

Galilean Satellites Mutual Phenomena 2009 - 2010

Once every six years or so inclination between orbital planes of Earth and Jupiter's Galilean Satellites becomes small enough so they can be seen as they pass in front of each other. During this about one year intervals satellites also sometimes pass through each others shadows so eclipses could be observed.

During the time interval 13 January 2009 - 08 April 2010 Earth experiences a total of 403 mutual events of Galilean satellites of Jupiter, 162 of which are eclipses and 241 are occultations. Below is the explanation of the columns in the catalog.

Date and Time	Calendar date and Universal Time of maximum eclipse or occultation.
Foreground	Eclipsing or occulting satellite.
Event	Three letter abbreviation for either Eclipse or Occultation, followed by an uppercase symbol.
	T Total
	A Annular
	P Partial
	N Penumbral (eclipses only)
Background	Eclipsed or occulted satellite.
dMag	Drop of magnitude.
dIll	The illumination at maximum eclipse or occultation, as a percentage of the full illumination of the moon alone (eclipses) or of both moons (occultation).
Elong	Distance of the eclipsed or occulted satellite from the center of Jupiter, in arcsec.
Contact Times	
	I Beginning of penumbral eclipse.
	II Beginning of partial eclipse or exterior ingress of occultation.
	III Beginning of central (total or annular) eclipse or inferior ingress of occultation.
	IV Maximum eclipse or occultation.
	V End of central (total or annular) eclipse or inferior egress of occultation.
	VI End of partial eclipse or exterior egress of occultation.
	VII End of penumbral eclipse.

An asterisk follows satellites eclipsed during an occultation, thus making it practically inobservable.

All computations are based on *relatively* accurate ephemerides and must be accurate for most purposes. Depending on the circumstances around an event contact times may differ by several seconds up to few minutes. Also some total or annular events might be partial and vice versa. Please note that method used to find mutual events somehow strangely does not take into account the presence of Jupiter. This means that were generated occultations and eclipses that are being prevented by Jupiter's disc. All known such events have already been removed from the list. Due to parallax events are seen slightly different for different locations worldwide. For some of the occultation there is a link for an animation of the event. To get a clearer picture about visibility of mutual occultations you might check our online [simulator](#).

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times							
							I	II	III	IV	V	VI	VII	
2009 Jan 13 14:45:56	Europa	Ecl P	Ganymede	0.1	91.0	44 E	14:26:35	14:33:18			14:45:56		14:58:34	15:05:17
2009 Jan 13 16:02:10	Europa	Occ P	Ganymede	0.0	99.6	55 E		15:54:35			16:02:10		16:09:46	
2009 Jan 20 12:03:59	Europa	Ecl N	Ganymede	0.0	98.8	20 W	11:51:54				12:03:59			12:16:04
2009 Feb 14 17:14:48	Europa	Occ P	Callisto	0.0	100.0	61 E		17:13:45			17:14:48		17:15:52	
2009 Mar 27 05:45:48	Callisto	Occ P	Ganymede	0.0	96.4	195 E		05:42:48			05:45:48		05:48:48	
2009 Mar 28 03:06:38	Callisto	Occ P	Io	0.1	94.1	50 E		03:04:47			03:06:38		03:08:29	
2009 Apr 05 07:28:56	Io	Occ P	Callisto	0.5	63.6	101 W		07:23:41			07:28:56		07:34:10	
2009 Apr 05 18:57:24	Io*	Occ P	Callisto	0.5	63.6	18 W		18:49:48			18:57:24		19:04:59	
2009 Apr 06 10:02:44	Io	Occ P	Callisto	0.4	71.2	91 E		09:58:46			10:02:44		10:06:43	
2009 Apr 09 23:57:39	Io	Occ P	Ganymede	0.1	95.4	250 E		23:55:36			23:57:39		23:59:42	
2009 Apr 13 00:54:22	Ganymede	Occ P	Io	0.1	95.0	43 E		00:52:44			00:54:22		00:56:00	
2009 Apr 13 06:28:08	Callisto	Occ P	Europa	0.2	80.0	170 E		06:21:31			06:28:08		06:34:45	
2009 Apr 13 17:28:25	Callisto	Ecl N	Io	0.0	98.3	28 E	17:23:25				17:28:25			17:33:25
2009 Apr 14 13:08:45	Callisto	Occ P	Io	0.3	76.5	52 W		13:06:03			13:08:45		13:11:26	
2009 Apr 15 04:53:54	Callisto	Occ P	Europa	0.4	70.6	165 W		04:47:51			04:53:54		04:59:56	
2009 Apr 15 15:02:38	Callisto	Occ P	Ganymede	0.2	79.9	234 W		14:57:00			15:02:38		15:08:16	
2009 Apr 17 03:01:15	Io	Occ P	Ganymede	0.2	81.3	74 E		02:58:30			03:01:15		03:03:59	
2009 Apr 20 03:48:03	Ganymede	Occ P	Io	0.3	78.9	57 E		03:45:29			03:48:03		03:50:36	
2009 Apr 21 21:29:02	Europa	Occ P	Callisto	0.2	83.7	146 W		21:25:26			21:29:02		21:32:39	
2009 Apr 22 20:22:46	Io	Occ P	Europa	0.0	99.8	70 W		20:22:20			20:22:46		20:23:11	
2009 Apr 24 05:58:00	Io	Occ A	Ganymede	0.4	67.7	63 E		05:55:06	05:57:42		05:58:00	05:58:17	06:00:53	
2009 Apr 24 11:23:06	Europa	Occ P	Ganymede	0.0	95.9	115 E		11:21:09			11:23:06		11:25:03	
2009 Apr 26 09:31:47	Io	Occ P	Europa	0.0	96.1	73 W		09:30:36			09:31:47		09:32:59	
2009 Apr 27 06:42:54	Ganymede	Occ T	Io	0.4	67.7	71 E		06:39:53	06:42:29		06:42:54	06:43:19	06:45:55	
2009 Apr 29 22:40:43	Io	Occ P	Europa	0.1	90.5	76 W		22:39:09			22:40:43		22:42:18	
2009 Apr 30 12:39:23	Callisto	Occ P	Europa	0.0	99.2	98 E		12:38:15			12:39:23		12:40:31	
2009 May 01 08:49:51	Io	Occ P	Ganymede	0.4	67.7	52 E		08:47:08			08:49:51		08:52:35	
2009 May 01 14:46:36	Europa	Occ P	Ganymede	0.2	83.2	111 E		14:43:47			14:46:36		14:49:26	
2009 May 02 05:06:21	Europa	Occ P	Io	0.0	98.1	67 W		05:05:27			05:06:21		05:07:15	
2009 May 03 11:49:22	Io	Occ P	Europa	0.2	84.1	79 W		11:47:32			11:49:22		11:51:13	
2009 May 04 04:59:32	Ganymede	Occ P	Europa	0.0	97.5	129 E		04:57:46			04:59:32		05:01:17	
2009 May 04 09:39:22	Ganymede	Occ T	Io	0.4	67.7	84 E		09:36:05	09:39:03		09:39:22	09:39:40	09:42:38	
2009 May 05 18:14:17	Europa	Occ P	Io	0.1	92.8	66 W		18:12:56			18:14:17		18:15:38	
2009 May 07 00:57:55	Io	Occ P	Europa	0.3	77.3	82 W		00:55:52			00:57:55		00:59:57	
2009 May 08 11:37:52	Io	Occ P	Ganymede	0.2	83.0	39 E		11:35:36			11:37:52		11:40:09	
2009 May 08 16:09:11	Io	Ecl N	Callisto	0.1	93.3	155 W	16:06:00				16:09:11			16:12:21
2009 May 08 18:06:51	Europa	Occ A	Ganymede	0.3	73.9	106 E		18:03:43	18:06:18		18:06:51	18:07:24	18:09:59	
2009 May 09 07:21:50	Europa	Occ P	Io	0.2	85.9	64 W		07:20:13			07:21:50		07:23:26	
2009 May 10 14:06:08	Io	Occ P	Europa	0.4	70.5	85 W		14:03:57			14:06:08		14:08:20	
2009 May 11 08:22:31	Ganymede	Occ P	Europa	0.2	83.5	139 E		08:19:21			08:22:31		08:25:41	
2009 May 11 12:39:25	Ganymede	Occ P	Io	0.3	76.1	97 E		12:35:58			12:39:25		12:42:51	
2009 May 12 20:28:58	Europa	Occ P	Io	0.3	78.2	63 W		20:27:11			20:28:58		20:30:44	
2009 May 14 03:14:17	Io	Occ P	Europa	0.5	64.1	88 W		03:11:59			03:14:17		03:16:35	
2009 May 15 14:22:43	Io	Occ P	Ganymede	0.0	96.6	26 E		14:21:19			14:22:43		14:24:07	
2009 May 15 21:23:46	Europa	Occ A	Ganymede	0.3	73.9	100 E		21:20:40	21:23:05		21:23:46	21:24:28	21:26:52	
2009 May 16 04:10:26	Callisto	Ecl N	Ganymede	0.2	85.2	166 E	04:04:06				04:10:26			04:16:45
2009 May 16 09:35:39	Europa	Occ P	Io	0.4	70.0	61 W		09:33:47			09:35:39		09:37:32	
2009 May 16 18:43:42	Callisto	Ecl P	Io	0.5	60.6	85 E	18:38:19	18:42:39			18:43:42		18:44:46	18:49:05
2009 May 17 10:55:46	Callisto	Ecl P	Io	0.7	53.1	9 W	10:45:37	10:51:03			10:55:46		11:00:29	11:05:55

