0   69+ 112     52 250  69N  66  23  72 +1.3 -5.9 +1.3-0.3 .414  +26  5 10  3.9  27 33 23
      773 is double :   7.1  8.7  14.0"  352.0
08 02 16 22 48  4 d     958cK1  6.7   80+ 126     44 261  63N  68  22  67 +2.2 -5.0 +1.1-0.7 .407  +35  6 18 20.8  27 12 37
      958 is double :   7.5  7.5   0.050"    0.0
08 02 17 18 41  8 d    1094 A0  7.1   87+ 138     61 138  36N  46  75  41 +3.7 -4.1 +1.6+3.4 .244  +55  7 12 49.4  25 44 55
08 02 21  2  1  8 r X 15270 G5 10.4   80E 179     34 242 -10N 322 287 303 +4.6 +1.2 +0.4-2.1 .449 +162 10  8 58.2  10 25 11
08 02 21  2  6  3 d X117340    11.0   72E 179     33 243 -46S 198 162 179 +4.5 +1.2 -1.6-3.9 .130  -74 10  9 26.2   9 56 25
Graze of X117340 nearby at Lat = +47.83 -1.05(E.Long -19.94), CA = -64.8S
     21  2 19 29 GrX117340    11.0  50E 179     32 248
Closest distance to graze path is 134km at azimuth 237
08 02 21  2 22 32 d X117400    10.6   44E 179     31 247 100U 167 130 148 +4.5 +1.2 +0.0-2.4 .352  -43 10 10 26.9   9 51 45
08 02 21  2 24 10 r X117340    11.0   42E 179     30 247 -83S 229 192 211 +4.5 +1.2 +2.6+0.0 .133 -106 10  9 26.2   9 56 25
08 02 21  2 25 19 D X 15316SF8  9.8   40E 179     30 247  63U 111  74  92 +4.5 +1.2 +0.7-1.8 .471  +12 10 11 16.2  10  0 40
   X 15316 is triple :  10.2 10.4   73"  186.0 :   9.5 10.7  340"  203.0
08 02 21  2 26 23 d X117424M   11.0   38E 179     30 247  79U 139 102 120 +4.5 +1.2 +0.4-2.0 .464  -16 10 11  0.0   9 54  7
   X117424 is triple :  10.3 10.7  134"   53.0 :  11.0 11.2  152"  196.0
08 02 21  2 26 59 d X117435M   11.2   37E 179     30 248  74U 132  94 113 +4.5 +1.2 +0.5-2.0 .478   -8 10 11  7.3   9 55 27
   X117435 is triple :  10.7 10.3  134"  233.0 :  10.7  9.5  340"   23.0
08 02 21  2 33 36 d X117451    11.0   26E 179     29 249  63U 120  82 101 +4.5 +1.2 +0.6-1.9 .485   +3 10 11 25.7   9 56 16
08 02 21  2 47 18 d X117480    10.9    8E 179     27 252  41U  92  53  73 +4.5 +1.2 +0.8-1.6 .423  +31 10 11 57.2  10  0  0
08 02 21  3  0 49 d X117472    10.9    0E 179     25 255  74U 147 108 128 +4.5 +1.3 +0.2-2.1 .453  -25 10 11 51.7   9 43 39
08 02 21  3  8  1 r X117400    10.6    0E 179     24 257  93U 259 219 240 +4.5 +1.3 +0.8-1.5 .370 -137 10 10 26.9   9 51 45
08 02 21  3 22 10 d X117522    10.8    0E 179     22 259  52U  96  56  77 +4.5 +1.3 +0.5-1.7 .460  +26 10 12 57.5   9 49 25
08 02 21  3 25 45 D X117525    10.0    0E 179     21 260  61U 108  68  89 +4.5 +1.3 +0.4-1.8 .498  +14 10 13  1.3   9 45 20
08 02 21  3 26 12 r X117424M   11.0    0E 179     21 260  72U 285 245 266 +4.5 +1.3 +0.4-1.7 .496 -164 10 11  0.0   9 54  7
   X117424 is triple :  10.3 10.7  134"   53.0 :  11.0 11.2  152"  196.0
08 02 21  3 26 37 R X 15316SF8  9.8    0E 179     21 260  56U 314 274 295 +4.5 +1.3 +0.2-2.0 .505 +168 10 11 16.2  10  0 40
   X 15316 is triple :  10.2 10.4   73"  186.0 :   9.5 10.7  340"  203.0
08 02 21  3 28 36 r X117435M   11.2    0E 179     21 261  66U 293 253 274 +4.5 +1.3 +0.3-1.8 .512 -172 10 11  7.3   9 55 27
   X117435 is triple :  10.7 10.3  134"  233.0 :  10.7  9.5  340"   23.0
08 02 21  3 35 30 r X117451    11.0    0E 179     20 262  55U 304 264 285 +4.5 +1.3 +0.2-1.9 .520 +177 10 11 25.7   9 56 16
08 02 21  3 38 40 D X117536 K5  9.9    0E 179     19 262  84U 134  94 115 +4.5 +1.3 +0.1-1.9 .508  -13 10 13  9.5   9 35 44
08 02 21  3 40 17 r X117480    10.9    0E 179     19 263  35U 332 292 313 +4.4 +1.3 +0.0-2.1 .448 +149 10 11 57.2  10  0  0
08 02 21  3 53  4 D  118172     9.4    0E 179     17 265  96U 138  97 119 +4.4 +1.4 +0.1-2.0 .506  -17 10 13 33.1   9 31  5
08 02 21  3 55 25 r X117472    10.9    1E 179     16 266  68U 276 235 257 +4.4 +1.4 +0.3-1.7 .482 -155 10 11 51.7   9 43 39
08 02 21  4 15 50 r X117522    10.8   22E 179     13 270  46U 325 285 306 +4.4 +1.4 -0.1-2.0 .489 +154 10 12 57.5   9 49 25
08 02 21  4 17 50 D X 15370 K0  9.9   26E 179     13 269 -47S 153 113 134 +4.4 +1.4 -0.1-2.0 .450  -34 10 14  5.8   9 22  2
08 02 21  4 21 36 D X 15388 F5  9.8   31E 179     12 270  23S  83  42  64 +4.4 +1.4 +0.2-1.5 .436  +37 10 14 47.4   9 36 59
08 02 21  4 23  0 R X117525    10.0   34E 179     12 271  55U 313 273 294 +4.4 +1.4 +0.0-1.9 .532 +166 10 13  1.3   9 45 20
08 02 21  4 34 52 R X117536 K5  9.9   54E 179 -11 10 273  78U 286 245 267 +4.4 +1.4 +0.0-1.7 .541 -167 10 13  9.5   9 35 44
08 02 21  4 47 18 R  118172     9.4   75E 179  -9  8 275  90U 281 241 262 +4.4 +1.5 +0.0-1.6 .537 -163 10 13 33.1   9 31  5
08 02 21  4 49  4 D  118183 F5  8.0   77E 179  -9  8 275 -67S 163 122 144 +4.4 +1.5 -0.2-2.1 .404  -44 10 14 57.5   9 12 40
08 02 21  4 54 56 d X117677    11.1   86E 179  -8  7 276  38S  57  16  38 +4.4 +1.5 +0.2-1.1 .265  +62 10 15 43.4   9 34 33
08 02 22  4 38 21 r    1599cK1  4.8   99- 167 -10 12 261  75S 289 249 268 +4.3 +3.0 +0.3-1.8 .501 -168 11  0 33.6   3 37  3
      1599 = 58 Leonis
      1599 is double :   4.8        0.200"   35.0
08 02 22 21 53 37 R    1685cG9  4.3   96- 158     32 139  57S 268 293 246 +4.9 +3.7 +1.6+1.3 .328 -141 11 36 56.9 - 0 49 25
      1685 = upsilon Leonis
      1685 is double :   4.5  9.0   0.100"  195.0
08 02 29  5 10 20 d    2383 B0  2.8   49-  89  -3 12 186 -62S 126 121 117 -2.0 +7.5 +1.7-0.6 .306  -27 16 35 53.0 -28 12 58
      2383 = tau Scorpii
```

