

# Grange Observatory

## LUNAR OCCULTATIONS FOR YEAR 2019

### TABLES LEGEND

Date/Day/Time	the time scale herein used is the Central Europe Time (CET)
A	estimated calculation error in time of event (seconds)
P	phenomenon
D	star disappearance
R	star reappearance
G	graze occultation
SAO	(when present) Smithsonian Astronomical Observatory catalogue star number
Mag	star magnitude in SAO catalogue
Al	star height above horizon (degrees)
Az	azimuth (degrees)
Sn	Sun height above horizon (negative = below horizon, degrees)
K	Moon's illumination (phase in percent)
Name	(when present) classic star designation

## Occultations 2019 for Grange Observatory WGS 84 coordinates

Day	Date	Time	A	Mag	P	K	Al	Az	Sn	SAO	Name
	d m y	h m s	s			%	°	°	°		
Tue	01-01-2019	04:50:28	1	5.8	R	22%-	12	121	-34	158887	13 Librae
Tue	01-01-2019	07:04:15	1	7.1	R	21%-	28	151	-11	158929	FY Librae
Thu	03-01-2019	06:07:47	1	7.0	R	7%-	4	122	-21	160018	
Tue	08-01-2019	18:41:54	2	5.4	D	6%+	6	237	-16	164286	30 Capricorni
Thu	10-01-2019	18:54:43	1	5.8	D	18%+	22	225	-18	165359	74 Aquarii, HI Aquarii
Sat	12-01-2019	18:20:47	2	7.4	D	35%+	40	197	-12	128739	
Sat	12-01-2019	22:27:51	2	6.9	D	36%+	10	256	-54	128787	
Mon	14-01-2019	20:26:22	1	6.8	D	55%+	46	213	-33	110264	
Tue	15-01-2019	17:32:57	2	4.3	D	64%+	46	133	-4	110723	mu Ceti
Sat	19-01-2019	03:44:04	1	4.4	D	93%+	23	276	-45	77705	chi 1 Orionis
Sun	20-01-2019	06:12:60	1	4.0	D	98%+	9	290	-19	79031	Mekbuda, zeta Geminorum
Tue	22-01-2019	00:14:18	1	6.3	R	99%-	59	145	-64	98276	FZ Cancri
Wed	23-01-2019	05:41:25	1	6.5	R	94%-	39	246	-24	98991	34 Leonis
Sat	26-01-2019	03:31:09	1	6.8	R	69%-	39	148	-47	139053	
Sun	27-01-2019	01:00:17	1	6.5	R	59%-	8	106	-63	139516	
Mon	28-01-2019	03:16:23	1	6.7	R	47%-	17	126	-49	158696	
Wed	30-01-2019	07:05:17	1	4.2	R	26%-	24	160	-9	159918	chi Ophiuchi
Sat	02-02-2019	06:26:51	1	0.8	D	6%-	1	123	-15		Saturn
Sat	02-02-2019	07:31:54	1	0.8	R	6%-	9	135	-4		Saturn
Sat	09-02-2019	19:33:39	2	7.6	D	20%+	27	240	-19	109552	
Mon	11-02-2019	17:00:46	2	4.3	D	37%+	53	166	+8	110543	xi 2 Ceti
