Events featuring the natural satellites of Jupiter, October 2025

The satellites (also known as Galilean satellites in honor of the first person to observe them) of Jupiter provide some of the most striking phenomena observable with basic instrumentation. With a good pair of binoculars mounted on a tripod or a small telescope, we may be able to observe eclipses, occultations and transits of the Galilean satellites or their shadows over Jupiter. Similarly, telescopic observation of Jupiter's Great Red Spot (GRS) allows us to enjoy one of the largest storms in the entire Solar System. The following table summarizes all the events featuring Jupiter's satellites and observable from Granada.

- Column 1: Day of the month
- Column 2: Time in Coordinated Universal Time (to transform to local time add one hour in winter time and two in summer time)
- Column 3: Jupiter's altitude above the horizon
- Column 4: Main object: GMR, Great Red Spot; Gan, Ganymede; Cal, Callisto; Io, Io; Eur: Europa.
- Column 5: Event

For those unfamiliar with astronomical language, here we indicate what each of the phenomena tabulated below consists of:

- Transit: This occurs when one of Jupiter's satellites is between us and the planet, i.e. it is (in projection) over Jupiter's disk.

- Transit of the shadow: Based on the previous definition, you can get an idea of what I'm referring to here. Both Jupiter and its satellites are illuminated by the Sun and they all project a shadow in turn. This shadow, if projected by a satellite, can be lost in space or can fall on Jupiter's surface. If this is the case, we will be able to see a dark spot moving across the surface of the planet. For an observer located on Jupiter's surface, it would be a solar eclipse.

- Occultation: If the shadow, instead of being projected by the satellite onto Jupiter's surface, is projected by Jupiter onto the satellite, an eclipse will occur. What we can observe is that a given satellite goes from being visible to not being visible, because it is in the shadow projected by Jupiter and therefore does not receive any light to reflect and be visible. It would be the equivalent phenomenon to a lunar eclipse on Earth.

- Regarding the Great Red Spot (GRS), what we tabulate in this table is the moment when it passes through the central meridian, i.e. when the spot is in front of us.

Day	Time (UT)	Altitude (^{o})	Objet	Event
(1)	(2)	(3)	(4)	(5)
01	04:27	48.5	GRS	Crosses central meridian
04	01:57	20.9	GRS	Crosses central meridian
04	05:28	62.5	Eur	Shadow transit begins
05	04:02	46.7	Io	Eclipse begins
06	01:17	14.7	Io	Shadow transit begins
06	01:30	17.1	Gan	Shadow transit ends
06	02:34	29.8	Io	Transit begins
06	03:33	41.8	Io	Shadow transit ends
06	03:34	41.8	Gan	Transit begins
06	03:35	42.1	GRS	Crosses central meridian
06	04:50	57.0	Io	Transit ends
06	05:33	64.6	Eur	Occultation ends
07	02:06	25.0	Io	Occultation ends
08	00:16	4.6	Eur	Transit ends
08	05:14	62.7	GRS	Crosses central meridian
09	01:05	14.6	GRS	Crosses central meridian
10	02:19	29.9	Cal	Eclipse begins
10	05:25	66.0	Cal	Eclipse ends
11	02:43	35.7	GRS	Crosses central meridian
12	05:56	71.6	Io	Eclipse begins
13	02:24	33.3	Gan	Shadow transit begins
13	02:45	37.6	Eur	Eclipse begins
13	03:11	42.7	Io	Shadow transit begins
13	04:22	56.8	GRS	Crosses central meridian
13	04:28	57.9	Io	Transit begins
13	05:27	68.2	Io	Shadow transit ends
13	05:29	68.5	Gan	Shadow transit ends
14	00:13	8.5	GRS	Crosses central meridian
14	00:24	10.5	Io	Eclipse begins
14	04:00	53.3	Io	Occultation ends
14	23:54	5.6	Io	Shadow transit ends
15	00:02	7.1	Eur	Transit begins
15	00:12	9.0	Eur	Shadow transit ends
15	01:13	20.8	Io	Transit ends
15	02:54	41.0	Eur	Transit ends
15	06:00	73.2	GRS	Crosses central meridian
16	01:52	29.2	GRS	Crosses central meridian
17	00:42	16.2	Gan	Occultation ends
18	03:30	50.5	GRS	Crosses central meridian
19	01:12	23.7	Cal	Transit begins
19	04:59	67.5	Cal	Transit ends
20	05:04	68.9	Io	Shadow transit begins
20	05:08	69.5	GRS	Crosses central meridian
20	05:18	70.9	Eur	Eclipse begins
21	01:00	22.8	GRS	Crosses central meridian

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Day	Time (TU)	Altitude (^{o})	Objet	Event
(1)	(2)	(3)	(4)	(5)
21	02:18	38.4	Io	Eclipse begins
21	05:54	74.3	Io	Occultation ends
21	23:32	6.6	Io	Shadow transit begins
21	23:59	11.7	Eur	Shadow transit begins
22	00:49	21.6	Io	Transit begins
22	01:47	33.1	Io	Shadow transit ends
22	02:38	43.2	Eur	Transit begins
22	02:49	45.4	Eur	Shadow transit ends
22	03:06	48.8	Io	Transit ends
22	05:29	73.0	Eur	Transit ends
23	00:23	17.1	Io	Occultation ends
23	02:38	44.1	GRS	Crosses central meridian
23	23:17	5.3	Gan	Eclipse ends
23	23:57	12.8	Eur	Occultation ends
24	01:21	29.5	Gan	Occultation begins
24	04:38	67.4	Gan	Occultation ends
25	04:16	64.4	GRS	Crosses central meridian
26	00:08	16.5	GRS	Crosses central meridian
26	23:34	10.7	Cal	Eclipse ends
27	05:55	74.3	GRS	Crosses central meridian
28	01:46	37.6	GRS	Crosses central meridian
28	04:12	65.6	Io	Eclipse begins
29	01:25	34.1	Io	Shadow transit begins
29	02:35	48.2	Eur	Shadow transit begins
29	02:41	49.4	Io	Transit begins
29	03:41	60.8	Io	Shadow transit ends
29	04:57	72.5	Io	Transit ends
29	05:11	73.7	Eur	Transit begins
29	05:25	74.4	Eur	Shadow transit ends
30	02:15	44.9	Io	Occultation ends
30	03:24	58.5	GRS	Crosses central meridian
30	23:16	10.2	GRS	Crosses central meridian
30	23:25	12.0	Io	Transit ends
31	00:09	20.5	Gan	Eclipse begins
31	02:27	48.1	Eur	Occultation ends
31	03:17	57.9	Gan	Eclipse ends
31	05:13	74.2	Gan	Occultation begins

Table 1: Phenomena Featuring Jupiter's Satellites and the Great Red Spot (GRS)