

conjunction	1600 Aug 01 11:42	9°♄12'41	-6°-7'-16	retrograde	1608 Mar 24 04:24	13°♂51'45	
minimum elong	1600 Aug 01 11:55	9°♄12'45	6°07'18	min. Earth dist.	1608 May 26 15:14	11°♂07'41	9.14311 AU
retrograde	1600 Dec 02 23:17	19°♄49'52		opposition	1608 Jun 01 04:01	10°♂44'18	5°26'22
opposition	1601 Feb 05 07:35	16°♄39'26	-7°-19'-1	direct	1608 Aug 09 16:56	7°♂38'39	
min. Earth dist.	1601 Feb 10 03:03	16°♄16'49	8.11115 AU				
direct	1601 Apr 12 16:27	13°♄21'10		conjunction	1608 Dec 08 07:57	16°♂41'08	4°55'26
max. Earth dist.	1601 Aug 12 04:23	23°♄56'55	9.86725 AU	minimum elong	1608 Dec 08 07:37	16°♂41'02	4°55'25
				max. Earth dist.	1608 Dec 14 20:46	17°♂26'15	11.48362 AU
conjunction	1601 Aug 17 21:07	24°♄43'53	-5°-29'-40	retrograde	1609 Apr 03 19:03	25°♂15'51	
minimum elong	1601 Aug 17 21:32	24°♄44'02	5°29'41	min. Earth dist.	1609 Jun 07 08:17	22°♂36'22	9.82454 AU
	1601 Sep 26 06:29	0°♄		opposition	1609 Jun 13 09:46	22°♂11'45	6°22'50
retrograde	1601 Dec 20 10:56	6°♄09'14		direct	1609 Aug 23 02:45	19°♂10'28	
opposition	1602 Feb 21 17:30	2°♄57'41	-6°-18'-15				
min. Earth dist.	1602 Feb 25 09:33	2°♄40'06	7.67995 AU	conjunction	1609 Dec 19 02:06	27°♂23'41	5°37'09
	1602 Apr 08 14:12	30°♄		minimum elong	1609 Dec 19 01:52	27°♂23'37	5°37'08
direct	1602 Apr 28 05:45	29°♄38'26		max. Earth dist.	1609 Dec 25 23:23	28°♂07'57	12.17587 AU
	1602 May 17 19:02	0°♄			1610 Jan 12 20:58	0°♄	
max. Earth dist.	1602 Aug 31 22:43	11°♄15'26	9.52248 AU	retrograde	1610 Apr 13 04:47	5°♄15'58	
				min. Earth dist.	1610 Jun 17 22:14	2°♄40'18	10.52577 AU
conjunction	1602 Sep 04 18:16	11°♄48'26	-4°-21'-51	opposition	1610 Jun 24 05:05	2°♄15'49	6°59'13
minimum elong	1602 Sep 04 18:49	11°♄48'37	4°21'53		1610 Aug 03 03:13	30°♄	
retrograde	1603 Jan 07 19:12	23°♄46'27		direct	1610 Sep 03 22:50	29°♂19'08	
opposition	1603 Mar 11 14:11	20°♄34'25	-4°-36'-40		1610 Oct 05 04:16	0°♄	
min. Earth dist.	1603 Mar 13 16:00	20°♄24'24	7.43064 AU				
direct	1603 May 15 16:12	17°♄15'40		conjunction	1610 Dec 28 14:09	6°♄50'08	6°04'32
max. Earth dist.	1603 Sep 21 23:50	29°♄36'25	9.38323 AU	minimum elong	1610 Dec 28 14:00	6°♄50'05	6°04'33
				max. Earth dist.	1611 Jan 04 14:26	7°♄32'13	12.87546 AU
conjunction	1603 Sep 23 10:17	29°♄49'05	-2°-46'-21	retrograde	1611 Apr 21 11:01	14°♄06'03	
minimum elong	1603 Sep 23 10:43	29°♄49'15	2°46'22	min. Earth dist.	1611 Jun 27 10:22	11°♄33'53	11.22421 AU
	1603 Sep 24 15:55	0°♄		opposition	1611 Jul 03 19:07	11°♄10'04	7°20'21
retrograde	1604 Jan 26 02:29	11°♄54'44		direct	1611 Sep 14 08:48	8°♄18'00	
opposition	1604 Mar 29 03:45	8°♄42'30	-2°-23'-8				
min. Earth dist.	1604 Mar 29 08:19	8°♄41'35	7.39955 AU	conjunction	1612 Jan 06 01:28	15°♄13'29	6°20'46
direct	1604 Jun 02 09:11	5°♄25'13		minimum elong	1612 Jan 06 01:22	15°♄13'27	6°20'47
				max. Earth dist.	1612 Jan 12 22:58	15°♄52'18	13.56405 AU
conjunction	1604 Oct 10 22:14	17°♄50'39	0°-54'-32	retrograde	1612 Apr 27 22:35	21°♄58'35	
minimum elong	1604 Oct 10 22:23	17°♄50'43	0°54'32	min. Earth dist.	1612 Jul 05 01:10	19°♄29'34	11.90433 AU
max. Earth dist.	1604 Oct 11 23:01	17°♄59'41	9.47031 AU	opposition	1612 Jul 11 08:50	19°♄06'48	7°30'11
retrograde	1605 Feb 11 10:32	29°♄36'32		direct	1612 Sep 22 18:20	16°♄19'14	
asc. node	1605 Apr 12 00:54	26°♄45'05					
min. Earth dist.	1605 Apr 14 18:10	26°♄32'21	7.59194 AU	conjunction	1613 Jan 12 16:30	22°♄44'56	6°28'29
opposition	1605 Apr 16 11:05	26°♄24'20	0°01'39	minimum elong	1613 Jan 12 16:29	22°♄44'55	6°28'29
direct	1605 Jun 21 09:17	23°♄09'05		max. Earth dist.	1613 Jan 19 10:24	23°♄20'47	14.22918 AU
	1605 Sep 21 22:37	0°♄		retrograde	1613 May 04 18:32	29°♄04'03	
				min. Earth dist.	1613 Jul 13 00:10	26°♄37'35	12.55603 AU
conjunction	1605 Oct 28 08:13	4°♄58'20	0°57'32	opposition	1613 Jul 19 02:40	26°♄16'21	7°31'44
minimum elong	1605 Oct 28 08:04	4°♄58'17	0°57'32	direct	1613 Oct 01 03:17	23°♄33'03	
max. Earth dist.	1605 Oct 31 12:46	5°♄25'12	9.76927 AU				
retrograde	1606 Feb 27 03:54	16°♄03'45		conjunction	1614 Jan 19 14:57	29°♄33'49	6°29'42
min. Earth dist.	1606 Apr 30 07:42	13°♄07'30	7.97951 AU	minimum elong	1614 Jan 19 14:58	29°♄33'49	6°29'42
opposition	1606 May 03 16:15	12°♄52'11	2°15'32		1614 Jan 24 19:34	0°♄	
direct	1606 Jul 09 16:28	9°♄39'29		max. Earth dist.	1614 Jan 26 02:55	0°♄06'34	14.86251 AU
				retrograde	1614 May 11 00:25	5°♄31'04	
conjunction	1606 Nov 13 02:39	20°♄35'36	2°36'32	min. Earth dist.	1614 Jul 20 06:41	3°♄07'01	13.17266 AU
minimum elong	1606 Nov 13 02:19	20°♄35'29	2°36'32	opposition	1614 Jul 26 04:05	2°♄47'11	7°27'11
max. Earth dist.	1606 Nov 17 22:24	21°♄13'56	10.23818 AU	direct	1614 Oct 08 15:42	0°♄07'50	
	1607 Feb 10 05:09	0°♄					
retrograde	1607 Mar 13 01:00	0°♄50'27		conjunction	1615 Jan 25 23:57	5°♄47'43	6°25'59
	1607 Apr 13 20:28	30°♄		minimum elong	1615 Jan 26 00:00	5°♄47'44	6°25'59
min. Earth dist.	1607 May 14 15:45	28°♄00'50	8.51368 AU	max. Earth dist.	1615 Feb 01 04:02	6°♄17'22	15.45870 AU
opposition	1607 May 19 07:04	27°♄40'26	4°04'53	retrograde	1615 May 16 21:14	11°♄26'29	
direct	1607 Jul 26 13:33	24°♄30'55		min. Earth dist.	1615 Jul 27 01:36	9°♄04'26	13.74951 AU
	1607 Oct 20 18:35	0°♄		opposition	1615 Aug 01 15:46	8°♄46'09	7°18'07
				direct	1615 Oct 15 16:04	6°♄10'25	
conjunction	1607 Nov 27 01:47	4°♄28'52	3°56'03				
minimum elong	1607 Nov 27 01:25	4°♄28'45	3°56'03	conjunction	1616 Jan 31 21:46	11°♄32'44	6°18'28
max. Earth dist.	1607 Dec 02 23:32	5°♄12'41	10.82538 AU	minimum elong	1616 Jan 31 21:51	11°♄32'45	6°18'28

max. Earth dist.	1616 Feb 06 18:30	11° \approx 59'42	16.01376 AU	max. Earth dist.	1624 Mar 10 07:55	17° \times 44'03	18.82174 AU
retrograde	1616 May 21 05:53	16° \approx 55'52		retrograde	1624 Jun 24 08:33	21° \times 55'12	
min. Earth dist.	1616 Aug 01 10:24	14° \approx 35'28	14.28374 AU	min. Earth dist.	1624 Sep 09 19:31	19° \times 38'56	16.90666 AU
