Phenomena of Jupiter's Moons, January 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Jan. 1	14:12	III.Ec.D		8:01	I.Oc.R		17:09	I.Sh.E	**Jan. 14**	0:57	I.Ec.D
	15:39	I.Ec.D		8:56	III.Tr.I		18:13	I.Tr.E		4:18	I.Oc.R
	17:39	III.Ec.R		12:06	III.Tr.E	**Jan. 10**	12:01	I.Ec.D		15:40	II.Sh.I
	19:06	III.Oc.D		18:52	II.Ec.D		15:24	I.Oc.R		17:50	II.Tr.I
	19:06	I.Oc.R		23:54	II.Oc.R		21:12	IV.Sh.I		18:29	II.Sh.E
	22:19	III.Oc.R	**Jan. 6**	1:57	I.Sh.I	**Jan. 11**	0:43	IV.Sh.E		20:34	II.Tr.E
Jan. 2	5:35	II.Ec.D		3:05	I.Tr.I		2:23	II.Sh.I		22:18	I.Sh.I
	10:41	II.Oc.R		4:12	I.Sh.E		4:37	II.Tr.I		23:21	I.Tr.I
	11:32	IV.Ec.D		5:19	I.Tr.E		5:12	II.Sh.E	**Jan. 15**	0:33	I.Sh.E
	13:01	I.Sh.I		23:04	I.Ec.D		7:21	II.Tr.E		1:35	I.Tr.E
	14:10	I.Tr.I	**Jan. 7**	2:29	I.Oc.R		8:05	IV.Tr.I		19:26	I.Ec.D
	15:10	IV.Ec.R		13:05	II.Sh.I		9:22	I.Sh.I		22:08	III.Ec.D
	15:16	I.Sh.E		15:23	II.Tr.I		10:12	IV.Tr.E		22:45	I.Oc.R
	16:24	I.Tr.E		15:54	II.Sh.E		10:27	I.Tr.I	**Jan. 16**	1:34	III.Ec.R
	23:24	IV.Oc.D		18:07	II.Tr.E		11:37	I.Sh.E		2:30	III.Oc.D
Jan. 3	1:42	IV.Oc.R		20:25	I.Sh.I		12:41	I.Tr.E		5:40	III.Oc.R
	10:07	I.Ec.D		21:32	I.Tr.I	**Jan. 12**	6:29	I.Ec.D		10:42	II.Ec.D
	13:34	I.Oc.R		22:40	I.Sh.E		8:10	III.Sh.I		15:31	II.Oc.R
	23:48	II.Sh.I		23:46	I.Tr.E		9:51	I.Oc.R		16:47	I.Sh.I
Jan. 4	2:10	II.Tr.I	**Jan. 8**	17:32	I.Ec.D		11:33	III.Sh.E		17:48	I.Tr.I
	2:37	II.Sh.E		18:10	III.Ec.D		12:37	III.Tr.I		19:02	I.Sh.E
	4:54	II.Tr.E		20:56	I.Oc.R		15:46	III.Tr.E		20:02	I.Tr.E
	7:29	I.Sh.I		21:36	III.Ec.R		21:25	II.Ec.D	**Jan. 17**	13:54	I.Ec.D
	8:37	I.Tr.I		22:50	III.Oc.D	**Jan. 13**	2:19	II.Oc.R		17:12	I.Oc.R
	9:44	I.Sh.E	**Jan. 9**	2:01	III.Oc.R		3:50	I.Sh.I	**Jan. 18**	4:58	II.Sh.I
	10:51	I.Tr.E		8:08	II.Ec.D		4:54	I.Tr.I		7:03	II.Tr.I
Jan. 5	4:13	III.Sh.I		13:07	II.Oc.R		6:05	I.Sh.E		7:47	II.Sh.E
	4:36	I.Ec.D		14:54	I.Sh.I		7:08	I.Tr.E		9:47	II.Tr.E
	7:36	III.Sh.E		16:00	I.Tr.I					11:15	I.Sh.I

	12:15	I.Tr.I		21:04	II.Sh.E		12:10	II.Tr.E		20:51	II.Sh.I
	13:30	I.Sh.E		22:58	II.Tr.E		13:08	I.Sh.I		22:37	II.Tr.I
	14:29	I.Tr.E	**Jan. 22**	0:11	I.Sh.I		14:02	I.Tr.I		23:39	II.Sh.E
Jan. 19	5:32	IV.Ec.D		1:09	I.Tr.I		15:23	I.Sh.E	**Jan. 29**	1:21	II.Tr.E
	8:23	I.Ec.D		2:26	I.Sh.E		16:16	I.Tr.E		2:04	I.Sh.I
	9:02	IV.Ec.R		3:22	I.Tr.E	**Jan. 26**	10:16	I.Ec.D		2:55	I.Tr.I
	11:39	I.Oc.R		21:19	I.Ec.D		13:27	I.Oc.R		4:20	I.Sh.E
	12:07	III.Sh.I	**Jan. 23**	0:33	I.Oc.R		16:04	III.Sh.I		5:09	I.Tr.E
	15:30	III.Sh.E		2:06	III.Ec.D		19:26	III.Sh.E		23:13	I.Ec.D
	15:53	IV.Oc.D		5:31	III.Ec.R		19:46	III.Tr.I	**Jan. 30**	2:20	I.Oc.R
	16:14	III.Tr.I		6:04	III.Oc.D		22:53	III.Tr.E		6:05	III.Ec.D
	17:49	IV.Oc.R		9:14	III.Oc.R	**Jan. 27**	2:32	II.Ec.D		9:29	III.Ec.R
	19:22	III.Tr.E		13:15	II.Ec.D		7:03	II.Oc.R		9:35	III.Oc.D
	23:59	II.Ec.D		17:53	II.Oc.R		7:36	I.Sh.I		12:44	III.Oc.R
Jan. 20	4:42	II.Oc.R		18:40	I.Sh.I		8:29	I.Tr.I		15:49	II.Ec.D
	5:43	I.Sh.I		19:35	I.Tr.I		9:51	I.Sh.E		20:12	II.Oc.R
	6:42	I.Tr.I		20:55	I.Sh.E		10:43	I.Tr.E		20:33	I.Sh.I
	7:58	I.Sh.E		21:49	I.Tr.E		15:11	IV.Sh.I		21:22	I.Tr.I
	8:56	I.Tr.E	**Jan. 24**	15:48	I.Ec.D		18:34	IV.Sh.E		22:48	I.Sh.E
Jan. 21	2:51	I.Ec.D		19:00	I.Oc.R	**Jan. 28**	0:03	IV.Tr.I		23:36	I.Tr.E
	6:06	I.Oc.R	**Jan. 25**	7:33	II.Sh.I		1:55	IV.Tr.E	**Jan. 31**	17:41	I.Ec.D
	18:15	II.Sh.I		9:26	II.Tr.I		4:45	I.Ec.D		20:46	I.Oc.R
	20:14	II.Tr.I		10:22	II.Sh.E		7:53	I.Oc.R			

Phenomena of Jupiter's Moons, February 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Feb. 1	10:09	II.Sh.I		4:41	I.Tr.I	**Feb. 10**	2:37	III.Tr.I	**Feb. 14**	0:19	I.Sh.I
	11:47	II.Tr.I		6:13	I.Sh.E		3:21	III.Sh.E		0:46	II.Oc.R
	12:58	II.Sh.E		6:55	I.Tr.E		5:45	III.Tr.E		0:52	I.Tr.I
	14:31	II.Tr.E		7:19	IV.Oc.D		7:39	II.Ec.D		2:34	I.Sh.E
	15:01	I.Sh.I		9:03	IV.Oc.R		11:22	I.Sh.I		3:06	I.Tr.E
	15:48	I.Tr.I	**Feb. 6**	1:07	I.Ec.D		11:38	II.Oc.R		21:29	I.Ec.D
	17:16	I.Sh.E		4:06	I.Oc.R		11:59	I.Tr.I	**Feb. 15**	0:17	I.Oc.R
	18:02	I.Tr.E		10:03	III.Ec.D		13:38	I.Sh.E		15:20	II.Sh.I
Feb. 2	12:10	I.Ec.D		16:10	III.Oc.R		14:14	I.Tr.E		16:25	II.Tr.I
	15:13	I.Oc.R		18:22	II.Ec.D	**Feb. 11**	8:32	I.Ec.D		18:09	II.Sh.E
	20:01	III.Sh.I		22:26	I.Sh.I		11:25	I.Oc.R		18:47	I.Sh.I
	23:13	III.Tr.I		22:30	II.Oc.R	**Feb. 12**	2:02	II.Sh.I		19:09	II.Tr.E
	23:23	III.Sh.E		23:07	I.Tr.I		3:15	II.Tr.I		19:18	I.Tr.I
Feb. 3	2:20	III.Tr.E	**Feb. 7**	0:41	I.Sh.E		4:51	II.Sh.E		21:03	I.Sh.E
	5:05	II.Ec.D		1:21	I.Tr.E		5:51	I.Sh.I		21:32	I.Tr.E
	9:21	II.Oc.R		19:35	I.Ec.D		6:00	II.Tr.E	**Feb. 16**	15:58	I.Ec.D
	9:29	I.Sh.I		22:32	I.Oc.R		6:26	I.Tr.I		18:43	I.Oc.R
	10:14	I.Tr.I	**Feb. 8**	12:44	II.Sh.I		8:06	I.Sh.E	**Feb. 17**	3:57	III.Sh.I
	11:44	I.Sh.E		14:07	II.Tr.I		8:40	I.Tr.E		5:58	III.Tr.I
	12:28	I.Tr.E		15:33	II.Sh.E	**Feb. 13**	3:01	I.Ec.D		7:18	III.Sh.E
Feb. 4	6:38	I.Ec.D		16:51	II.Tr.E		5:51	I.Oc.R		9:06	III.Tr.E
	9:39	I.Oc.R		16:54	I.Sh.I		9:09	IV.Sh.I		10:12	II.Ec.D
	23:26	II.Sh.I		17:33	I.Tr.I		12:25	IV.Sh.E		13:15	I.Sh.I
	23:33	IV.Ec.D		19:09	I.Sh.E		14:01	III.Ec.D		13:44	I.Tr.I
Feb. 5	0:57	II.Tr.I		19:47	I.Tr.E		15:04	IV.Tr.I		13:53	II.Oc.R
	2:15	II.Sh.E	**Feb. 9**	14:04	I.Ec.D		16:50	IV.Tr.E		15:31	I.Sh.E
	2:55	IV.Ec.R		16:59	I.Oc.R		19:32	III.Oc.R		15:58	I.Tr.E
	3:41	II.Tr.E		23:59	III.Sh.I		20:56	II.Ec.D	**Feb. 18**	10:26	I.Ec.D
	3:57	I.Sh.I								13:10	I.Oc.R