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times						
							I	II	III	IV	V	VI	VII
2009 May 17 16:22:05	Io	Occ P	Europa	0.6	58.5	91 W		16:19:42		16:22:05		16:24:28	
2009 May 17 21:10:06	Callisto	Ecl N	Io	0.3	79.1	118 W	21:03:22			21:10:06			21:16:51
2009 May 18 11:43:19	Ganymede	Occ T	Europa	0.3	73.9	149 E		11:39:34	11:42:40	11:43:19	11:43:58	11:47:04	
2009 May 18 15:45:02	Ganymede	Occ P	Io	0.2	84.6	109 E		15:41:24		15:45:02		15:48:40	
2009 May 19 22:41:57	Europa	Occ P	Io	0.5	61.9	59 W		22:40:01		22:41:57		22:43:52	
2009 May 21 05:29:48	Io	Occ T	Europa	0.6	57.5	94 W		05:27:21	05:29:37	05:29:48	05:29:59	05:32:15	
2009 May 23 00:37:35	Europa	Occ P	Ganymede	0.2	79.8	95 E		00:34:49		00:37:35		00:40:21	
2009 May 23 11:47:47	Europa	Occ A	Io	0.6	57.5	57 W		11:45:51	11:47:39	11:47:47	11:47:55	11:49:43	
2009 May 24 18:37:07	Io	Occ P	Europa	0.6	57.6	97 W		18:34:37		18:37:07		18:39:36	
2009 May 25 15:02:08	Ganymede	Occ T	Europa	0.3	73.9	158 E		14:58:11	15:01:12	15:02:08	15:03:05	15:06:06	
2009 May 25 19:02:12	Ganymede	Occ P	Io	0.1	89.3	119 E		18:57:59		19:02:12		19:06:24	
2009 May 25 21:22:51	Ganymede	Ecl N	Callisto	0.0	98.8	72 W	21:19:34			21:22:51			21:26:07
2009 May 26 01:22:32	Io	Ecl N	Callisto	0.4	68.9	39 W	01:18:24		01:21:42	01:22:32	01:23:23		01:26:40
2009 May 26 08:12:46	Ganymede	Occ P	Io	0.4	68.8	26 W		08:01:09		08:12:46		08:24:22	
2009 May 26 08:30:33	Europa	Ecl N	Callisto	0.0	99.9	22 E	08:29:00			08:30:33			08:32:05
2009 May 26 17:00:26	Ganymede	Occ P	Io	0.1	93.3	121 W		16:55:05		17:00:26		17:05:47	
2009 May 27 00:53:13	Europa	Occ P	Io	0.6	58.0	56 W		00:51:18		00:53:13		00:55:08	
2009 May 28 07:44:23	Io	Occ P	Europa	0.5	61.2	100 W		07:41:52		07:44:23		07:46:54	
2009 May 29 16:50:31	Io	Ecl N	Ganymede	0.0	100.0	34 W	16:49:54			16:50:31			16:51:08
2009 May 30 03:47:37	Europa	Occ P	Ganymede	0.1	92.1	89 E		03:45:30		03:47:37		03:49:44	
2009 May 30 13:58:12	Europa	Occ P	Io	0.5	64.7	54 W		13:56:20		13:58:12		14:00:03	
2009 May 31 20:51:12	Io	Occ P	Europa	0.5	65.4	103 W		20:48:40		20:51:12		20:53:44	
2009 Jun 01 18:11:51	Ganymede	Ecl N	Io	0.0	98.9	103 E	18:09:23			18:11:51			18:14:18
2009 Jun 01 18:18:51	Ganymede	Occ P	Europa	0.3	76.1	168 E		18:14:56		18:18:51		18:22:46	
2009 Jun 01 22:48:43	Ganymede	Occ P	Io	0.1	89.8	122 E		22:42:02		22:48:43		22:55:24	
2009 Jun 02 01:56:35	Callisto	Ecl P	Europa	0.5	65.9	198 E	01:39:36	01:49:41		01:56:35		02:03:30	02:13:34
2009 Jun 02 06:37:00	Ganymede	Occ P	Io	0.4	71.9	36 E		06:24:59		06:37:00		06:49:02	
2009 Jun 03 03:02:45	Europa	Occ P	Io	0.4	71.7	52 W		03:00:58		03:02:45		03:04:32	
2009 Jun 03 03:30:36	Callisto	Ecl A	Io	0.3	74.8	44 W	03:26:36	03:29:19	03:29:42	03:30:36	03:31:30	03:31:53	03:34:37
2009 Jun 03 22:43:43	Callisto	Ecl P	Europa	0.5	63.8	194 W	22:36:39	22:42:20		22:43:43		22:45:06	22:50:47
2009 Jun 04 09:58:03	Io	Occ P	Europa	0.4	69.2	106 W		09:55:30		09:58:03		10:00:35	
2009 Jun 04 11:40:07	Callisto	Ecl N	Ganymede	0.1	91.2	306 W	11:33:01			11:40:07			11:47:14
2009 Jun 06 06:54:13	Europa	Occ P	Ganymede	0.0	99.8	83 E		06:53:32		06:54:13		06:54:54	
2009 Jun 06 16:06:51	Europa	Occ P	Io	0.3	78.1	50 W		16:05:10		16:06:51		16:08:31	
2009 Jun 07 23:04:23	Io	Occ P	Europa	0.3	72.5	109 W		23:01:50		23:04:23		23:06:56	
2009 Jun 08 21:31:33	Ganymede	Ecl N	Io	0.1	92.3	118 E	21:27:08			21:31:33			21:35:58
2009 Jun 08 21:33:40	Ganymede	Occ P	Europa	0.2	84.8	177 E		21:30:00		21:33:40		21:37:21	
2009 Jun 09 10:32:20	Ganymede	Ecl P	Io	0.2	84.5	1 W	10:23:03	10:28:42		10:32:20		10:35:58	10:41:37
2009 Jun 09 19:32:16	Ganymede	Ecl P	Io	0.2	80.0	124 W	19:25:06	19:30:40		19:32:16		19:33:52	19:39:25
2009 Jun 10 05:10:32	Europa	Occ P	Io	0.2	83.9	48 W		05:08:59		05:10:32		05:12:05	
2009 Jun 10 07:29:23	Ganymede	Ecl A	Callisto	0.4	71.5	331 W	07:21:32	07:26:32	07:27:33	07:29:23	07:31:13	07:32:14	07:37:15
2009 Jun 10 14:37:53	Europa	Ecl N	Callisto	0.5	60.8	277 W	14:31:08	14:35:56	14:35:02	14:37:53	14:40:45	14:39:51	14:44:38
2009 Jun 11 06:12:44	Io	Ecl N	Callisto	0.5	60.9	149 W	06:08:41	06:11:42	06:11:16	06:12:44	06:14:11	06:13:45	06:16:47
2009 Jun 11 12:10:46	Io	Occ P	Europa	0.3	75.3	112 W		12:08:13		12:10:46		12:13:19	
2009 Jun 12 22:15:46	Io	Ecl N	Ganymede	0.1	94.1	61 W	22:13:23			22:15:46			22:18:09
2009 Jun 13 18:13:46	Europa	Occ P	Io	0.1	88.8	46 W		18:12:23		18:13:46		18:15:10	
2009 Jun 14 23:21:11	Io	Ecl N	Europa	0.0	100.0	138 W	23:20:44			23:21:11			23:21:39
2009 Jun 15 01:16:38	Io	Occ P	Europa	0.3	77.7	115 W		01:14:04		01:16:38		01:19:12	
2009 Jun 16 00:46:58	Ganymede	Occ P	Europa	0.1	91.6	186 E		00:43:41		00:46:58		00:50:14	