opposition	1616 Aug 06 16:13	14° \approx 18'46	7°05'41	opposition	1624 Sep 12 00:33	19° \times 32'41	4°26'39
direct	1616 Oct 21 01:12	11° \approx 46'17		direct	1624 Nov 27 19:07	17° \times 14'21	
conjunction	1617 Feb 05 10:28	16° \approx 53'49	6°08'01	conjunction	1625 Mar 11 18:17	21° \times 24'16	3°48'03
minimum elong	1617 Feb 05 10:34	16° \approx 53'50	6°08'01	minimum elong	1625 Mar 11 18:24	21° \times 24'17	3°48'04
max. Earth dist.	1617 Feb 10 21:14	17° \approx 17'56	16.52539 AU	max. Earth dist.	1625 Mar 13 23:12	21° \times 32'28	18.96882 AU
retrograde	1617 May 26 10:16	22° \approx 03'43		retrograde	1625 Jun 28 12:08	25° \times 42'53	
min. Earth dist.	1617 Aug 07 09:10	19° \approx 44'49	14.77319 AU	min. Earth dist.	1625 Sep 14 07:26	23° \times 26'16	17.03080 AU
opposition	1617 Aug 12 07:18	19° \approx 29'31	6°50'41	opposition	1625 Sep 16 03:54	23° \times 21'03	4°02'28
direct	1617 Oct 27 01:08	16° \approx 59'54		direct	1625 Dec 01 22:14	21° \times 03'19	
conjunction	1618 Feb 10 15:26	21° \approx 54'57	5°55'16	conjunction	1626 Mar 15 19:29	25° \times 11'07	3°26'13
minimum elong	1618 Feb 10 15:32	21° \approx 54'58	5°55'16	minimum elong	1626 Mar 15 19:35	25° \times 11'08	3°26'13
max. Earth dist.	1618 Feb 15 18:02	22° \approx 16'48	16.99178 AU	max. Earth dist.	1626 Mar 17 15:25	25° \times 17'52	19.07163 AU
retrograde	1618 May 31 05:51	26° \approx 53'39		retrograde	1626 Jul 02 12:56	29° \times 28'03	
min. Earth dist.	1618 Aug 13 02:31	24° \approx 35'44	15.21665 AU	min. Earth dist.	1626 Sep 18 19:16	27° \times 10'47	17.11052 AU
opposition	1618 Aug 17 14:42	24° \approx 22'01	6°33'42	opposition	1626 Sep 20 05:57	27° \times 06'43	3°37'32
direct	1618 Nov 01 13:57	21° \approx 54'55		direct	1626 Dec 06 00:25	24° \times 49'24	
conjunction	1619 Feb 15 14:10	26° \approx 39'25	5°40'40	conjunction	1627 Mar 19 20:00	28° \times 55'54	3°03'39
minimum elong	1619 Feb 15 14:18	26° \approx 39'26	5°40'40	minimum elong	1627 Mar 19 20:06	28° \times 55'55	3°03'40
max. Earth dist.	1619 Feb 20 05:53	26° \approx 58'45	17.41196 AU	max. Earth dist.	1627 Mar 21 04:49	29° \times 00'55	19.13019 AU
retrograde	1619 Apr 10 00:04	0° \times		retrograde	1627 Apr 06 10:53	0° \times	
min. Earth dist.	1619 Jun 04 23:20	1° \times 28'38		min. Earth dist.	1627 Jul 06 16:13	3° \times 11'59	
opposition	1619 Aug 01 17:25	30° \approx		opposition	1627 Sep 23 05:20	0° \times 53'58	17.14594 AU
direct	1619 Aug 18 11:12	29° \approx 11'41	15.61336 AU	direct	1627 Sep 24 07:02	0° \times 50'57	3°11'52
conjunction	1619 Aug 22 15:14	28° \approx 59'13	6°15'11	conjunction	1627 Oct 12 21:11	30° \times	
minimum elong	1619 Nov 06 19:55	26° \approx 34'17		minimum elong	1627 Dec 10 00:26	28° \times 33'48	
max. Earth dist.	1620 Feb 02 21:06	0° \times		max. Earth dist.	1628 Feb 04 16:09	0° \times	
retrograde				retrograde			
min. Earth dist.				min. Earth dist.			
opposition				opposition			
direct				direct			
conjunction	1620 Feb 20 07:35	1° \times 09'55	5°24'34	conjunction	1628 Mar 22 20:26	2° \times 39'51	2°40'21
minimum elong	1620 Feb 20 07:43	1° \times 09'56	5°24'35	minimum elong	1628 Mar 22 20:31	2° \times 39'52	2°40'20
max. Earth dist.	1620 Feb 24 14:38	1° \times 27'17	17.78552 AU	max. Earth dist.	1628 Mar 23 19:48	2° \times 43'26	19.14420 AU
retrograde	1620 Jun 08 10:12	5° \times 51'08		retrograde	1628 Jul 09 18:12	6° \times 55'55	
min. Earth dist.	1620 Aug 22 16:47	3° \times 34'38	15.96333 AU	min. Earth dist.	1628 Sep 27 07:59	4° \times 34'58	2°45'27
opposition	1620 Aug 26 10:28	3° \times 23'38	5°55'24	opposition	1628 Sep 26 16:07	4° \times 36'50	17.13659 AU
direct	1620 Nov 10 19:12	1° \times 00'34		direct	1628 Dec 12 23:34	2° \times 17'47	
conjunction	1621 Feb 23 20:20	5° \times 28'43	5°07'13	conjunction	1629 Mar 26 20:58	6° \times 24'11	2°16'20
minimum elong	1621 Feb 23 20:27	5° \times 28'45	5°07'13	minimum elong	1629 Mar 26 21:02	6° \times 24'11	2°16'20
max. Earth dist.	1621 Feb 27 16:29	5° \times 43'54	18.11274 AU	max. Earth dist.	1629 Mar 27 09:09	6° \times 26'02	19.11347 AU
retrograde	1621 Jun 12 20:11	10° \times 03'17		retrograde	1629 Jul 13 23:13	10° \times 41'03	
min. Earth dist.	1621 Aug 27 15:39	7° \times 47'14	16.26709 AU	min. Earth dist.	1629 Oct 01 09:06	8° \times 19'56	2°18'15
opposition	1621 Aug 31 01:04	7° \times 37'23	5°34'32	opposition	1629 Oct 01 02:38	8° \times 20'41	17.08226 AU
direct	1621 Nov 15 13:05	5° \times 15'51		direct	1629 Dec 16 22:45	6° \times 02'27	
conjunction	1622 Feb 28 05:39	9° \times 37'51	4°48'47	conjunction	1630 Mar 30 22:36	10° \times 10'02	1°51'35
minimum elong	1622 Feb 28 05:47	9° \times 37'52	4°48'47	minimum elong	1630 Mar 30 22:40	10° \times 10'03	1°51'34
max. Earth dist.	1622 Mar 03 17:13	9° \times 51'20	18.39413 AU	max. Earth dist.	1630 Mar 31 00:34	10° \times 10'20	19.03726 AU
retrograde	1622 Jun 17 01:16	14° \times 06'53		retrograde	1630 Jul 18 04:12	14° \times 28'30	
min. Earth dist.	1622 Sep 01 12:30	11° \times 50'53	16.52520 AU	min. Earth dist.	1630 Oct 05 10:45	12° \times 07'00	1°50'15
opposition	1622 Sep 04 11:47	11° \times 42'21	5°12'44	opposition	1630 Oct 05 14:20	12° \times 06'34	16.98215 AU
direct	1622 Nov 20 03:03	9° \times 22'07		direct	1630 Dec 20 21:38	9° \times 48'59	
conjunction	1623 Mar 04 11:58	13° \times 39'04	4°29'24	conjunction	1631 Apr 04 01:29	13° \times 58'34	1°26'04
minimum elong	1623 Mar 04 12:05	13° \times 39'05	4°29'23	minimum elong	1631 Apr 04 01:32	13° \times 58'35	1°26'04
max. Earth dist.	1623 Mar 07 12:35	13° \times 50'37	18.63034 AU	max. Earth dist.	1631 Apr 03 15:42	13° \times 57'04	18.91517 AU
retrograde	1623 Jun 21 06:52	18° \times 03'41		retrograde	1631 Jul 22 12:54	18° \times 19'29	
min. Earth dist.	1623 Sep 06 04:32	15° \times 47'43	16.73831 AU	min. Earth dist.	1631 Oct 09 13:34	15° \times 57'19	1°21'23
opposition	1623 Sep 08 19:25	15° \times 40'16	4°50'05	opposition	1631 Oct 10 03:02	15° \times 55'43	16.83587 AU