Mon	11-02-2019	18:23:48	2	6.9	D	38%+	53	200	-6	110566	
Thu	14-02-2019	00:42:60	1	7.0	D	61%+	19	276	-58	93913	
Fri	15-02-2019	00:06:42	1	6.7	D	71%+	36	262	-57	94467	V1159 Tauri
Fri	15-02-2019	00:37:57	2	6.2	D	71%+	31	268	-58	94478	
Fri	15-02-2019	18:54:23	1	6.8	D	79%+	54	122	-10	78077	
Mon	18-02-2019	01:44:03	1	6.5	D	96%+	49	242	-54	97884	
Mon	18-02-2019	20:40:36	1	6.3	D	99%+	39	107	-28	98561	
Sun	24-02-2019	01:01:26	1	6.5	R	75%-	18	124	-54	139834	
Sun	24-02-2019	01:20:28	1	6.6	R	75%-	20	128	-54	139847	
Thu	28-02-2019	06:43:39	1	6.9	R	33%-	21	162	-6	185966	NSV 24045
Fri	01-03-2019	05:12:20	1	5.4	R	24%-	7	132	-22	187255	28 Sagittarii, NSV 24582
Sat	02-03-2019	06:17:22	1	7.4	R	16%-	9	135	-10	188414	
Sat	09-03-2019	19:40:26	1	7.4	D	9%+	16	259	-13	109952	
Sun	10-03-2019	19:26:17	1	6.8	D	15%+	29	251	-11	110464	
Wed	13-03-2019	19:47:46	2	7.6	D	43%+	56	229	-14	94183	
Fri	15-03-2019	01:22:23	1	6.9	D	56%+	12	287	-46	77889	
Fri	15-03-2019	21:12:17	2	6.6	D	65%+	61	220	-27	78852	
Fri	15-03-2019	21:30:58	2	7.0	D	65%+	59	228	-30	78858	
Sun	17-03-2019	20:48:58	1	6.6	D	85%+	60	150	-23	98265	
Sun	17-03-2019	21:24:16	1	6.3	D	85%+	62	166	-29	98276	FZ Cancri
Wed	20-03-2019	05:22:08	1	5.8	D	99%+	12	270	-14	118735	
Fri	29-03-2019	03:54:58	1	5.6	R	41%-	7	132	-25	187992	
Tue	09-04-2019	21:12:12	2	7.1	D	19%+	22	275	-21	94078	
Tue	09-04-2019	22:35:53	1	6.0	D	20%+	8	288	-31	94112	NGC 1647 star
Wed	10-04-2019	19:52:53	1	7.7	D	28%+	46	251	-8	77323	
Wed	10-04-2019	23:46:47	1	6.9	D	30%+	7	292	-36	77516	Y Tauri
Sat	13-04-2019	20:36:59	1	6.7	D	62%+	62	207	-14	97976	
Sat	13-04-2019	21:56:60	1	6.8	D	62%+	53	237	-25	98019	NSV 17953, M 44 star
Sun	14-04-2019	00:29:34	1	6.8	D	63%+	27	270	-36	98098	
Sun	14-04-2019	20:12:51	1	5.7	D	72%+	61	167	-10	98673	8 Leonis
Tue	16-04-2019	03:48:17	1	5.3	D	85%+	7	278	-19	99305	53 Leonis
Mon	22-04-2019	02:36:58	2	6.3	R	91%-	26	177	-26	159807	
Wed	24-04-2019	02:06:47	1	5.9	R	77%-	15	146	-28		M21, open cluster
Mon	06-05-2019	21:15:18	1	6.9	D	4%+	1	295	-14	93963	
Wed	08-05-2019	21:46:38	1	6.5	D	17%+	16	285	-18	78355	14 Geminorum

