DATE	TIME (UT) H M S	ACC SEC	V	O	Z.C.	USNO REF NO	S.A.O. NUMBER	MAG	SP	PH	PERCENT SUNLIT	ELG	PA DEG	CUSP ANGL	VA DEG	MOON ALT	MOON AZI	SUN ALT	AA DEG	LIBRATION LONG	LIBRATION LAT	MIN MAG
APR 16	4 59 19	9	9	9	2366C	Z15712	184415	1.2		D	87 WAN	137	55	41N	90	13	140		57	3.6	5.9	
APR 16	5 35 28	9	9	9	2366C	Z15712	184415	1.2		R	86 WAN	137	351	23N	20	17	147		343	3.5	6.0	
APR 16	6 9 44	6	7	5		Z15720	184423	8.6	A0	R	86 WAN	136	322	52N	344	20	154		314	3.5	6.1	
APR 16	6 10 20	7	7	4		Z15724	184427	9.0	F8	R	86 WAN	136	337	37N	359	20	154		329	3.5	6.1	
APR 16	6 36 17	39	7	4		Z15739	184443	9.1	F0	R	86 WAN	136	14	0N	32	22	160		6	3.4	6.1	
APR 16	9 5 58	6	7	4		Z15768	184471	9.5	F0	R	86 WAN	135	245	51S	232	22	195		238	3.1	6.3	
APR 16	9 37 39	13	8	5		Z15787	184487	9.0	K2	R	85 WAN	135	216	21S	195	20	202	-10	207	3.0	6.3	
APR 16	10 5 26	5	7	4		Z15795	184495	9.4	G5	R	85 WAN	135	304	69N	280	18	209	-5	297	3.0	6.4	
APR 16	9 59 50	6	8	4		Z15796	184496	9.2	A0	R	85 WAN	135	320	53N	297	19	207	-6	313	3.0	6.4	
APR 17	5 18 42	6	6	4		Z16992	185502	9.3	G	R	77 WAN	123	251	65S	291	5	134		249	5.1	6.9	
APR 17	6 23 16	5	8	6		Z17038	185534	9.0	K5	R	77 WAN	123	274	88S	304	13	145		272	5.0	7.0	
APR 17	6 31 13	10	6	6		Z17048	185542	9.2	F8	R	77 WAN	123	223	37S	252	14	147		221	5.0	7.0	
APR 17	7 31 17	5	8	6		Z17082	185570	9.1		R	77 WAN	122	262	76S	280	19	159		260	4.9	7.1	
APR 17	7 57 10	15	6	7		Z17111	185595	8.7	A0	R	77 WAN	122	210	24S	223	20	165		208	4.9	7.1	
APR 17	8 18 11	5	6	6		Z17113	185597	9.2	K0	R	76 WAN	122	263	77S	272	21	169		261	4.8	7.2	
APR 17	8 30 52	7	6	9	2540	Z17121	185604	7.0	B8	R	76 WAN	122	323	43N	330	22	172		322	4.8	7.2	
APR 17	9 35 59	5	8	7		Z17154	185626	8.7	F5	R	76 WAN	121	290	75N	284	22	187	-10	289	4.6	7.2	
APR 17	9 28 16	17	3	9		Z17165	185632	8.0	F0	R	76 WAN	121	201	16S	197	22	185	-12	200	4.6	7.2	
APR 18	6 0 22	11	6	4		Z19007	187129	7.9	B8	R	67 WAN	109	359	20N	21	2	130		342	6.3	7.5	
APR 18	6 24 17	6	6	6		Z19017	187135	8.9	A0	R	67 WAN	109	301	57N	340	5	136		305	6.3	7.5	
APR 18	6 45 53	5	5	9		Z19040	187152	9.1	B9	R	66 WAN	109	261	83S	297	8	138		265	6.3	7.5	
APR 18	7 12 2	5	7	9		Z19067	187174	9.0	K2	R	66 WAN	109	291	67N	324	11	143		296	6.2	7.6	
APR 18	7 30 17	5	7	9		Z19085	187188	9.2	F2	R	66 WAN	109	281	77N	311	13	146		286	6.2	7.6	
APR 18	7 28 13	8	5	8		Z19097	187197	9.4	K0	R	66 WAN	109	223	45S	253	13	146		227	6.2	7.6	
APR 18	7 42 13	7	5	9		Z19112	187206	8.5	K2	R	66 WAN	109	319	39N	347	14	148		323	6.2	7.6	
APR 18	9 14 49	5	5	8		Z19129	187223	9.5	A0	R	66 WAN	109	281	77N	303	17	155		286	6.1	7.6	