direct	1623 Nov 24 12:00	13° \times 21'05		direct	1631 Dec 24 21:13	13° \times 38'27	
conjunction	1624 Mar 07 16:01	17° \times 34'03	4°09'08	conjunction	1632 Apr 06 09:13	17° \times 47'41	18.74648 AU
minimum elong	1624 Mar 07 16:08	17° \times 34'04	4°09'08	minimum elong	1632 Apr 07 06:03	17° \times 50'56	0°59'47

minimum elong	1632 Apr 07 06:05	17°♃50'56	0°59'47	min. Earth dist.	1639 Nov 18 02:17	21°♃27'11	14.01361 AU
retrograde	1632 Jul 25 22:15	22°♃15'10		direct	1640 Jan 27 08:08	19°♃03'15	
opposition	1632 Oct 12 18:01	19°♃52'04	0°51'34	max. Earth dist.	1640 May 09 22:25	24°♃01'55	15.74932 AU
min. Earth dist.	1632 Oct 13 17:27	19°♃49'15	16.64287 AU				
direct	1632 Dec 27 22:22	17°♃32'04		conjunction	1640 May 14 20:43	24°♃24'26	-3°-3'-10
max. Earth dist.	1633 Apr 10 04:09	21°♃43'11	18.53135 AU	minimum elong	1640 May 14 20:35	24°♃24'24	3°03'12
					1640 Aug 27 18:13	0°♂	
conjunction	1633 Apr 11 12:53	21°♃48'21	0°32'40	retrograde	1640 Sep 05 05:05	0°♂02'26	
minimum elong	1633 Apr 11 12:54	21°♃48'22	0°32'39		1640 Sep 13 15:26	30°♃	
retrograde	1633 Jul 30 12:47	26°♃16'53		opposition	1640 Nov 19 01:14	27°♃21'34	-3°-50'-10
opposition	1633 Oct 17 00:29	23°♃52'33	0°20'44	min. Earth dist.	1640 Nov 23 08:05	27°♃06'52	13.46200 AU
min. Earth dist.	1633 Oct 18 10:07	23°♃48'27	16.40355 AU	direct	1641 Jan 31 17:46	24°♃40'48	
direct	1634 Jan 01 00:05	21°♃31'06		max. Earth dist.	1641 May 15 18:11	29°♃53'32	15.17704 AU
max. Earth dist.	1634 Apr 14 02:21	25°♃45'07	18.26973 AU		1641 May 17 02:41	0°♂	
conjunction	1634 Apr 15 22:37	25°♃52'13	0°04'43	conjunction	1641 May 21 06:30	0°♂19'52	-3°-37'-18
minimum elong	1634 Apr 15 22:38	25°♃52'13	0°04'43	minimum elong	1641 May 21 06:20	0°♂19'50	3°37'20
behind sun begin	1634 Apr 15 16:04	25°♃51'12		retrograde	1641 Sep 12 10:00	6°♂16'42	
behind sun end	1634 Apr 16 05:13	25°♃53'15		opposition	1641 Nov 25 09:31	3°♂32'20	-4°-31'-6
desc. node	1634 Jun 15 04:16	29°♃18'14		min. Earth dist.	1641 Nov 30 02:36	3°♂15'37	12.87001 AU
	1634 Jul 04 17:05	0°♂		direct	1642 Feb 06 10:49	0°♂47'20	
retrograde	1634 Aug 04 05:01	0°♂26'04		max. Earth dist.	1642 May 22 06:11	6°♂17'43	14.56537 AU
	1634 Sep 03 17:23	30°♃					
opposition	1634 Oct 21 09:39	28°♃00'14	0°-11'-12	conjunction	1642 May 28 06:21	6°♂47'52	-4°-11'-35
min. Earth dist.	1634 Oct 23 05:01	27°♃54'52	16.11794 AU	minimum elong	1642 May 28 06:09	6°♂47'50	4°11'36
direct	1635 Jan 05 05:02	25°♃37'02		retrograde	1642 Sep 20 08:15	13°♂07'09	
max. Earth dist.	1635 Apr 18 03:30	29°♃54'55	17.96216 AU	opposition	1642 Dec 02 07:33	10°♂19'00	-5°-12'-36
	1635 Apr 19 10:32	0°♂		min. Earth dist.	1642 Dec 07 09:44	10°♂00'17	12.24079 AU
				direct	1643 Feb 12 18:03	7°♂29'23	
conjunction	1635 Apr 20 11:50	0°♂04'08	0°-24'-16	max. Earth dist.	1643 May 29 09:12	13°♂20'46	13.91806 AU
minimum elong	1635 Apr 20 11:49	0°♂04'08	0°24'18				
retrograde	1635 Aug 09 03:36	4°♂44'30		conjunction	1643 Jun 04 23:05	13°♂55'41	-4°-45'-19
opposition	1635 Oct 25 22:03	2°♂16'52	0°-44'-21	minimum elong	1643 Jun 04 22:52	13°♂55'38	4°45'21
min. Earth dist.	1635 Oct 28 03:56	2°♂10'05	15.78670 AU	retrograde	1643 Sep 29 02:13	20°♂41'42	
	1635 Dec 24 00:14	30°♃		opposition	1643 Dec 09 22:39	17°♂49'34	-5°-53'-47
direct	1636 Jan 09 11:27	29°♃51'35		min. Earth dist.	1643 Dec 15 08:24	17°♂28'53	11.57906 AU
	1636 Jan 25 22:15	0°♂		direct	1644 Feb 19 14:15	14°♂55'00	
max. Earth dist.	1636 Apr 21 09:14	4°♂14'35	17.60888 AU	max. Earth dist.	1644 Jun 05 11:44	21°♂12'32	13.24142 AU
conjunction	1636 Apr 24 05:26	4°♂25'59	0°-54'-9	conjunction	1644 Jun 12 12:30	21°♂52'15	-5°-17'-20
minimum elong	1636 Apr 24 05:24	4°♂25'58	0°54'09	minimum elong	1644 Jun 12 12:16	21°♂52'12	5°17'21
retrograde	1636 Aug 13 05:55	9°♂14'12		retrograde	1644 Oct 07 20:09	29°♂10'10	
opposition	1636 Oct 29 14:44	6°♂44'30	-1°-18'-47	opposition	1644 Dec 17 10:34	26°♂13'53	-6°-33'-4
min. Earth dist.	1636 Nov 01 05:56	6°♂36'23	15.41010 AU	min. Earth dist.	1644 Dec 23 03:57	25°♂51'04	10.89280 AU
direct	1637 Jan 12 21:59	4°♂16'50		direct	1645 Feb 26 06:53	23°♂14'02	
max. Earth dist.	1637 Apr 25 19:29	8°♂46'09	17.21054 AU		1645 Jun 14 02:42	0°♂	
				max. Earth dist.	1645 Jun 14 17:45	0°♂03'46	12.54490 AU
conjunction	1637 Apr 29 04:04	8°♂59'59	-1°-25'00	conjunction	1645 Jun 22 03:21	0°♂48'29	-5°-45'-45
minimum elong	1637 Apr 29 04:01	8°♂59'58	1°25'01	minimum elong	1645 Jun 22 03:08	0°♂48'26	5°45'45
retrograde	1637 Aug 18 15:58	13°♂57'38		retrograde	1645 Oct 18 18:54	8°♂44'10	
opposition	1637 Nov 03 12:35	11°♂25'33	-1°-54'-34	opposition	1645 Dec 27 00:00	5°♂43'45	-7°-7'-46
min. Earth dist.	1637 Nov 06 14:35	11°♂15'51	14.98871 AU	min. Earth dist.	1646 Jan 01 21:20	5°♂19'16	10.19392 AU
direct	1638 Jan 17 11:51	8°♂55'09		direct	1646 Mar 06 21:41	2°♂38'35	
max. Earth dist.	1638 Apr 30 12:35	13°♂32'24	16.76728 AU	max. Earth dist.	1646 Jun 25 08:44	10°♂07'30	11.84341 AU
conjunction	1638 May 04 09:27	13°♂48'49	-1°-56'-50	conjunction	1646 Jul 03 00:48	10°♂57'21	-6°-7'-38
minimum elong	1638 May 04 09:22	13°♂48'48	1°56'51	minimum elong	1646 Jul 03 00:39	10°♂57'19	6°07'38
retrograde	1638 Aug 24 09:15	18°♂57'39		retrograde	1646 Oct 31 04:41	19°♂37'11	
opposition	1638 Nov 08 16:32	16°♂22'57	-2°-31'-44	opposition	1647 Jan 06 20:33	16°♂32'55	-7°-33'-29
min. Earth dist.	1638 Nov 12 03:35	16°♂11'46	14.52292 AU	min. Earth dist.	1647 Jan 12 17:36	16°♂07'25	9.50046 AU
direct	1639 Jan 22 07:27	13°♂49'28		direct	1647 Mar 16 15:41	13°♂22'41	
max. Earth dist.	1639 May 05 12:19	18°♂36'15	16.27996 AU	max. Earth dist.	1647 Jul 07 19:21	21°♂39'43	11.15946 AU
conjunction	1639 May 09 22:24	18°♂55'40	-2°-29'-36	conjunction	1647 Jul 15 10:29	22°♂33'16	-6°-18'-34
minimum elong	1639 May 09 22:17	18°♂55'39	2°29'37	minimum elong	1647 Jul 15 10:27	22°♂33'16	6°18'35
retrograde	1639 Aug 30 12:21	24°♂17'50			1647 Sep 24 18:18	0°♂	
opposition	1639 Nov 14 04:17	21°♂40'12	-3°-10'-19				