Feb. 19	4:38	II.Sh.I
	5:32	II.Tr.I
	7:27	II.Sh.E
	7:44	I.Sh.I
	8:10	I.Tr.I
	8:17	II.Tr.E
	9:59	I.Sh.E
	10:24	I.Tr.E
Feb. 20	4:55	I.Ec.D
	7:36	I.Oc.R
	17:59	III.Ec.D
	22:51	III.Oc.R
	23:29	II.Ec.D
Feb. 21	2:12	I.Sh.I
	2:36	I.Tr.I
	3:00	II.Oc.R
	4:28	I.Sh.E
	4:50	I.Tr.E
	17:36	IV.Ec.D
	20:49	IV.Ec.R
	21:53	IV.Oc.D
	23:23	I.Ec.D
	23:38	IV.Oc.R
Feb. 22	2:02	I.Oc.R
	17:56	II.Sh.I
	18:41	II.Tr.I
	20:41	I.Sh.I
	20:45	II.Sh.E
	21:02	I.Tr.I
	21:26	II.Tr.E
	22:56	I.Sh.E
	23:16	I.Tr.E
Feb. 23	17:52	I.Ec.D
	20:28	I.Oc.R
Feb. 24	7:56	III.Sh.I
	9:17	III.Tr.I
	11:16	III.Sh.E
	12:25	III.Tr.E
	12:46	II.Ec.D
	15:09	I.Sh.I
	15:28	I.Tr.I
	16:07	II.Oc.R
	17:24	I.Sh.E
	17:42	I.Tr.E
Feb. 25	12:20	I.Ec.D
	14:54	I.Oc.R
Feb. 26	7:14	II.Sh.I
	7:48	II.Tr.I
	9:37	I.Sh.I
	9:53	I.Tr.I
	10:03	II.Sh.E
	10:33	II.Tr.E
	11:53	I.Sh.E
	12:08	I.Tr.E
Feb. 27	6:49	I.Ec.D
	9:20	I.Oc.R
	21:57	III.Ec.D
Feb. 28	2:03	II.Ec.D
	2:08	III.Oc.R
	4:06	I.Sh.I
	4:19	I.Tr.I
	5:14	II.Oc.R
	6:21	I.Sh.E
	6:34	I.Tr.E
Feb. 29	1:17	I.Ec.D
	3:46	I.Oc.R
	20:33	II.Sh.I
	20:57	II.Tr.I
	22:34	I.Sh.I
	22:45	I.Tr.I
	23:21	II.Sh.E
	23:42	II.Tr.E

Phenomena of Jupiter's Moons, March 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Mar. 1	0:50	I.Sh.E	**Mar. 5**	8:43	I.Ec.D		18:58	III.Tr.E		2:12	I.Tr.I
	1:00	I.Tr.E		11:04	I.Oc.R		19:10	III.Sh.E		2:22	I.Sh.I
	3:08	IV.Sh.I	**Mar. 6**	1:56	III.Ec.D		20:39	II.Ec.R		4:13	II.Tr.E
	5:22	IV.Tr.I		4:36	II.Ec.D		21:09	I.Tr.E		4:27	I.Tr.E
	6:16	IV.Sh.E		5:26	III.Oc.R		21:12	I.Sh.E		4:34	II.Sh.E
	7:16	IV.Tr.E		5:59	I.Sh.I	**Mar. 10**	16:06	I.Oc.D		4:37	I.Sh.E
	19:46	I.Ec.D		6:03	I.Tr.I		18:26	I.Ec.R		23:24	I.Oc.D
	22:12	I.Oc.R		7:27	II.Oc.R	**Mar. 11**	12:19	II.Tr.I	**Mar. 16**	1:51	I.Ec.R
Mar. 2	11:53	III.Sh.I		8:15	I.Sh.E		12:27	II.Sh.I		19:03	III.Tr.I
	12:33	III.Tr.I		8:17	I.Tr.E		13:20	I.Tr.I		19:49	III.Sh.I
	15:13	III.Sh.E	**Mar. 7**	3:12	I.Ec.D		13:25	I.Sh.I		20:04	II.Oc.D
	15:19	II.Ec.D		5:30	I.Oc.R		15:05	II.Tr.E		20:38	I.Tr.I
	15:42	III.Tr.E		23:09	II.Sh.I		15:16	II.Sh.E		20:50	I.Sh.I
	17:02	I.Sh.I		23:12	II.Tr.I		15:35	I.Tr.E		22:14	III.Tr.E
	17:11	I.Tr.I	**Mar. 8**	0:28	I.Sh.I		15:40	I.Sh.E		22:53	I.Tr.E
	18:21	II.Oc.R		0:29	I.Tr.I	**Mar. 12**	10:32	I.Oc.D		23:05	I.Sh.E
	19:18	I.Sh.E		1:57	II.Tr.E		12:54	I.Ec.R		23:07	III.Sh.E
	19:25	I.Tr.E		1:58	II.Sh.E	**Mar. 13**	5:30	III.Oc.D		23:13	II.Ec.R
Mar. 3	14:14	I.Ec.D		2:43	I.Tr.E		6:57	II.Oc.D	**Mar. 17**	17:50	I.Oc.D
	16:38	I.Oc.R		2:43	I.Sh.E		7:46	I.Tr.I		19:24	IV.Tr.I
Mar. 4	9:51	II.Sh.I		21:40	I.Oc.D		7:53	I.Sh.I		20:20	I.Ec.R
	10:04	II.Tr.I		23:57	I.Ec.R		9:15	III.Ec.R		21:10	IV.Sh.I
	11:31	I.Sh.I	**Mar. 9**	11:38	IV.Ec.D		9:56	II.Ec.R		21:36	IV.Tr.E
	11:37	I.Tr.I		14:42	IV.Ec.R		10:01	I.Tr.E	**Mar. 18**	0:08	IV.Sh.E
	12:39	II.Sh.E		15:48	III.Tr.I		10:08	I.Sh.E		14:34	II.Tr.I
	12:49	II.Tr.E		15:51	III.Sh.I	**Mar. 14**	4:58	I.Oc.D		15:04	II.Sh.I
	13:46	I.Sh.E		17:50	II.Oc.D		7:23	I.Ec.R		15:04	I.Tr.I
	13:51	I.Tr.E		18:54	I.Tr.I	**Mar. 15**	1:27	II.Tr.I		15:18	I.Sh.I
				18:56	I.Sh.I		1:46	II.Sh.I		17:19	I.Tr.E

	17:21	II.Tr.E		6:31	I.Sh.E		19:28	I.Sh.E		6:10	I.Sh.I
	17:34	I.Sh.E		7:11	II.Sh.E		19:37	II.Tr.E		7:00	II.Sh.I
	17:52	II.Sh.E	**Mar. 23**	1:09	I.Oc.D		20:29	II.Sh.E		7:55	I.Tr.E
Mar. 19	12:16	I.Oc.D		3:46	I.Ec.R	**Mar. 26**	1:55	IV.Oc.D		8:25	I.Sh.E
	14:49	I.Ec.R		22:17	II.Oc.D		4:17	IV.Oc.R		8:47	II.Tr.E
Mar. 20	8:47	III.Oc.D		22:20	III.Tr.I		5:42	IV.Ec.D		9:47	II.Sh.E
	9:10	II.Oc.D		22:22	I.Tr.I		8:36	IV.Ec.R	**Mar. 30**	2:54	I.Oc.D
	9:30	I.Tr.I		22:44	I.Sh.I		14:01	I.Oc.D		5:41	I.Ec.R
	9:47	I.Sh.I		23:47	III.Sh.I		16:43	I.Ec.R	**Mar. 31**	0:07	I.Tr.I
	11:45	I.Tr.E	**Mar. 24**	0:37	I.Tr.E	**Mar. 27**	11:14	I.Tr.I		0:32	II.Oc.D
	12:02	I.Sh.E		0:59	I.Sh.E		11:25	II.Oc.D		0:38	I.Sh.I
	12:29	II.Ec.R		1:32	III.Tr.E		11:41	I.Sh.I		1:39	III.Tr.I
	13:14	III.Ec.R		1:46	II.Ec.R		12:05	III.Oc.D		2:21	I.Tr.E
Mar. 21	6:42	I.Oc.D		3:05	III.Sh.E		13:29	I.Tr.E		2:53	I.Sh.E
	9:17	I.Ec.R		19:35	I.Oc.D		13:56	I.Sh.E		3:47	III.Sh.I
Mar. 22	3:43	II.Tr.I		22:15	I.Ec.R		15:03	II.Ec.R		4:20	II.Ec.R
	3:56	I.Tr.I	**Mar. 25**	16:48	I.Tr.I		17:12	III.Ec.R		4:53	III.Tr.E
	4:15	I.Sh.I		16:51	II.Tr.I	**Mar. 28**	8:27	I.Oc.D		7:03	III.Sh.E
	4:23	II.Sh.I		17:12	I.Sh.I		11:12	I.Ec.R		21:20	I.Oc.D
	6:11	I.Tr.E		17:41	II.Sh.I	**Mar. 29**	5:41	I.Tr.I			
	6:29	II.Tr.E		19:03	I.Tr.E		6:00	II.Tr.I			