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times							
							I	II	III	IV	V	VI	VII	
2009 Jun 16 01:29:42	Ganymede	Ecl P	Io	0.2	79.7	129 E	01:21:03	01:27:22			01:29:42		01:32:01	01:38:20
2009 Jun 16 08:45:58	Ganymede	Ecl P	Io	0.3	77.8	65 E	08:34:52	08:40:23			08:45:58		08:51:32	08:57:03
2009 Jun 16 23:16:29	Ganymede	Ecl P	Io	0.5	65.2	130 W	23:11:08	23:14:20			23:16:29		23:18:38	23:21:50
2009 Jun 17 07:16:36	Europa	Occ P	Io	0.1	92.9	44 W		07:15:23			07:16:36		07:17:49	
2009 Jun 18 12:29:59	Io	Ecl N	Europa	0.0	99.7	140 W	12:28:49				12:29:59			12:31:09
2009 Jun 18 14:22:36	Io	Occ P	Europa	0.2	79.6	118 W		14:20:01			14:22:36		14:25:11	
2009 Jun 19 05:11:26	Callisto	Ecl N	Europa	0.5	65.8	96 E	05:06:25				05:11:26			05:16:27
2009 Jun 19 08:32:47	Callisto	Ecl N	Io	0.3	75.9	80 E	08:28:32				08:32:47			08:37:02
2009 Jun 19 23:21:18	Callisto	Ecl N	Ganymede	0.2	83.6	93 W	23:14:46	23:19:27	23:18:53		23:21:18	23:23:43	23:23:10	23:27:51
2009 Jun 20 00:58:12	Io	Ecl N	Ganymede	0.2	85.2	74 W	00:55:24				00:58:12			01:00:59
2009 Jun 20 05:10:38	Callisto	Ecl P	Io	0.8	49.5	72 W	04:51:58	05:03:48			05:10:38		05:17:28	05:29:19
2009 Jun 20 09:36:42	Callisto	Ecl P	Io	0.7	50.5	124 W	09:19:04	09:30:23			09:36:42		09:43:02	09:54:20
2009 Jun 20 20:18:58	Europa	Occ P	Io	0.0	96.2	42 W		20:17:57			20:18:58		20:19:58	
2009 Jun 22 01:38:47	Io	Ecl N	Europa	0.0	98.8	142 W	01:37:12				01:38:47			01:40:21
2009 Jun 22 03:28:03	Io	Occ P	Europa	0.2	81.0	121 W		03:25:27			03:28:03		03:30:39	
2009 Jun 23 03:58:11	Ganymede	Occ P	Europa	0.0	96.0	195 E		03:55:25			03:58:11		04:00:56	
2009 Jun 24 02:32:09	Ganymede	Ecl P	Io	0.8	45.8	128 W	02:27:28	02:29:51			02:32:09		02:34:28	02:36:51
2009 Jun 24 09:20:56	Europa	Occ P	Io	0.0	98.5	40 W		09:20:11			09:20:56		09:21:41	
2009 Jun 25 14:48:05	Io	Ecl N	Europa	0.0	97.0	144 W	14:46:10				14:48:05			14:50:00
2009 Jun 25 16:33:37	Io	Occ P	Europa	0.2	82.0	123 W		16:30:59			16:33:37		16:36:16	
2009 Jun 27 03:41:06	Io	Ecl P	Ganymede	0.3	73.0	86 W	03:38:00	03:39:55			03:41:06		03:42:16	03:44:12
2009 Jun 27 22:16:22	Europa	Ecl N	Callisto	0.4	72.2	159 W	22:11:41	22:15:18	22:14:06		22:16:22	22:18:39	22:17:27	22:21:04
2009 Jun 27 22:22:27	Europa	Occ P	Io	0.0	99.8	38 W		22:22:05			22:22:27		22:22:49	
2009 Jun 29 03:57:24	Io	Ecl N	Europa	0.1	94.4	146 W	03:55:13				03:57:24			03:59:36
2009 Jun 29 05:38:40	Io	Occ P	Europa	0.2	82.7	126 W		05:35:58			05:38:40		05:41:22	
2009 Jun 29 14:59:58	Ganymede	Ecl A	Callisto	0.4	68.0	219 E	14:50:50	14:56:02	14:57:54		14:59:58	15:02:01	15:03:53	15:09:05
2009 Jun 30 07:08:11	Ganymede	Occ P	Europa	0.0	98.3	203 E		07:05:57			07:08:11		07:10:24	
2009 Jul 01 05:35:29	Ganymede	Ecl P	Io	1.0	40.3	122 W	05:31:09	05:33:09			05:35:29		05:37:49	05:39:49
2009 Jul 02 17:07:21	Io	Ecl N	Europa	0.1	90.9	148 W	17:04:54				17:07:21			17:09:48
2009 Jul 02 18:43:57	Io	Occ P	Europa	0.2	82.9	128 W		18:41:11			18:43:57		18:46:44	
2009 Jul 04 06:24:57	Io	Ecl A	Ganymede	0.5	63.3	98 W	06:21:36	06:23:19	06:24:03		06:24:57	06:25:51	06:26:35	06:28:18
2009 Jul 04 15:59:59	Europa	Ecl N	Ganymede	0.0	100.0	23 E	15:59:03				15:59:59			16:00:55
2009 Jul 05 09:22:18	Callisto	Ecl N	Ganymede	0.0	98.5	224 E	09:17:56				09:22:18			09:26:40
2009 Jul 06 06:17:20	Io	Ecl P	Europa	0.2	86.6	149 W	06:14:39	06:17:16			06:17:20		06:17:24	06:20:02
2009 Jul 06 07:48:44	Io	Occ P	Europa	0.2	82.8	131 W		07:45:53			07:48:44		07:51:36	
2009 Jul 06 14:15:33	Callisto	Ecl A	Europa	0.2	83.2	38 W	14:10:53	14:14:26	14:14:30		14:15:33	14:16:37	14:16:40	14:20:13
2009 Jul 06 17:38:15	Callisto	Ecl N	Io	0.0	98.1	58 W	17:36:02				17:38:15			17:40:27
2009 Jul 07 07:14:24	Ganymede	Ecl N	Europa	0.0	99.5	192 E	07:12:02				07:14:24			07:16:45
2009 Jul 07 10:16:25	Ganymede	Occ P	Europa	0.0	99.3	211 E		10:14:37			10:16:25		10:18:13	
2009 Jul 08 08:31:10	Ganymede	Ecl P	Io	0.6	55.3	113 W	08:27:06	08:28:53			08:31:10		08:33:27	08:35:14
2009 Jul 08 12:09:48	Europa	Ecl N	Io	0.0	99.9	56 W	12:09:05				12:09:48			12:10:30
2009 Jul 09 19:28:05	Io	Ecl P	Europa	0.2	81.8	151 W	19:25:09	19:27:06			19:28:05		19:29:03	19:31:00
2009 Jul 09 20:53:53	Io	Occ P	Europa	0.2	82.3	133 W		20:50:54			20:53:53		20:56:52	
2009 Jul 11 09:10:29	Io	Ecl A	Ganymede	0.5	64.9	108 W	09:06:56	09:08:35	09:09:15		09:10:29	09:11:44	09:12:24	09:14:03
2009 Jul 11 19:12:54	Europa	Ecl N	Ganymede	0.0	98.8	20 E	19:10:44				19:12:54			19:15:03
2009 Jul 12 01:15:48	Europa	Ecl N	Io	0.0	99.2	53 W	01:14:42				01:15:48			01:16:54
2009 Jul 13 08:38:51	Io	Ecl P	Europa	0.3	76.7	152 W	08:35:42	08:37:28			08:38:51		08:40:14	08:42:00
2009 Jul 13 09:58:31	Io	Occ P	Europa	0.2	81.5	135 W		09:55:24			09:58:31		10:01:38	
2009 Jul 14 10:46:27	Ganymede	Ecl N	Europa	0.1	90.4	204 E	10:42:07				10:46:27			10:50:47