retrograde	1647 Nov 14 03:18	2°♏03'12		direct	1655 Jul 22 09:47	21°♍10'48	
	1648 Jan 04 16:28	30°♄			1655 Nov 12 14:24	0°♂	
opposition	1648 Jan 19 06:16	28°♄55'42	-7°-43'-28				
min. Earth dist.	1648 Jan 24 21:59	28°♄30'11	8.83960 AU	conjunction	1655 Nov 23 16:13	1°♂23'42	3°36'12
direct	1648 Mar 26 23:41	25°♄41'07		minimum elong	1655 Nov 23 15:51	1°♂23'35	3°36'12
	1648 Jun 09 11:51	0°♏		max. Earth dist.	1655 Nov 29 08:08	2°♂06'31	10.66615 AU
max. Earth dist.	1648 Jul 21 10:17	4°♏55'38	10.52580 AU	retrograde	1656 Mar 21 05:45	10°♂59'37	
				min. Earth dist.	1656 May 23 10:12	8°♂14'10	8.97527 AU
conjunction	1648 Jul 28 13:31	5°♏49'40	-6°-12'-32	opposition	1656 May 28 17:58	7°♂51'24	5°06'23
minimum elong	1648 Jul 28 13:40	5°♏49'43	6°12'34	direct	1656 Aug 05 23:16	4°♂44'43	
retrograde	1648 Nov 28 17:24	16°♏13'04					
opposition	1649 Feb 01 09:59	13°♏03'11	-7°-28'-30	conjunction	1656 Dec 05 08:27	14°♂00'57	4°40'46
min. Earth dist.	1649 Feb 06 12:06	12°♏39'28	8.24914 AU	minimum elong	1656 Dec 05 08:06	14°♂00'51	4°40'46
direct	1649 Apr 09 02:00	9°♏45'32		max. Earth dist.	1656 Dec 11 19:17	14°♂46'19	11.31110 AU
max. Earth dist.	1649 Aug 07 10:27	20°♏04'14	9.98652 AU	retrograde	1657 Apr 01 05:49	22°♂47'22	
				min. Earth dist.	1657 Jun 04 11:24	20°♂06'42	9.64808 AU
conjunction	1649 Aug 13 12:10	20°♏53'33	-5°-42'-32	opposition	1657 Jun 10 09:25	19°♂42'25	6°09'05
minimum elong	1649 Aug 13 12:32	20°♏53'40	5°42'34	direct	1657 Aug 19 18:18	16°♂40'00	
	1649 Oct 28 22:19	0°♎					
retrograde	1649 Dec 15 20:42	2°♎07'30		conjunction	1657 Dec 16 11:08	25°♂05'11	5°26'54
	1650 Feb 03 17:30	30°♏		minimum elong	1657 Dec 16 10:51	25°♂05'06	5°26'54
opposition	1650 Feb 17 09:06	28°♏56'13	-6°-38'-34	max. Earth dist.	1657 Dec 23 07:40	25°♂50'02	11.99881 AU
min. Earth dist.	1650 Feb 21 10:31	28°♏36'52	7.77704 AU		1658 Feb 02 22:04	0°♄	
direct	1650 Apr 24 02:52	25°♏37'08		retrograde	1658 Apr 10 20:27	3°♄07'37	
	1650 Jul 04 12:20	0°♎		min. Earth dist.	1658 Jun 15 06:32	0°♄31'11	10.34823 AU
max. Earth dist.	1650 Aug 26 16:53	6°♎59'20	9.59394 AU	opposition	1658 Jun 21 13:05	0°♄06'31	6°50'22
					1658 Jun 23 04:43	30°♂	
conjunction	1650 Aug 31 01:24	7°♎36'38	-4°-43'-2	direct	1658 Sep 01 00:30	27°♂08'40	
minimum elong	1650 Aug 31 01:55	7°♎36'50	4°43'03		1658 Nov 05 10:40	0°♄	
retrograde	1651 Jan 03 01:24	19°♎28'26					
opposition	1651 Mar 06 22:05	16°♎16'30	-5°-7'-45	conjunction	1658 Dec 26 06:27	4°♄49'50	5°57'50
min. Earth dist.	1651 Mar 09 11:12	16°♎04'14	7.47524 AU	minimum elong	1658 Dec 26 06:16	4°♄49'47	5°57'50
direct	1651 May 11 02:13	12°♎57'33		max. Earth dist.	1659 Jan 02 05:34	5°♄32'20	12.70017 AU
max. Earth dist.	1651 Sep 16 12:32	25°♎09'22	9.39752 AU	retrograde	1659 Apr 19 09:49	12°♄14'19	
				min. Earth dist.	1659 Jun 25 00:27	9°♄41'32	11.05067 AU
conjunction	1651 Sep 18 14:42	25°♎27'48	-3°-14'-16	opposition	1659 Jul 01 09:54	9°♄17'22	7°15'13
minimum elong	1651 Sep 18 15:11	25°♎27'59	3°14'17	direct	1659 Sep 11 20:03	6°♄24'13	
	1651 Oct 20 02:34	0°♌					
retrograde	1652 Jan 21 11:00	7°♌34'18		conjunction	1660 Jan 03 23:43	13°♄28'09	6°16'51
opposition	1652 Mar 24 09:16	4°♌22'05	-3°-1'-13	minimum elong	1660 Jan 03 23:37	13°♄28'07	6°16'52
min. Earth dist.	1652 Mar 25 01:50	4°♌18'46	7.38538 AU	max. Earth dist.	1660 Jan 10 22:45	14°♄07'58	13.39474 AU
direct	1652 May 28 13:10	1°♌04'21		retrograde	1660 Apr 26 02:43	20°♄20'25	
				min. Earth dist.	1660 Jul 02 22:00	17°♄50'41	11.73840 AU
conjunction	1652 Oct 06 06:09	13°♌34'55	-1°-25'-24	opposition	1660 Jul 09 05:29	17°♄27'43	7°27'52
minimum elong	1652 Oct 06 06:23	13°♌35'01	1°25'25	direct	1660 Sep 20 10:32	14°♄39'08	
max. Earth dist.	1652 Oct 06 15:10	13°♌38'14	9.42588 AU				
retrograde	1653 Feb 07 02:29	25°♌28'19		conjunction	1661 Jan 10 19:26	21°♄11'50	6°26'44
opposition	1653 Apr 11 20:12	22°♌16'02	0°-37'-14	minimum elong	1661 Jan 10 19:23	21°♄11'50	6°26'44
min. Earth dist.	1653 Apr 10 14:11	22°♌21'57	7.52151 AU	max. Earth dist.	1661 Jan 17 15:03	21°♄48'34	14.06849 AU
direct	1653 Jun 16 13:56	19°♌00'11		retrograde	1661 May 03 01:15	27°♄36'58	
asc. node	1653 Jul 20 02:31	20°♌01'48		min. Earth dist.	1661 Jul 10 23:30	25°♄10'05	12.40001 AU
	1653 Oct 16 20:58	0°♍		opposition	1661 Jul 17 04:10	24°♄48'23	7°31'31
				direct	1661 Sep 29 00:11	22°♄04'07	
conjunction	1653 Oct 24 00:35	1°♍00'56	0°28'00				
minimum elong	1653 Oct 24 00:30	1°♍00'55	0°28'01	conjunction	1662 Jan 17 21:56	28°♄10'43	6°29'38
max. Earth dist.	1653 Oct 26 15:51	1°♍23'25	9.67347 AU	minimum elong	1662 Jan 17 21:56	28°♄10'43	6°29'38
retrograde	1654 Feb 23 06:22	12°♍18'10		max. Earth dist.	1662 Jan 24 11:00	28°♄44'07	14.71244 AU
min. Earth dist.	1654 Apr 26 09:21	9°♍20'07	7.86309 AU		1662 Feb 08 15:58	0°♁	
opposition	1654 Apr 29 09:27	9°♍06'18	1°41'10	retrograde	1662 May 09 11:30	4°♁12'56	
direct	1654 Jul 05 03:20	5°♍52'51		min. Earth dist.	1662 Jul 18 10:11	1°♁48'30	13.02782 AU
				opposition	1662 Jul 24 09:22	1°♁28'15	7°28'35
					1662 Aug 20 23:12	30°♄	
conjunction	1654 Nov 09 05:53	17°♍03'34	2°11'18	direct	1662 Oct 06 20:14	28°♄48'03	
minimum elong	1654 Nov 09 05:36	17°♍03'28	2°11'18		1662 Nov 21 08:37	0°♁	
max. Earth dist.	1654 Nov 13 15:57	17°♍39'17	10.10384 AU				
retrograde	1655 Mar 09 14:50	27°♍31'47		conjunction	1663 Jan 24 10:04	4°♁32'46	6°27'15
min. Earth dist.	1655 May 11 01:21	24°♍40'42	8.36500 AU	minimum elong	1663 Jan 24 10:08	4°♁32'46	6°27'15
opposition	1655 May 15 10:31	24°♍21'13	3°37'39				

max. Earth dist.	1663 Jan 30 17:17	5°≈03'21	15.32020 AU	max. Earth dist.	1671 Mar 06 13:33	13°≈04'55	18.59788 AU
retrograde	1663 May 15 07:38	10°≈15'39		retrograde	1671 Jun 20 03:37	17°≈17'57	
min. Earth dist.	1663 Jul 25 08:45	7°≈53'13	13.61689 AU	min. Earth dist.	1671 Sep 04 21:50	15°≈02'16	16.71319 AU
opposition	1663 Jul 31 00:26	7°≈34'36	7°20'45	opposition	1671 Sep 07 15:20	14°≈54'29	4°57'05
direct	1663 Oct 13 22:02	4°≈58'05		direct	1671 Nov 23 09:58	12°≈35'16	