```
08 02 29  6 24 58 r    2383 B0  2.8   48-  88   8  9 203  60S 247 231 239 -2.3 +7.5 +1.5-0.6 .316 -153 16 35 53.0 -28 12 58
      2383 = tau Scorpii

Occultation Predictions for Krakow in marzec 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time    P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A    B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s     o  m  s
08 03 02  4 18 12 r    2660 A3  6.2   30-  67 -11  7 153  88S 264 283 265 -4.0 +6.3 +1.5+1.1 .372 -175 18 22  0.1 -28 25 48
08 03 11 18 43 49 d   75558 A0  7.7   21+  54     29 268  26S 133  89 150 -0.5 -6.2 +0.1-3.7 .280  -58  2 45 47.8  20 41 34
08 03 12 17 56 30 D     538cB8  5.7   30+  67     48 250  83N  68  26  81 +0.9 -6.4 +1.1-0.4 .458  +12  3 45  9.7  24 50 21
      538 = 18 Tauri
      538 is double :   6.4  6.4   0.050"    0.0
Graze of 539SB6 nearby at Lat = +52.43 -0.15(E.Long -19.94), CA = -5.4S
      12 18 21 14 Gr    539SB6  4.3  31+  67     43 253
Closest distance to graze path is 255km at azimuth 14
08 03 12 18 30 35 D     542 B8  5.8   31+  67     43 257  19S 146 102 159 +0.9 -6.4 +0.2-5.0 .205  -65  3 45 54.5  24 33 16
      542 = Asterope = 21 Tauri
08 03 12 19 21 18 D     555 K5  6.4   31+  68     35 268  72N  57  12  70 +0.9 -6.3 +0.8-0.4 .461  +26  3 48  6.5  24 59 18
08 03 12 20 53 40 d     571cA2  6.8   32+  68     21 284  46N  32 348  44 +0.9 -6.2 +0.8+0.3 .346  +53  3 51 25.3  25  9 47
      571 is double :   7.1  9.1   0.000"    0.0
08 03 12 21  9 27 d     574cG0  6.8   32+  69     19 287  51N  37 354  49 +0.9 -6.2 +0.6+0.0 .392  +48  3 52 11.4  25  9 47
      574 is double :   7.6  7.6   0.100"   90.0
08 03 14 18  9 57 D     890cA0  4.6s  53+  94     64 216  72N  71  46  73 +3.4 -5.4 +1.6+0.2 .389  +24  5 53 19.6  27 36 44
      890 = 136 Tauri
      890 is double :   4.8  6.3   0.050"  270.0
      890 = NSV 02696,   4.50 to  4.61 V ,  Type
Graze of 77724 B1 nearby at Lat = +48.49 -0.38(E.Long -19.94), CA = 9.7N
      14 19 50 39 Gr  77724 B1  7.0  54+  94     52 252
Closest distance to graze path is 151km at azimuth 210
08 03 14 20  2 36 d   77753 G2  7.2   54+  95     50 253  70S 110  67 112 +3.2 -5.3 +0.8-1.7 .460  -11  5 57  5.6  27 19  0
08 03 14 21 22 36 d     906cK1  6.6   55+  95     37 269  86S  95  48  96 +3.2 -5.1 +0.5-1.5 .513   +6  6  0  6.0  27 16 20
      906 is double :   7.3  8.3   0.038"  153.0
08 03 15 19 34 37 D    1061SF8  6.2s  65+ 107     60 224  67N  74  44  70 +4.2 -4.3 +1.7-0.1 .366  +32  6 58 47.4  26  4 52
      1061 is triple :   6.1        0.50"  158.0 :   6.1 12.1   29"   34.0
      1061 = NSV 17256,   6.10 +/- 0.02 V ,  Type VAR:
08 03 15 19 55 21 d    1062cB8  6.4   65+ 108     58 232  86S 101  66  96 +4.1 -4.2 +1.3-1.2 .436   +7  6 59 27.9  25 54 51
      1062 is double :   6.4        0.100"   69.0
08 03 15 21 47 18 d    1068 A2  7.1   66+ 108     41 261  13S 175 130 170 +4.0 -4.0 -1.0-4.2 .202  -66  7  2  7.2  25 25 32
08 03 16 23  1 11 d    1215 K0  6.8   76+ 122     36 261  38S 154 111 144 +4.5 -2.6 -0.1-2.5 .386  -40  8  3 50.5  22  4 15
08 03 17  1  8 34 d    1224 G2  5.3   77+ 123     16 284   4S 189 147 178 +4.4 -2.3 -1.7-3.5 .131  -77  8  7 45.9  21 34 55
      1224 = mu Cancri
      Distance of    1224 to Terminator = 6.1 ; to 3km sunlit peak = 0.0
08 03 17 17 50  8 d    1322 A2  6.4   84+ 132 -11 51 132  69S 128 158 114 +5.5 -1.6 +1.2-0.5 .405  -14  8 50 45.1  18 49 56
08 03 20 17 56 29 D    1635cM0  5.2   99+ 169 -11 19 111  62S 129 166 108 +5.3 +2.9 +0.5+0.2 .461   -7 11 17 17.4   2  0 38
      1635 = 75 Leonis
      Distance of    1635 to Terminator = 14.7 ; to 3km sunlit peak = 5.8
      1635 is double :   5.8  6.6   0.044"    0.0
08 03 20 19 10 54 d    1637 K0  5.9   99+ 169     29 128  43S 148 178 126 +5.1 +3.0 +0.6-0.7 .397  -23 11 18 55.0   1 39  1
      1637 = 76 Leonis
      Distance of    1637 to Terminator = 8.0 ; to 3km sunlit peak = 1.9
08 03 22 22  1 26 r    1845SG8  6.5s  98- 166     27 156  85S 306 322 284 +3.6 +5.7 +1.1-0.2 .396 -179 12 51 22.9 -10 20 18
      1845 is triple :   6.5  9.7   29"  298.0 :   6.5 10.9  141"  213.0
      1845 = NSV 05994,   6.41 +/- 0.07 V ,  Type