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times						
							I	II	III	IV	V	VI	VII
2009 Jul 14 13:23:54	Ganymede	Occ P	Europa	0.0	99.4	217 E		13:22:07		13:23:54		13:25:41	
2009 Jul 15 02:24:14	Ganymede	Ecl N	Callisto	0.1	90.5	42 W	02:19:22			02:24:14			02:29:06
2009 Jul 15 07:34:15	Europa	Ecl N	Callisto	0.4	71.3	11 E	07:29:48		07:32:37	07:34:15	07:35:53		07:38:41
2009 Jul 15 11:22:10	Ganymede	Ecl A	Io	0.0	100.0	100 W	11:18:20	11:20:01	11:21:53	11:22:10	11:22:28	11:24:20	11:26:01
2009 Jul 15 14:21:50	Europa	Ecl N	Io	0.0	97.5	49 W	14:20:28			14:21:50			14:23:12
2009 Jul 16 21:50:33	Io	Ecl P	Europa	0.4	71.6	152 W	21:47:11	21:48:51		21:50:33		21:52:16	21:53:55
2009 Jul 16 23:03:40	Io	Occ P	Europa	0.2	80.3	137 W		23:00:23		23:03:40		23:06:57	
2009 Jul 18 11:57:55	Io	Ecl A	Ganymede	0.0	100.0	117 W	11:54:09	11:55:49	11:56:33	11:57:55	11:59:17	12:00:00	12:01:41
2009 Jul 18 22:25:29	Europa	Ecl N	Ganymede	0.1	94.5	18 E	22:22:41			22:25:29			22:28:17
2009 Jul 19 03:27:51	Europa	Ecl N	Io	0.1	94.7	44 W	03:26:17			03:27:51			03:29:25
2009 Jul 20 11:02:21	Io	Ecl P	Europa	0.4	66.7	153 W	10:58:45	11:00:21		11:02:21		11:04:21	11:05:57
2009 Jul 20 12:08:22	Io	Occ P	Europa	0.3	78.8	139 W		12:04:54		12:08:22		12:11:50	
2009 Jul 21 14:22:20	Ganymede	Ecl P	Europa	0.4	66.3	214 E	14:16:34	14:20:23		14:22:20		14:24:17	14:28:06
2009 Jul 21 16:31:21	Ganymede	Occ P	Europa	0.0	99.1	223 E		16:29:04		16:31:21		16:33:38	
2009 Jul 22 14:10:05	Ganymede	Ecl P	Io	0.6	57.0	85 W	14:06:29	14:08:09		14:10:05		14:12:01	14:13:42
2009 Jul 22 16:33:52	Europa	Ecl N	Io	0.1	90.5	40 W	16:32:09			16:33:52			16:35:36
2009 Jul 23 23:10:56	Callisto	Ecl N	Europa	0.1	91.4	165 W	23:07:08			23:10:56			23:14:45
2009 Jul 24 00:15:19	Io	Ecl P	Europa	0.5	62.1	153 W	00:11:29	00:13:03		00:15:19		00:17:36	00:19:10
2009 Jul 24 01:13:50	Io	Occ P	Europa	0.3	76.9	141 W		01:10:08		01:13:50		01:17:31	
2009 Jul 24 17:07:49	Callisto	Ecl N	Ganymede	0.3	77.9	329 W	16:59:51			17:07:49			17:15:48
2009 Jul 25 14:48:27	Io	Ecl A	Ganymede	0.5	64.9	125 W	14:44:29	14:46:14	14:47:06	14:48:27	14:49:49	14:50:41	14:52:26
2009 Jul 26 01:38:11	Europa	Ecl N	Ganymede	0.2	86.4	16 E	01:34:57			01:38:11			01:41:25
2009 Jul 26 05:39:53	Europa	Ecl N	Io	0.2	84.9	36 W	05:38:02			05:39:53			05:41:45
2009 Jul 27 13:28:28	Io	Ecl P	Europa	0.6	57.9	153 W	13:24:23	13:25:56		13:28:28		13:31:01	13:32:34
2009 Jul 27 14:18:54	Io	Occ P	Europa	0.3	74.8	142 W		14:14:59		14:18:54		14:22:50	
2009 Jul 28 18:03:39	Ganymede	Ecl P	Europa	1.2	33.4	222 E	17:56:34	17:59:39		18:03:39		18:07:38	18:10:43
2009 Jul 28 19:40:17	Ganymede	Occ P	Europa	0.0	98.0	227 E		19:37:07		19:40:17		19:43:28	
2009 Jul 29 16:55:58	Ganymede	Ecl P	Io	0.9	45.3	67 W	16:52:37	16:54:23		16:55:58		16:57:33	16:59:19
2009 Jul 29 18:45:56	Europa	Ecl P	Io	0.3	77.9	31 W	18:43:58	18:45:29		18:45:56		18:46:23	18:47:54
2009 Jul 31 02:43:05	Io	Ecl P	Europa	0.7	54.2	152 W	02:38:42	02:40:16		02:43:05		02:45:54	02:47:27
2009 Jul 31 03:24:59	Io	Occ P	Europa	0.4	72.2	143 W		03:20:47		03:24:59		03:29:11	
2009 Aug 01 17:42:42	Io	Ecl A	Ganymede	0.5	63.1	131 W	17:38:27	17:40:21	17:41:30	17:42:42	17:43:54	17:45:03	17:46:57
2009 Aug 02 04:50:29	Europa	Ecl N	Ganymede	0.3	75.2	15 E	04:46:58	04:49:33	04:49:30	04:50:29	04:51:28	04:51:25	04:54:00
2009 Aug 02 07:51:59	Europa	Ecl P	Io	0.4	70.0	26 W	07:49:56	07:51:14		07:51:59		07:52:44	07:54:02
2009 Aug 03 15:58:05	Io	Ecl P	Europa	0.7	51.1	151 W	15:53:25	15:54:59		15:58:05		16:01:12	16:02:46
2009 Aug 03 16:30:52	Io	Occ P	Europa	0.4	69.5	144 W		16:26:23		16:30:52		16:35:22	
2009 Aug 04 21:52:59	Ganymede	Ecl P	Europa	0.7	52.9	228 E	21:44:33	21:47:30		21:52:59		21:58:29	22:01:26
2009 Aug 04 22:53:01	Ganymede	Occ P	Europa	0.0	96.2	229 E		22:48:43		22:53:01		22:57:20	
2009 Aug 05 19:40:45	Ganymede	Ecl P	Io	0.6	55.7	48 W	19:37:42	19:39:47		19:40:45		19:41:43	19:43:48
2009 Aug 05 20:58:04	Europa	Ecl P	Io	0.5	61.6	21 W	20:55:56	20:57:08		20:58:04		20:58:59	21:00:11
2009 Aug 07 05:15:03	Io	Ecl P	Europa	0.8	48.8	149 W	05:10:01	05:11:37		05:15:03		05:18:29	05:20:06
2009 Aug 07 05:38:09	Io	Occ P	Europa	0.4	66.3	144 W		05:33:19		05:38:09		05:42:59	
2009 Aug 08 20:42:59	Io	Ecl A	Ganymede	0.5	64.2	135 W	20:38:20	20:40:28	20:42:14	20:42:59	20:43:44	20:45:30	20:47:38
2009 Aug 09 08:02:42	Europa	Ecl N	Ganymede	0.4	68.3	14 E	07:59:00	08:01:13	08:01:10	08:02:42	08:04:14	08:04:11	08:06:24
2009 Aug 09 10:04:08	Europa	Ecl P	Io	0.7	53.0	16 W	10:01:57	10:03:05		10:04:08		10:05:11	10:06:19
2009 Aug 10 18:32:50	Io	Ecl P	Europa	0.8	47.2	147 W	18:27:23	18:29:03		18:32:50		18:36:38	18:38:18
2009 Aug 10 18:45:30	Io	Occ P	Europa	0.5	63.1	145 W		18:40:17		18:45:30		18:50:43	
2009 Aug 12 01:53:18	Ganymede	Ecl T	Europa	9.9	0.0	230 E	01:43:13	01:46:18	01:53:00	01:53:18	01:53:36	02:00:18	02:03:22
2009 Aug 12 02:11:17	Ganymede	Occ P	Europa	0.1	93.7	230 E		02:05:35		02:11:17		02:16:58	