APR 18	8 30 37	7	5	9		Z19154	187243	8.8	A3	R	66 WAN	108	314	44N	333	19	150		319	6.0	7.6	
APR 18	8 31 29	17	5	9		Z19167	187254	9.2	A2	R	66 WAN	108	343	15N	2	19	158		348	6.0	7.6	
APR 18	9 19 59	5	7	9		Z19184	187268	9.0	G5	R	66 WAN	108	276	81N	286	21	169		281	5.9	7.7	
APR 19	5 56 2	5	3	5		Z20920	188524	8.3	K5	R	55 WAN	96	265	86N	309	3	129		275	7.1	7.6	
APR 19	7 25 14	6	4	9	2885	Z20844	188544	7.7	KC	R	55 WAN	96	291	59N	331	7	133		301	7.0	7.6	
APR 19	7 30 37	6	4	9		Z20953	188550	9.0	KC	R	55 WAN	96	238	68S	277	7	134		248	7.0	7.6	
APR 19	8 14 8	13	5	9		Z20904	188589	8.7	F2	R	55 WAN	96	331	19N	4	13	142		342	7.0	7.7	
APR 19	9 26 53	7	5	9		Z20927	188609	9.2	F8	R	55 WAN	95	300	50N	321	20	156	-12	310	6.8	7.7	
APR 19	9 44 44	5	2	9		Z20939	188617	8.8	F8	R	55 WAN	95	258	88S	275	21	161	-8	269	6.7	7.7	
APR 19	9 50 6	5	3	9		Z20967	188621	8.1	G5	R	55 WAN	95	242	72S	258	21	162	-7	253	6.7	7.7	
APR 19	9 45 1	8	6	9	2898	Z20952	188626	7.2	B9	R	55 WAN	95	206	36S	223	21	161	-8	216	6.7	7.7	
APR 19	10 13 43	5	5	1		Z20954	188628	9.0	A0	R	54 WAN	95	274	76N	285	23	167	-3	284	6.6	7.7	
APR 20	7 39 44	9	5	4		Z22172	189644	8.7	F5	R	44 WAN	83	316	28N	1	3	124		330	7.5	7.3	
APR 20	7 58 39	20	5	8		Z22194	189668	8.9	K0	R	44 WAN	83	333	11N	16	6	127		348	7.4	7.3	
APR 20	9 53 59	5	5	8		Z22263	189725	9.1	K2	R	44 WAN	82	253	89S	279	20	149	-6	268	7.2	7.3	
APR 20	9 48 2	6	5	9		Z22272	189732	9.2	G0	R	44 WAN	82	216	50S	243	20	148	-7	229	7.2	7.3	
APR 20	10 8 49	5	5	3		Z22281	189741	9.0		R	43 WAN	82	234	70S	257	22	152	-4	249	7.1	7.3	
APR 21	9 40 23	23	8	9	3178	Z23324	164601	6.2	A3	R	33 WAN	70	170	11S	207	16	133	-9	188	7.3	6.6	
APR 22	8 38 44	9	9	9	3304	Z24076	165127	6.4	A0	R	24 WAN	59	189	33S	238	3	111		210	7.1	5.7	
APR 23	10 4 31	7	9	3		Z26746	166618	8.9	G5	R	16 WAN	47	283	50N	329	15	116	-4	304	6.4	4.4	
APR 24	10 3 10	5	9	8	3517	Z25348	147045	6.9	A3	R	9 WAN	35	217	64S	266	11	103	-4	239	5.6	3.1	
APR 25	10 11 20	5	9	1		Z00620	109527	7.8	MA	R	4 WAN	24	250	84N	301	9	93	-2	271	4.5	1.7	
APR 29	0 1 35	5	9	5	486	Z02748	75886	5.2	B3	D	2 WAX	14	91	63S	38	13	287	-1	105	-1.4	-3.6	
APR 29	0 31 50	11	9	9		Z02750	75888	9.0	F0	D	2 WAX	14	15	40N	324	7	292	-7	29	-1.4	-3.6	
APR 30	0 48 4	9	8	9		Z03476	76491	8.8	F5	D	5 WAX	25	139	23S	85	15	290	-9	148	-2.8	-4.6	
APR 30	0 54 17	9	8	9		Z03477	76492	8.9	B9	D	5 WAX	25	28	46N	335	14	291	-11	38	-2.8	-4.6	
APR 30	0 42 56	5	8	9		Z03478	76493	8.3	K0	D	5 WAX	25	100	62S	46	16	289	-9	110	-2.8	-4.6	
APR 30	1 31 42	5	8	9		Z03499	76509	9.0	G0	D	5 WAX	26	65	83N	14	7	296		74	-2.8	-4.6	