conjunction	1664 Jan 30 10:31	10°≈24'25	6°20'48	conjunction	1672 Mar 06 13:06	16°≈48'49	4°15'27
minimum elong	1664 Jan 30 10:36	10°≈24'26	6°20'48	minimum elong	1672 Mar 06 13:13	16°≈48'50	4°15'27
max. Earth dist.	1664 Feb 05 08:26	10°≈51'54	15.88755 AU	max. Earth dist.	1672 Mar 09 07:02	16°≈59'10	18.80362 AU
retrograde	1664 May 19 21:04	15°≈50'59		retrograde	1672 Jun 23 07:38	21°≈10'21	
min. Earth dist.	1664 Jul 30 18:31	13°≈30'27	14.16360 AU	min. Earth dist.	1672 Sep 08 12:49	18°≈54'30	16.89602 AU
opposition	1664 Aug 05 03:27	13°≈13'15	7°09'18	opposition	1672 Sep 10 20:59	18°≈47'52	4°33'52
direct	1664 Oct 19 11:21	10°≈40'03		direct	1672 Nov 26 15:39	16°≈29'35	
conjunction	1665 Feb 04 01:24	15°≈50'56	6°11'13	conjunction	1673 Mar 10 15:43	20°≈39'50	3°54'36
minimum elong	1665 Feb 04 01:30	15°≈50'57	6°11'12	minimum elong	1673 Mar 10 15:50	20°≈39'51	3°54'37
max. Earth dist.	1665 Feb 09 15:35	16°≈15'54	16.41176 AU	max. Earth dist.	1673 Mar 13 00:43	20°≈48'42	18.96504 AU
retrograde	1665 May 25 01:04	21°≈03'40		retrograde	1673 Jun 27 09:16	24°≈58'35	
min. Earth dist.	1665 Aug 05 21:22	18°≈44'28	14.66585 AU	min. Earth dist.	1673 Sep 13 01:13	22°≈42'26	17.03436 AU
opposition	1665 Aug 10 20:50	18°≈28'55	6°55'05	opposition	1673 Sep 15 00:33	22°≈36'53	4°09'53
direct	1665 Oct 25 12:21	15°≈58'42		direct	1673 Nov 30 21:10	20°≈19'18	
conjunction	1666 Feb 09 08:02	20°≈56'29	5°59'10	conjunction	1674 Mar 14 16:48	24°≈27'09	3°32'58
minimum elong	1666 Feb 09 08:08	20°≈56'30	5°59'11	minimum elong	1674 Mar 14 16:54	24°≈27'10	3°32'58
max. Earth dist.	1666 Feb 14 12:02	21°≈18'45	16.89089 AU	max. Earth dist.	1674 Mar 16 14:51	24°≈34'15	19.08209 AU
retrograde	1666 May 30 00:27	25°≈57'32		retrograde	1674 Jul 01 11:37	28°≈44'00	
min. Earth dist.	1666 Aug 11 14:22	23°≈39'36	15.12224 AU	min. Earth dist.	1674 Sep 17 13:11	26°≈27'15	17.12839 AU
opposition	1666 Aug 16 05:58	23°≈25'24	6°38'46	opposition	1674 Sep 19 02:47	26°≈22'51	3°45'09
direct	1666 Oct 31 03:04	20°≈57'46		direct	1674 Dec 04 22:12	24°≈05'44	
conjunction	1667 Feb 14 08:13	25°≈44'32	5°45'10	conjunction	1675 Mar 18 17:22	28°≈12'03	3°10'34
minimum elong	1667 Feb 14 08:19	25°≈44'33	5°45'10	minimum elong	1675 Mar 18 17:28	28°≈12'04	3°10'35
max. Earth dist.	1667 Feb 19 03:28	26°≈04'37	17.32408 AU	max. Earth dist.	1675 Mar 20 06:21	28°≈17'43	19.15476 AU
retrograde	1667 Apr 29 22:36	0°≈		retrograde	1675 Apr 18 00:59	0°≈	
min. Earth dist.	1667 Jun 03 17:19	0°≈35'39		min. Earth dist.	1675 Jul 05 13:18	2°≈27'47	
opposition	1667 Jul 09 01:38	30°≈		opposition	1675 Sep 21 23:09	0°≈10'21	17.17775 AU
direct	1667 Aug 17 02:12	28°≈18'33	15.53210 AU	direct	1675 Sep 23 03:50	0°≈07'00	3°19'39
conjunction	1667 Aug 21 07:56	28°≈05'50	6°20'47	conjunction	1675 Sep 25 15:53	30°≈	
minimum elong	1667 Nov 05 11:48	25°≈40'28		minimum elong	1675 Dec 08 23:37	27°≈50'08	
max. Earth dist.	1668 Feb 14 16:52	0°≈		max. Earth dist.	1676 Feb 17 22:22	0°≈	
retrograde				retrograde			
min. Earth dist.				min. Earth dist.			
opposition				opposition			
direct				direct			
conjunction	1668 Feb 19 02:33	0°≈17'55	5°29'34	conjunction	1676 Mar 21 17:26	1°≈55'44	2°47'26
minimum elong	1668 Feb 19 02:40	0°≈17'56	5°29'34	minimum elong	1676 Mar 21 17:31	1°≈55'45	2°47'26
max. Earth dist.	1668 Feb 23 11:23	0°≈35'41	17.71095 AU	max. Earth dist.	1676 Mar 22 19:04	1°≈59'39	19.18277 AU
retrograde	1668 Jun 07 06:58	5°≈00'41		retrograde	1676 Jul 08 15:37	6°≈11'11	
min. Earth dist.	1668 Aug 21 07:14	2°≈44'17	15.89573 AU	min. Earth dist.	1676 Sep 25 10:05	3°≈52'42	17.18242 AU
opposition	1668 Aug 25 04:19	2°≈32'50	6°01'26	opposition	1676 Sep 26 04:42	3°≈50'31	2°53'24
direct	1668 Nov 09 11:49	0°≈09'24		direct	1676 Dec 11 22:09	1°≈33'40	
conjunction	1669 Feb 22 16:13	4°≈39'02	5°12'38	conjunction	1677 Mar 25 17:45	5°≈39'20	2°23'34
minimum elong	1669 Feb 22 16:20	4°≈39'03	5°12'38	minimum elong	1677 Mar 25 17:50	5°≈39'21	2°23'34
max. Earth dist.	1669 Feb 26 16:13	4°≈54'55	18.05193 AU	max. Earth dist.	1677 Mar 26 10:03	5°≈41'50	19.16581 AU
retrograde	1669 Jun 11 16:03	9°≈14'47		retrograde	1677 Jul 12 19:07	9°≈55'17	
min. Earth dist.	1669 Aug 26 08:07	6°≈58'48	16.21339 AU	min. Earth dist.	1677 Sep 30 05:28	7°≈34'32	2°26'21
opposition	1669 Aug 29 19:47	6°≈48'39	5°40'57	opposition	1677 Sep 29 19:54	7°≈35'39	17.14173 AU
direct	1669 Nov 14 08:45	4°≈26'53		direct	1677 Dec 15 22:03	5°≈17'26	
conjunction	1670 Feb 27 02:02	8°≈50'01	4°54'33	conjunction	1678 Mar 29 18:45	9°≈23'59	1°58'56
minimum elong	1670 Feb 27 02:09	8°≈50'02	4°54'33	minimum elong	1678 Mar 29 18:49	9°≈24'00	1°58'57
max. Earth dist.	1670 Mar 02 15:36	9°≈03'53	18.34737 AU	max. Earth dist.	1678 Mar 29 23:03	9°≈24'39	19.10333 AU
retrograde	1670 Jun 15 23:35	13°≈19'58		retrograde	1678 Jul 16 23:32	13°≈41'15	
min. Earth dist.	1670 Aug 31 04:40	11°≈04'13	16.48583 AU	min. Earth dist.	1678 Oct 04 06:40	11°≈20'07	1°58'30
opposition	1670 Sep 03 07:14	10°≈55'16	5°19'27	opposition	1678 Oct 04 07:40	11°≈20'00	17.05537 AU
direct	1670 Nov 18 21:57	8°≈34'54		direct	1678 Dec 19 19:55	9°≈02'30	
conjunction	1671 Mar 03 08:56	12°≈52'42	4°35'27	conjunction	1679 Apr 02 21:00	13°≈10'45	1°33'33
minimum elong	1671 Mar 03 09:03	12°≈52'44	4°35'28	minimum elong	1679 Apr 02 21:03	13°≈10'46	1°33'32

max. Earth dist.	1679 Apr 02 15:15	13°♄09'52	18.99485 AU	max. Earth dist.	1687 May 03 20:53	17°♄10'43	16.48387 AU
retrograde	1679 Jul 21 05:53	17°♄30'07					
opposition	1679 Oct 08 08:45	15°♄08'22	1°29'45	conjunction	1687 May 08 01:17	17°♄28'49	-2°-21'-5
min. Earth dist.	1679 Oct 08 18:53	15°♄07'10	16.92274 AU	minimum elong	1687 May 08 01:10	17°♄28'48	2°21'05
direct	1679 Dec 23 20:15	12°♄49'58		retrograde	1687 Aug 28 10:29	22°♄45'16	
max. Earth dist.	1680 Apr 05 06:19	16°♄57'57	18.84017 AU	opposition	1687 Nov 12 07:41	20°♄08'50	-3°00'-10
				min. Earth dist.	1687 Nov 16 01:07	19°♄56'35	14.22564 AU