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times							
							I	II	III	IV	V	VI	VII	
2009 Aug 12 22:24:26	Ganymede	Ecl N	Io	0.3	78.8	27 W	22:21:45				22:24:26			22:27:07
2009 Aug 12 23:10:15	Europa	Ecl A	Io	0.8	47.2	11 W	23:08:02	23:09:07	23:09:49	23:10:15	23:10:41	23:11:23	23:12:28	
2009 Aug 14 07:53:24	Io	Ecl P	Europa	0.8	46.8	145 W	07:47:24	07:49:10		07:53:24		07:57:38	07:59:23	
2009 Aug 14 07:54:45	Io	Occ P	Europa	0.6	59.6	144 W		07:49:06		07:54:45		08:00:25		
2009 Aug 14 21:59:24	Io	Occ P	Europa	0.0	99.5	79 E		21:50:32		21:59:24		22:08:16		
2009 Aug 15 00:44:55	Io	Occ P	Europa	0.1	91.6	120 E		00:26:36		00:44:55		01:03:13		
2009 Aug 15 23:53:06	Io	Ecl P	Ganymede	0.4	69.2	176 E	23:47:44	23:50:13		23:53:06		23:55:59	23:58:28	
2009 Aug 16 11:14:56	Europa	Ecl N	Ganymede	0.2	81.5	14 E	11:11:09	11:13:15	11:13:13	11:14:56	11:16:40	11:16:37	11:18:43	
2009 Aug 16 12:16:23	Europa	Ecl A	Io	0.7	52.6	6 W	12:14:08	12:15:11	12:15:48	12:16:23	12:16:57	12:17:34	12:18:37	
2009 Aug 16 16:46:54	Io	Ecl A	Ganymede	0.4	70.6	87 E	16:23:38	16:29:39	16:40:58	16:46:54	16:52:50	17:04:09	17:10:10	
2009 Aug 16 17:14:03	Io	Occ P	Ganymede	0.1	92.7	93 E		16:56:24		17:14:03		17:31:42		
2009 Aug 16 20:14:13	Io	Occ P	Ganymede	0.0	99.9	131 E		20:09:57		20:14:13		20:18:29		
2009 Aug 16 20:45:46	Io	Ecl P	Ganymede	0.5	62.6	138 E	20:26:00	20:32:41		20:45:46		20:58:51	21:05:33	
2009 Aug 17 21:04:31	Io	Occ T	Europa	0.6	57.5	144 W		20:58:21	21:04:16	21:04:31	21:04:46	21:10:42		
2009 Aug 17 21:15:40	Io	Ecl P	Europa	0.8	47.4	141 W	21:09:02	21:10:54		21:15:40		21:20:27	21:22:19	
2009 Aug 18 14:36:11	Io	Occ P	Europa	0.1	87.4	131 E		14:25:17		14:36:11		14:47:04		
2009 Aug 18 14:58:51	Io	Ecl N	Europa	0.0	98.0	136 E	14:52:12			14:58:51			15:05:30	
2009 Aug 19 05:40:26	Ganymede	Occ P	Europa	0.1	91.1	228 E		05:32:58		05:40:26		05:47:54		
2009 Aug 19 06:13:16	Ganymede	Ecl P	Europa	0.2	85.5	226 E	06:00:47	06:04:21		06:13:16		06:22:12	06:25:46	
2009 Aug 20 17:52:53	Ganymede	Ecl N	Europa	0.0	97.3	218 W	17:43:45			17:52:53			18:02:01	
2009 Aug 21 10:17:10	Io	Occ T	Europa	0.6	57.5	143 W		10:10:21	10:16:40	10:17:10	10:17:41	10:24:00		
2009 Aug 21 10:42:43	Io	Ecl P	Europa	0.8	49.8	137 W	10:35:08	10:37:13		10:42:43		10:48:13	10:50:18	
2009 Aug 22 04:07:54	Io	Occ P	Europa	0.2	84.6	136 E		03:59:25		04:07:54		04:16:22		
2009 Aug 22 04:42:32	Io	Ecl P	Europa	0.1	91.6	144 E	04:36:04	04:40:28		04:42:32		04:44:36	04:49:00	
2009 Aug 23 03:22:35	Io	Ecl P	Ganymede	0.4	71.6	133 W	03:15:32	03:18:39		03:22:35		03:26:31	03:29:38	
2009 Aug 23 15:30:56	Io*	Occ P	Ganymede*	0.2	82.4	27 E		15:21:01		15:30:56		15:40:51		
2009 Aug 24 23:31:18	Io	Occ P	Europa	0.6	57.7	141 W		23:23:41		23:31:18		23:38:55		
2009 Aug 24 01:28:44	Io	Ecl P	Ganymede	0.2	84.3	155 E	01:22:12	01:26:05		01:28:44		01:31:23	01:35:16	
2009 Aug 25 00:14:16	Io	Ecl P	Europa	0.7	53.9	131 W	00:05:17	00:07:42		00:14:16		00:20:51	00:23:16	
2009 Aug 25 17:29:20	Io	Occ P	Europa	0.2	82.9	139 E		17:22:06		17:29:20		17:36:33		
2009 Aug 25 18:14:08	Io	Ecl P	Europa	0.2	82.9	148 E	18:07:56	18:10:49		18:14:08		18:17:27	18:20:19	
2009 Aug 26 09:26:56	Ganymede	Occ P	Europa	0.1	88.9	221 E		09:16:51		09:26:56		09:37:02		
2009 Aug 26 11:12:24	Ganymede	Ecl P	Europa	1.7	21.7	212 E	10:54:48	10:59:51		11:12:24		11:24:58	11:30:01	
2009 Aug 27 01:01:32	Ganymede	Ecl N	Europa	0.0	100.0	36 E	00:58:03			01:01:32			01:05:00	
2009 Aug 27 22:49:02	Ganymede	Ecl N	Europa	0.0	97.0	227 W	22:42:36			22:49:02			22:55:28	
2009 Aug 28 12:50:28	Io	Occ P	Europa	0.5	61.9	138 W		12:41:42		12:50:28		12:59:14		
2009 Aug 28 13:57:55	Io	Ecl P	Europa	0.5	61.5	123 W	13:46:09	13:49:20		13:57:55		14:06:29	14:09:40	
2009 Aug 29 06:47:44	Io	Occ P	Europa	0.2	81.7	140 E		06:41:22		06:47:44		06:54:05		
2009 Aug 29 07:41:21	Io	Ecl P	Europa	0.3	72.8	152 E	07:35:27	07:37:42		07:41:21		07:45:00	07:47:16	
2009 Aug 30 05:47:29	Io	Occ P	Ganymede	0.0	98.3	143 W		05:44:06		05:47:29		05:50:53		
2009 Aug 30 07:57:41	Io	Ecl P	Ganymede	0.4	67.4	116 W	07:40:39	07:46:49		07:57:41		08:08:33	08:14:43	
2009 Aug 30 12:27:11	Io	Ecl A	Ganymede	0.5	64.6	58 W	12:06:28	12:11:56	12:22:54	12:27:11	12:31:28	12:42:27	12:47:54	
2009 Aug 30 14:34:50	Io	Occ P	Ganymede	0.3	77.7	30 W		14:24:15		14:34:50		14:45:24		
2009 Aug 31 05:00:33	Io	Ecl N	Ganymede	0.0	96.6	157 E	04:56:48			05:00:33			05:04:19	
2009 Sep 01 02:13:52	Io	Occ P	Europa	0.4	67.4	134 W		02:03:21		02:13:52		02:24:23		
2009 Sep 01 04:08:37	Io	Ecl P	Europa	0.3	75.4	107 W	03:46:53	03:53:29		04:08:37		04:23:46	04:30:22	
2009 Sep 01 04:30:02	Io	Ecl N	Europa	0.0	99.2	102 W	04:18:36			04:30:02			04:41:28	
2009 Sep 01 07:00:34	Io	Ecl N	Europa	0.0	98.9	63 W	06:46:58			07:00:34			07:14:10	
2009 Sep 01 20:01:52	Io	Occ P	Europa	0.2	81.1	141 E		19:56:08		20:01:52		20:07:36		