Occultation Predictions for Krakow in kwiecien 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time    P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A    B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s     o  m  s
08 04 11 23 14 13 d    1049 A2  6.8   41+  79     10 298  90N  94  55  90 +4.9 -3.8 -0.3-1.2 .632  +10  6 51 58.2  25 39 47
08 04 12 20  2 51 d   79657 K5  7.4   50+  90     46 250  72S 118  77 110 +5.6 -2.9 +0.7-1.8 .476   -5  7 44 32.1  23 20 43
08 04 12 21 56 23 d    1178SG2  6.3s  51+  91     28 273  69N  80  35  71 +5.5 -2.7 +0.5-1.3 .457  +33  7 48 33.6  23  8 28
```

```
      1178 is multiple :   6.1  6.6   0.27"   33.3 :   6.3 13.5   4.1"   34.0 :   6.3 12.0   67"   25.0
      1178 = NSV 17606,   6.18 +/- 0.00 V ,  Type VAR:
08 04 13 19 21 55 d    1293SK0  6.8s  61+ 103     55 219  87N 102  76  89 +6.2 -1.6 +1.4-1.1 .411  +17  8 39 50.7  19 32 27
      1293 is multiple :   6.8  9.9   0.49"  225.7 :   6.7  9.7   0.50"  232.0 :   6.7  6.9   92"   62.0
      1293 = NSV 04171,   6.52 to  6.61 V ,  Type
08 04 13 19 24 55 d    1294SA0  7.3s  61+ 103     54 220  82N  97  71  84 +6.2 -1.6 +1.5-1.0 .400  +22  8 39 56.5  19 33 11
      1294 is multiple :   6.9 11.9   1.20"  291.0 :   6.9  7.2   45"  157.0 :   6.9  6.7   92"  242.0
      1294 = NSV 04175,   7.32 +/- 0.00 V ,  Type
08 04 13 19 36 58 m    1292 F0  6.7v  61+ 103     53 225  14N  29   0  16 +6.1 -1.5 +0.6-2.3 .403 +155  8 39 42.7  19 46 42
      1292 = BT Cnc,   6.66 +/- 0.06 V ,  Type DSCTC
Graze of 1292 F0 nearby at Lat = +49.45 -0.67(E.Long -19.94), CA = 14.3N
      13 19 37 53 Gr   1292 F0  6.7  61+ 103     53 226
Closest distance to graze path is 48km at azimuth 226
08 04 13 19 43 31 D    1299WA*  6.3   61+ 103     52 226  69N  84  55  71 +6.1 -1.5 +1.6-0.8 .359  +35  8 40 27.0  19 32 41
      1299 is double :   6.3  7.4  135"  250.0
08 04 13 19 47  1 d    1297cA9  6.8s  61+ 103     52 227  69S 126  96 113 +6.1 -1.5 +0.9-1.8 .436   -7  8 40 20.1  19 20 56
      1297 is double :   6.7        0.100"  160.0
      1297 = NSV 17953,   6.78 +/- 0.00 V ,  Type DSCT:
08 04 13 19 51  7 d    1298SK0  6.4   61+ 103     51 229  33N  48  16  34 +6.1 -1.5 +3.5+2.0 .136  +72  8 40 22.1  19 40 12
      1298 is multiple :   6.4 10.3   21"   55.0 :   6.4  7.7   64"  343.0 :   6.4  9.3   83"   43.0
Graze of 1298SK0 nearby at Lat = +51.61 -0.70(E.Long -19.94), CA = 13.8N
      13 19 59 48 Gr   1298SK0  6.4  61+ 103     49 230
Closest distance to graze path is 114km at azimuth 49
08 04 13 20  8 25 d    1303 A6  6.8v  61+ 103     49 234  40N  55  21  42 +6.1 -1.5 +2.6+0.6 .196  +64  8 40 56.3  19 34 49
      1303 = EP Cnc,   6.76 +/- 0.03 V ,  Type DSCTC
Graze of 1303 A6 nearby at Lat = +53.37 -0.74(E.Long -19.94), CA = 13.3N
      13 20 18  6 Gr   1303 A6  6.8  61+ 103     46 234
Closest distance to graze path is 231km at azimuth 51
08 04 13 22 32 44 d    1312 F2  6.8   62+ 104     28 267  86N 101  58  88 +5.9 -1.2 +0.4-1.7 .503  +16  8 45 29.6  18 49  3
Graze of 1516 K5 nearby at Lat = +50.13 -0.90(E.Long -19.94), CA = 16.4N
      15 20 48  9 Gr   1516 K5  6.6  81+ 128     45 210
Closest distance to graze path is 4km at azimuth 54
08 04 15 20 48 15 g    1516 K5  6.6s  81+ 128     45 210  16N  37  18  17 +6.0 +1.6 -1.2-4.2 .155 +112 10 22 14.2   8 57 52
      1516 = NSV 18388,   6.72 to  6.81 Hp,  Type IB

Occultation Predictions for Krakow in maj 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time    P    Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration    A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s       No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s     o  m  s
08 05 10 12 22 29 D Mars         1.3   33+  70  51 43 108  64N  75 117  65 +7.3 -2.2 +1.0+2.0 .382  +30  8 11 22.8  21 47 20
   Duration of Partial Stage for Disk = 14.1 secs
08 05 10 13 26 10 R Mars         1.3   33+  70  43 52 125 -53N 319 353 308 +7.2 -2.2 +1.3-1.0 .361 +150  8 11 22.8  21 47 20
   Duration of Partial Stage for Disk = 14.9 secs
08 05 10 20  2 10 d    1261WA5  7.3   35+  73     32 263  65S 128  86 117 +6.5 -1.5 +0.2-2.0 .515  -12  8 24 49.2  20  9 11
      1261 is double :   7.3  8.7   38"  191.0
08 05 11 21 30 13 m    1385 A1  6.6   47+  86     23 266  11N  29 347  13 +6.9 +0.2 +0.5-2.9 .289 +134  9 21 15.3  15 22 17
Graze of 1385 A1 nearby at Lat = +48.26 -0.90(E.Long -19.94), CA = 11.3N
      11 21 33 26 Gr   1385 A1  6.6  47+  86     23 268
Closest distance to graze path is 119km at azimuth 234
08 05 12 19 29 56 D    1486dK4  4.4   57+  98 -10 42 224  65S 135 109 117 +7.1 +1.5 +0.8-1.9 .425  -10 10  7 54.3   9 59 51
      1486 = 31 Leonis = A Leonis
      1486 is double :   4.3 13.6   8.1"   42.0
08 05 12 20 50 39 d  118138 M3  7.1s  57+  98     32 245  38S 162 126 143 +7.0 +1.7 +0.1-2.4 .361  -39 10  9 31.5   9 35 35
    118138 = NSV 18340,   7.13 to  7.22 Hp,  Type SRB
08 05 13 23 19 36 D    1599cK1  4.8   68+ 111     11 262  24N  46   6  25 +6.4 +3.3 +1.0-0.6 .138  +74 11  0 33.6   3 37  3
      1599 = 58 Leonis
      1599 is double :   4.8        0.200"   35.0
Graze of 1599cK1 nearby at Lat = +53.79 -0.82(E.Long -19.94), CA = 8.3N
      13 23 20 51 Gr   1599cK1  4.8  68+ 111     11 262
Closest distance to graze path is 243km at azimuth 54
08 05 14 16 53 52 d    1685cG9  4.3   75+ 121  12 34 145  69N  91 112  69 +6.8 +3.9 +1.7+1.1 .326  +36 11 36 56.9 - 0 49 25
      1685 = upsilon Leonis
```