conjunction	1680 Apr 06 00:25	17°♄00'45	1°07'22	direct	1688 Jan 25 16:42	17°♄33'19	
minimum elong	1680 Apr 06 00:27	17°♄00'46	1°07'22	max. Earth dist.	1688 May 08 00:52	22°♄26'40	15.96896 AU
retrograde	1680 Jul 24 14:41	21°♄23'07					
opposition	1680 Oct 11 12:21	19°♄00'27	1°00'05	conjunction	1688 May 12 19:21	22°♄48'06	-2°-54'-32
min. Earth dist.	1680 Oct 12 09:09	18°♄57'58	16.74401 AU	minimum elong	1688 May 12 19:13	22°♄48'04	2°54'33
direct	1680 Dec 26 19:21	16°♄40'58		retrograde	1688 Sep 02 20:09	28°♄19'25	
max. Earth dist.	1681 Apr 09 01:45	20°♄50'45	18.63941 AU	opposition	1688 Nov 17 00:45	25°♄39'53	-3°-39'-46
				min. Earth dist.	1688 Nov 21 04:32	25°♄25'48	13.68911 AU
conjunction	1681 Apr 10 06:08	20°♄55'12	0°40'21	direct	1689 Jan 29 20:18	23°♄00'42	
minimum elong	1681 Apr 10 06:09	20°♄55'12	0°40'20	max. Earth dist.	1689 May 13 17:57	28°♄07'32	15.41131 AU
retrograde	1681 Jul 29 01:47	25°♄21'26					
opposition	1681 Oct 15 17:35	22°♄57'37	0°29'24	conjunction	1689 May 19 00:19	28°♄32'14	-3°-28'-38
min. Earth dist.	1681 Oct 16 23:23	22°♄54'01	16.51936 AU	minimum elong	1689 May 19 00:09	28°♄32'12	3°28'40
direct	1681 Dec 30 21:47	20°♄36'46			1689 Jun 06 20:39	0°♂	
max. Earth dist.	1682 Apr 12 21:21	24°♄48'55	18.39295 AU	retrograde	1689 Sep 09 20:36	4°♂21'14	
				opposition	1689 Nov 23 04:02	1°♂38'17	-4°-20'-31
conjunction	1682 Apr 14 14:15	24°♄55'26	0°12'29	min. Earth dist.	1689 Nov 27 17:48	1°♂22'18	13.11100 AU
minimum elong	1682 Apr 14 14:15	24°♄55'26	0°12'29		1689 Dec 23 05:51	30°♄	
behind sun begin	1682 Apr 14 09:56	24°♄54'46		direct	1690 Feb 04 11:40	28°♄55'02	
behind sun end	1682 Apr 14 18:34	24°♄56'06			1690 Mar 19 04:10	0°♂	
retrograde	1682 Aug 02 17:10	29°♄26'37		max. Earth dist.	1690 May 19 21:33	4°♂17'47	14.81259 AU
desc. node	1682 Sep 22 20:05	28°♄17'25					
opposition	1682 Oct 20 01:23	27°♄01'21	0°-2'-22	conjunction	1690 May 25 18:18	4°♂46'38	-4°-3'-4
min. Earth dist.	1682 Oct 21 18:00	26°♄56'22	16.24921 AU	minimum elong	1690 May 25 18:06	4°♂46'35	4°03'04
direct	1683 Jan 03 23:50	24°♄38'50		retrograde	1690 Sep 17 10:31	10°♂56'37	
max. Earth dist.	1683 Apr 16 22:16	28°♄54'42	18.10093 AU	opposition	1690 Nov 29 20:22	8°♂10'00	-5°-2'-2
				min. Earth dist.	1690 Dec 04 19:04	7°♂52'05	12.49340 AU
conjunction	1683 Apr 19 01:46	29°♄03'03	0°-16'-21	direct	1691 Feb 10 11:46	5°♂22'16	
minimum elong	1683 Apr 19 01:45	29°♄03'03	0°16'22	max. Earth dist.	1691 May 26 18:46	11°♂04'47	14.17587 AU
	1683 May 03 19:16	0°♄					
retrograde	1683 Aug 07 11:56	3°♄40'17		conjunction	1691 Jun 02 03:47	11°♂37'54	-4°-37'-13
opposition	1683 Oct 24 12:03	1°♄13'21	0°-35'-18	minimum elong	1691 Jun 02 03:34	11°♂37'51	4°37'14
min. Earth dist.	1683 Oct 26 13:34	1°♄07'09	15.93379 AU	retrograde	1691 Sep 25 20:31	18°♂12'59	
	1683 Nov 19 03:03	30°♄		opposition	1691 Dec 07 04:21	15°♂22'23	-5°-43'-38
direct	1684 Jan 08 06:09	28°♄48'52		min. Earth dist.	1691 Dec 12 12:46	15°♂02'14	11.84044 AU
	1684 Feb 26 10:54	0°♄		direct	1692 Feb 17 04:25	12°♂29'43	
max. Earth dist.	1684 Apr 20 00:46	3°♄09'12	17.76385 AU	max. Earth dist.	1692 Jun 02 11:32	18°♂36'22	13.50606 AU
conjunction	1684 Apr 22 17:05	3°♄19'51	0°-46'-5	conjunction	1692 Jun 09 08:42	19°♂14'16	-5°-10'-8
minimum elong	1684 Apr 22 17:03	3°♄19'51	0°46'06	minimum elong	1692 Jun 09 08:28	19°♂14'13	5°10'09
retrograde	1684 Aug 11 12:15	8°♄04'27		retrograde	1692 Oct 04 06:01	26°♂19'15	
opposition	1684 Oct 28 02:48	5°♄35'33	-1°-9'-30	opposition	1692 Dec 14 07:32	23°♂24'28	-6°-24'-1
min. Earth dist.	1684 Oct 30 15:10	5°♄27'52	15.57350 AU	min. Earth dist.	1692 Dec 19 22:41	23°♂02'22	11.15861 AU
direct	1685 Jan 11 13:16	3°♄08'49		direct	1693 Feb 23 12:29	20°♂26'34	
max. Earth dist.	1685 Apr 24 10:04	7°♄35'13	17.38179 AU	max. Earth dist.	1693 Jun 11 04:13	27°♂02'34	12.81147 AU
conjunction	1685 Apr 27 13:24	7°♄48'00	-1°-16'-47	conjunction	1693 Jun 18 12:58	27°♂45'54	-5°-40'-13
minimum elong	1685 Apr 27 13:21	7°♄48'00	1°16'47	minimum elong	1693 Jun 18 12:44	27°♂45'50	5°40'14
retrograde	1685 Aug 16 19:15	12°♄41'25			1693 Jul 11 12:11	0°♄	
opposition	1685 Nov 01 22:11	10°♄10'17	-1°-45'-1	retrograde	1693 Oct 14 16:14	5°♄26'26	
min. Earth dist.	1685 Nov 04 19:29	10°♄01'16	15.16848 AU	opposition	1693 Dec 23 10:34	2°♄27'25	-7°00'-57
direct	1686 Jan 16 02:14	7°♄40'59		min. Earth dist.	1693 Dec 29 07:06	2°♄03'27	10.45799 AU
max. Earth dist.	1686 Apr 28 22:49	12°♄14'29	16.95504 AU		1694 Feb 03 02:57	30°♂	
				direct	1694 Mar 03 16:08	29°♂24'05	
conjunction	1686 May 02 15:40	12°♄29'59	-1°-48'-28		1694 Apr 01 01:44	0°♄	
minimum elong	1686 May 02 15:36	12°♄29'59	1°48'29	max. Earth dist.	1694 Jun 21 06:43	6°♄36'53	12.10473 AU
retrograde	1686 Aug 22 08:56	17°♄33'56					
opposition	1686 Nov 06 23:24	15°♄00'17	-2°-21'-54	conjunction	1694 Jun 28 21:49	7°♄25'08	-6°-4'-58
min. Earth dist.	1686 Nov 10 07:37	14°♄49'36	14.71899 AU	minimum elong	1694 Jun 28 21:38	7°♄25'05	6°04'58
direct	1687 Jan 20 17:19	12°♄28'03		retrograde	1694 Oct 26 10:48	15°♄47'40	

opposition	1695 Jan 02 18:28	12°♄44'34	-7°-30'-42	direct	1702 Jun 29 16:37	0°♌27'06	
min. Earth dist.	1695 Jan 08 17:55	12°♄19'01	9.75470 AU				
direct	1695 Mar 13 01:11	9°♄35'56		conjunction	1702 Nov 04 21:21	12°♌01'25	1°39'31
max. Earth dist.	1695 Jul 03 00:38	17°♄33'51	11.40566 AU	minimum elong	1702 Nov 04 21:07	12°♌01'20	1°39'31
				max. Earth dist.	1702 Nov 08 18:06	12°♌33'28	9.88931 AU
conjunction	1695 Jul 10 17:04	18°♄26'17	-6°-20'-30	retrograde	1703 Mar 06 02:13	22°♌51'53	
minimum elong	1695 Jul 10 16:59	18°♄26'15	6°20'31	min. Earth dist.	1703 May 07 07:33	19°♌57'41	8.12692 AU
retrograde	1695 Nov 08 19:28	27°♄37'11		opposition	1703 May 11 04:39	19°♌40'08	3°04'23
opposition	1696 Jan 14 13:23	24°♄30'28	-7°-47'-25	direct	1703 Jul 17 14:45	16°♌27'54	
min. Earth dist.	1696 Jan 20 09:19	24°♄04'31	9.07263 AU				
direct	1696 Mar 22 17:18	21°♄17'04		conjunction	1703 Nov 20 01:54	27°♌05'37	3°12'58