★ STAR DUST

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★ STAR DUST

NATIONAL CAPITAL ASTRONOMERS

APRIL 1968 Vol. XXV No. 8

A METEORITE ODYSSEY

Every day, something like 10^8 meteors enter the earth's atmosphere. Most of these are vaporized completely by the high entry temperatures, but a small fraction are sufficiently massive to survive their fiery plunge; these may often be found and recognized by a careful rock collector. Meteorites of course carry useful clues as to the composition of matter in interplanetary space, and to the age and origin of the solar system.

Dr. Edward P. Henderson, a curator at the Smithsonian Institution, and well-known authority on meteorites, will describe the field work involved in obtaining, identifying, and studying meteorites, as well as summarizing the knowledge gleaned to date from these fascinating intruders. Dr. Henderson's emphasis on field work, and the techniques for recognizing meteorites, will be of interest to amateurs who would like to take up this activity, where they can make a worthwhile contribution to science.

Dr. Henderson has been associated with the Smithsonian Institution throughout most of his career. He received his PhD in astronomy from Bern University in 1963.

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CALENDAR

APRIL 6-------- 6:15 p.m. Dinner with the speaker. Bassin's, at the corner of 14th & Penn. N.W. Call Jerry Hudson 948-2809 to make reservations.

6-------- 8:15 p.m. A METEORITE ODYSSEY. Dr. Edward P. Henderson, Smithsonian Institution. Departmental Auditorium. Followed by regular business meeting.

13-------- 8:15 p.m. Discussion Group. Dept. of Commerce, Rm. 2062. Mr. John Stolarik, former president of N.C.A. will describe a recent trip to Norway with N.A.S.A. and experiments conducted there with releases of barium into the upper atmosphere.

6-------- GENERAL MEETING OF JUNIOR DIVISION at 7:30 P.M. in the Dept. of Commerce auditorium. All Juniors are urged to attend.

14 (?)---- JUNIOR DIVISION ASTRONOMY CLASS. Sunday afternoon at 3 P.M. in the Planetarium of the Montgomery Junior College. Call Mark Goldberg 933-0823 to confirm date.

2,9,16,23,30--- TELESCOPE MAKING CLASS at Chevy Chase Community Center at 7:30 with Hoy Walls.

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PLEASE NOTE THAT THE APRIL MEETING WILL BE HELD AT THE DEPARTMENTAL AUDITORIUM

THE EARLY DAYS OF THE NAVAL OBSERVATORY (MARCH LECTURE)

In 1825, President John Quincy Adams first went before Congress to plead for support of his "lighthouses of the sky". He was distressed that there was not a single astronomical observatory in all of America. There were grave doubts that Congress had the authority to establish such an institution, and for many years Adams' appeals for a national observatory went unheeded. Finally, in 1842, Congress appropriated $25,000 for a new and enlarged Depot of Charts and Instruments (which ultimately became the U.S. Naval Observatory) largely through the efforts of Navy Lieutenant James M. Gilliss.