```
      1685 is double :   4.5  9.0   0.100"  195.0
08 05 27  1 19 37 r    3177cA9  5.9   61- 103 -10 16 138  75N 266 292 284 -7.2 +0.7 +1.3+1.4 .375 +156 21 43  4.4 -14 23 59
      3177 = 44 Capricorni
      3177 is double :   6.8  6.8   0.100"   90.0

Occultation Predictions for Krakow in czerwiec 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s    o  m  s
Graze of 78944SF8 nearby at Lat = +46.80 -0.68(E.Long -19.94), CA = 13.6N
      05 19 47 23 Gr  78944SF8  8.1   6+  28 -11  8 299
Closest distance to graze path is 257km at azimuth 225
08 06 24 23 20 41 r    3380cK0  5.9   66- 109     14 115  70N 267 303 288 -6.8 -2.0 +0.7+1.7 .420 +153 23  1 31.7 - 4 42 41
      3380 is double :   7.0  7.0   0.100"   90.0
08 06 26  2  6 31 r    3515cA1  6.3   55-  95  -4 35 139  77N 259 284 282 -7.0 -3.5 +1.3+1.3 .402 +155 23 53  4.8   2  5 26
      3515 is double :   7.0  7.0   0.050"    0.0
08 06 30  8  4 35 r     541cB8  3.9   11-  39  49 64 187  12S 185 181 198 -2.6 -6.2 +0.5+5.8 .162 -111  3 45 49.6  24 22  4
       541 = Maia = 20 Tauri
       541 is double :   4.4  5.4   0.003"   69.0

Occultation Predictions for Krakow in lipiec 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s    o  m  s
08 07 13 20 11 58 d    2276 A3  5.6   82+ 130 -11 12 195  50N  57  47  45 +1.7 +7.5 +1.8-0.2 .244  +45 15 55 30.1 -26 15 58
      2276 = 4 Scorpii

Occultation Predictions for Krakow in sierpien 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s    o  m  s
08 08 13 20 36 33 d    2804dK2  5.8   91+ 145     14 183  51N  39  37  45 -2.7 +4.5 +1.3+0.5 .298  +34 19 13 13.7 -25 54 24
      2804 is double :   5.7        4.0"   42.0
08 08 16 19 51 18 r X241702    11.2   87E 179     16 137 -73S 197 224 215 -4.6 +0.3 +0.8+2.0 .298 -135 21 43 56.0 -14 18 29
08 08 16 19 55 28 r X180390D   11.0   83E 179     16 138 -62N 242 268 260 -4.6 +0.3 +1.1+1.6 .419 -179 21 43 24.8 -14 10 10
   X180390 is double :  11.0 10.5   1.90"  113.0
08 08 16 19 55 30 r X 50751SG0 10.5   82E 179     16 138 -62N 242 268 260 -4.6 +0.3 +1.1+1.6 .419 -179 21 43 24.9 -14 10 11
   X 50751 is triple :  10.5 11.0   1.90"  293.0 :   8.0 12.0  11.5"   36.0
08 08 16 19 55 59 d X 50799    10.3   82E 179     16 137  96U  59  85  77 -4.6 +0.3 +1.1+1.6 .420   +3 21 45 16.0 -13 54 46
08 08 16 19 59 30 r X241707    11.1   77E 179     17 139 -84S 206 232 224 -4.6 +0.3 +0.9+1.9 .338 -144 21 43 59.1 -14 15 56
08 08 16 20  2 56 r X 50763    10.7   73E 179     17 139 -73N 229 254 247 -4.6 +0.3 +1.1+1.7 .406 -167 21 43 44.5 -14 11 34
08 08 16 20 15 13 d X180520    10.8   56E 179     18 142 101U  35  59  53 -4.6 +0.3 +1.0+1.7 .372  +26 21 45 27.1 -13 46 16
08 08 16 20 24 38 R  164613 F8  9.6   44E 179     19 144 -25N 270 293 288 -4.6 +0.2 +1.5+1.2 .359 +151 21 44  1.4 -13 57  1
08 08 16 20 30  7 D  164626WK3  8.7   38E 179     20 145  72N   5  27  23 -4.6 +0.2 +0.5+2.2 .229  +56 21 45 18.4 -13 40 33
    164626 is double :   8.5 11.9   27"  224.0
08 08 16 20 39 48 D  164628 G1  8.9   28E 180     21 148  73N   1  22  19 -4.7 +0.2 +0.4+2.2 .210  +59 21 45 28.7 -13 38 31
08 08 16 20 51 34 R  164622 G5  9.5   20E 180     22 151  98U 247 266 265 -4.7 +0.2 +1.4+1.2 .402 +173 21 44 46.0 -13 57 36
08 08 16 21 10 57 r X 50799    10.3   15E 180     23 155  83U 242 258 260 -4.8 +0.2 +1.4+1.2 .401 +177 21 45 16.0 -13 54 46
08 08 16 21 13 57 R  164626WK3  8.7   15E 180     23 156  29S 294 310 312 -4.8 +0.2 +2.3+0.3 .224 +124 21 45 18.4 -13 40 33
    164626 is double :   8.5 11.9   27"  224.0
08 08 16 21 20 18 R  164628 G1  8.9   16E 180     24 158  38S 297 312 315 -4.8 +0.2 +2.4+0.2 .206 +121 21 45 28.7 -13 38 31
08 08 16 21 21 57 D X 50845 F5 10.0   16E 180     24 158  56N  21  35  39 -4.8 +0.2 +0.8+1.6 .316  +38 21 46 50.1 -13 30 42
08 08 16 21 23 45 r X180520    10.8   17E 180     24 159  91U 264 278 283 -4.8 +0.2 +1.7+0.8 .359 +154 21 45 27.1 -13 46 16
08 08 16 21 26 49 d X180661    10.7   18E 180     24 159  79U  91 105 109 -4.8 +0.1 +1.8+0.7 .336  -33 21 47 38.2 -13 44 32
08 08 16 21 30 19 D  164649 K0  9.8   20E 180     24 160  36N  31  44  49 -4.8 +0.1 +1.0+1.4 .356  +27 21 47 12.6 -13 30 10
Graze of X180614 nearby at Lat = +46.65 +1.03(E.Long -19.94), CA = 53.2N
      16 22 12 15 GrX180614    11.1  64E 180     30 171
Closest distance to graze path is 211km at azimuth 124
08 08 16 22 14 36 D X 50872 G5 10.1   67E 180     26 171   0N  21  27  39 -4.9 +0.1 +0.7+1.4 .326  +35 21 48  3.9 -13 19 19
08 08 16 22 23 40 d X180730    11.2   79E 180     27 174 -32N  46  50  64 -4.9 +0.0 +1.2+0.9 .392  +10 21 48 39.5 -13 21  3
```