Phenomena of Jupiter's Moons, April 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Apr. 1	0:09	I.Ec.R		9:40	I.Tr.E	**Apr. 10**	14:45	I.Tr.I		8:28	III.Tr.I
	18:33	I.Tr.I		10:19	I.Sh.E		15:29	I.Sh.I		9:28	II.Ec.R
	19:07	I.Sh.I		11:05	II.Tr.E		15:57	II.Oc.D		11:43	III.Tr.E
	19:09	II.Tr.I		12:24	II.Sh.E		17:00	I.Tr.E		11:45	III.Sh.I
	20:18	II.Sh.I	**Apr. 6**	4:39	I.Oc.D		17:44	I.Sh.E		14:59	III.Sh.E
	20:48	I.Tr.E		7:35	I.Ec.R		18:48	III.Oc.D	**Apr. 15**	0:53	I.Oc.D
	21:22	I.Sh.E	**Apr. 7**	1:52	I.Tr.I		20:11	II.Ec.R		3:59	I.Ec.R
	21:55	II.Tr.E		2:32	I.Sh.I	**Apr. 11**	1:08	III.Ec.R		22:05	I.Tr.I
	23:05	II.Sh.E		2:48	II.Oc.D		11:59	I.Oc.D		22:55	I.Sh.I
Apr. 2	15:46	I.Oc.D		4:07	I.Tr.E		15:02	I.Ec.R		23:49	II.Tr.I
	18:38	I.Ec.R		4:47	I.Sh.E		16:26	IV.Oc.D	**Apr. 16**	0:20	I.Tr.E
Apr. 3	9:41	IV.Tr.I		5:01	III.Tr.I		19:08	IV.Oc.R		1:10	I.Sh.E
	12:13	IV.Tr.E		6:54	II.Ec.R		23:48	IV.Ec.D		1:32	II.Sh.I
	12:59	I.Tr.I		7:45	III.Sh.I	**Apr. 12**	2:30	IV.Ec.R		2:36	II.Tr.E
	13:35	I.Sh.I		8:16	III.Tr.E		9:12	I.Tr.I		4:19	II.Sh.E
	13:40	II.Oc.D		11:01	III.Sh.E		9:58	I.Sh.I		19:20	I.Oc.D
	15:11	IV.Sh.I		23:06	I.Oc.D		10:39	II.Tr.I		22:28	I.Ec.R
	15:14	I.Tr.E	**Apr. 8**	2:04	I.Ec.R		11:27	I.Tr.E	**Apr. 17**	16:32	I.Tr.I
	15:25	III.Oc.D		20:19	I.Tr.I		12:13	I.Sh.E		17:24	I.Sh.I
	15:50	I.Sh.E		21:01	I.Sh.I		12:14	II.Sh.I		18:16	II.Oc.D
	17:37	II.Ec.R		21:28	II.Tr.I		13:26	II.Tr.E		18:47	I.Tr.E
	17:59	IV.Sh.E		22:33	I.Tr.E		15:01	II.Sh.E		19:38	I.Sh.E
	21:10	III.Ec.R		22:55	II.Sh.I	**Apr. 13**	6:26	I.Oc.D		22:16	III.Oc.D
Apr. 4	10:13	I.Oc.D		23:16	I.Sh.E		9:30	I.Ec.R		22:45	II.Ec.R
	13:07	I.Ec.R	**Apr. 9**	0:15	II.Tr.E	**Apr. 14**	3:39	I.Tr.I	**Apr. 18**	1:34	III.Oc.R
Apr. 5	7:26	I.Tr.I		1:42	II.Sh.E		4:27	I.Sh.I		1:51	III.Ec.D
	8:04	I.Sh.I		17:33	I.Oc.D		5:06	II.Oc.D		5:07	III.Ec.R
	8:18	II.Tr.I		20:33	I.Ec.R		5:53	I.Tr.E		13:47	I.Oc.D
	9:37	II.Sh.I					6:41	I.Sh.E		16:56	I.Ec.R

Apr. 19	10:59	I.Tr.I
	11:52	I.Sh.I
	13:01	II.Tr.I
	13:14	I.Tr.E
	14:07	I.Sh.E
	14:51	II.Sh.I
	15:48	II.Tr.E
	17:37	II.Sh.E
Apr. 20	0:38	IV.Tr.I
	3:27	IV.Tr.E
	8:14	I.Oc.D
	9:14	IV.Sh.I
	11:25	I.Ec.R
	11:50	IV.Sh.E
Apr. 21	5:26	I.Tr.I
	6:21	I.Sh.I
	7:27	II.Oc.D
	7:41	I.Tr.E
	8:35	I.Sh.E
	11:57	III.Tr.I
	12:02	II.Ec.R
	15:14	III.Tr.E
	15:44	III.Sh.I
	18:57	III.Sh.E
Apr. 22	2:41	I.Oc.D
	5:54	I.Ec.R
	23:53	I.Tr.I
Apr. 23	0:50	I.Sh.I
	2:08	I.Tr.E
	2:12	II.Tr.I
	3:04	I.Sh.E
	4:10	II.Sh.I
	4:59	II.Tr.E
	6:55	II.Sh.E
	21:08	I.Oc.D
Apr. 24	0:23	I.Ec.R
	18:20	I.Tr.I
	19:18	I.Sh.I
	20:35	I.Tr.E
	20:37	II.Oc.D
	21:33	I.Sh.E
Apr. 25	1:19	II.Ec.R
	1:48	III.Oc.D
	5:07	III.Oc.R
	5:51	III.Ec.D
	9:06	III.Ec.R
	15:35	I.Oc.D
	18:51	I.Ec.R
Apr. 26	12:47	I.Tr.I
	13:47	I.Sh.I
	15:02	I.Tr.E
	15:25	II.Tr.I
	16:01	I.Sh.E
	17:29	II.Sh.I
	18:12	II.Tr.E
	20:14	II.Sh.E
Apr. 27	10:02	I.Oc.D
	13:20	I.Ec.R
Apr. 28	7:15	I.Tr.I
	7:46	IV.Oc.D
	8:15	I.Sh.I
	9:29	I.Tr.E
	9:49	II.Oc.D
	10:30	I.Sh.E
	10:44	IV.Oc.R
	14:36	II.Ec.R
	15:31	III.Tr.I
	17:53	IV.Ec.D
	18:48	III.Tr.E
	19:43	III.Sh.I
	20:24	IV.Ec.R
	22:55	III.Sh.E
Apr. 29	4:30	I.Oc.D
	7:49	I.Ec.R
Apr. 30	1:42	I.Tr.I
	2:44	I.Sh.I
	3:57	I.Tr.E
	4:38	II.Tr.I
	4:58	I.Sh.E
	6:47	II.Sh.I
	7:25	II.Tr.E
	9:32	II.Sh.E
	22:57	I.Oc.D

Phenomena of Jupiter's Moons, May 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

May 1	2:18	I.Ec.R		19:09	III.Tr.I		17:04	III.Ec.R		9:35	II.Tr.I
	20:09	I.Tr.I		22:27	III.Tr.E		19:16	I.Oc.D		12:01	II.Sh.I
	21:13	I.Sh.I		23:41	III.Sh.I		22:42	I.Ec.R		12:23	II.Tr.E
	22:24	I.Tr.E	**May 6**	2:53	III.Sh.E	**May 10**	16:27	I.Tr.I		14:45	II.Sh.E
	23:01	II.Oc.D		6:20	I.Oc.D		17:36	I.Sh.I	**May 15**	0:05	IV.Oc.D
	23:27	I.Sh.E		9:44	I.Ec.R		18:42	I.Tr.E		2:40	I.Oc.D
May 2	3:53	II.Ec.R		16:29	IV.Tr.I		19:50	I.Sh.E		3:14	IV.Oc.R
	5:24	III.Oc.D		19:31	IV.Tr.E		20:20	II.Tr.I		6:08	I.Ec.R
	8:45	III.Oc.R	**May 7**	3:18	IV.Sh.I		22:43	II.Sh.I		12:00	IV.Ec.D
	9:50	III.Ec.D		3:32	I.Tr.I		23:08	II.Tr.E		14:17	IV.Ec.R
	13:05	III.Ec.R		4:39	I.Sh.I	**May 11**	1:27	II.Sh.E		23:51	I.Tr.I
	17:25	I.Oc.D		5:42	IV.Sh.E		13:44	I.Oc.D	**May 16**	1:02	I.Sh.I
	20:46	I.Ec.R		5:47	I.Tr.E		17:10	I.Ec.R		2:06	I.Tr.E
May 3	14:37	I.Tr.I		6:53	I.Sh.E	**May 12**	10:55	I.Tr.I		3:16	I.Sh.E
	15:41	I.Sh.I		7:05	II.Tr.I		12:05	I.Sh.I		3:54	II.Oc.D
	16:51	I.Tr.E		9:24	II.Sh.I		13:10	I.Tr.E		9:03	II.Ec.R
	17:52	II.Tr.I		9:53	II.Tr.E		14:19	I.Sh.E		12:51	III.Oc.D
	17:56	I.Sh.E		12:09	II.Sh.E		14:40	II.Oc.D		16:13	III.Oc.R
	20:06	II.Sh.I	**May 8**	0:48	I.Oc.D		19:45	II.Ec.R		17:50	III.Ec.D
	20:39	II.Tr.E		4:13	I.Ec.R		22:52	III.Tr.I		21:03	III.Ec.R
	22:51	II.Sh.E		22:00	I.Tr.I	**May 13**	2:10	III.Tr.E		21:08	I.Oc.D
May 4	11:52	I.Oc.D		23:07	I.Sh.I		3:40	III.Sh.I	**May 17**	0:37	I.Ec.R
	15:15	I.Ec.R	**May 9**	0:14	I.Tr.E		6:51	III.Sh.E		18:19	I.Tr.I
May 5	9:04	I.Tr.I		1:21	I.Sh.E		8:11	I.Oc.D		19:31	I.Sh.I
	10:10	I.Sh.I		1:26	II.Oc.D		11:39	I.Ec.R		20:34	I.Tr.E
	11:19	I.Tr.E		6:28	II.Ec.R	**May 14**	5:23	I.Tr.I		21:45	I.Sh.E
	12:13	II.Oc.D		9:06	III.Oc.D		6:33	I.Sh.I		22:51	II.Tr.I
	12:24	I.Sh.E		12:27	III.Oc.R		7:38	I.Tr.E	**May 18**	1:20	II.Sh.I
	17:11	II.Ec.R		13:51	III.Ec.D		8:47	I.Sh.E		1:39	II.Tr.E