Lt. Gilliss was put in charge of drawing the plans and securing the required instruments for the new observatory. While Lt. Gilliss was busy with these activities, another Navy Lieutenant by the name of Matthew F. Maury was looking for a command on land because a leg injury made sea duty impossible for him. Lt. Maury was a capable navigator and, in fact, had written an outstanding textbook on navigation. He was also quite an opportunist, and when Lt. Gilliss was in Europe purchasing telescopes, Lt. Maury managed to get himself appointed Superintendent of the new observatory by gaining favor with the right people high in the Navy and the government. (He let the President look at the moon through one of his telescopes one night!) At the beginning of the Civil War in 1861, Maury, a Virginian, resigned from his post at the observatory and joined the Confederacy. At last, the then Captain Gilliss became the superintendent of the Naval Observatory and served until his death in 1865.

The original Naval Observatory building stands on 23rd Street, Northwest opposite the Department of State. The Observatory was moved to its present site in 1893.

Our March speaker, Dr. David Musto, is preparing an article on this subject which will probably appear in a forthcoming issue of the Review of Popular Astronomy.

\- Leith Holloway

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APRIL MEETING AT THE DEPARTMENTAL AUDITORIUM ....

***

NEW MEMBERS

REGULAR

Miss Anne F. Walton
601 Four Mile Rd., #414
Alexandria, Va. 22305

Vincent P. Zirakian
6005 Flanders St.
Springfield, Va. 22150

JUNIOR

John Hunter
4802 Indian Lane
College Park, Maryland 20740

***

BOB WRIGHT and FRANK CECIL ATTEND 13th ANNIVERSARY DINNER-HARRISBURG

Bob Wright, as Regional Representative of the Middle East Region of the Astronomical League along with Mr. Frank Cecil of Baltimore, Regional Treasurer, attended the 13th Anniversary Dinner of the Harrisburg Astronomical Society on Feb. 15th. After the dinner they visited the New Astronomical Park and saw their progress in building a new Observatory facility.

STARDUST, the monthly publication of the Harrisburg group carries a reprint of the paper given by our William Winkler at the 1967 AL Convention held here in Washington.

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REGIONAL CONVENTION - The Amateur Astronomers Assn. of Pittsburgh cordially invites all members to the Middle East Regional Convention to be held June 14, 15, and 16, 1968.

U. S. NAVAL OBSERVATORY COMPLETE LUNAR OCCULTATION PREDICTIONS
COMPUTED FOR WASHINGTON (LAT 38.920 LONG 77.065) FOR 1968 (DISTANCE FROM STANDARD STATION = 0 MILES)
STANDARD STATION AT LAT 38.920 LONG 77.065