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times							
							I	II	III	IV	V	VI	VII	
2009 Sep 01 21:03:47	Io	Ecl P	Europa	0.5	62.0	154 E	20:58:07	21:00:02			21:03:47		21:07:31	21:09:26
2009 Sep 02 13:54:20	Ganymede	Occ P	Europa	0.1	88.4	207 E		13:38:29			13:54:20		14:10:10	
2009 Sep 04 03:06:57	Ganymede	Ecl N	Europa	0.0	98.3	226 W	03:02:14				03:06:57			03:11:39
2009 Sep 04 15:50:28	Io	Occ P	Europa	0.3	74.5	127 W		15:36:11			15:50:28		16:04:45	
2009 Sep 04 20:30:09	Io	Occ P	Europa	0.0	99.0	58 W		20:23:00			20:30:09		20:37:19	
2009 Sep 05 09:15:12	Io	Occ P	Europa	0.2	80.8	141 E		09:09:59			09:15:12		09:20:25	
2009 Sep 05 10:24:34	Io	Ecl P	Europa	0.7	50.3	156 E	10:19:09	10:20:51			10:24:34		10:28:18	10:30:00
2009 Sep 07 08:11:59	Io	Ecl N	Ganymede	0.0	100.0	154 E	08:10:39				08:11:59			08:13:19
2009 Sep 08 06:46:10	Io	Occ P	Europa	0.1	95.5	101 W		06:19:26			06:46:10		07:12:53	
2009 Sep 08 07:31:42	Io	Occ P	Europa	0.1	93.5	90 W		06:53:55			07:31:42		08:09:29	
2009 Sep 08 22:26:06	Io	Occ P	Europa	0.2	80.8	141 E		22:21:18			22:26:06		22:30:55	
2009 Sep 08 23:42:36	Io	Ecl P	Europa	1.0	38.4	157 E	23:37:23	23:38:56			23:42:36		23:46:15	23:47:49
2009 Sep 11 07:07:03	Ganymede	Ecl N	Europa	0.0	99.6	221 W	07:03:59				07:07:03			07:10:07
2009 Sep 12 11:36:57	Io	Occ P	Europa	0.2	81.0	140 E		11:32:30			11:36:57		11:41:25	
2009 Sep 12 12:59:54	Io	Ecl P	Europa	1.5	26.2	157 E	12:54:53	12:56:20			12:59:54		13:03:27	13:04:54
2009 Sep 14 00:06:22	Europa	Ecl N	Ganymede	0.1	90.2	7 E	00:03:17				00:06:22			00:09:26
2009 Sep 16 00:46:15	Io	Occ P	Europa	0.2	81.4	139 E		00:42:06			00:46:15		00:50:25	
2009 Sep 16 02:15:19	Io	Ecl P	Europa	1.3	30.4	157 E	02:10:30	02:11:53			02:15:19		02:18:45	02:20:08
2009 Sep 19 13:55:46	Io	Occ P	Europa	0.2	81.9	138 E		13:51:53			13:55:46		13:59:40	
2009 Sep 19 15:30:21	Io	Ecl P	Europa	0.7	52.9	157 E	15:25:44	15:27:04			15:30:21		15:33:39	15:34:58
2009 Sep 20 23:19:34	Europa	Ecl N	Io	0.2	84.4	41 E	23:17:41				23:19:34			23:21:26
2009 Sep 21 00:48:24	Europa	Occ P	Ganymede	0.3	78.2	28 W		00:45:53			00:48:24		00:50:55	
2009 Sep 23 03:04:15	Io	Occ P	Europa	0.2	82.5	136 E		03:00:36			03:04:15		03:07:55	
2009 Sep 23 04:44:01	Io	Ecl A	Europa	0.0	100.0	156 E	04:39:35	04:40:53	04:43:39		04:44:01	04:44:23	04:47:09	04:48:27
2009 Sep 24 12:26:05	Europa	Ecl N	Io	0.1	89.7	45 E	12:24:19				12:26:05			12:27:51
2009 Sep 25 11:11:40	Ganymede	Occ P	Europa	0.0	99.4	216 W		11:09:36			11:11:40		11:13:45	
2009 Sep 26 16:13:09	Io	Occ P	Europa	0.2	83.0	134 E		16:09:42			16:13:09		16:16:35	
2009 Sep 26 17:57:30	Io	Ecl A	Europa	0.6	57.0	155 E	17:53:16	17:54:33	17:57:28		17:57:30	17:57:32	18:00:26	18:01:43
2009 Sep 28 01:32:40	Europa	Ecl N	Io	0.1	93.8	49 E	01:31:03				01:32:40			01:34:18
2009 Sep 28 03:39:57	Europa	Occ A	Ganymede	0.3	73.9	36 W		03:37:16	03:39:33		03:39:57	03:40:22	03:42:38	
2009 Sep 30 05:21:20	Io	Occ P	Europa	0.2	83.6	132 E		05:18:04			05:21:20		05:24:35	
2009 Sep 30 07:09:55	Io	Ecl P	Europa	1.2	32.1	153 E	07:05:54	07:07:11			07:09:55		07:12:40	07:13:57
2009 Oct 01 13:08:54	Europa	Occ P	Io*	0.6	58.8	23 E		13:07:10			13:08:54		13:10:39	
2009 Oct 01 14:39:17	Europa	Ecl N	Io	0.0	96.7	52 E	14:37:49				14:39:17			14:40:44
2009 Oct 02 14:32:19	Ganymede	Occ P	Europa	0.0	96.4	210 W		14:28:59			14:32:19		14:35:39	
2009 Oct 03 18:30:00	Io	Occ P	Europa	0.2	84.1	130 E		18:26:54			18:30:00		18:33:05	
2009 Oct 03 20:22:16	Io	Ecl P	Europa	1.4	28.5	152 E	20:18:27	20:19:45			20:22:16		20:24:47	20:26:05
2009 Oct 05 02:11:09	Europa	Occ A	Io*	0.6	57.5	26 E		02:09:24	02:11:05		02:11:09	02:11:14	02:12:55	
2009 Oct 05 03:45:58	Europa	Ecl N	Io	0.0	98.6	55 E	03:44:43				03:45:58			03:47:13
2009 Oct 05 06:34:52	Europa	Occ A	Ganymede	0.3	73.9	43 W		06:32:07	06:34:11		06:34:52	06:35:33	06:37:38	
2009 Oct 05 17:15:14	Io	Occ P	Ganymede	0.0	99.4	87 E		17:14:18			17:15:14		17:16:10	
2009 Oct 07 07:38:07	Io	Occ P	Europa	0.2	84.6	128 E		07:35:10			07:38:07		07:41:04	
2009 Oct 07 09:33:44	Io	Ecl P	Europa	1.0	41.2	150 E	09:30:08	09:31:28			09:33:44		09:35:59	09:37:19
2009 Oct 08 15:13:50	Europa	Occ A	Io*	0.6	57.5	28 E		15:12:04	15:13:42		15:13:50	15:13:58	15:15:36	
2009 Oct 08 16:52:41	Europa	Ecl N	Io	0.0	99.6	58 E	16:51:43				16:52:41			16:53:39
2009 Oct 08 17:50:12	Ganymede	Occ P	Io	0.0	97.5	74 E		17:48:48			17:50:12		17:51:35	
2009 Oct 09 17:53:04	Ganymede	Occ P	Europa	0.1	92.6	202 W		17:49:15			17:53:04		17:56:54	
2009 Oct 10 20:46:47	Io	Occ P	Europa	0.2	84.9	125 E		20:43:58			20:46:47		20:49:37	
2009 Oct 10 22:45:11	Io	Ecl P	Europa	0.7	54.0	148 E	22:41:49	22:43:14			22:45:11		22:47:08	22:48:32