	4:04	II.Sh.E	**May 22**	4:32	I.Oc.D		3:57	II.Sh.I		17:28	II.Tr.E
	15:36	I.Oc.D		8:03	I.Ec.R		4:12	II.Tr.E		19:58	II.Sh.E
	19:05	I.Ec.R	**May 23**	1:43	I.Tr.I		6:40	II.Sh.E	**May 29**	6:26	I.Oc.D
May 19	12:47	I.Tr.I		2:57	I.Sh.I		17:29	I.Oc.D		9:58	I.Ec.R
	13:59	I.Sh.I		3:58	I.Tr.E		21:01	I.Ec.R	**May 30**	3:37	I.Tr.I
	15:02	I.Tr.E		5:11	I.Sh.E	**May 26**	14:40	I.Tr.I		4:52	I.Sh.I
	16:13	I.Sh.E		6:24	II.Oc.D		15:54	I.Sh.I		5:52	I.Tr.E
	17:09	II.Oc.D		9:18	IV.Tr.I		16:55	I.Tr.E		7:05	I.Sh.E
	22:20	II.Ec.R		11:38	II.Ec.R		18:08	I.Sh.E		8:57	II.Oc.D
May 20	2:40	III.Tr.I		12:28	IV.Tr.E		19:40	II.Oc.D		14:13	II.Ec.R
	5:59	III.Tr.E		16:41	III.Oc.D	**May 27**	0:55	II.Ec.R		20:35	III.Oc.D
	7:40	III.Sh.I		20:03	III.Oc.R		6:32	III.Tr.I		23:57	III.Oc.R
	10:04	I.Oc.D		21:22	IV.Sh.I		9:51	III.Tr.E	**May 31**	0:55	I.Oc.D
	10:50	III.Sh.E		21:49	III.Ec.D		11:39	III.Sh.I		1:48	III.Ec.D
	13:34	I.Ec.R		23:01	I.Oc.D		11:57	I.Oc.D		4:27	I.Ec.R
May 21	7:15	I.Tr.I		23:34	IV.Sh.E		14:48	III.Sh.E		4:59	III.Ec.R
	8:28	I.Sh.I	**May 24**	1:01	III.Ec.R		15:29	I.Ec.R		17:23	IV.Oc.D
	9:30	I.Tr.E		2:32	I.Ec.R	**May 28**	9:08	I.Tr.I		20:38	IV.Oc.R
	10:42	I.Sh.E		20:12	I.Tr.I		10:23	I.Sh.I		22:05	I.Tr.I
	12:07	II.Tr.I		21:26	I.Sh.I		11:23	I.Tr.E		23:20	I.Sh.I
	14:38	II.Sh.I		22:26	I.Tr.E		12:37	I.Sh.E			
	14:54	II.Tr.E		23:39	I.Sh.E		14:41	II.Tr.I			
	17:22	II.Sh.E	**May 25**	1:24	II.Tr.I		17:15	II.Sh.I			

Phenomena of Jupiter's Moons, June 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

June 1	0:20	I.Tr.E		22:35	II.Sh.E		18:29	I.Tr.I	**June 14**	4:35	III.Oc.D
	1:34	I.Sh.E	**June 5**	8:21	I.Oc.D		19:44	I.Sh.I		4:46	I.Oc.D
	3:59	II.Tr.I		11:53	I.Ec.R		20:44	I.Tr.E		7:58	III.Oc.R
	6:08	IV.Ec.D	**June 6**	5:31	I.Tr.I		21:58	I.Sh.E		8:17	I.Ec.R
	6:34	II.Sh.I		6:46	I.Sh.I	**June 10**	0:49	II.Oc.D		9:48	III.Ec.D
	6:46	II.Tr.E		7:46	I.Tr.E		6:05	II.Ec.R		12:57	III.Ec.R
	8:10	IV.Ec.R		9:00	I.Sh.E		14:28	III.Tr.I	**June 15**	1:56	I.Tr.I
	9:17	II.Sh.E		11:31	II.Oc.D		15:48	I.Oc.D		3:10	I.Sh.I
	19:23	I.Oc.D		16:48	II.Ec.R		17:48	III.Tr.E		4:10	I.Tr.E
	22:56	I.Ec.R	**June 7**	0:33	III.Oc.D		19:19	I.Ec.R		5:24	I.Sh.E
June 2	16:34	I.Tr.I		2:50	I.Oc.D		19:39	III.Sh.I		9:15	II.Tr.I
	17:49	I.Sh.I		3:56	III.Oc.R		22:46	III.Sh.E		11:47	II.Sh.I
	18:49	I.Tr.E		5:48	III.Ec.D	**June 11**	12:58	I.Tr.I		12:02	II.Tr.E
	20:03	I.Sh.E		6:22	I.Ec.R		14:13	I.Sh.I		14:29	II.Sh.E
	22:14	II.Oc.D		8:58	III.Ec.R		15:13	I.Tr.E		23:15	I.Oc.D
June 3	3:30	II.Ec.R	**June 8**	0:00	I.Tr.I		16:26	I.Sh.E	**June 16**	2:46	I.Ec.R
	10:28	III.Tr.I		1:15	I.Sh.I		19:55	II.Tr.I		20:25	I.Tr.I
	13:48	III.Tr.E		2:15	I.Tr.E		22:29	II.Sh.I		21:39	I.Sh.I
	13:52	I.Oc.D		3:29	I.Sh.E		22:42	II.Tr.E		22:40	I.Tr.E
	15:39	III.Sh.I		6:36	II.Tr.I	**June 12**	1:11	II.Sh.E		23:52	I.Sh.E
	17:24	I.Ec.R		9:11	II.Sh.I		10:17	I.Oc.D	**June 17**	3:26	II.Oc.D
	18:47	III.Sh.E		9:23	II.Tr.E		13:48	I.Ec.R		8:40	II.Ec.R
June 4	11:03	I.Tr.I		11:53	II.Sh.E	**June 13**	7:27	I.Tr.I		11:35	IV.Oc.D
	12:18	I.Sh.I		21:19	I.Oc.D		8:41	I.Sh.I		14:51	IV.Oc.R
	13:17	I.Tr.E	**June 9**	0:51	I.Ec.R		9:41	I.Tr.E		17:44	I.Oc.D
	14:31	I.Sh.E		3:02	IV.Tr.I		10:55	I.Sh.E		18:32	III.Tr.I
	17:17	II.Tr.I		6:15	IV.Tr.E		14:07	II.Oc.D		21:14	I.Ec.R
	19:52	II.Sh.I		15:27	IV.Sh.I		19:23	II.Ec.R		21:51	III.Tr.E
	20:04	II.Tr.E		17:24	IV.Sh.E					23:38	III.Sh.I

June 18	0:17	IV.Ec.D
	2:02	IV.Ec.R
	2:44	III.Sh.E
	14:54	I.Tr.I
	16:07	I.Sh.I
	17:09	I.Tr.E
	18:21	I.Sh.E
	22:34	II.Tr.I
June 19	1:05	II.Sh.I
	1:21	II.Tr.E
	3:47	II.Sh.E
	12:13	I.Oc.D
	15:43	I.Ec.R
June 20	9:23	I.Tr.I
	10:36	I.Sh.I
	11:38	I.Tr.E
	12:50	I.Sh.E
	16:46	II.Oc.D
	21:58	II.Ec.R
June 21	6:42	I.Oc.D
	8:41	III.Oc.D
	10:12	I.Ec.R
	12:04	III.Oc.R
	13:48	III.Ec.D
	16:56	III.Ec.R
June 22	3:52	I.Tr.I
	5:05	I.Sh.I
	6:07	I.Tr.E
	7:19	I.Sh.E
	11:55	II.Tr.I
	14:24	II.Sh.I
	14:41	II.Tr.E
	17:05	II.Sh.E
June 23	1:12	I.Oc.D
	4:41	I.Ec.R
	22:21	I.Tr.I
	23:34	I.Sh.I
June 24	0:36	I.Tr.E
	1:47	I.Sh.E
	6:05	II.Oc.D
	11:16	II.Ec.R
	19:41	I.Oc.D
	22:38	III.Tr.I
	23:09	I.Ec.R
June 25	1:58	III.Tr.E
	3:37	III.Sh.I
	6:42	III.Sh.E
	16:51	I.Tr.I
	18:02	I.Sh.I
	19:05	I.Tr.E
	20:16	I.Sh.E
	21:35	IV.Tr.I
June 26	0:47	IV.Tr.E
	1:15	II.Tr.I
	3:42	II.Sh.I
	4:02	II.Tr.E
	6:23	II.Sh.E
	9:34	IV.Sh.I
	11:14	IV.Sh.E
	14:10	I.Oc.D
	17:38	I.Ec.R
June 27	11:20	I.Tr.I
	12:31	I.Sh.I
	13:35	I.Tr.E
	14:45	I.Sh.E
	19:26	II.Oc.D
June 28	0:34	II.Ec.R
	8:40	I.Oc.D
	12:07	I.Ec.R
	12:51	III.Oc.D
	16:13	III.Oc.R
	17:48	III.Ec.D
	20:55	III.Ec.R
June 29	5:49	I.Tr.I
	7:00	I.Sh.I
	8:04	I.Tr.E
	9:14	I.Sh.E
	14:36	II.Tr.I
	17:00	II.Sh.I
	17:23	II.Tr.E
	19:41	II.Sh.E
June 30	3:09	I.Oc.D
	6:36	I.Ec.R