DATE	TIME(UT) H M S	ACC SEC	V O	Z.C.	USNO REF NO	S.A.O. NUMBER	MAG	SP	PH	PERCENT SUNLIT	ELG	PA DEG	CUSP ANGL	VA DEG	MOON ALT	MOON AZI	SUN ALT	AA DEG	LIBRATION LONG	LIBRATION LAT	MIN MAG
APR 4	0 0 39	11	2 9		204279	77083	8.7	F5	D	30 WAX	66	26	32N	329	38	261	-6	30	-4.7	-5.8	
APR 4	2 9 51	5	2 9		204342	77125	9.0	MO	D	30 WAX	66	110	66S	51	-33	280		114	-5.1	-5.8	
APR 4	4 43 59	7	3 9	4126	204417	77177	7.9	F8	D	31 WAX	68	46	51N	357	6	301		49	-5.2	-5.6	
APR 5	0 35 47	6	2 9		205629	78117	9.2	F5	D	39 WAX	77	71	71N	11	61	258	-12	70	-5.8	-6.4	
APR 5	1 19 13	7	2 9		205644	78126	8.7	A5	D	39 WAX	77	156	35S	84	53	266		146	-6.0	-6.3	
APR 5	1 59 24	5	2 9		205683	78154	8.0	A0	D	39 WAX	78	88	88N	26	45	273		86	-6.1	-6.3	
APR 5	2 5 8	5	2 9		205689	78159	9.0	F8	D	39 WAX	78	87	87N	25	44	273		85	-6.1	-6.3	
APR 5	2 10 25	6	2 9		205692	78163	8.9	A0	D	39 WAX	78	69	69N	7	43	274		67	-6.1	-6.3	
APR 5	2 53 17	5	2 9		205727	78185	9.1	K2	D	40 WAX	78	102	78S	41	35	280		100	-6.2	-6.2	
APR 5	3 4 26	5	2 9		205733	78191	7.4	A0	D	40 WAX	78	114	66S	53	33	281		112	-6.2	-6.2	
APR 5	3 25 7	5	2 9		205754	78206	9.0	K0	D	40 WAX	78	95	86S	36	29	284		93	-6.2	-6.2	
APR 5	4 10 10	6	2 9		205793	78240	9.6	K0	D	40 WAX	78	74	73N	18	21	290		72	-6.3	-6.2	
APR 5	5 19 52	17	5 9		205951	78283	8.8	A0	D	41 WAX	79	27	26N	336	10	299		25	-6.3	-6.1	
APR 5	5 13 46	6	5 9		205862	78291	7.5	K2	D	41 WAX	79	72	71N	20	10	295		69	-6.3	-6.1	
APR 5	5 26 8	6	5 9		205872	78299	7.9	A0	D	41 WAX	79	129	52S	79	8	299		127	-6.3	-6.1	
APR 6	2 17 53	5	1 9		207037	79155	9.1	G0	D	49 WAX	89	88	81N	26	52	266		91	-6.9	-6.5	
APR 6	2 58 20	9	2 9		207048	79165	9.1	A2	D	49 WAX	89	165	22S	104	44	272		158	-7.0	-6.5	
APR 6	2 46 25	5	2 9	1093A	207053	79172	6.4	F5	D	49 WAX	89	124	63S	63	46	270		117	-7.0	-6.5	
APR 6	4 9 31	9	2 9		207101	79201	8.9	K0	D	50 WAX	90	165	22S	106	30	282		159	-7.1	-6.4	
APR 6	4 55 24	6	2 2		207191	79240	9.2	K2	D	50 WAX	90	135	52S	78	22	288		127	-7.2	-6.3	
APR 6	5 10 6	9	4 9		207177	79256	7.5	K0	D	50 WAX	90	56	49N	1	19	291		43	-7.2	-6.3	
APR 6	5 47 43	6	5 3		207200	79279	5.5	F0	D	51 WAX	90	73	65N	20	13	294		63	-7.2	-6.2	
APR 6	5 55 1	5	2 9	1109	207218	79286	6.9	K0	D	51 WAX	91	110	78S	57	12	295		132	-7.2	-6.2	
APR 6	5 55 9	6	5 9		207219	79287	9.1	G5	D	51 WAX	91	79	71N	26	12	295		71	-7.2	-6.2	
APR 6	6 35 45	6	5 8		207251	79324	8.3	K2	D	51 WAX	91	136	52S	87	5	301		128	-7.2	-6.2	
APR 6	6 59 34	14	5 7		207259	79311	8.0	A0	D	51 WAX	91	174	14S	128	1	304		166	-7.2	-6.1	
APR 7	1 14 43	7	2 3		208155	79935	8.7	K5	D	59 WAX	100	71	58N	28	71	231		59	-7.2	-6.5	