Day	Date	Time	A	Mag	P	K	Al	Az	Sn	SAO	Name
	d m y	h m s	s			%	°	°	°		
Thu	09-05-2019	21:04:12	1	7.3	D	26%+	33	268	-12	79361	
Thu	09-05-2019	22:19:11	1	6.5	D	26%+	20	280	-21	79386	
Thu	09-05-2019	22:38:32	1	5.3	D	26%+	17	283	-23	79403	63 Geminorum
Thu	09-05-2019	23:09:50	4	7.2	D	26%+	12	289	-25	79410	
Fri	10-05-2019	20:11:55	1	7.2	D	36%+	50	243	-5	80131	
Fri	10-05-2019	21:23:48	1	7.3	D	36%+	39	260	-15	80164	
Sun	19-05-2019	23:20:47	1	5.6	R	99%-	19	149	-23	160052	
Mon	27-05-2019	04:28:06	2	6.9	R	46%-	22	137	-4	165366	75 Aquarii
Sat	01-06-2019	04:10:18	1	4.3	R	6%-	2	78	-6	110723	mu Ceti
Fri	07-06-2019	22:22:49	1	6.9	D	24%+	16	280	-16	98425	80 Cancri
Tue	25-06-2019	01:57:58	1	4.6	R	53%-	12	111	-19	128572	33 Piscium, BC Piscium
Wed	26-06-2019	03:14:41	2	4.8	R	43%-	21	114	-12	129009	20 Ceti
Thu	04-07-2019	21:21:15	1	6.4	D	6%+	5	292	-9	98162	
Thu	11-07-2019	22:05:29	1	6.8	D	76%+	27	206	-14	159117	NSV 20279
Fri	12-07-2019	23:54:43	1	6.4	D	85%+	17	218	-22	159745	
Mon	15-07-2019	01:48:32	1	5.7	D	96%+	13	218	-21	186135	NSV 09996
Tue	16-07-2019	01:28:50	1	5.9	D	99%+	18	203	-22	187468	
Tue	16-07-2019	22:19:29	2	8.2	D	36%E	15	147	-16		
Tue	16-07-2019	23:13:35	2	8.2	R	52%E	20	159	-21		
Sun	28-07-2019	04:21:38	4	7.1	R	20%-	29	92	-8	94078	
Sat	24-08-2019	04:47:04	1	3.8	R	44%-	53	128	-10	93897	Hyadum II, delta 1 Tauri
Sat	24-08-2019	06:39:52	1	4.3	R	44%-	63	175	+9	93923	68 Tauri, V776 Tauri
Sun	25-08-2019	03:19:05	1	7.7	R	34%-	32	93	-23	77054	
Sun	25-08-2019	03:42:22	1	7.8	R	34%-	36	97	-20	77064	
Sun	25-08-2019	04:06:59	1	7.6	R	34%-	40	102	-16	77076	
Sun	25-08-2019	04:27:06	1	6.8	R	34%-	44	107	-13	77084	CD Tauri
Sun	25-08-2019	05:12:29	2	6.2	R	34%-	51	117	-6	77098	
Mon	26-08-2019	02:22:28	1	7.4	R	25%-	14	74	-29	78074	NSV 02859
Mon	26-08-2019	03:38:09	1	7.0	R	24%-	27	85	-21	78129	
Tue	27-08-2019	03:34:56	1	7.0	R	15%-	17	75	-21	79216	NSV 17395
Tue	27-08-2019	04:44:07	1	3.5	D	15%-	28	86	-11	79294	Wasat, delta Geminorum
Tue	27-08-2019	05:35:50	1	3.5	R	14%-	37	95	-3	79294	Wasat, delta Geminorum
Mon	02-09-2019	20:49:12	1	7.0	D	16%+	3	257	-17	139548	
Wed	11-09-2019	01:21:15	1	4.9	D	91%+	13	224	-39	189986	Chow, eta Capricorni
Sat	14-09-2019	20:02:07	1	4.4	R	99%-	7	105	-14	147042	30 Piscium, YY Piscium
Sat	14-09-2019	22:07:15	1	4.6	R	99%-	26	130	-32	128572	33 Piscium, BC Piscium
Wed	18-09-2019	05:40:33	1	6.2	R	86%-	43	233	-7	110565	
Thu	19-09-2019	01:07:39	2	6.1	R	80%-	43	119	-42	93327	
Fri	20-09-2019	05:39:22	2	6.1	R	70%-	60	206	-7	93777	
Sat	21-09-2019	01:44:26	1	6.4	R	61%-	37	100	-41	94199	
Sun	22-09-2019	00:54:17	1	7.3	R	51%-	21	80	-44	77596	
Mon	23-09-2019	00:56:02	1	7.0	R	40%-	13	71	-44	78742	
Mon	23-09-2019	01:39:14	2	7.3	R	40%-	20	78	-42	78774	
Mon	23-09-2019	06:10:20	2	6.9	R	38%-	63	140	-2	78921	
Wed	25-09-2019	03:09:51	1	7.6	R	18%-	13	76	-32	98198	
Thu	03-10-2019	20:37:51	1	6.3	D	31%+	6	232	-27	185024	
Fri	04-10-2019	20:41:36	1	6.3	D	41%+	11	221	-28		M20, Trifid nebula
Wed	16-10-2019	06:08:23		5.6	G	95%-	29	259	-8	93276	
Sat	19-10-2019	03:31:19	2	6.4	R	75%-	64	151	-35	77358	
Sun	20-10-2019	23:50:40	1	6.8	R	56%-	13	72	-55	79401	NSV 17476
Mon	21-10-2019	04:29:19	2	7.0	R	54%-	59	129	-26	79558	
Tue	22-10-2019	02:27:09	1	5.3	R	44%-	29	89	-46	80243	eta Cancri
Tue	22-10-2019	04:12:26	1	7.5	R	43%-	46	110	-29	80278	
Tue	22-10-2019	06:25:20	4	6.8	R	42%-	63	155	-6	80354	M 44 star
Wed	23-10-2019	01:39:27	1	7.3	R	33%-	9	74	-52	98600	
Thu	24-10-2019	06:15:02	1	7.8	R	21%-	42	119	-8	99210	
Fri	25-10-2019	05:17:26	1	7.9	R	12%-	21	100	-19	118905	NSV 18783
Fri	01-11-2019	18:56:13	2	5.5	D	24%+	13	215	-17	186981	24 Sagittarii
Fri	01-11-2019	20:08:31	1	5.1	D	25%+	5	229	-30		M22, globular cluster