```
08 08 16 22 23 49 R X 50845 F5 10.0   79E 180      26 174  79S 274 278 292 -4.9 +0.0 +2.0+0.1 .314 +142 21 46 50.1 -13 30 42
08 08 16 22 30 22 r X180661    10.7   87E 180      26 176  85U 203 205 221 -5.0 +0.0 +0.8+1.3 .334 -147 21 47 38.2 -13 44 32
08 08 23 20 46 22 R     537SB6  3.7s  51-  91       5  58  71S 238 275 251 -1.2 -5.8 -0.5+1.4 .640 -164  3 44 52.5  24  6 48
      537 = Electra = 17 Tauri
      537 is triple :   3.9  7.0   0.005"    0.0 :   3.9  7.5   0.196"  117.0
      537 = NSV 15755,   3.70 +/- 0.00 V ,  Type
08 08 23 20 48 17 R     539SB6  4.3   51-  91       6  58  27N 320 357 333 -1.2 -5.8 +0.1+0.4 .270 +114  3 45 12.5  24 28  2
      539 = Taygeta = 19 Tauri
      539 is multiple :              0.000"  348.0 :   4.6  6.1   0.012"    0.0 :   4.3  8.1   71"  329.0
08 08 23 20 48 28 r     536cB7  5.5   51-  91       6  58  71N 276 313 289 -1.2 -5.8 -0.4+1.1 .616 +158  3 44 48.2  24 17 22
      536 = Celaeno = 16 Tauri
      536 is double :   5.7  7.7   0.100"   90.0
08 08 23 21  4 18 d     552SB7  2.9s  51-  91       7  61 -27S 140 178 153 -1.2 -5.8 +0.2+0.4 .267  -66  3 47 29.1  24  6 18
      552 = Alcyone = eta Tauri
      552 is multiple :        1.5   0.031"  207.1 :   3.0  4.6   0.031"  207.1 :   2.8  6.2  117"  290.0
      552 = NSV 15775,   2.87 +/- 0.00 V ,  Type VAR:
08 08 23 21 10 28 R     541cB8  3.9   51-  91       9  62  69N 278 317 291 -1.2 -5.8 -0.3+1.1 .590 +155  3 45 49.6  24 22  4
      541 = Maia = 20 Tauri
      541 is double :   4.4  5.4   0.003"   69.0
08 08 23 21 20 59 R Pleiade C   3.0   51-  91      10  64  38S 206 245 219 -1.1 -5.8 -0.7+1.9 .431 -132  2  7 46.0  18  1 46
   Duration of Partial Stage for Disk = 545 mins
08 08 23 21 24 29 R     552SB7  2.9s  51-  91      10  64  20S 187 227 201 -1.1 -5.8 -1.1+2.4 .261 -114  3 47 29.1  24  6 18
      552 = Alcyone = eta Tauri
      552 is multiple :        1.5   0.031"  207.1 :   3.0  4.6   0.031"  207.1 :   2.8  6.2  117"  290.0
      552 = NSV 15775,   2.87 +/- 0.00 V ,  Type VAR:
08 08 23 22 24 23 r     562SB9  6.6   50-  90      19  75  62S 229 272 242 -1.1 -5.9 -0.3+1.8 .555 -157  3 49 21.8  24 22 51
      562 is triple :   7.3  7.4   0.100"  134.0 :   6.5  7.5   87"  309.0
08 08 25  2 10 53 r     750SG2  6.9   37-  75      46 103  35S 210 255 217 +0.2 -5.4 +0.1+3.2 .322 -131  5  1 44.3  26 40 16
      750 is triple :   7.0  9.0   0.30"  349.0 :   6.7  8.2   78"  160.0
08 08 26  1  5  4 r      912 B8  7.0   27-  62      26  79  38S 221 266 221 +1.4 -4.4 -0.4+2.6 .393 -134  6  3 33.9  26 31 45
08 08 26  2 39 47 r   77974 K0  7.5   26-  61 -11 41  96  64S 247 293 248 +1.4 -4.5 +0.5+2.0 .470 -159  6  7  2.7  26 40 16
08 08 26  2 47 51 r     926cB9  7.1   26-  61 -10 42  98  66S 249 295 250 +1.4 -4.5 +0.6+1.9 .471 -161  6  7 20.0  26 40 56
      926 is double :   7.0        0.100"  343.0
08 08 27  0 57 48 R   79054dK8  6.9   17-  49      15  69  83S 272 313 267 +2.6 -3.1 -0.1+1.3 .605 -178  7  6 11.6  24 51 37
     79054 is double :   7.1 11.1   9.8"   63.0
08 08 28  1  9 31 R    1224 G2  5.3    9-  35       5  63  38N 336  14 325 +3.7 -1.6 +0.3-0.5 .361 +125  8  7 45.9  21 34 55
      1224 = mu Cancri

Occultation Predictions for Krakow in wrzesien 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

