

Five Millennium Catalog of Lunar Eclipses: -1999 to +3000 (2nd Edition)
Fred Espenak and Jean Meeus

Cat Num	Canon Plate	Calendar Date	Greatest Eclipse	ΔT s	ID of						Eclipse Phase						Greatest		
					Luna Num	Saros Num	Ecl. Type	QSE	Gamma	Pen. Mag.	Um. Mag.	Pen. Mag.	Par.	Total	m	m	m	in Zenith	
																		Lat.	Long.
9661	484	2005 Apr 24	09:55:55	65	65	141	N	h-	-1.0885	0.8650	-0.1436	245.6	-	-	-	-	14S	150W	
9662	484	2005 Oct 17	12:04:27	65	71	146	P	a-	0.9796	1.0585	0.0625	259.8	56.0	-	-	-	10N	175E	
9663	484	2006 Mar 14	23:48:34	65	76	113	N*	-t	1.0210	1.0300	-0.0604	287.5	-	-	-	-	3N	6E	
9664	484	2006 Sep 07	18:52:25	65	82	118	P	a-	-0.9262	1.1329	0.1837	254.4	91.1	-	-	-	7S	77E	
9665	484	2007 Mar 03	23:21:59	65	88	123	T	-p	0.3175	2.3188	1.2328	365.4	221.1	73.4	7N	13E			
9666	484	2007 Aug 28	10:38:27	66	94	128	T-	-p	-0.2145	2.4526	1.4758	327.3	212.2	90.0	10S	159W			
9667	484	2008 Feb 21	03:27:09	66	100	133	T	a-	-0.3992	2.1451	1.1062	339.0	205.4	49.8	10N	48W			
9668	484	2008 Aug 16	21:11:12	66	106	138	P	t-	0.5646	1.8366	0.8076	330.5	188.1	-	-	-	13S	43E	
9669	484	2009 Feb 09	14:39:22	66	112	143	N	a-	-1.0640	0.8994	-0.0882	238.8	-	-	-	-	14N	144E	
9670	484	2009 Jul 07	09:39:43	66	117	110	N	-t	-1.4915	0.1562	-0.9133	121.5	-	-	-	-	24S	143W	
9671	484	2009 Aug 06	00:40:18	66	118	148	N	t-	1.3572	0.4019	-0.6661	189.8	-	-	-	-	16S	9W	
9672	484	2009 Dec 31	19:23:46	67	123	115	P	-a	0.9765	1.0556	0.0763	251.1	60.0	-	-	-	24N	70E	
9673	484	2010 Jun 26	11:39:34	67	129	120	P	-t	-0.7091	1.5773	0.5368	322.1	162.9	-	-	-	24S	174W	
9674	484	2010 Dec 21	08:18:04	67	135	125	T	-p	0.3214	2.2807	1.2561	335.1	208.7	72.3	24N	125W			
9675	484	2011 Jun 15	20:13:43	67	141	130	T+	pp	0.0897	2.6868	1.6999	336.1	219.3	100.2	23S	57E			
9676	484	2011 Dec 10	14:32:56	68	147	135	T	p-	-0.3882	2.1860	1.1061	356.4	212.2	51.1	23N	140E			
9677	484	2012 Jun 04	11:04:20	68	153	140	P	a-	0.8247	1.3183	0.3704	270.0	126.6	-	-	-	22S	166W	
9678	484	2012 Nov 28	14:34:07	68	159	145	N	t-	-1.0869	0.9155	-0.1873	276.0	-	-	-	-	20N	139E	
9679	484	2013 Apr 25	20:08:38	68	164	112	P	-a	-1.0121	0.9866	0.0148	247.7	27.0	-	-	-	14S	57E	
9680	484	2013 May 25	04:11:06	68	165	150	Nb	a-	1.5350	0.0157	-0.9335	33.6	-	-	-	-	19S	63W	
9681	485	2013 Oct 18	23:51:25	68	170	117	N	-h	1.1508	0.7649	-0.2718	239.1	-	-	-	-	11N	2W	
9682	485	2014 Apr 15	07:46:48	69	176	122	T	-a	-0.3017	2.3182	1.2907	343.9	214.7	77.8	10S	116W			
9683	485	2014 Oct 08	10:55:44	69	182	127	T	-p	0.3826	2.1456	1.1659	318.1	199.5	58.8	6N	167W			
9684	485	2015 Apr 04	12:01:24	69	188	132	T	t-	0.4460	2.0792	1.0008	357.5	209.0	4.7	5S	179W			
9685	485	2015 Sep 28	02:48:17	69	194	137	T	p-	-0.3296	2.2296	1.2764	310.7	199.9	71.9	2N	44W			
9686	485	2016 Mar 23	11:48:21	70	200	142	N	t-	1.1591	0.7747	-0.3118	255.4	-	-	-	-	0S	175W	
9687	485	2016 Sep 16	18:55:27	70	206	147	N	a-	-1.0548	0.9080	-0.0635	239.3	-	-	-	-	3S	75E	
9688	485	2017 Feb 11	00:45:03	70	211	114	N	a-	-1.0254	0.9884	-0.0354	259.2	-	-	-	-	13N	8W	