APR 7	2 23 46	24	2 9		208165	79943	9.3	F0	D	59 WAX	101	193	0S	137	59	254		192	-7.4	-6.4	
GRAZING OCCULTATION NEARBY-- APPROXIMATE S. LIMIT LAT. = 38.49 + 0.62(W. LONG. - 77.061																					
APR 7	3 38 11	6	2 9		208224	79982	8.3	G5	D	60 WAX	101	142	51S	83	46	267		130	-7.6	-6.3	
APR 7	4 13 14	6	2 9		208242	79996	9.2	G0	D	60 WAX	101	141	52S	82	39	273		129	-7.6	-6.3	
APR 7	5 16 33	7	6 9		209273	80011	9.1	K0	D	60 WAX	102	156	37S	98	26	283		144	-7.7	-6.1	
APR 7	5 33 31	6	7 9		208290	80021	6.9	A3	D	60 WAX	102	75	62N	19	24	284		65	-7.7	-6.1	
APR 7	5 19 29	5	7 9		208313	80040	8.9	K7	D	61 WAX	102	125	69S	71	15	290		115	-7.7	-6.0	
APR 7	7 8 34	10	7 3		208324	80057	9.1	G0	D	61 WAX	103	170	24S	120	6	295		158	-7.7	-6.0	
APR 9	2 40 23	5	5 9	1349	209174	80596	9.2	G5	D	69 WAX	113	114	84S	69	63	237		99	-7.6	-6.0	
APR 9	4 43 25	5	5 9		209232	80626	8.5	K0	D	70 WAX	114	120	78S	64	41	265		104	-7.8	-5.7	
APR 9	5 37 4	7	7 9		209265	80660	9.1	K0	D	70 WAX	114	70	69N	22	32	274		63	-7.9	-5.6	
APR 9	5 43 9	5	3 8		209272	80657	8.9	K0	D	70 WAX	114	98	79N	42	29	274		82	-7.9	-5.6	
APR 9	7 32 51	5	9 3		209320	80686	8.7	F8	D	71 WAX	115	101	82N	49	9	289		95	-7.9	-5.5	
APR 9	7 35 24	5	9 3	1360	209335	80695	9.2	G5	D	71 WAX	115	116	83S	64	8	290		99	-7.9	-5.4	
APR 9	1 4 15	5	7 6		209987	98826	9.1		M	79 WAX	125	32	9N	55	66	152		14	-7.0	-5.3	
GRAZING OCCULTATION NEARBY-- APPROXIMATE N. LIMIT LAT. = 38.74 + 0.44(W. LONG. - 77.061																					
APR 9	1 8 2	6	6 6		209982	98828	8.0		D	79 WAX	125	144	59S	165	66	154		125	-7.0	-5.3	
APR 9	1 22 17	7	6 6		209985	98835	9.8	G5	D	79 WAX	125	78	55N	93	67	162		59	-7.0	-5.3	
APR 9	1 57 59	5	7 6		209911	98841	9.2		D	79 WAX	125	126	77S	123	69	184		107	-7.1	-5.2	
APR 9	3 46 57	5	7 9	1462	209934	98862	7.6	K0	D	79 WAX	126	115	87N	68	57	236		91	-7.4	-5.0	
APR 9	3 52 19	5	7 6		209941	98865	9.1		D	79 WAX	126	105	82N	62	56	237		85	-7.4	-5.0	
APR 9	4 1 53	6	7 5		209950	98872	9.3		D	79 WAX	126	92	69N	47	54	240		73	-7.4	-5.0	
APR 9	5 16 26	6	1 6		209976	98888	8.5	G	D	80 WAX	126	89	66N	34	41	257		70	-7.6	-4.9	
APR 9	5 46 4	5	9 9		209987	98902	7.5	K0	D	80 WAX	126	128	75S	75	35	262		109	-7.6	-4.8	
APR 9	6 10 25	5	9 9		209995	98907	7.9	K0	D	80 WAX	127	141	62S	87	29	267		121	-7.6	-4.7	
APR 9	6 35 2	12	9 5		210022	98908	9.2		D	80 WAX	127	57	34N	3	26	270		35	-7.6	-4.7	
APR 9	6 55 12	5	9 6		210013	98918	9.1		D	80 WAX	127	131	72S	77	22	273		112	-7.7	-4.7	
APR 9	8 12 6	6	9 7		210046	98936	8.2	K0	D	81 WAX	128	144	59S	93	8	284		125	-7.6	-4.5	
APR 10	0 47 4	27	7 4		210553	99268	9.1	A2	D	87 WAX	137	202	4S	239	51	131		191	-6.2	-4.2	