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times						
							I	II	III	IV	V	VI	VII
2009 Oct 12 04:16:59	Europa	Occ A	Io*	0.6	57.5	30 E		04:15:12	04:16:51	04:16:59	04:17:06	04:18:45	
2009 Oct 12 05:59:27	Europa	Ecl N	Io	0.0	100.0	61 E	05:58:56		05:59:27				05:59:59
2009 Oct 12 09:33:26	Europa	Occ A	Ganymede	0.3	73.9	50 W		09:30:39	09:32:45	09:33:26	09:34:06	09:36:12	
2009 Oct 12 19:53:46	Io	Occ P	Ganymede	0.0	98.2	74 E		19:52:31		19:53:46		19:55:01	
2009 Oct 14 09:55:04	Io	Occ P	Europa	0.2	85.1	123 E		09:52:22		09:55:04		09:57:47	
2009 Oct 14 11:55:55	Io	Ecl P	Europa	0.4	66.2	146 E	11:52:48	11:54:20		11:55:55		11:57:29	11:59:01
2009 Oct 15 17:20:34	Europa	Occ A	Io*	0.6	57.5	32 E		17:18:47	17:20:28	17:20:34	17:20:39	17:22:20	
2009 Oct 15 20:29:39	Ganymede	Occ P	Io	0.1	93.5	85 E		20:27:40		20:29:39		20:31:37	
2009 Oct 16 21:13:53	Ganymede	Occ P	Europa	0.1	88.7	194 W		21:09:52		21:13:53		21:17:53	
2009 Oct 17 23:03:56	Io	Occ P	Europa	0.2	85.1	120 E		23:01:19		23:03:56		23:06:33	
2009 Oct 18 01:06:41	Io	Ecl P	Europa	0.3	77.4	143 E	01:03:51	01:05:37		01:06:41		01:07:44	01:09:31
2009 Oct 19 06:24:38	Europa	Occ P	Io*	0.6	57.5	34 E		06:22:51		06:24:38		06:26:25	
2009 Oct 19 12:35:59	Europa	Occ A	Ganymede	0.3	73.9	58 W		12:33:13	12:35:26	12:35:59	12:36:32	12:38:46	
2009 Oct 19 22:33:26	Io	Occ P	Ganymede	0.0	97.3	59 E		22:32:04		22:33:26		22:34:48	
2009 Oct 21 12:12:29	Io	Occ P	Europa	0.2	85.0	117 E		12:09:57		12:12:29		12:15:02	
2009 Oct 21 14:16:50	Io	Ecl N	Europa	0.2	86.9	141 E	14:14:18			14:16:50			14:19:21
2009 Oct 22 19:29:08	Europa	Occ P	Io*	0.6	58.1	36 E		19:27:21		19:29:08		19:30:56	
2009 Oct 22 23:14:47	Ganymede	Occ P	Io	0.1	89.5	95 E		23:12:20		23:14:47		23:17:14	
2009 Oct 24 00:35:42	Ganymede	Occ P	Europa	0.2	85.4	186 W		00:31:40		00:35:42		00:39:44	
2009 Oct 25 01:21:36	Io	Occ P	Europa	0.2	84.6	115 E		01:19:07		01:21:36		01:24:04	
2009 Oct 25 03:27:00	Io	Ecl N	Europa	0.1	93.8	138 E	03:24:50			03:27:00			03:29:10
2009 Oct 26 08:34:08	Europa	Occ P	Io*	0.6	58.6	39 E		08:32:21		08:34:08		08:35:56	
2009 Oct 26 15:42:12	Europa	Occ A	Ganymede	0.3	73.9	65 W		15:39:25	15:41:48	15:42:12	15:42:36	15:44:58	
2009 Oct 27 01:14:09	Io	Occ P	Ganymede	0.0	96.9	45 E		01:12:46		01:14:09		01:15:32	
2009 Oct 28 14:30:30	Io	Occ P	Europa	0.2	84.0	112 E		14:28:04		14:30:30		14:32:56	
2009 Oct 28 16:36:40	Io	Ecl N	Europa	0.0	97.9	135 E	16:34:55			16:36:40			16:38:25
2009 Oct 29 21:39:33	Europa	Occ P	Io*	0.6	58.8	41 E		21:37:45		21:39:33		21:41:21	
2009 Oct 30 02:07:07	Ganymede	Occ P	Io	0.2	86.2	103 E		02:04:10		02:07:07		02:10:03	
2009 Oct 30 20:14:32	Ganymede	Ecl N	Io	0.0	99.5	61 W	20:09:05			20:14:32			20:19:59
2009 Oct 31 03:58:57	Ganymede	Occ P	Europa	0.2	83.0	177 W		03:55:00		03:58:57		04:02:54	
2009 Nov 01 03:39:55	Io	Occ P	Europa	0.2	83.0	109 E		03:37:32		03:39:55		03:42:19	
2009 Nov 01 05:46:21	Io	Ecl N	Europa	0.0	99.7	132 E	05:45:11			05:46:21			05:47:31
2009 Nov 02 10:45:27	Europa	Occ P	Io*	0.6	58.7	43 E		10:43:38		10:45:27		10:47:16	
2009 Nov 02 18:52:22	Europa	Occ A	Ganymede	0.3	73.9	71 W		18:49:33	18:51:59	18:52:22	18:52:44	18:55:10	
2009 Nov 03 03:56:32	Io	Occ P	Ganymede	0.0	97.3	30 E		03:55:14		03:56:32		03:57:49	
2009 Nov 04 16:49:13	Io	Occ P	Europa	0.2	81.8	106 E		16:46:51		16:49:13		16:51:35	
2009 Nov 05 23:51:45	Europa	Occ P	Io	0.6	58.4	45 E		23:49:55		23:51:45		23:53:35	
2009 Nov 06 05:09:34	Ganymede	Occ P	Io	0.2	83.4	110 E		05:06:00		05:09:34		05:13:08	
2009 Nov 06 18:31:24	Ganymede	Ecl N	Io	0.0	99.6	2 E	18:26:35			18:31:24			18:36:12
2009 Nov 07 07:23:50	Ganymede	Occ P	Europa	0.2	81.8	168 W		07:20:02		07:23:50		07:27:39	
2009 Nov 08 05:58:57	Io	Occ P	Europa	0.2	80.3	103 E		05:56:35		05:58:57		06:01:18	
2009 Nov 09 12:58:32	Europa	Occ P	Io	0.6	57.8	47 E		12:56:41		12:58:32		13:00:22	
2009 Nov 09 22:05:44	Europa	Occ A	Ganymede	0.3	73.9	78 W		22:02:52	22:05:14	22:05:44	22:06:15	22:08:37	
2009 Nov 10 06:40:14	Io	Occ P	Ganymede	0.0	98.5	15 E		06:39:10		06:40:14		06:41:18	
2009 Nov 11 19:08:36	Io	Occ P	Europa	0.3	78.3	100 E		19:06:15		19:08:36		19:10:57	
2009 Nov 13 02:05:41	Europa	Occ A	Io	0.6	57.5	49 E		02:03:49	02:05:37	02:05:41	02:05:46	02:07:33	
2009 Nov 13 08:28:36	Ganymede	Occ P	Io	0.2	80.7	115 E		08:23:57		08:28:36		08:33:16	
2009 Nov 13 22:33:11	Ganymede	Occ T	Io	0.4	67.7	34 W		22:20:50	22:31:23	22:33:11	22:35:00	22:45:33	
2009 Nov 14 06:21:21	Ganymede	Occ P	Io	0.2	81.3	116 W		06:13:37		06:21:21		06:29:06	