     day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration    A    B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o  h  m   s    o  m  s
08 09 08 18 31 35 d    2583cA7  5.8   61+ 103      11 195  42N  41  31  40 -1.3 +6.0 +1.2+0.1 .265  +41 17 56 41.8 -28  3 55
      2583 is double :   6.6  6.6   0.100"   90.0
Graze of 536cB7 nearby at Lat = +51.02 +0.16(E.Long -19.94), CA = -0.2S
      20  2 46 17 Gr    536cB7  5.5  73- 118     63 189
Closest distance to graze path is 103km at azimuth 346
08 09 20  3 16 51 d     541cB8  3.9   73- 118 -11 63 204  -4S 161 144 174 -0.6 -6.2 +9.9+9.9 .038  -85  3 45 49.6  24 22  4
      541 = Maia = 20 Tauri
      541 is double :   4.4  5.4   0.003"   69.0
Graze of 541cB8 nearby at Lat = +49.98 +0.10(E.Long -19.94), CA = 1.2S
      20  3 20 21 Gr    541cB8  3.9  73- 118 -11 62 206
Closest distance to graze path is 8km at azimuth 171
08 09 20  3 22 57 R     541cB8  3.9   73- 118 -10 62 208   7S 172 152 185 -0.6 -6.2 +9.9+9.9 .038  -95  3 45 49.6  24 22  4
      541 = Maia = 20 Tauri
      541 is double :   4.4  5.4   0.003"   69.0
08 09 20  3 37  4 R     539SB6  4.3   73- 118  -8 61 214  60S 225 202 238 -0.6 -6.2 +1.4+1.3 .368 -148  3 45 12.5  24 28  2
      539 = Taygeta = 19 Tauri
      539 is multiple :              0.000"  348.0 :   4.6  6.1   0.012"    0.0 :   4.3  8.1   71"  329.0
08 09 20  3 37 56 R     538cB8  5.7   73- 118  -8 61 215  35N 310 286 323 -0.6 -6.2 +1.7-3.0 .261 +127  3 45  9.7  24 50 21
      538 = 18 Tauri
      538 is double :   6.4  6.4   0.050"    0.0
```

```
08 09 20  4  4  8 R     542 B8  5.8   73- 117  -4 59 225  72S 237 207 250 -0.6 -6.2 +1.4+0.6 .410 -159  3 45 54.5  24 33 16
      542 = Asterope = 21 Tauri
08 09 20  4  5 30 r     543cA0  6.4   73- 117  -4 58 225  64S 229 199 242 -0.6 -6.2 +1.4+0.9 .384 -151  3 46  2.9  24 31 40
      543 is double :   7.3  7.3   0.100"    0.0
08 09 21 21 27 39 r     849cG9  6.5   53-  94     13  64  69S 247 288 250 +2.2 -4.5 -0.4+1.5 .600 -163  5 38 57.4  26 37  5
      849 is double :   7.3  7.3   0.100"   90.0
08 09 23  0 26 56 r   78778cK0  6.8v  40-  79     29  85  83S 269 314 265 +3.3 -3.4 +0.3+1.4 .531 -176  6 49 43.2  25 29  4
     78778 is double :   7.7  8.4   0.25"   69.0
     78778 = QU Gem,   6.88 to  7.06 Hp,  Type LB:
Graze of 1046cF8 nearby at Lat = +49.99 +0.36(E.Long -19.94), CA = 2.9N
      23  0 27 39 Gr   1046cF8  7.0  40-  79     30  84
Closest distance to graze path is 7km at azimuth 150
08 09 23  1 15 39 r    1049 A2  6.8   40-  78     37  93  49N 317   2 313 +3.3 -3.4 +1.1-0.2 .366 +137  6 51 58.2  25 39 47
08 09 23  1 52 48 r   78827 A*  7.4   40-  78     43 101  55S 241 285 237 +3.3 -3.4 +0.6+2.4 .397 -146  6 53  6.2  25 18 41
08 09 23  3  1 29 R    1055 G0  5.7s  39-  78     53 118  81S 268 307 263 +3.2 -3.4 +1.2+1.1 .440 -170  6 55 18.7  25 22 33
      1055 = 37 Geminorum
      1055 = NSV 17225,   5.73 +/- 0.02 V ,  Type VAR:
08 09 24  1 43 43 r    1187 K0  7.1   29-  65     30  90  77S 268 312 259 +4.2 -2.0 +0.5+1.5 .497 -167  7 53  1.0  22 20  4
08 09 25  2 11 21 R    1321cG5  6.9   19-  52     23  89  78N 298 340 284 +4.9 -0.4 +0.5+0.7 .512 +170  8 50 40.4  18  0 12
      1321 is double :   7.5  7.6   0.22"   83.6
08 09 25  2 16 14 r   98165dK5  8.2   19-  52     23  90  67N 309 351 295 +4.9 -0.4 +0.5+0.3 .483 +159  8 50 57.5  18  2  0
     98165 is double :   9.2  9.3   1.00"  102.0
08 09 25  2 38 20 r   98173 G5  8.0   19-  52     27  94  62S 258 301 244 +4.9 -0.4 +0.4+2.0 .436 -150  8 51 29.7  17 45 15
08 09 25  3 51  3 r   98204 A0  7.2   19-  51  -7 38 109  60S 256 296 242 +4.8 -0.3 +0.9+2.0 .381 -145  8 53 50.7  17 32 42

Occultation Predictions for Krakow in pazdziernik 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec    o  h  m    s    o  m  s
08 10 08 20 22 31 d    2961 G8  5.9   64+ 106      11 216  68S  98  74 110 -5.2 +2.4 +1.5-1.5 .334  -36 20 18  1.4 -21 48 36
      2961 = 4 Capricorni
08 10 09 20 26  7 d    3086 B9  6.2   73+ 117      18 208  87S  76  57  92 -6.0 +0.9 +1.3-0.6 .389  -18 21  7 44.7 -17 27 21
08 10 11 19 26 15 d    3334 A0  6.4   89+ 141      33 170  55S 105 111 126 -6.4 -1.9 +2.3-0.1 .262  -51 22 43 14.3 - 6 57 47
08 10 15 19 14 47 r     317 F5  6.4   99- 166      33 103  37S 180 222 200 -2.3 -5.7 -0.7+3.0 .257 -118  2  9 23.1  17 13 27
      Distance of     317 to Terminator = 10.4 ; to 3km sunlit peak = 3.1
08 10 17 23 57 17 R    647WB9  5.4s  86- 136      61 141  53S 219 246 229 +1.0 -5.6 +0.9+2.5 .361 -142  4 22 34.9  25 37 46
       647 = chi Tauri
       647 is double :   5.4  8.4  19.6"   25.0
       647 = NSV 15957,   5.34 to  5.39 Hp,  Type
08 10 19  2  1 51 r     833 B5  7.1   76- 122      67 169  61N 295 303 298 +2.5 -4.8 +1.6-0.9 .395 +155  5 32 27.6  26 58 54
08 10 19  4 21 52 R     844SB9  5.8S  76- 121  -8 58 235  61N 294 258 298 +2.3 -4.6 +1.1-1.7 .436 +162  5 37  8.9  26 55 28
       844 is triple :   6.5  6.6   1.10"  324.0 :   5.7 10.5  178"  300.0
       844 = NSV 02426,   3.50 to  5.78 B ,  Type
08 10 19  4 21 53 r X 75950D    6.6   76- 121  -8 58 235  62N 294 258 298 +2.3 -4.6 +1.1-1.7 .436 +162  5 37  8.9  26 55 27
   X 75950 is double :   6.6  6.5   1.10"  144.0
08 10 20  4 25 52 r   78653wM0  7.4   65- 107  -8 63 210  59S 242 221 239 +3.7 -3.4 +1.8+0.8 .326 -138  6 42 12.0  25 28  7
     78653 is double :   7.8 11.8  19.0"   92.0
08 10 21  2 49 48 R    1161 K5  5.9   54-  95     57 138  77N 293 321 285 +5.0 -2.1 +1.4-0.2 .427 +173  7 40 58.5  23  1  7
08 10 21  3 27 19 r   79621 K0  7.4   54-  94     61 153  79N 291 310 283 +4.9 -2.0 +1.5-0.4 .425 +177  7 42  5.1  22 55 44
08 10 22  5 18 41 d    1310SK0  3.9   42-  81   0 58 179 -75S 120 121 106 +5.5 -0.3 +1.4-1.0 .421   -2  8 44 41.1  18  9 16
      1310 = Asellus Australis = Delta Cancri
      1310 is triple :   3.9        0.100"  166.0 :   3.9 12.2   39"   90.0
08 10 22  6 33  3 r    1310SK0  3.9   41-  80  11 55 211  78N 298 277 284 +5.3 -0.2 +1.2-1.4 .436 -178  8 44 41.1  18  9 16
      1310 = Asellus Australis = Delta Cancri
      1310 is triple :   3.9        0.100"  166.0 :   3.9 12.2   39"   90.0
08 10 23  0  7 42 r    1396 K2  6.8s  33-  70     12  82  69N 309 351 293 +6.4 +0.9 +0.2+0.4 .512 +160  9 26 56.7  14 18 11
      1396 = NSV 04490,   7.70 to  8.20 P ,  Type
08 10 26  4 25 26 r    1727 F2  6.9    7-  32  -9 16 118  62S 259 293 236 +6.2 +5.2 +1.0+2.2 .336 -136 11 58  6.8 - 4 22 14
```

Occultation Predictions for Krakow in listopad 2008
E.Long. 19 56 13.0 Lat. 50 3 42.0 Alt. 100m. T.dia 100mm. dMag 0.0