Phenomena of Jupiter's Moons, July 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

July 1	0:19	I.Tr.I		19:52	IV.Ec.R		11:36	III.Sh.I		10:49	I.Sh.I
	1:28	I.Sh.I		22:07	II.Oc.D		14:40	III.Sh.E		12:01	I.Tr.E
	2:34	I.Tr.E	**July 5**	3:09	II.Ec.R		20:46	I.Tr.I		13:03	I.Sh.E
	3:42	I.Sh.E		10:38	I.Oc.D		21:52	I.Sh.I		20:02	II.Tr.I
	8:46	II.Oc.D		14:02	I.Ec.R		23:01	I.Tr.E		22:12	II.Sh.I
	13:51	II.Ec.R		17:03	III.Oc.D	**July 10**	0:06	I.Sh.E		22:48	II.Tr.E
	21:39	I.Oc.D		20:25	III.Oc.R		6:40	II.Tr.I	**July 14**	0:53	II.Sh.E
July 2	1:04	I.Ec.R		21:47	III.Ec.D		8:54	II.Sh.I		7:06	I.Oc.D
	2:48	III.Tr.I	**July 6**	0:54	III.Ec.R		9:26	II.Tr.E		10:25	I.Ec.R
	6:07	III.Tr.E		7:47	I.Tr.I		11:35	II.Sh.E	**July 15**	4:15	I.Tr.I
	7:36	III.Sh.I		8:55	I.Sh.I		18:07	I.Oc.D		5:18	I.Sh.I
	10:40	III.Sh.E		10:02	I.Tr.E		21:28	I.Ec.R		6:30	I.Tr.E
	18:48	I.Tr.I		11:08	I.Sh.E	**July 11**	15:16	I.Tr.I		7:32	I.Sh.E
	19:57	I.Sh.I		17:19	II.Tr.I		16:21	I.Sh.I		14:12	II.Oc.D
	21:03	I.Tr.E		19:36	II.Sh.I		17:31	I.Tr.E		19:03	II.Ec.R
	22:11	I.Sh.E		20:05	II.Tr.E		18:35	I.Sh.E	**July 16**	1:36	I.Oc.D
July 3	3:57	II.Tr.I		22:17	II.Sh.E	**July 12**	0:50	II.Oc.D		4:54	I.Ec.R
	6:18	II.Sh.I	**July 7**	5:07	I.Oc.D		5:45	II.Ec.R		11:17	III.Tr.I
	6:43	II.Tr.E		8:30	I.Ec.R		12:36	I.Oc.D		14:36	III.Tr.E
	8:59	II.Sh.E	**July 8**	2:17	I.Tr.I		15:56	I.Ec.R		15:35	III.Sh.I
	16:08	I.Oc.D		3:23	I.Sh.I		16:48	IV.Tr.I		18:38	III.Sh.E
	19:33	I.Ec.R		4:32	I.Tr.E		19:54	IV.Tr.E		22:45	I.Tr.I
July 4	6:33	IV.Oc.D		5:37	I.Sh.E		21:17	III.Oc.D		23:47	I.Sh.I
	9:45	IV.Oc.R		11:28	II.Oc.D	**July 13**	0:38	III.Oc.R	**July 17**	1:00	I.Tr.E
	13:18	I.Tr.I		16:27	II.Ec.R		1:46	III.Ec.D		2:01	I.Sh.E
	14:26	I.Sh.I		23:37	I.Oc.D		3:42	IV.Sh.I		9:25	II.Tr.I
	15:33	I.Tr.E	**July 9**	2:59	I.Ec.R		4:52	III.Ec.R		11:30	II.Sh.I
	16:40	I.Sh.E		7:02	III.Tr.I		5:02	IV.Sh.E		12:10	II.Tr.E
	18:27	IV.Ec.D		10:21	III.Tr.E		9:46	I.Tr.I		14:10	II.Sh.E

	20:06	I.Oc.D		9:05	I.Oc.D		22:05	I.Oc.D	**July 29**	8:14	I.Tr.I
	23:22	I.Ec.R		12:20	I.Ec.R	**July 25**	1:17	I.Ec.R		9:08	I.Sh.I
July 18	17:15	I.Tr.I		12:42	IV.Ec.D		19:14	I.Tr.I		10:30	I.Tr.E
	18:16	I.Sh.I		13:38	IV.Ec.R		20:10	I.Sh.I		11:22	I.Sh.E
	19:30	I.Tr.E	**July 22**	6:14	I.Tr.I		21:30	I.Tr.E		12:33	IV.Tr.I
	20:30	I.Sh.E		7:13	I.Sh.I		22:24	I.Sh.E		15:29	IV.Tr.E
July 19	3:35	II.Oc.D		8:30	I.Tr.E	**July 26**	6:20	II.Oc.D		19:43	II.Oc.D
	8:21	II.Ec.R		9:27	I.Sh.E		10:57	II.Ec.R	**July 30**	0:15	II.Ec.R
	14:36	I.Oc.D		16:57	II.Oc.D		16:35	I.Oc.D		5:35	I.Oc.D
	17:51	I.Ec.R		21:39	II.Ec.R		19:46	I.Ec.R		8:43	I.Ec.R
July 20	1:34	III.Oc.D	**July 23**	3:35	I.Oc.D	**July 27**	5:53	III.Oc.D		19:56	III.Tr.I
	4:54	III.Oc.R		6:48	I.Ec.R		9:12	III.Oc.R		23:12	III.Tr.E
	5:45	III.Ec.D		15:36	III.Tr.I		9:44	III.Ec.D		23:34	III.Sh.I
	8:50	III.Ec.R		18:53	III.Tr.E		12:48	III.Ec.R	**July 31**	2:35	III.Sh.E
	11:45	I.Tr.I		19:35	III.Sh.I		13:44	I.Tr.I		2:44	I.Tr.I
	12:44	I.Sh.I		22:37	III.Sh.E		14:39	I.Sh.I		3:37	I.Sh.I
	14:00	I.Tr.E	**July 24**	0:44	I.Tr.I		16:00	I.Tr.E		5:00	I.Tr.E
	14:58	I.Sh.E		1:42	I.Sh.I		16:53	I.Sh.E		5:51	I.Sh.E
	22:47	II.Tr.I		3:00	I.Tr.E	**July 28**	1:33	II.Tr.I		14:56	II.Tr.I
July 21	0:48	II.Sh.I		3:56	I.Sh.E		3:23	II.Sh.I		16:41	II.Sh.I
	1:33	II.Tr.E		12:10	II.Tr.I		4:18	II.Tr.E		17:41	II.Tr.E
	2:09	IV.Oc.D		14:06	II.Sh.I		6:03	II.Sh.E		19:21	II.Sh.E
	3:28	II.Sh.E		14:55	II.Tr.E		11:05	I.Oc.D			
	5:13	IV.Oc.R		16:46	II.Sh.E		14:14	I.Ec.R			

Phenomena of Jupiter's Moons, August 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Aug. 1	0:05	I.Oc.D	**Aug. 6**	2:51	II.Ec.R		18:29	I.Sh.I	**Aug. 15**	0:30	II.Sh.E
	3:12	I.Ec.R		7:35	I.Oc.D		20:00	I.Tr.E		4:06	I.Oc.D
	21:14	I.Tr.I		10:37	I.Ec.R		20:43	I.Sh.E		7:00	I.Ec.R
	22:05	I.Sh.I		22:15	IV.Oc.D		20:45	III.Ec.R		8:45	IV.Tr.I
	23:30	I.Tr.E	**Aug. 7**	0:17	III.Tr.I	**Aug. 11**	7:06	II.Tr.I		11:25	IV.Tr.E
Aug. 2	0:19	I.Sh.E		1:04	IV.Oc.R		8:34	II.Sh.I	**Aug. 16**	1:15	I.Tr.I
	9:07	II.Oc.D		3:33	III.Sh.I		9:50	II.Tr.E		1:55	I.Sh.I
	13:33	II.Ec.R		3:33	III.Tr.E		11:13	II.Sh.E		3:31	I.Tr.E
	18:35	I.Oc.D		4:44	I.Tr.I		15:06	I.Oc.D		4:09	I.Sh.E
	21:40	I.Ec.R		5:31	I.Sh.I		18:03	I.Ec.R		14:43	II.Oc.D
Aug. 3	10:15	III.Oc.D		6:33	III.Sh.E	**Aug. 12**	12:15	I.Tr.I		18:45	II.Ec.R
	13:33	III.Oc.R		7:00	I.Tr.E		12:57	I.Sh.I		22:36	I.Oc.D
	13:44	III.Ec.D		7:46	I.Sh.E		14:30	I.Tr.E	**Aug. 17**	1:29	I.Ec.R
	15:44	I.Tr.I		17:42	II.Tr.I		15:12	I.Sh.E		19:03	III.Oc.D
	16:34	I.Sh.I		19:16	II.Sh.I	**Aug. 13**	1:19	II.Oc.D		19:45	I.Tr.I
	16:47	III.Ec.R		20:27	II.Tr.E		5:27	II.Ec.R		20:23	I.Sh.I
	18:00	I.Tr.E		21:56	II.Sh.E		9:36	I.Oc.D		22:01	I.Tr.E
	18:48	I.Sh.E	**Aug. 8**	2:05	I.Oc.D		12:32	I.Ec.R		22:38	I.Sh.E
Aug. 4	4:19	II.Tr.I		5:06	I.Ec.R	**Aug. 14**	4:40	III.Tr.I	**Aug. 18**	0:44	III.Ec.R
	5:59	II.Sh.I		23:14	I.Tr.I		6:45	I.Tr.I		9:53	II.Tr.I
	7:04	II.Tr.E	**Aug. 9**	0:00	I.Sh.I		7:26	I.Sh.I		11:09	II.Sh.I
	8:38	II.Sh.E		1:30	I.Tr.E		7:32	III.Sh.I		12:37	II.Tr.E
	13:05	I.Oc.D		2:14	I.Sh.E		7:55	III.Tr.E		13:47	II.Sh.E
	16:09	I.Ec.R		11:55	II.Oc.D		9:00	I.Tr.E		17:06	I.Oc.D
Aug. 5	10:14	I.Tr.I		16:09	II.Ec.R		9:40	I.Sh.E		19:57	I.Ec.R
	11:03	I.Sh.I		20:35	I.Oc.D		10:31	III.Sh.E	**Aug. 19**	14:15	I.Tr.I
	12:30	I.Tr.E		23:35	I.Ec.R		20:29	II.Tr.I		14:52	I.Sh.I
	13:17	I.Sh.E	**Aug. 10**	14:38	III.Oc.D		21:51	II.Sh.I		16:31	I.Tr.E
	22:31	II.Oc.D		17:44	I.Tr.I		23:13	II.Tr.E		17:06	I.Sh.E

