

# *Eclipses de Lune visibles en France de 2013 à 2023*

## **Lunar Eclipse Type**

The first character in this 2-character parameter gives the lunar eclipse type. The three basic types of lunar eclipses are:

- 1) N = Penumbral Lunar Eclipse (Moon traverses through Earth's penumbral shadow; Moon is partly or completely within the penumbra)
- 2) P = Partial Lunar Eclipse (Part of the Moon traverses through Earth's umbral shadow)
- 3) T = Total Lunar Eclipse (Entire Moon traverses through Earth's umbral shadow)

The second character of the lunar eclipse type is a qualifier defined as follows.

- 1) m = Middle eclipse of Saros series.
- 2) + = Central total eclipse (Moon's center passes north of shadow axis).
- 3) - = Central total eclipse (Moon's center passes south of shadow axis).
- 4) \* = Total penumbral eclipse.
- 5) b = Saros series begins (first penumbral eclipse in a Saros series).
- 6) e = Saros series ends (last penumbral eclipse in a Saros series).

Qualifiers 1 through 3 are used exclusively with total lunar eclipses while qualifiers 4 through 6 are only used with penumbral eclipses.

## **Quincena Solar Eclipse Parameter (QSE)**

A solar eclipse always occurs within ~15 days of a lunar eclipse. The Quincena Solar Eclipse parameter (QSE) identifies the type of the solar eclipse and whether it precedes or succeeds a particular lunar eclipse. There are four basic types of solar eclipses:

- 1) p = partial solar eclipse (Moon's penumbral shadow traverses Earth; umbral/antumbral shadow completely misses Earth)
- 2) a = annular solar eclipse (Moon's antumbral shadow traverses Earth; Moon is too far from Earth to completely cover the Sun)
- 3) t = total solar eclipse (Moon's umbral shadow traverses Earth; Moon is close enough to Earth to completely cover the Sun)
- 4) h = hybrid solar eclipse (Moon's umbral and antumbral shadows traverse different parts of Earth; eclipse appears either total or annular along different sections of its path—hybrid eclipses are also known as annular-total eclipses)

The QSE is a two character string consisting of one or more of the above solar eclipse types. The first character in the QSE identifies a solar eclipse preceding a lunar eclipse, while the second character identifies a solar eclipse succeeding a lunar eclipse. In most instances, one of the two characters is “-” indicating a single solar eclipse either precedes or succeeds the lunar eclipse. On rare occasions, a double quincena occurs in which a lunar eclipse is both preceded and succeeded by solar eclipses.

Calendar Date	TD of Greatest Eclipse	DT	Luna Num	Saros Num	Ecl. Type	QSE	Gamma	Pen.Mag.	Um.Mag.	Eclipse Phase ---- Durations ----			Greatest in Zenith	
										Pen.	Par.	Total	Lat.	Lng.
2013 Apr 25	20:08:38	68	164	112	P	-a	-1.0121	0.9866	0.0148	247.7	27.0	-	14S	57E
2013 May 25	04:11:06	68	165	150	Nb	a-	1.5350	0.0157	-0.9335	33.6	-	-	19S	63W
2013 Oct 18	23:51:25	68	170	117	N	-h	1.1508	0.7649	-0.2718	239.1	-	-	11N	2W
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
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
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
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
2016 Mar 23	11:48:21	70	200	142	N	t-	1.1591	0.7747	-0.3118	255.4	-	-	0S	175W
2016 Sep 16	18:55:27	70	206	147	N	a-	-1.0548	0.9080	-0.0635	239.3	-	-	3S	75E
2017 Feb 11	00:45:03	70	211	114	N	-a	-1.0254	0.9884	-0.0354	259.2	-	-	13N	8W
2017 Aug 07	18:21:38	70	217	119	P	-t	0.8668	1.2886	0.2464	300.9	115.2	-	15S	86E
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
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
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
2019 Jul 16	21:31:55	71	241	139	P	t-	-0.6430	1.7037	0.6531	333.7	177.9	-	22S	39E
2020 Jan 10	19:11:11	72	247	144	N	a-	1.0726	0.8956	-0.1160	244.6	-	-	23N	74E
2020 Jun 05	19:26:14	72	252	111	N	-a	1.2406	0.5683	-0.4053	198.2	-	-	21S	69E
2020 Jul 05	04:31:12	72	253	149	N	a-	-1.3638	0.3546	-0.6436	165.0	-	-	24S	66W
2020 Nov 30	09:44:01	72	258	116	N	-t	-1.1309	0.8285	-0.2620	261.0	-	-	21N	148W
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
2021 Nov 19	09:04:06	73	270	126	P	-t	-0.4552	2.0720	0.9742	361.5	208.4	-	19N	139W
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
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
2023 May 05	17:24:05	73	288	141	N	h-	-1.0349	0.9636	-0.0457	257.5	-	-	17S	98E
2023 Oct 28	20:15:18	74	294	146	P	a-	0.9471	1.1181	0.1220	264.6	77.4	-	14N	52E

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