```
      day  Time    P    Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s        No  D       V  ill     Alt Alt Az   o    o   o   o    L     B   m/o m/o "/sec   o  h  m    s     o  m  s
08 11 09 15 35  1 d     3515cA1  6.3   83+ 131  -5 23 116  72S  87 122 110 -6.9  -3.8 +0.9+1.6 .430  -29 23 53  4.8    2  5 26
      3515 is double :   7.0  7.0   0.050"    0.0
08 11 12 18 59 34 g      399SA0  5.7  100+ 172     44 115  42S 154 193 172 -2.9  -5.9 +1.3+0.7 .328  -53  2 42 21.9   20  0 41
       399 = mu Arietis
      Distance of     399 to Terminator = 3.8 ; to 3km sunlit peak = 0.3
       399 is multiple :        2.3   0.047"  276.0 :   5.6        0.049"  280.9 :   5.7 12.2  19.2"  265.0
Graze of 399SA0 nearby at Lat = +50.08 +0.69(E.Long -19.94), CA = 42.3S
      12 18 59 36 Gr    399SA0  5.7 100+ 172     44 115
Closest distance to graze path is 1km at azimuth 313
08 11 13 19  6 24 d Pleiade C   3.0   99- 171     39  99 -52S  88 132 101 -0.8  -5.6 +0.7+1.3 .530  -17  2  7 46.0   18  1 46
      Distance of Pleiade to Terminator = 7.2 ; to 3km sunlit peak = 0.0
   Duration of Partial Stage for Disk = 459 mins
08 11 13 19 16 28 R      537SB6  3.7s  99- 171     41 101  55N 265 309 279 -0.8  -5.6 +0.7+1.4 .528 +165  3 44 52.5   24  6 48
       537 = Electra = 17 Tauri
      Distance of     537 to Terminator = 7.7 ; to 3km sunlit peak = 1.8
       537 is triple :   3.9  7.0   0.005"    0.0 :   3.9  7.5   0.196"  117.0
       537 = NSV 15755,   3.70 +/- 0.00 V ,  Type
08 11 13 19 21  1 d      552SB7  2.9s  99- 171     41 102 -41S  99 143 112 -0.8  -5.6 +0.9+1.1 .481  -28  3 47 29.1   24  6 18
       552 = Alcyone = eta Tauri
      Distance of     552 to Terminator = 5.1 ; to 3km sunlit peak = 0.0
       552 is multiple :        1.5   0.031"  207.1 :   3.0  4.6   0.031"  207.1 :   2.8  6.2  117"  290.0
       552 = NSV 15775,   2.87 +/- 0.00 V ,  Type VAR:
08 11 13 19 37 21 R      545 B6  4.1v  99- 171     44 106  67S 207 250 220 -0.8  -5.6 +0.0+2.7 .384 -136  3 46 19.6   23 56 54
       545 = Merope = 23 Tauri
      Distance of     545 to Terminator = 10.1 ; to 3km sunlit peak = 3.1
       545 = V0971 Tau,   4.18 +/- 0.01 V ,  Type BCEP
08 11 13 20  5 55 R Pleiade C   3.0   99- 171     48 112  87N 234 275 248 -0.8  -5.7 +0.6+1.9 .496 -163  2  7 46.0   18  1 46
      Distance of Pleiade to Terminator = 12.5 ; to 3km sunlit peak = 4.4
   Duration of Partial Stage for Disk = 492 mins
08 11 13 20 14 41 r      549SA0  6.3   99- 171     50 115  86S 228 267 241 -0.8  -5.7 +0.6+2.1 .469 -156  3 47 21.0   24  6 59
      Distance of     549 to Terminator = 12.7 ; to 3km sunlit peak = 4.5
       549 is multiple :              0.000"  109.9 :   7.1  8.2   0.001"  205.0 :   6.2  8.7   74"  306.0
08 11 13 20 16 26 R      552SB7  2.9s  99- 171     50 115  82S 223 263 236 -0.8  -5.7 +0.5+2.2 .453 -152  3 47 29.1   24  6 18
       552 = Alcyone = eta Tauri
      Distance of     552 to Terminator = 12.5 ; to 3km sunlit peak = 4.4
       552 is multiple :        1.5   0.031"  207.1 :   3.0  4.6   0.031"  207.1 :   2.8  6.2  117"  290.0
       552 = NSV 15775,   2.87 +/- 0.00 V ,  Type VAR:
08 11 13 20 26 57 r      553cA0  6.8   99- 170     51 118  62N 259 298 272 -0.8  -5.7 +1.0+1.3 .502 +172  3 47 29.5   24 17 18
      Distance of     553 to Terminator = 10.2 ; to 3km sunlit peak = 3.1
       553 is double :   7.1  8.5   0.000"    0.0
Graze of 560cB8 nearby at Lat = +52.15 +0.46(E.Long -19.94), CA = 20.1S
      13 20 31 16 Gr    560cB8  3.6  99- 170     51 121
Closest distance to graze path is 186km at azimuth 323
08 11 13 20 51  8 R      561cB7  5.1V  99- 170     54 125  55S 197 233 210 -0.8  -5.7 +0.1+3.4 .292 -126  3 49 11.2   24  8 12
       561 = Pleione = 28 BU Tauri
      Distance of     561 to Terminator = 9.2 ; to 3km sunlit peak = 2.5
       561 is double :   5.0        0.200"   37.0
       561 = BU Tau,   4.77 to  5.50 V ,  Type GCAS
08 11 13 21 19  4 r      562SB9  6.6   99- 170     58 134  72N 250 280 263 -0.9  -5.7 +1.1+1.3 .485 -178  3 49 21.8   24 22 51
      Distance of     562 to Terminator = 12.8 ; to 3km sunlit peak = 4.6
       562 is triple :   7.3  7.4   0.100"  134.0 :   6.5  7.5   87"  309.0
08 11 14 23 35 54 r      750SG2  6.9   95- 155     66 164  47N 299 311 306 +1.2  -5.0 +1.6-1.0 .381 +146  5  1 44.3   26 40 16
       750 is triple :   7.0  9.0   0.31"  351.0 :   6.7  8.2   78"  160.0
08 11 15  1 34 47 r      762cB5  6.6   95- 155     61 223  72S 240 210 246 +1.0  -4.9 +1.5+0.6 .401 -149  5  5 53.4   26 25 48
       762 is double :   6.8  8.2   0.076"  327.0
```