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times						
							I	II	III	IV	V	VI	VII
2009 Nov 14 10:50:44	Ganymede	Occ P	Europa	0.2	82.0	159 W		10:47:07			10:50:44		10:54:21
2009 Nov 15 08:18:40	Io	Occ P	Europa	0.3	76.0	97 E		08:16:19			08:18:40		08:21:01
2009 Nov 16 15:13:18	Europa	Occ A	Io	0.6	57.5	51 E		15:11:25	15:13:10		15:13:18	15:13:25	15:15:11
2009 Nov 17 01:22:33	Europa	Occ A	Ganymede	0.3	73.9	84 W		01:19:36	01:21:52		01:22:33	01:23:15	01:25:31
2009 Nov 18 21:28:42	Io	Occ P	Europa	0.3	73.3	95 E		21:26:22			21:28:42		21:31:03
2009 Nov 20 04:21:18	Europa	Occ A	Io	0.6	57.5	52 E		04:19:23	04:21:09		04:21:18	04:21:26	04:23:12
2009 Nov 20 12:22:37	Ganymede	Occ P	Io	0.3	77.1	115 E		12:14:55			12:22:37		12:30:20
2009 Nov 20 20:45:41	Ganymede	Occ T	Io	0.4	67.7	29 E		20:33:43	20:43:54		20:45:41	20:47:28	20:57:39
2009 Nov 21 10:19:51	Ganymede	Occ P	Io	0.1	90.7	112 W		10:15:57			10:19:51		10:23:46
2009 Nov 21 14:18:47	Ganymede	Occ P	Europa	0.2	83.8	150 W		14:15:25			14:18:47		14:22:09
2009 Nov 22 10:39:06	Io	Occ P	Europa	0.4	70.1	92 E		10:36:46			10:39:06		10:41:27
2009 Nov 23 17:29:43	Europa	Occ A	Io	0.6	57.5	54 E		17:27:48	17:29:35		17:29:43	17:29:50	17:31:38
2009 Nov 24 04:42:39	Europa	Occ A	Ganymede	0.3	73.9	90 W		04:39:37	04:41:53		04:42:39	04:43:25	04:45:41
2009 Nov 25 23:49:28	Io	Occ P	Europa	0.4	66.4	89 E		23:47:08			23:49:28		23:51:49
2009 Nov 27 06:38:31	Europa	Occ P	Io	0.6	57.7	56 E		06:36:35			06:38:31		06:40:28
2009 Nov 28 13:45:48	Ganymede	Occ P	Io	0.0	98.0	103 W		13:43:53			13:45:48		13:47:44
2009 Nov 28 17:48:27	Ganymede	Occ P	Europa	0.1	87.3	140 W		17:45:25			17:48:27		17:51:28
2009 Nov 29 13:00:10	Io	Occ P	Europa	0.5	62.4	86 E		12:57:50			13:00:10		13:02:29
2009 Nov 30 19:47:42	Europa	Occ P	Io	0.6	60.0	58 E		19:45:45			19:47:42		19:49:39
2009 Dec 01 08:06:01	Europa	Occ A	Ganymede	0.3	73.9	96 W		08:02:57	08:05:25		08:06:01	08:06:38	08:09:06
2009 Dec 03 02:10:50	Io	Occ P	Europa	0.6	58.4	83 E		02:08:32			02:10:50		02:13:09
2009 Dec 04 08:57:16	Europa	Occ P	Io	0.5	63.1	60 E		08:55:19			08:57:16		08:59:13
2009 Dec 05 21:18:59	Ganymede	Occ P	Europa	0.1	92.3	131 W		21:16:27			21:18:59		21:21:31
2009 Dec 06 15:21:48	Io	Occ T	Europa	0.6	57.5	80 E		15:19:32	15:21:38		15:21:48	15:21:58	15:24:05
2009 Dec 07 22:07:11	Europa	Occ P	Io	0.4	66.7	62 E		22:05:14			22:07:11		22:09:08
2009 Dec 08 11:32:48	Europa	Occ P	Ganymede	0.3	76.8	102 W		11:29:49			11:32:48		11:35:47
2009 Dec 10 04:32:46	Io	Occ T	Europa	0.6	57.5	77 E		04:30:32	04:32:43		04:32:46	04:32:49	04:35:00
2009 Dec 11 11:17:28	Europa	Occ P	Io	0.4	70.5	63 E		11:15:32			11:17:28		11:19:25
2009 Dec 13 00:50:35	Ganymede	Occ P	Europa	0.0	97.7	122 W		00:48:54			00:50:35		00:52:15
2009 Dec 13 17:43:57	Io	Occ P	Europa	0.5	61.9	74 E		17:41:47			17:43:57		17:46:07
2009 Dec 15 00:28:06	Europa	Occ P	Io	0.3	74.4	65 E		00:26:12			00:28:06		00:30:01
2009 Dec 15 15:02:27	Europa	Occ P	Ganymede	0.2	86.3	107 W		14:59:45			15:02:27		15:05:09
2009 Dec 17 06:55:09	Io	Occ P	Europa	0.4	68.1	71 E		06:53:04			06:55:09		06:57:15
2009 Dec 18 13:39:06	Europa	Occ P	Io	0.3	78.4	67 E		13:37:14			13:39:06		13:40:58
2009 Dec 20 20:06:33	Io	Occ P	Europa	0.3	74.8	69 E		20:04:35			20:06:33		20:08:31
2009 Dec 22 02:50:24	Europa	Occ P	Io	0.2	82.4	68 E		02:48:36			02:50:24		02:52:13
2009 Dec 22 18:35:18	Europa	Occ P	Ganymede	0.0	95.9	113 W		18:33:20			18:35:18		18:37:15
2009 Dec 24 09:17:59	Io	Occ P	Europa	0.2	81.5	66 E		09:16:11			09:17:59		09:19:47
2009 Dec 25 16:02:05	Europa	Occ P	Io	0.2	86.4	70 E		16:00:22			16:02:05		16:03:49
2009 Dec 27 22:29:32	Io	Occ P	Europa	0.1	88.1	63 E		22:27:56			22:29:32		22:31:07
2009 Dec 29 05:14:03	Europa	Occ P	Io	0.1	90.1	72 E		05:12:27			05:14:03		05:15:40
2009 Dec 31 11:41:07	Io	Occ P	Europa	0.1	94.1	60 E		11:39:50			11:41:07		11:42:24
2010 Jan 01 18:26:25	Europa	Occ P	Io	0.1	93.4	73 E		18:24:58			18:26:25		18:27:53
2010 Jan 04 00:52:48	Io	Occ P	Europa	0.0	98.8	58 E		00:52:01			00:52:48		00:53:34
2010 Jan 05 07:39:01	Europa	Occ P	Io	0.0	96.4	75 E		07:37:47			07:39:01		07:40:16
2010 Jan 08 20:52:04	Europa	Occ P	Io	0.0	98.7	77 E		20:51:09			20:52:04		20:52:59
2010 Jan 12 10:05:19	Europa	Occ P	Io	0.0	100.0	78 E		10:05:11			10:05:19		10:05:27
2010 Mar 17 22:59:38	Europa	Occ P	Io	0.4	69.1	45 W		22:37:20			22:59:38		23:21:56
2010 Mar 21 10:06:45	Europa	Occ P	Io	0.6	59.6	20 W		09:51:09			10:06:45		10:22:22

Date and Time	Foreground	Event	Background	dMag	dIll	Elong	Contact Times							
							I	II	III	IV	V	VI	VII	
2010 Mar 21 11:24:33	Europa	Ecl	P Io	0.7	53.9	37 W	11:02:45	11:06:16			11:24:33		11:42:51	11:46:22
2010 Mar 24 21:35:28	Europa	Occ	P Io	0.6	57.7	4 E		21:20:47			21:35:28		21:50:10	
2010 Mar 24 22:49:29	Europa	Ecl	P Io	1.0	38.3	15 W	22:32:45	22:35:06			22:49:29		23:03:53	23:06:14
2010 Mar 28 08:59:21	Europa	Occ	P Io	0.6	58.9	26 E		08:42:51			08:59:21		09:15:50	
2010 Mar 28 10:24:45	Europa	Ecl	P Io	1.2	31.8	6 E	10:09:07	10:11:14			10:24:45		10:38:15	10:40:22
2010 Mar 31 17:05:46	Europa	Occ	P Io	0.1	92.2	83 E		16:47:52			17:05:46		17:23:40	
2010 Mar 31 19:57:50	Europa	Occ	P Io	0.4	68.1	53 E		19:29:07			19:57:50		20:26:32	
2010 Mar 31 22:04:04	Europa	Ecl	A Io	1.2	34.0	25 E	21:47:38	21:49:52	22:03:26		22:04:04	22:04:42	22:18:16	22:20:30
2010 Apr 04 04:41:05	Europa	Ecl	N Io	0.0	99.2	93 E	04:33:46				04:41:05			04:48:25
2010 Apr 04 09:30:01	Europa	Ecl	P Io	1.1	37.8	47 E	09:09:12	09:12:13			09:30:01		09:47:49	09:50:50
2010 Apr 07 19:51:17	Europa	Ecl	P Io	0.2	82.7	77 E	19:28:07	19:34:07			19:51:17		20:08:28	20:14:28