9689	485	2017 Aug 07	18:21:38	70	217	119	P	-t	0.8668	1.2886	0.2464	300.9	115.2	-	-	-	15S	86E	
9690	485	2018 Jan 31	13:31:00	71	223	124	T	-p	-0.3014	2.2941	1.3155	317.2	202.7	76.1	17N	161E			
9691	485	2018 Jul 27	20:22:54	71	229	129	T+	pp	0.1168	2.6792	1.6087	373.8	234.5	103.0	19S	56E			
9692	485	2019 Jan 21	05:13:27	71	235	134	T	p-	0.3684	2.1684	1.1953	311.5	196.8	62.0	20N	75W			
9693	485	2019 Jul 16	21:31:55	71	241	139	P	t-	-0.6430	1.7037	0.6531	333.7	177.9	-	22S	39E			
9694	485	2020 Jan 10	19:11:11	72	247	144	N	a-	1.0726	0.8956	-0.1160	244.6	-	-	-	-	23N	74E	
9695	485	2020 Jun 05	19:26:14	72	252	111	N	-a	1.2406	0.5683	-0.4053	198.2	-	-	-	-	21S	69E	
9696	485	2020 Jul 04	04:31:12	72	253	149	N	a-	-1.3638	0.3546	-0.6436	165.0	-	-	-	-	24S	66W	
9697	485	2020 Nov 30	09:44:01	72	258	116	N	-t	-1.1309	0.8285	-0.2620	261.0	-	-	-	-	21N	148W	
9698	485	2021 May 26	11:19:53	72	264	121	T	a-	0.4774	1.9540	1.0095	302.0	187.4	14.5	21S	170W			
9699	485	2021 Nov 19	09:04:06	73	270	126	P	-t	-0.4552	2.0720	0.9742	361.5	208.4	-	-	-	19N	139W	
9700	485	2022 May 16	04:12:42	73	276	131	T-	p-	-0.2532	2.3726	1.4137	318.7	207.2	84.9	19S	64W			
9701	486	2022 Nov 08	11:00:22	73	282	136	T+	p-	0.2570	2.4143	1.3589	353.9	219.8	85.0	17N	169W			
9702	486	2023 May 05	17:24:05	73	288	141	N	h-	-1.0349	0.9636	-0.0457	257.5	-	-	-	-	17S	98E	
9703	486	2023 Oct 28	20:15:18	74	294	146	P	a-	0.9471	1.1181	0.1220	264.6	77.4	-	-	-	14N	52E	
9704	486	2024 Mar 25	07:13:59	74	299	113	N	-t	1.0609	0.9557	-0.1325	279.1	-	-	-	-	1S	106W	
9705	486	2024 Sep 18	02:45:25	74	305	118	P	a-	-0.9792	1.0372	0.0848	246.3	62.8	-	-	-	3S	42W	
9706	486	2025 Mar 14	06:59:56	75	311	123	T	-p	0.3484	2.2595	1.1784	362.6	218.3	65.4	3N	102W			
9707	486	2025 Sep 07	18:12:58	75	317	128	T	-p	-0.2752	2.3440	1.3619	326.7	209.4	82.1	6S	87E			
9708	486	2026 Mar 03	11:34:52	75	323	133	T	a-	-0.3765	2.1838	1.1507	338.6	207.2	58.3	6N	171W			
9709	486	2026 Aug 28	04:14:04	75	329	138	P	t-	0.4964	1.9645	0.9299	337.8	198.1	-	-	-	9S	63W	
9710	486	2027 Feb 20	23:14:06	76	335	143	N	a-	-1.0480	0.9266	-0.0569	241.0	-	-	-	-	10N	15E	
9711	486	2027 Jul 18	16:04:09	76	340	110	Ne	-t	-1.5758	0.0014	-1.0680	11.8	-	-	-	-	22S	121E	
9712	486	2027 Aug 17	07:14:59	76	341	148	N	t-	1.2797	0.5456	-0.5254	218.6	-	-	-	-	12S	108W	
9713	486	2028 Jan 12	04:14:13	76	346	115	P	-a	0.9817	1.0468	0.0662	250.7	56.0	-	-	-	23N	61W	
9714	486	2028 Jul 06	18:20:57	77	352	120	P	-t	-0.7903	1.4266	0.3892	310.6	141.5	-	-	-	23S	86E	
9715	486	2028 Dec 31	16:53:15	77	358	125	T	-p	0.3258	2.2742	1.2463	336.2	208.8	71.3	23N	108E			
9716	486	2029 Jun 26	03:23:22	77	364	130	T+	pp	0.0124	2.8266	1.8436	335.1	219.5	101.9	23S	50W			
9717	486	2029 Dec 20	22:43:12	78	370	135	T	p-	-0.3811	2.2008	1.1174	358.0	213.3	53.7	23N	19E			
9718	486	2030 Jun 15	18:34:34	78	376	140	P	a-	0.7534	1.4480	0.5025	278.2	144.4	-	-	-	23S	82E	
9719	486	2030 Dec 09	22:28:51	78	382	145	N	t-	-1.0731	0.9416	-0.1628	279.2	-	-	-	-	22N	21E	
9720	486	2031 May 07	03:52:02	78	387	112	N	a-	-1.0694	0.8814	-0.0904	237.3	-	-	-	-	18S	59W	