APR 10	0 18 1	6	7 4		210559	99271	9.1	F8	D	87 WAX	137	149	57S	191	49	122	-8	128	-6.2	-4.3	
APR 10	1 33 3	5	7 5	1577	210550	99285	8.4	A0	D	87 WAX	135	107	81N	133	50	147		86	-6.3	-4.2	
APR 10	3 40 10	6	5 4		210624	99301	9.1	G0	D	88 WAX	139	156	49S	130	58	212		134	-6.7	-3.9	
APR 10	3 40 2	5	9 9	1574	210630	99305	5.3	A0	D	88 WAX	139	128	77S	106	59	208		107	-6.6	-3.9	
APR 10	4 31 45	5	8 4		210644	99314	9.6	MA	D	88 WAX	139	122	83S	86	53	228		101	-6.8	-3.8	
APR 11	0 52 55	9	9 4	1696	211248	118959	8.1	K0	D	94 WAX	151	69	42N	109	42	124		47	-5.1	-2.8	
APR 11	1 52 17	6	8 3		211264	118958	8.7	M5	D	94 WAX	151	167	40S	196	49	142		145	-5.2	-2.7	
APR 11	2 1 2	5	9 3		211277	118968	8.5	F2	D	94 WAX	151	117	90S	144	50	145		95	-5.2	-2.7	
APR 11	4 12 9	10	9 3	1694	211305	118984	8.6	G5	D	94 WAX	152	190	17S	175	54	198		169	-5.5	-2.4	
APR 11	5 34 14	5	9 3		211365	119073	8.7	A5	D	95 WAX	153	125	81S	82	36	241		103	-5.8	-2.0	
APR 11	7 39 35	21	8 3		211374	119021	8.5	K0	D	95 WAX	154	201	5S	152	24	253		179	-5.8	-1.9	
APR 11	7 11 1	5	8 3		211375	119023	8.5	K0	D	95 WAX	153	145	61S	98	29	248		123	-5.8	-2.0	
APR 11	9 17 19	5	9 4		211425	119069	7.7	F6	D	95 WAX	155	134	72S	82	6	269		112	-5.8	-1.7	
APR 12	0 47 14	9	9 3		211926	138796	7.9	G5	D	98 WAX	165	181	25S	225	27	119		159	-3.7	-1.2	
APR 12	1 10 17	5	9 4	1799	211948	138813	7.6	MC	D	98 WAX	165	138	68S	179	31	123		116	-3.7	-1.1	
APR 12	5 14 55	8	3 3	1901	212002	138852	8.0	G5	D	99 WAX	166	192	22S	166	46	200		160	-4.1	-0.5	
APR 12	5 27 37	5	9 3		212017	138861	8.3	K5	D	99 WAX	166	106	82N	89	45	202		84	-4.1	-0.5	
APR 12	7 44 2	5	9 5	1914	212057	138885	6.9	K5	D	99 WAX	157	139	64S	97	27	239		114	-4.3	-0.2	
APR 12	23 54 15	6	9 2		212636	139282	8.4	K0	D	100 WAX	178	153	36S	203	5	105	-3	133	-2.0	0.5	
APR 13	0 43 35	6	9 9		212636	139282	8.4	K0	R	100 WAX	178	273	-89N	319	15	114	-12	252	-1.9	0.6	
APR 12	23 59 59	5	9 4		212641	139284	8.5	G5	D	100 WAX	178	128	60S	177	6	106	-4	109	-2.0	0.5	
APR 13	0 57 31	5	9 9		212641	139284	8.5	G5	R	100 WAX	179	299	-60N	344	16	116		278	-2.0	0.6	
APR 13	0 14 46	5	9 0		212648	139289	8.9	F2	D	100 WAX	178	13	27N	81	9	109	-7	12	-2.0	0.6	
GRAZING OCCULTATION NEARBY-- APPROXIMATE N. LIMIT LAT. = 38.63 + 0.24(W. LONG. - 77.061																					
APR 13	0 45 56	8	9 9		212662	139298	8.5	G0	D	100 WAX	178	74	73N	120	14	114		53	-1.9	0.6	
APR 13	1 24 31	8	9 9		212662	139298	8.5	G0	R	100 WAX	179	356	3N	39	20	121		336	-2.0	0.7	
APR 13	1 7 55	6	9 9		212571	139305	9.3	F8	D	100 WAX	179	104	73S	149	17	111		94	-2.0	0.7	