Aug. 20	4:08	II.Oc.D	**Aug. 23**	3:16	I.Tr.I		15:23	II.Tr.E		16:42	III.Tr.E
	8:03	II.Ec.R		3:49	I.Sh.I		16:22	II.Sh.E		18:28	III.Sh.E
	11:36	I.Oc.D		5:31	I.Tr.E		19:07	I.Oc.D	**Aug. 29**	2:04	II.Tr.I
	14:26	I.Ec.R		6:04	I.Sh.E		21:52	I.Ec.R		3:01	II.Sh.I
Aug. 21	8:46	I.Tr.I		17:33	II.Oc.D	**Aug. 26**	16:16	I.Tr.I		4:47	II.Tr.E
	9:04	III.Tr.I		18:44	IV.Oc.D		16:47	I.Sh.I		5:39	II.Sh.E
	9:21	I.Sh.I		21:12	IV.Oc.R		18:32	I.Tr.E		8:07	I.Oc.D
	11:01	I.Tr.E		21:21	II.Ec.R		19:01	I.Sh.E		10:49	I.Ec.R
	11:30	III.Sh.I	**Aug. 24**	0:37	I.Oc.D	**Aug. 27**	6:57	II.Oc.D	**Aug. 30**	5:17	I.Tr.I
	11:35	I.Sh.E		3:23	I.Ec.R		10:39	II.Ec.R		5:44	I.Sh.I
	12:18	III.Tr.E		21:46	I.Tr.I		13:37	I.Oc.D		7:33	I.Tr.E
	14:30	III.Sh.E		22:18	I.Sh.I		16:20	I.Ec.R		7:58	I.Sh.E
	23:17	II.Tr.I		23:28	III.Oc.D	**Aug. 28**	10:47	I.Tr.I		20:23	II.Oc.D
Aug. 22	0:26	II.Sh.I	**Aug. 25**	0:02	I.Tr.E		11:15	I.Sh.I		23:58	II.Ec.R
	2:00	II.Tr.E		0:32	I.Sh.E		13:02	I.Tr.E	**Aug. 31**	2:37	I.Oc.D
	3:05	II.Sh.E		4:41	III.Ec.R		13:30	I.Sh.E		5:17	I.Ec.R
	6:06	I.Oc.D		12:40	II.Tr.I		13:31	III.Tr.I		23:47	I.Tr.I
	8:55	I.Ec.R		13:43	II.Sh.I		15:30	III.Sh.I			

Phenomena of Jupiter's Moons, September 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Sept. 1	0:13	I.Sh.I	**Sept. 5**	4:52	II.Tr.I		20:36	I.Sh.I	**Sept. 15**	3:50	I.Tr.I
	2:03	I.Tr.E		5:35	II.Sh.I		22:34	I.Tr.E		4:02	I.Sh.I
	2:27	I.Sh.E		7:34	II.Tr.E		22:50	I.Sh.E		6:06	I.Tr.E
	3:54	III.Oc.D		8:13	II.Sh.E	**Sept. 10**	12:38	II.Oc.D		6:16	I.Sh.E
	5:15	IV.Tr.I		10:08	I.Oc.D		15:52	II.Ec.R		12:48	III.Oc.D
	7:33	IV.Tr.E		12:43	I.Ec.R		17:39	I.Oc.D		16:34	III.Ec.R
	8:39	III.Ec.R	**Sept. 6**	7:18	I.Tr.I		20:08	I.Ec.R		21:04	II.Tr.I
	15:28	II.Tr.I		7:38	I.Sh.I	**Sept. 11**	14:49	I.Tr.I		21:26	II.Sh.I
	16:18	II.Sh.I		9:34	I.Tr.E		15:04	I.Sh.I		23:45	II.Tr.E
	18:11	II.Tr.E		9:53	I.Sh.E		17:05	I.Tr.E	**Sept. 16**	0:04	II.Sh.E
	18:56	II.Sh.E		23:13	II.Oc.D		17:19	I.Sh.E		1:09	I.Oc.D
	21:08	I.Oc.D	**Sept. 7**	2:34	II.Ec.R		22:26	III.Tr.I		3:33	I.Ec.R
	23:46	I.Ec.R		4:38	I.Oc.D		23:28	III.Sh.I		22:20	I.Tr.I
Sept. 2	18:18	I.Tr.I		7:11	I.Ec.R	**Sept. 12**	1:34	III.Tr.E		22:30	I.Sh.I
	18:41	I.Sh.I	**Sept. 8**	1:49	I.Tr.I		2:25	III.Sh.E	**Sept. 17**	0:36	I.Tr.E
	20:33	I.Tr.E		2:07	I.Sh.I		7:40	II.Tr.I		0:45	I.Sh.E
	20:56	I.Sh.E		4:04	I.Tr.E		8:09	II.Sh.I		15:29	II.Oc.D
Sept. 3	9:48	II.Oc.D		4:22	I.Sh.E		10:22	II.Tr.E		18:28	II.Ec.R
	13:15	II.Ec.R		8:21	III.Oc.D		10:47	II.Sh.E		19:40	I.Oc.D
	15:38	I.Oc.D		12:36	III.Ec.R		12:09	I.Oc.D		22:02	I.Ec.R
	18:14	I.Ec.R		18:16	II.Tr.I		14:37	I.Ec.R	**Sept. 18**	2:01	IV.Tr.I
Sept. 4	12:48	I.Tr.I		18:52	II.Sh.I	**Sept. 13**	9:20	I.Tr.I		3:45	IV.Tr.E
	13:10	I.Sh.I		20:58	II.Tr.E		9:33	I.Sh.I		16:51	I.Tr.I
	15:04	I.Tr.E		21:30	II.Sh.E		11:35	I.Tr.E		16:59	I.Sh.I
	15:24	I.Sh.E		23:08	I.Oc.D		11:47	I.Sh.E		19:06	I.Tr.E
	17:58	III.Tr.I	**Sept. 9**	1:40	I.Ec.R	**Sept. 14**	2:04	II.Oc.D		19:13	I.Sh.E
	19:29	III.Sh.I		15:31	IV.Oc.D		5:10	II.Ec.R	**Sept. 19**	2:53	III.Tr.I
	21:08	III.Tr.E		17:30	IV.Oc.R		6:39	I.Oc.D		3:27	III.Sh.I
	22:26	III.Sh.E		20:19	I.Tr.I		9:05	I.Ec.R		5:59	III.Tr.E

	6:23	III.Sh.E		8:10	I.Sh.E	**Sept. 25**	18:52	I.Tr.I		15:36	I.Sh.E
	10:28	II.Tr.I		17:17	III.Oc.D		18:53	I.Sh.I		15:38	I.Tr.E
	10:43	II.Sh.I		20:32	III.Ec.R		21:08	I.Tr.E	**Sept. 28**	7:44	II.Ec.D
	13:09	II.Tr.E		23:52	II.Tr.I		21:08	I.Sh.E		10:29	II.Oc.R
	13:21	II.Sh.E	**Sept. 23**	0:00	II.Sh.I	**Sept. 26**	7:21	III.Tr.I		10:39	I.Ec.D
	14:10	I.Oc.D		2:32	II.Tr.E		7:25	III.Sh.I		12:55	I.Oc.R
	16:30	I.Ec.R		2:37	II.Sh.E		10:20	III.Sh.E	**Sept. 29**	7:50	I.Sh.I
Sept. 20	11:21	I.Tr.I		3:10	I.Oc.D		10:25	III.Tr.E		7:53	I.Tr.I
	11:27	I.Sh.I		5:27	I.Ec.R		12:33	IV.Oc.D		10:05	I.Sh.E
	13:37	I.Tr.E	**Sept. 24**	0:22	I.Tr.I		13:17	II.Tr.I		10:08	I.Tr.E
	13:42	I.Sh.E		0:25	I.Sh.I		13:17	II.Sh.I		21:34	III.Ec.D
Sept. 21	4:55	II.Oc.D		2:37	I.Tr.E		13:43	IV.Oc.R	**Sept. 30**	0:49	III.Oc.R
	7:47	II.Ec.R		2:39	I.Sh.E		15:54	II.Sh.E		2:34	II.Sh.I
	8:40	I.Oc.D		18:21	II.Oc.D		15:56	II.Tr.E		2:41	II.Tr.I
	10:59	I.Ec.R		21:04	II.Ec.R		16:10	I.Ec.D		5:07	I.Ec.D
Sept. 22	5:52	I.Tr.I		21:40	I.Oc.D		18:25	I.Oc.R		5:11	II.Sh.E
	5:56	I.Sh.I		23:56	I.Ec.R	**Sept. 27**	13:22	I.Sh.I		5:20	II.Tr.E
	8:07	I.Tr.E					13:23	I.Tr.I		7:25	I.Oc.R