```
08 11 15  4 28 57 r     780cG5  6.8   95- 153     37 269  85N 263 217 269 +0.9 -4.7 +0.6-1.2 .541 -168  5 12 21.5  26 27 17
      780 is double :   7.6  7.6   0.050"    0.0
08 11 15 18 34 46 R     900cB1  4.8   90- 144     16  69  40S 216 258 217 +3.3 -3.8 -0.7+2.3 .403 -129  5 57 59.7  25 57 14
      900 = 139 Tauri
      900 is double :   5.6  5.6   0.060"  221.0
08 11 16 22 18  5 R    1092 F5  5.9   81- 128     39  98  84S 270 314 264 +5.1 -2.4 +0.7+1.3 .506 -173  7 12 26.4  24  7 43
      1092 = 48 Geminorum
08 11 18  2 36  8 r   80131 K0  7.2   69- 113     59 163  57N 316 328 304 +6.1 -0.6 +1.2-1.4 .403 +158  8 22  3.9  19 57 33
08 11 19  1 12 43 R    1375 K1  5.4   59- 100     41 120  52S 249 284 233 +7.2 +0.9 +1.3+2.4 .315 -134  9 15 13.9  14 56 29
      1375 = pi Cancri
08 11 22  4 18  4 r    1703 K0  7.7   26-  62     31 143  80N 302 324 280 +7.3 +5.2 +1.1+0.0 .417 -176 11 46 19.5 - 3  0  9

Occultation Predictions for Krakow in grudzien 2008
E.Long.   19 56 13.0   Lat.  50  3 42.0   Alt. 100m.   T.dia 100mm.   dMag 0.0

      day  Time   P   Star  Sp  Mag    % Elon Sun  Moon   CA   PA  VA  WA Libration   A   B   RV   Cct   R.A. (J2000)  Dec
 y  m  d  h  m  s      No  D       V   ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/sec   o   h  m   s     o  m  s
08 12 01 16 21 44 D Venus      -4.1   13+  43      8 218  74S  99  74 108 -3.8 +2.8 +1.7-1.8 .290  -35 19 38 36.1 -23 55 56
   Duration of Partial Stage for Disk = 52 secs
08 12 01 17 26 48 R Venus      -4.1   13+  43        231 -36S 209 176 217 -4.0 +2.7 -0.1+0.2 .314 -144 19 38 36.1 -23 55 56
   Duration of Partial Stage for Disk = 48 secs
08 12 06 21 51 11 D    3494 A7  4.5   60+ 101     15 254  55N  33 354  55 -8.7 -4.3 +0.3+0.4 .435  +28 23 42  2.8   1 46 48
      3494 = lambda Piscium
08 12 08 15 54 18 d     177 F5  6.9   78+ 124 -11 39 123  37N  17  51  39 -7.0 -5.5 +0.1+2.4 .367  +41  1 12 19.1  12 16 55
08 12 11 19 46  3 D     647WB9  5.4s  99+ 167     57 127  78N  86 121  97 -1.9 -5.4 +1.2+0.9 .484  -10  4 22 34.9  25 37 46
      647 = chi Tauri
      647 is double :   5.4  8.4  19.6"   25.0
      647 = NSV 15957,   5.34 to  5.39 Hp,  Type
08 12 13 21 25 35 d    1030WA3  3.1s  98- 162     52 117 -59S 119 158 116 +2.7 -3.0 +1.2+0.0 .453  -23  6 43 55.9  25  7 52
      1030 = Mebsuta = epsilon Geminorum
      1030 is double :   2.9  9.2  111"   94.0
      1030 = NSV 03183,   2.97 to  3.09 V ,  Type
08 12 13 22 30 23 R    1030WA3  3.1s  98- 162     60 140  78S 256 284 253 +2.7 -3.0 +1.4+1.2 .433 -157  6 43 55.9  25  7 52
      1030 = Mebsuta = epsilon Geminorum
      1030 is double :   2.9  9.2  111"   94.0
      1030 = NSV 03183,   2.97 to  3.09 V ,  Type
08 12 14 19 44 49 r    1167 K0  6.3   93- 149     26  85  64N 305 349 296 +4.8 -1.4 +0.5+0.5 .517 +155  7 43 22.2  22 23 58
08 12 16 23  0  2 R    1439 K4  5.7   75- 120     31 110  42N 339  17 321 +7.6 +2.1 +0.7-1.3 .359 +137  9 46 23.3  11 48 36
      1439 = 18 Leonis
08 12 16 23 48 54 r    1441cA7  6.4   75- 120     37 121  66N 314 348 296 +7.5 +2.1 +0.9-0.3 .451 +164  9 47 26.0  11 34  5
      1441 is double :   6.4        0.130"   19.8
08 12 18  3  4 38 r  118448SK3  7.3   63- 106     44 169  66N 317 324 297 +7.8 +4.0 +1.1-1.1 .417 +169 10 43 20.5   4 44 48
    118448 is triple :   8.2  8.2   0.050"    0.0 :   6.8  5.7   6.7"   60.0
08 12 18  3  4 41 R    1565MK3  6.2   63- 106     44 169  65N 318 325 297 +7.8 +4.0 +1.1-1.1 .416 +168 10 43 20.9   4 44 52
      1565 is triple :   5.7  6.8   6.7"  240.0 :   5.7  7.9  334"  210.0
08 12 19  1 20 53 r  138233 K4  7.0   53-  94     27 129  39N 345  15 323 +8.3 +5.0 +0.3-1.4 .339 +139 11 29 24.3 - 0 50 56
```

W następnym numerze kolejne miasta: Łódź i Poznań