APR 13	2 6 7	5	9 9		212571	139305	9.3	F8	R	100 WAX	179	329	-13N	5	27	129		307	-2.0	0.8	
APR 13	1 24 12	5	1 9		212681	139312	8.5	F5	D	100 WAX	179	100	72S	142	21	122		79	-2.0	0.7	
APR 13	2 26 16	6	9 9		212681	139310	8.5	F5	R	100 WAX	179	334	1N	9	29	134		313	-2.0	0.9	
APR 13	3 2 22	20	9 9		212695	139319	9.2	G0	D	100 WAX	179	204	-67S	233	33	143		184	-2.1	1.0	
APR 13	3 19 44	20	9 9		212645	139318	9.2	G0	R	100 WAX	179	233	-76N	259	35	147		213	-2.1	1.0	
APR 13	4 40 12	15	9 9		212728	157939	9.4	G5	D	100 WAX	179	200	-79N	207	40	171		199	-2.2	1.2	
APR 13	5 4 21	15	9 9		212728	157939	9.4	G5	R	100 WAX	179	238	-34N	239	41	179		218	-2.3	1.3	
APR 13	4 52 4	12	9 9		212731	157945	9.1	K5	D	100 WAX	179	195	-80N	199	40	175		175	-2.2	1.2	
APR 13	5 21 52	12	9 9		212731	157945	9.1	K5	R	100 WAN	179	243	-24S	239	40	184		223	-2.3	1.3	
APR 13	5 16 47	8	9 9		212762	157953	9.1	K0	D	100 WAN	179	178	-89N	177	40	182		158	-2.3	1.3	
APR 13	6 7 29	8	9 9		212762	157953	9.1	K0	R	100 WAN	178	259	9S	245	39	197		239	-2.4	1.4	
APR 13	5 23 40	19	9 9		212752	157961	9.9	A0	D	100 WAN	179	55	32N	51	41	184		34	-2.3	1.3	
APR 13	5 44 9	19	9 9		212752	157961	9.9	AC	R	100 WAN	179	22	61N	14	40	191		2	-2.3	1.4	
APR 13	5 32 51	5	9 9		212756	157963	8.4	F2	D	100 WAN	179	118	-33N	112	40	187		97	-2.3	1.3	
APR 13	6 45 13	5	9 9		212756	157963	8.4	F2	R	100 WAN	178	317	64S	294	36	209		297	-2.5	1.5	
APR 13	6 46 29	5	9 9		212782	157980	9.9	G0	D	100 WAN	178	115	-42N	93	36	209		95	-2.5	1.5	
APR 13	7 56 50	5	9 9		212782	157980	9.0	G0	R	100 WAN	178	313	69S	278	27	227		293	-2.6	1.6	
APR 13	8 27 25	5	9 9	1942	212797	157989	8.5	G0	R	100 WAN	178	293	51S	253	23	233		273	-2.6	1.7	
APR 13	8 34 13	5	9 9	A	212833	158011	7.9	F2	D	100 WAN	178	121	-60N	81	22	234		101	-2.6	1.7	
APR 13	9 39 44	5	9 3	A	212833	158011	7.9	F2	R	100 WAN	177	296	60S	250	11	246	-11	276	-2.6	1.8	
APR 14	7 16 25	8	9 3	2068	213638	158568	8.2	K5	R	98 WAN	164	253	44S	236	31	200		235	-0.9	3.3	
APR 14	7 17 9	11	9 2		213655	158582	8.6	K5	R	98 WAN	164	5	-24N	348	31	200		347	-0.5	3.3	
APR 15	5 17 33	8	9 3		214585	183434	8.5	K5	R	94 WAN	151	246	-45S	268	24	155		233	1.7	4.7	
APR 15	6 2 3	13	9 3		214635	183474	8.6	K0	R	94 WAN	151	7	-15N	20	27	165		354	1.6	5.8	
APR 16	4 18 30	8	5 5		215682	184386	9.2	AC	R	87 WAN	137	245	51S	285	8	133		237	3.6	5.8	
APR 16	4 36 19	7	7 6	2340	215687	184397	8.3	KC	R	87 WAN	137	338	36N	15	10	136		330	3.6	5.9	
APR 16	5 17 46	5	7 6		215696	184402	9.3	A3	R	87 WAN	137	315	59N	346	15	144		307	3.5	6.0	
APR 16	5 25 25	5	7 6		215699	184404	9.3	K2	R	86 WAN	137	316	50N	350	16	145		309	3.5	6.0	