Phenomena of Jupiter's Moons, October 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Oct. 1	2:19	I.Sh.I		12:32	I.Ec.D		18:15	III.Sh.E	**Oct. 15**	6:07	I.Sh.I
	2:23	I.Tr.I		13:19	II.Oc.R		18:25	II.Sh.I		6:26	I.Tr.I
	4:33	I.Sh.E		14:56	I.Oc.R		18:52	II.Tr.I		8:22	I.Sh.E
	4:39	I.Tr.E	**Oct. 6**	9:45	I.Sh.I		19:16	III.Tr.E		8:41	I.Tr.E
	21:01	II.Ec.D		9:54	I.Tr.I		19:58	I.Ec.D	**Oct. 16**	2:15	II.Ec.D
	23:36	I.Ec.D		11:59	I.Sh.E		21:01	II.Sh.E		3:23	I.Ec.D
	23:54	II.Oc.R		12:09	I.Tr.E		21:30	II.Tr.E		5:34	II.Oc.R
Oct. 2	1:55	I.Oc.R	**Oct. 7**	1:33	III.Ec.D		22:26	I.Oc.R		5:56	I.Oc.R
	20:48	I.Sh.I		5:08	II.Sh.I	**Oct. 11**	17:10	I.Sh.I	**Oct. 17**	0:36	I.Sh.I
	20:54	I.Tr.I		5:15	III.Oc.R		17:25	I.Tr.I		0:56	I.Tr.I
	23:02	I.Sh.E		5:28	II.Tr.I		19:25	I.Sh.E		2:50	I.Sh.E
	23:09	I.Tr.E		7:01	I.Ec.D		19:40	I.Tr.E		3:11	I.Tr.E
Oct. 3	11:24	III.Sh.I		7:44	II.Sh.E	**Oct. 12**	12:57	II.Ec.D		19:21	III.Sh.I
	11:49	III.Tr.I		8:06	II.Tr.E		14:26	I.Ec.D		20:45	III.Tr.I
	14:17	III.Sh.E		9:26	I.Oc.R		16:09	II.Oc.R		20:58	II.Sh.I
	14:50	III.Tr.E	**Oct. 8**	4:13	I.Sh.I		16:56	I.Oc.R		21:40	II.Tr.I
	15:51	II.Sh.I		4:25	I.Tr.I	**Oct. 13**	11:39	I.Sh.I		21:51	I.Ec.D
	16:04	II.Tr.I		6:27	I.Sh.E		11:56	I.Tr.I		22:13	III.Sh.E
	18:04	I.Ec.D		6:40	I.Tr.E		13:53	I.Sh.E		23:34	II.Sh.E
	18:27	II.Sh.E		23:38	II.Ec.D		14:10	I.Tr.E		23:41	III.Tr.E
	18:43	II.Tr.E	**Oct. 9**	1:29	I.Ec.D	**Oct. 14**	5:31	III.Ec.D	**Oct. 18**	0:16	II.Tr.E
	20:26	I.Oc.R		2:44	II.Oc.R		7:41	II.Sh.I		0:26	I.Oc.R
Oct. 4	15:16	I.Sh.I		3:56	I.Oc.R		8:16	II.Tr.I		19:04	I.Sh.I
	15:24	I.Tr.I		22:42	I.Sh.I		8:54	I.Ec.D		19:27	I.Tr.I
	17:30	I.Sh.E		22:55	I.Tr.I		9:39	III.Oc.R		21:19	I.Sh.E
	17:39	I.Tr.E	**Oct. 10**	0:56	I.Sh.E		10:17	II.Sh.E		21:41	I.Tr.E
	23:04	IV.Tr.I		1:10	I.Tr.E		10:53	II.Tr.E	**Oct. 19**	15:33	II.Ec.D
	23:45	IV.Tr.E		15:22	III.Sh.I		11:26	I.Oc.R		16:20	I.Ec.D
Oct. 5	10:20	II.Ec.D		16:17	III.Tr.I					18:56	I.Oc.R

	18:59	II.Oc.R	**Oct. 23**	4:51	II.Ec.D		4:05	III.Tr.E		15:23	II.Sh.E
Oct. 20	13:33	I.Sh.I		5:16	I.Ec.D		20:59	I.Sh.I		15:26	I.Oc.R
	13:57	I.Tr.I		7:56	I.Oc.R		21:27	I.Tr.I		16:25	II.Tr.E
	15:47	I.Sh.E		8:24	II.Oc.R		23:13	I.Sh.E		18:26	III.Oc.R
	16:11	I.Tr.E	**Oct. 24**	2:30	I.Sh.I		23:42	I.Tr.E	**Oct. 29**	9:56	I.Sh.I
Oct. 21	9:29	III.Ec.D		2:57	I.Tr.I	**Oct. 26**	18:10	II.Ec.D		10:28	I.Tr.I
	10:15	II.Sh.I		4:44	I.Sh.E		18:13	I.Ec.D		12:10	I.Sh.E
	10:48	I.Ec.D		5:12	I.Tr.E		20:56	I.Oc.R		12:42	I.Tr.E
	11:03	II.Tr.I		23:20	III.Sh.I		21:49	II.Oc.R	**Oct. 30**	7:09	I.Ec.D
	12:50	II.Sh.E		23:32	II.Sh.I	**Oct. 27**	15:27	I.Sh.I		7:27	II.Ec.D
	13:26	I.Oc.R		23:45	I.Ec.D		15:58	I.Tr.I		9:56	I.Oc.R
	13:39	II.Tr.E	**Oct. 25**	0:27	II.Tr.I		17:41	I.Sh.E		11:13	II.Oc.R
	14:03	III.Oc.R		1:12	III.Tr.I		18:12	I.Tr.E	**Oct. 31**	4:24	I.Sh.I
Oct. 22	8:02	I.Sh.I		2:07	II.Sh.E	**Oct. 28**	12:41	I.Ec.D		4:58	I.Tr.I
	8:27	I.Tr.I		2:10	III.Sh.E		12:48	II.Sh.I		6:38	I.Sh.E
	10:16	I.Sh.E		2:26	I.Oc.R		13:26	III.Ec.D		7:12	I.Tr.E
	10:41	I.Tr.E		3:02	II.Tr.E		13:50	II.Tr.I			

Phenomena of Jupiter's Moons, November 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Nov. 1	1:38	I.Ec.D		22:48	III.Oc.R	**Nov. 10**	0:55	I.Oc.R	**Nov. 15**	5:24	I.Ec.D
	2:05	II.Sh.I	**Nov. 5**	11:50	I.Sh.I		3:26	II.Oc.R		7:12	II.Sh.I
	3:13	II.Tr.I		12:28	I.Tr.I		19:15	I.Sh.I		8:24	I.Oc.R
	3:19	III.Sh.I		14:03	I.Sh.E		19:58	I.Tr.I		8:44	II.Tr.I
	4:26	I.Oc.R		14:42	I.Tr.E		21:29	I.Sh.E		9:45	II.Sh.E
	4:40	II.Sh.E	**Nov. 6**	9:03	I.Ec.D		22:12	I.Tr.E		11:15	III.Sh.I
	5:39	III.Tr.I		10:04	II.Ec.D	**Nov. 11**	16:28	I.Ec.D		11:17	II.Tr.E
	5:48	II.Tr.E		11:55	I.Oc.R		17:55	II.Sh.I		14:02	III.Sh.E
	6:08	III.Sh.E		14:01	II.Oc.R		19:22	II.Tr.I		14:26	III.Tr.I
	8:28	III.Tr.E	**Nov. 7**	6:18	I.Sh.I		19:24	I.Oc.R		17:09	III.Tr.E
	22:53	I.Sh.I		6:58	I.Tr.I		20:29	II.Sh.E	**Nov. 16**	2:41	I.Sh.I
	23:28	I.Tr.I		8:32	I.Sh.E		21:23	III.Ec.D		3:28	I.Tr.I
Nov. 2	1:06	I.Sh.E		9:12	I.Tr.E		21:55	II.Tr.E		4:54	I.Sh.E
	1:42	I.Tr.E	**Nov. 8**	3:31	I.Ec.D	**Nov. 12**	0:11	III.Ec.R		5:41	I.Tr.E
	20:06	I.Ec.D		4:38	II.Sh.I		0:23	III.Oc.D		23:52	I.Ec.D
	20:46	II.Ec.D		5:59	II.Tr.I		3:09	III.Oc.R	**Nov. 17**	1:59	II.Ec.D
	22:55	I.Oc.R		6:25	I.Oc.R		13:44	I.Sh.I		2:53	I.Oc.R
Nov. 3	0:38	II.Oc.R		7:13	II.Sh.E		14:28	I.Tr.I		6:13	II.Oc.R
	17:21	I.Sh.I		7:17	III.Sh.I		15:57	I.Sh.E		21:09	I.Sh.I
	17:58	I.Tr.I		8:32	II.Tr.E		16:42	I.Tr.E		21:58	I.Tr.I
	19:35	I.Sh.E		10:03	III.Tr.I	**Nov. 13**	10:56	I.Ec.D		23:22	I.Sh.E
	20:12	I.Tr.E		10:05	III.Sh.E		12:40	II.Ec.D	**Nov. 18**	0:11	I.Tr.E
Nov. 4	14:34	I.Ec.D		12:50	III.Tr.E		13:54	I.Oc.R		18:21	I.Ec.D
	15:22	II.Sh.I	**Nov. 9**	0:47	I.Sh.I		16:49	II.Oc.R		20:28	II.Sh.I
	16:36	II.Tr.I		1:28	I.Tr.I	**Nov. 14**	8:12	I.Sh.I		21:23	I.Oc.R
	17:24	III.Ec.D		3:00	I.Sh.E		8:58	I.Tr.I		22:07	II.Tr.I
	17:25	I.Oc.R		3:42	I.Tr.E		10:26	I.Sh.E		23:02	II.Sh.E
	17:56	II.Sh.E		21:59	I.Ec.D		11:11	I.Tr.E	**Nov. 19**	0:38	II.Tr.E
	19:10	II.Tr.E		23:22	II.Ec.D					1:21	III.Ec.D