	1696 Jul 14 12:24	0°♌		minimum elong	1703 Nov 20 01:32	27°♌05'29	3°12'58
max. Earth dist.	1696 Jul 15 18:12	0°♌09'07	10.74328 AU	max. Earth dist.	1703 Nov 25 09:06	27°♌46'52	10.40891 AU
					1703 Dec 12 19:09	0°♌	
conjunction	1696 Jul 23 04:14	1°♌03'46	-6°-21'-20	retrograde	1704 Mar 18 09:03	7°♌03'40	
minimum elong	1696 Jul 23 04:19	1°♌03'48	6°21'21	min. Earth dist.	1704 May 20 04:58	4°♌15'48	8.70368 AU
retrograde	1696 Nov 22 19:38	11°♌07'51		opposition	1704 May 25 05:37	3°♌53'56	4°44'35
opposition	1697 Jan 27 01:03	7°♌58'18	-7°-42'-36	direct	1704 Aug 01 22:35	0°♌45'14	
min. Earth dist.	1697 Feb 01 09:46	7°♌33'31	8.44531 AU				
direct	1697 Apr 04 01:50	4°♌41'11		conjunction	1704 Dec 02 11:05	10°♌24'39	4°25'34
max. Earth dist.	1697 Jul 31 20:12	14°♌35'40	10.15739 AU	minimum elong	1704 Dec 02 10:42	10°♌24'32	4°25'34
				max. Earth dist.	1704 Dec 08 16:02	11°♌09'39	11.02956 AU
conjunction	1697 Aug 07 11:10	15°♌28'11	-6°00'-32	retrograde	1705 Mar 29 23:48	19°♌31'17	
minimum elong	1697 Aug 07 11:28	15°♌28'17	6°00'33	min. Earth dist.	1705 Jun 01 18:13	16°♌48'44	9.35941 AU
retrograde	1697 Dec 09 11:14	26°♌25'30		opposition	1705 Jun 07 13:13	16°♌24'33	5°56'45
opposition	1698 Feb 11 08:43	23°♌14'06	-7°-5'-58	direct	1705 Aug 16 11:51	13°♌20'03	
min. Earth dist.	1698 Feb 15 20:43	22°♌52'43	7.91720 AU				
direct	1698 Apr 18 08:38	19°♌54'48		conjunction	1705 Dec 14 04:30	22°♌05'33	5°18'16
	1698 Aug 12 18:57	0°♌		minimum elong	1705 Dec 14 04:12	22°♌05'28	5°18'16
max. Earth dist.	1698 Aug 19 08:19	0°♌55'00	9.69805 AU	max. Earth dist.	1705 Dec 20 21:45	22°♌50'52	11.70695 AU
					1706 Mar 16 11:43	0°♌	
conjunction	1698 Aug 24 12:01	1°♌38'28	-5°-11'-25	retrograde	1706 Apr 09 04:26	0°♌25'39	
minimum elong	1698 Aug 24 12:31	1°♌38'39	5°11'26		1706 May 03 07:34	30°♌	
retrograde	1698 Dec 27 10:00	13°♌20'28		min. Earth dist.	1706 Jun 13 02:02	27°♌47'28	10.05436 AU
opposition	1699 Feb 28 09:59	10°♌08'07	-5°-48'-59	opposition	1706 Jun 19 06:49	27°♌22'36	6°45'07
min. Earth dist.	1699 Mar 03 14:14	9°♌52'47	7.54027 AU	direct	1706 Aug 29 08:36	24°♌22'41	
direct	1699 May 04 16:15	6°♌48'19			1706 Dec 01 19:33	0°♌	
max. Earth dist.	1699 Sep 08 19:11	18°♌46'11	9.41807 AU				
				conjunction	1706 Dec 24 12:00	2°♌21'08	5°54'09
conjunction	1699 Sep 11 20:06	19°♌12'50	-3°-51'-26	minimum elong	1706 Dec 24 11:47	2°♌21'05	5°54'09
minimum elong	1699 Sep 11 20:38	19°♌13'02	3°51'27	max. Earth dist.	1706 Dec 31 11:44	3°♌05'01	12.40756 AU
	1699 Dec 09 08:59	0°♌		retrograde	1707 Apr 18 03:41	10°♌00'41	
retrograde	1700 Jan 14 22:31	1°♌19'54		min. Earth dist.	1707 Jun 23 07:15	7°♌26'13	10.75971 AU
	1700 Feb 21 17:24	30°♌		opposition	1707 Jun 29 15:32	7°♌01'48	7°14'56
opposition	1700 Mar 18 16:55	28°♌07'08	-3°-51'-57	direct	1707 Sep 09 16:01	4°♌06'35	
min. Earth dist.	1700 Mar 20 03:31	28°♌00'10	7.36274 AU				
direct	1700 May 22 17:30	24°♌48'11		conjunction	1708 Jan 02 15:09	11°♌25'04	6°16'44
	1700 Aug 08 03:45	0°♌		minimum elong	1708 Jan 02 15:01	11°♌25'02	6°16'44
				max. Earth dist.	1708 Jan 09 15:30	12°♌06'15	13.10760 AU
conjunction	1700 Sep 30 15:47	7°♌25'42	-2°-6'-26	retrograde	1708 Apr 25 04:08	18°♌30'07	
minimum elong	1700 Sep 30 16:08	7°♌25'50	2°06'27	min. Earth dist.	1708 Jul 01 11:40	15°♌59'05	11.45541 AU
max. Earth dist.	1700 Sep 30 02:28	7°♌20'47	9.35674 AU	opposition	1708 Jul 07 20:53	15°♌35'30	7°30'55
retrograde	1701 Feb 02 01:46	19°♌30'26		direct	1708 Sep 18 17:31	12°♌44'55	
opposition	1701 Apr 06 08:50	16°♌17'30	-1°-28'-58				
min. Earth dist.	1701 Apr 05 20:59	16°♌19'52	7.41140 AU	conjunction	1709 Jan 09 19:08	19°♌29'51	6°29'05
direct	1701 Jun 10 17:56	13°♌00'13		minimum elong	1709 Jan 09 19:04	19°♌29'50	6°29'05
				max. Earth dist.	1709 Jan 16 15:46	20°♌07'43	13.79104 AU
conjunction	1701 Oct 18 22:45	25°♌18'41	0°-10'-43	retrograde	1709 May 02 10:00	26°♌05'46	
minimum elong	1701 Oct 18 22:47	25°♌18'42	0°10'44	min. Earth dist.	1709 Jul 09 21:07	23°♌37'39	12.12801 AU
behind sun begin	1701 Oct 18 17:10	25°♌16'41		opposition	1709 Jul 16 03:28	23°♌15'20	7°36'44
behind sun end	1701 Oct 19 04:24	25°♌20'42		direct	1709 Sep 27 17:46	20°♌29'13	
max. Earth dist.	1701 Oct 20 19:30	25°♌34'52	9.52257 AU				
	1701 Nov 21 05:04	0°♌		conjunction	1710 Jan 17 04:16	26°♌46'03	6°33'39
asc. node	1701 Nov 23 11:56	0°♌18'12		minimum elong	1710 Jan 17 04:16	26°♌46'03	6°33'39
retrograde	1702 Feb 18 23:12	6°♌54'54		max. Earth dist.	1710 Jan 23 20:54	27°♌20'58	14.44695 AU
min. Earth dist.	1702 Apr 22 02:32	3°♌53'07	7.67883 AU		1710 Feb 25 07:28	0°♌	
opposition	1702 Apr 24 10:47	3°♌42'10	0°56'36	retrograde	1710 May 08 23:04	2°♌57'24	

min. Earth dist.	1710 Jul 17 14:48	0°31'43	12.76880 AU	conjunction	1718 Feb 27 09:26	8°29'51	5°00'19
opposition	1710 Jul 23 15:23	0°10'59	7°35'08	minimum elong	1718 Feb 27 09:34	8°29'52	5°00'19
	1710 Jul 26 19:58	30°☾		max. Earth dist.	1718 Mar 03 02:28	8°44'25	18.19605 AU
direct	1710 Oct 05 20:26	27°☾29'02		retrograde	1718 Jun 16 08:08	13°02'30	
	1710 Dec 11 18:41	0°☾		min. Earth dist.	1718 Aug 31 08:09	10°46'16	16.34206 AU
				opposition	1718 Sep 03 14:15	10°36'50	5°26'05
conjunction	1711 Jan 23 21:53	3°22'22	6°32'21	direct	1718 Nov 19 05:36	8°15'32	
minimum elong	1711 Jan 23 21:56	3°22'22	6°32'20				
max. Earth dist.	1711 Jan 30 06:47	3°53'56	15.06800 AU	conjunction	1719 Mar 03 17:32	12°35'52	4°40'58
retrograde	1711 May 15 02:06	9°13'02		minimum elong	1719 Mar 03 17:40	12°35'54	4°40'59
min. Earth dist.	1711 Jul 24 16:40	6°49'39	13.37160 AU	max. Earth dist.	1719 Mar 07 01:09	12°48'40	18.46139 AU
opposition	1711 Jul 30 11:47	6°30'20	7°28'05	retrograde	1719 Jun 20 13:14	17°03'29	
direct	1711 Oct 13 04:56	3°52'09		min. Earth dist.	1719 Sep 05 03:55	14°47'16	16.58439 AU
				opposition	1719 Sep 07 23:55	14°39'08	5°03'21
conjunction	1712 Jan 30 02:57	9°25'48	6°26'34	direct	1719 Nov 23 16:28	12°19'07	
minimum elong	1712 Jan 30 03:01	9°25'49	6°26'34				