Day	Date	Time	A	Mag	P	K	Al	Az	Sn	SAO	Name
	d m y	h m s	s			%	°	°	°		
Wed	06-11-2019	22:11:49	3	6.9	D	72%+	28	210	-51	165366	75 Aquarii
Mon	11-11-2019	22:42:29	1	6.3	D	99%+	53	151	-56	93067	85 (Ceti)/Arietis, NSV 00899
Fri	15-11-2019	20:59:32	1	5.9	R	89%+	15	73	-42	78045	NSV 16789
Fri	15-11-2019	23:23:17	1	3.5	R	88%+	39	97	-61	78135	Propus, eta Geminorum
Fri	15-11-2019	23:23:17	1	6.1	R	88%+	39	97	-61		
Sat	16-11-2019	03:56:21	2	2.9	R	87%+	66	203	-38	78297	Tejat Posterior, mu Geminorum
Tue	19-11-2019	02:07:53	1	7.0	R	59%+	36	100	-55	98468	
Tue	19-11-2019	06:54:29	1	7.3	R	57%+	61	205	-7	98552	
Fri	22-11-2019	02:51:17	2	7.1	R	25%+	7	90	-50	119200	IZ Virginis
Fri	22-11-2019	04:38:34	1	7.4	R	25%+	24	110	-31	119227	
Fri	22-11-2019	06:48:47	2	6.9	R	24%+	42	141	-9	119262	
Sat	23-11-2019	04:24:10	1	7.5	R	15%+	9	101	-34	139090	
Thu	28-11-2019	10:20:07	1	-1.4	D	4%+	6	131	+18		Jupiter
Thu	28-11-2019	11:31:21	1	-1.4	R	4%+	14	145	+23		Jupiter
Mon	02-12-2019	18:50:31	1	7.5	D	35%+	25	200	-20	164637	
Thu	05-12-2019	16:56:28	3	4.4	D	63%+	28	133	-2	147042	30 Piscium, YY Piscium
Thu	05-12-2019	19:03:56	1	4.6	D	64%+	39	168	-23	128572	33 Piscium, BC Piscium
Thu	05-12-2019	23:09:30	7	5.8	D	65%+	22	237	-63	128621	NSV 15038
Mon	09-12-2019	01:46:43	1	6.2	D	89%+	29	254	-62	110565	
Mon	09-12-2019	20:56:23	1	6.1	D	94%+	52	140	-43	93327	
Wed	11-12-2019	00:36:25	2	6.1	D	98%+	58	215	-68	93777	
Fri	13-12-2019	02:26:44	1	6.4	R	99%+	62	222	-57	77858	141 (Tauri)/Orionis
Fri	13-12-2019	06:17:25	1	5.9	R	99%+	26	276	-18	78045	NSV 16789
Sat	14-12-2019	04:18:40	2	6.0	R	96%+	55	241	-38	79042	44 Geminorum
Sun	15-12-2019	05:26:59	1	5.3	R	90%+	53	242	-26	79959	mu Cancri
Tue	17-12-2019	05:10:47	2	6.4	R	72%+	60	187	-29	98944	
Tue	17-12-2019	06:55:20	1	7.1	R	72%+	51	229	-12	98960	
Thu	19-12-2019	00:28:11	1	4.0	R	52%+	5	85	-68	119035	nu Virginis
Thu	19-12-2019	06:45:10	1	7.6	R	50%+	50	182	-14	119125	
Mon	23-12-2019	06:22:24	1	6.8	R	10%+	12	128	-18	159285	
Mon	30-12-2019	17:45:04	2	6.6	D	19%+	26	205	-8	164949	