	4:08	III.Ec.R
	4:46	III.Oc.D
	7:28	III.Oc.R
	15:37	I.Sh.I
	16:28	I.Tr.I
	17:51	I.Sh.E
	18:41	I.Tr.E
Nov. 20	12:49	I.Ec.D
	15:16	II.Ec.D
	15:53	I.Oc.R
	19:36	II.Oc.R
Nov. 21	10:06	I.Sh.I
	10:58	I.Tr.I
	12:19	I.Sh.E
	13:10	I.Tr.E
Nov. 22	7:17	I.Ec.D
	9:45	II.Sh.I
	10:22	I.Oc.R
	11:29	II.Tr.I
	12:18	II.Sh.E
	14:00	II.Tr.E
	15:13	III.Sh.I
	17:58	III.Sh.E
	18:48	III.Tr.I
	21:27	III.Tr.E
Nov. 23	4:34	I.Sh.I
	5:27	I.Tr.I
	6:48	I.Sh.E
	7:40	I.Tr.E
Nov. 24	1:46	I.Ec.D
	4:35	II.Ec.D
	4:52	I.Oc.R
	8:59	II.Oc.R
	23:03	I.Sh.I
	23:57	I.Tr.I
Nov. 25	1:16	I.Sh.E
	2:10	I.Tr.E
	20:14	I.Ec.D
	23:02	II.Sh.I
	23:21	I.Oc.R
Nov. 26	0:51	II.Tr.I
	1:35	II.Sh.E
	3:21	II.Tr.E
	5:19	III.Ec.D
	8:05	III.Ec.R
	9:06	III.Oc.D
	11:46	III.Oc.R
	17:31	I.Sh.I
	18:27	I.Tr.I
	19:44	I.Sh.E
	20:39	I.Tr.E
Nov. 27	14:42	I.Ec.D
	17:51	I.Oc.R
	17:52	II.Ec.D
	22:22	II.Oc.R
Nov. 28	12:00	I.Sh.I
	12:56	I.Tr.I
	14:13	I.Sh.E
	15:09	I.Tr.E
Nov. 29	9:10	I.Ec.D
	12:18	II.Sh.I
	12:20	I.Oc.R
	14:12	II.Tr.I
	14:51	II.Sh.E
	16:42	II.Tr.E
	19:11	III.Sh.I
	21:55	III.Sh.E
	23:07	III.Tr.I
Nov. 30	1:43	III.Tr.E
	6:28	I.Sh.I
	7:26	I.Tr.I
	8:41	I.Sh.E
	9:38	I.Tr.E

Phenomena of Jupiter's Moons, December 2016

For telescopic observers, here is the complete list of phenomena involving Jupiter's four bright moons and the planet's disk or shadow. The first columns give the date and midpoint time of the event in Universal Time. Next is the satellite involved: I for Io, II Europa, III Ganymede, or IV Callisto. This is followed by the type of event: Oc for an occultation of the satellite behind Jupiter's limb, Ec for an eclipse by Jupiter's shadow, Tr for a transit of the satellite across the planet's face, or Sh for the satellite casting its tiny black shadow onto Jupiter. An occultation or eclipse begins when the satellite disappears (D) and ends when it reappears (R). A transit or shadow passage begins at ingress (I) and ends at egress (E). Each event is gradual, lasting several minutes. These predictions are courtesy IMCCE / Paris Observatory.

Dec. 1	3:39	I.Ec.D		17:07	I.Tr.E		13:13	III.Ec.D		13:33	I.Tr.E
	6:49	I.Oc.R	**Dec. 6**	11:03	I.Ec.D		15:58	III.Ec.R	**Dec. 15**	7:24	I.Ec.D
	7:11	II.Ec.D		14:17	I.Oc.R		17:40	III.Oc.D		10:43	I.Oc.R
	11:44	II.Oc.R		14:52	II.Sh.I		20:12	III.Oc.R		12:22	II.Ec.D
Dec. 2	0:57	I.Sh.I		16:55	II.Tr.I		21:19	I.Sh.I		17:10	II.Oc.R
	1:56	I.Tr.I		17:24	II.Sh.E		22:23	I.Tr.I	**Dec. 16**	4:44	I.Sh.I
	3:10	I.Sh.E		19:24	II.Tr.E		23:31	I.Sh.E		5:51	I.Tr.I
	4:08	I.Tr.E		23:09	III.Sh.I	**Dec. 11**	0:35	I.Tr.E		6:56	I.Sh.E
	22:07	I.Ec.D	**Dec. 7**	1:52	III.Sh.E		18:28	I.Ec.D		8:02	I.Tr.E
Dec. 3	1:19	I.Oc.R		3:25	III.Tr.I		21:45	I.Oc.R	**Dec. 17**	1:53	I.Ec.D
	1:35	II.Sh.I		5:57	III.Tr.E		23:04	II.Ec.D		5:12	I.Oc.R
	3:34	II.Tr.I		8:22	I.Sh.I	**Dec. 12**	3:49	II.Oc.R		6:42	II.Sh.I
	4:08	II.Sh.E		9:24	I.Tr.I		15:47	I.Sh.I		8:56	II.Tr.I
	6:03	II.Tr.E		10:35	I.Sh.E		16:52	I.Tr.I		9:13	II.Sh.E
	9:16	III.Ec.D		11:36	I.Tr.E		18:00	I.Sh.E		11:24	II.Tr.E
	12:02	III.Ec.R	**Dec. 8**	5:32	I.Ec.D		19:04	I.Tr.E		17:10	III.Ec.D
	13:24	III.Oc.D		8:47	I.Oc.R	**Dec. 13**	12:56	I.Ec.D		19:54	III.Ec.R
	16:00	III.Oc.R		9:46	II.Ec.D		16:14	I.Oc.R		21:53	III.Oc.D
	19:25	I.Sh.I		14:28	II.Oc.R		17:25	II.Sh.I		23:12	I.Sh.I
	20:25	I.Tr.I	**Dec. 9**	2:50	I.Sh.I		19:36	II.Tr.I	**Dec. 18**	0:20	I.Tr.I
	21:38	I.Sh.E		3:53	I.Tr.I		19:57	II.Sh.E		0:21	III.Oc.R
	22:37	I.Tr.E		5:03	I.Sh.E		22:04	II.Tr.E		1:25	I.Sh.E
Dec. 4	16:35	I.Ec.D		6:05	I.Tr.E	**Dec. 14**	3:07	III.Sh.I		2:31	I.Tr.E
	19:48	I.Oc.R	**Dec. 10**	0:00	I.Ec.D		5:49	III.Sh.E		20:21	I.Ec.D
	20:28	II.Ec.D		3:16	I.Oc.R		7:40	III.Tr.I		23:41	I.Oc.R
Dec. 5	1:06	II.Oc.R		4:08	II.Sh.I		10:08	III.Tr.E	**Dec. 19**	1:39	II.Ec.D
	13:53	I.Sh.I		6:16	II.Tr.I		10:15	I.Sh.I		6:30	II.Oc.R
	14:55	I.Tr.I		6:40	II.Sh.E		11:21	I.Tr.I		17:41	I.Sh.I
	16:06	I.Sh.E		8:44	II.Tr.E		12:28	I.Sh.E		18:49	I.Tr.I

	19:53	I.Sh.E		19:51	II.Oc.R		22:14	I.Ec.D		16:15	I.Sh.E
	21:00	I.Tr.E	**Dec. 23**	6:37	I.Sh.I	**Dec. 26**	1:37	I.Oc.R		17:25	I.Tr.E
Dec. 20	14:49	I.Ec.D		7:47	I.Tr.I		4:15	II.Ec.D		18:21	III.Tr.E
	18:10	I.Oc.R		8:50	I.Sh.E		9:10	II.Oc.R	**Dec. 29**	11:10	I.Ec.D
	19:58	II.Sh.I		9:58	I.Tr.E		19:34	I.Sh.I		14:34	I.Oc.R
	22:16	II.Tr.I	**Dec. 24**	3:46	I.Ec.D		20:45	I.Tr.I		17:33	II.Ec.D
	22:30	II.Sh.E		7:08	I.Oc.R		21:46	I.Sh.E		22:29	II.Oc.R
Dec. 21	0:43	II.Tr.E		9:15	II.Sh.I		22:56	I.Tr.E	**Dec. 30**	8:31	I.Sh.I
	7:06	III.Sh.I		11:36	II.Tr.I	**Dec. 27**	16:42	I.Ec.D		9:43	I.Tr.I
	9:46	III.Sh.E		11:46	II.Sh.E		20:05	I.Oc.R		10:43	I.Sh.E
	11:52	III.Tr.I		14:02	II.Tr.E		22:32	II.Sh.I		11:53	I.Tr.E
	12:09	I.Sh.I		21:08	III.Ec.D	**Dec. 28**	0:55	II.Tr.I	**Dec. 31**	5:38	I.Ec.D
	13:18	I.Tr.I		23:50	III.Ec.R		1:03	II.Sh.E		9:03	I.Oc.R
	14:17	III.Tr.E	**Dec. 25**	1:06	I.Sh.I		3:21	II.Tr.E		11:48	II.Sh.I
	14:21	I.Sh.E		2:02	III.Oc.D		11:03	III.Sh.I		14:14	II.Tr.I
	15:29	I.Tr.E		2:16	I.Tr.I		13:43	III.Sh.E		14:19	II.Sh.E
Dec. 22	9:17	I.Ec.D		3:18	I.Sh.E		14:02	I.Sh.I		16:39	II.Tr.E
	12:39	I.Oc.R		4:27	I.Tr.E		15:14	I.Tr.I			
	14:58	II.Ec.D		4:27	III.Oc.R		16:00	III.Tr.I			