max. Earth dist.	1712 Feb 05 04:26	9°54'30	15.64933 AU	conjunction	1720 Mar 06 23:01	16°34'51	4°20'42
retrograde	1712 May 19 18:37	14°58'59		minimum elong	1720 Mar 06 23:08	16°34'53	4°20'42
min. Earth dist.	1712 Jul 30 08:49	12°37'21	13.93242 AU	max. Earth dist.	1720 Mar 09 20:33	16°45'52	18.68205 AU
opposition	1712 Aug 04 19:22	12°19'43	7°17'01	retrograde	1720 Jun 23 17:56	20°58'27	
direct	1712 Oct 18 22:48	9°44'59		min. Earth dist.	1720 Sep 08 18:50	18°42'19	16.78187 AU
				opposition	1720 Sep 11 06:40	18°35'13	4°39'48
conjunction	1713 Feb 03 21:26	15°02'03	6°17'21	direct	1720 Nov 27 01:36	16°16'14	
minimum elong	1713 Feb 03 21:32	15°02'04	6°17'20				
max. Earth dist.	1713 Feb 09 14:00	15°27'53	16.18757 AU	conjunction	1721 Mar 11 02:29	20°28'23	3°59'36
retrograde	1713 May 25 02:32	20°20'28		minimum elong	1721 Mar 11 02:36	20°28'25	3°59'36
min. Earth dist.	1713 Aug 05 13:40	18°00'25	14.44893 AU	max. Earth dist.	1721 Mar 13 14:19	20°37'44	18.85796 AU
opposition	1713 Aug 10 16:33	17°44'14	7°02'56	retrograde	1721 Jun 27 20:17	24°48'56	
direct	1713 Oct 25 03:39	15°12'34		min. Earth dist.	1721 Sep 13 09:52	22°32'26	16.93471 AU
				opposition	1721 Sep 15 11:26	22°26'36	4°15'30
conjunction	1714 Feb 09 07:20	20°15'39	6°05'27	direct	1721 Dec 01 05:48	20°08'26	
minimum elong	1714 Feb 09 07:27	20°15'41	6°05'27				
max. Earth dist.	1714 Feb 14 14:38	20°38'53	16.68100 AU	conjunction	1722 Mar 15 04:36	24°17'55	3°37'44
retrograde	1714 May 30 04:07	25°21'33		minimum elong	1722 Mar 15 04:43	24°17'56	3°37'44
min. Earth dist.	1714 Aug 11 10:45	23°02'43	14.91950 AU	max. Earth dist.	1722 Mar 17 06:23	24°25'38	18.98934 AU
opposition	1714 Aug 16 04:42	22°48'02	6°46'33	retrograde	1722 Jul 01 23:50	28°36'17	
direct	1714 Oct 31 01:12	20°19'05		min. Earth dist.	1722 Sep 17 21:15	26°19'28	17.04269 AU
				opposition	1722 Sep 19 14:27	26°14'38	3°50'28
conjunction	1715 Feb 14 09:56	25°10'22	5°51'27	direct	1722 Dec 05 09:51	23°57'02	
minimum elong	1715 Feb 14 10:03	25°10'23	5°51'28				
max. Earth dist.	1715 Feb 19 08:00	25°31'11	17.12842 AU	conjunction	1723 Mar 19 05:47	28°04'46	3°15'08
	1715 May 21 06:34	0°☾		minimum elong	1723 Mar 19 05:53	28°04'47	3°15'07
retrograde	1715 Jun 03 22:31	0°05'40		max. Earth dist.	1723 Mar 20 21:16	28°10'50	19.07567 AU
	1715 Jun 17 15:38	30°☾			1723 Apr 20 14:13	0°☾	
min. Earth dist.	1715 Aug 17 00:43	27°47'45	15.34392 AU	retrograde	1723 Jul 06 01:05	2°21'49	
opposition	1715 Aug 21 09:23	27°34'32	6°28'22	min. Earth dist.	1723 Sep 22 09:48	0°04'12	17.10559 AU
direct	1715 Nov 05 11:03	25°07'55		opposition	1723 Sep 23 16:26	0°00'37	3°24'44
					1723 Sep 23 21:43	30°☾	
conjunction	1716 Feb 19 06:33	29°49'15	5°35'45	direct	1723 Dec 09 09:59	27°43'23	
minimum elong	1716 Feb 19 06:41	29°49'17	5°35'44		1724 Feb 20 07:50	0°☾	
	1716 Feb 21 21:09	0°☾					
max. Earth dist.	1716 Feb 23 18:43	0°07'48	17.52994 AU	conjunction	1724 Mar 22 06:37	1°50'10	2°51'49
retrograde	1716 Jun 07 13:33	4°35'36		minimum elong	1724 Mar 22 06:43	1°50'11	2°51'50
min. Earth dist.	1716 Aug 21 07:42	2°18'30	15.72214 AU	max. Earth dist.	1724 Mar 23 11:57	1°54'40	19.11692 AU
opposition	1716 Aug 25 07:51	2°06'34	6°08'45	retrograde	1724 Jul 09 05:05	6°06'43	
	1716 Oct 16 03:01	30°☾		opposition	1724 Sep 26 17:49	3°45'44	2°58'17
direct	1716 Nov 09 16:07	29°42'00		min. Earth dist.	1724 Sep 25 19:49	3°48'18	17.12305 AU
	1716 Dec 03 21:07	0°☾		direct	1724 Dec 12 11:08	1°28'35	
conjunction	1717 Feb 22 21:55	4°14'59	5°18'38	conjunction	1725 Mar 26 07:22	5°35'15	2°27'49
minimum elong	1717 Feb 22 22:02	4°15'00	5°18'38	minimum elong	1725 Mar 26 07:27	5°35'16	2°27'48
max. Earth dist.	1717 Feb 27 00:58	4°31'32	17.88560 AU	max. Earth dist.	1725 Mar 27 01:41	5°38'03	19.11237 AU
retrograde	1717 Jun 11 23:42	8°53'51		retrograde	1725 Jul 13 07:27	9°52'07	
min. Earth dist.	1717 Aug 26 10:59	6°37'11	16.05478 AU	opposition	1725 Sep 30 19:17	7°31'06	2°31'05
opposition	1717 Aug 30 01:22	6°26'37	5°47'56	min. Earth dist.	1725 Sep 30 08:06	7°32'24	17.09454 AU
direct	1717 Nov 14 12:33	4°03'49		direct	1725 Dec 16 09:53	5°13'46	

conjunction	1726 Mar 30 08:55	9°♃21'07	2°03'06	min. Earth dist.	1733 Nov 05 07:54	9°♃58'18	15.20619 AU
minimum elong	1726 Mar 30 08:59	9°♃21'08	2°03'06	direct	1734 Jan 16 14:21	7°♃38'04	
max. Earth dist.	1726 Mar 30 16:43	9°♃22'19	19.06173 AU	max. Earth dist.	1734 Apr 29 15:19	12°♃11'14	16.99741 AU
retrograde	1726 Jul 17 13:16	13°♃39'05					
opposition	1726 Oct 04 20:46	11°♃17'46	2°03'08	conjunction	1734 May 03 04:36	12°♃26'05	-1°-44'-6
min. Earth dist.	1726 Oct 04 18:32	11°♃18'01	17.01961 AU	minimum elong	1734 May 03 04:32	12°♃26'04	1°44'07
direct	1726 Dec 20 09:56	8°♃59'59		retrograde	1734 Aug 22 23:03	17°♃28'57	
				opposition	1734 Nov 07 12:43	14°♃55'35	-2°-16'-51
conjunction	1727 Apr 03 11:16	13°♃08'50	1°37'39	min. Earth dist.	1734 Nov 10 18:30	14°♃45'15	14.76616 AU
minimum elong	1727 Apr 03 11:20	13°♃08'50	1°37'39	direct	1735 Jan 21 07:44	12°♃23'42	
max. Earth dist.	1727 Apr 03 07:12	13°♃08'12	18.96444 AU	max. Earth dist.	1735 May 04 10:29	17°♃05'24	16.53535 AU
retrograde	1727 Jul 21 18:38	17°♃28'43					
opposition	1727 Oct 08 23:18	15°♃06'49	1°34'20	conjunction	1735 May 08 13:25	17°♃23'11	-2°-16'-38
min. Earth dist.	1727 Oct 09 07:58	15°♃05'47	16.89803 AU	minimum elong	1735 May 08 13:19	17°♃23'09	2°16'40
direct	1727 Dec 24 09:03	12°♃48'18		retrograde	1735 Aug 28 20:31	22°♃38'14	
				opposition	1735 Nov 12 20:27	20°♃02'09	-2°-54'-59
conjunction	1728 Apr 06 14:56	16°♃59'29	1°11'27	min. Earth dist.	1735 Nov 16 12:02	19°♃50'11	14.28150 AU
minimum elong	1728 Apr 06 14:58	16°♃59'29	1°11'27	direct	1736 Jan 26 04:27	17°♃27'05	
max. Earth dist.	1728 Apr 06 00:23	16°♃57'13	18.82070 AU	max. Earth dist.	1736 May 08 15:25	22°♃19'28	16.02895 AU
retrograde	1728 Jul 25 04:02	21°♃22'08					
opposition	1728 Oct 12 02:56	18°♃59'24	1°04'39	conjunction	1736 May 13 06:35	22°♃40'13	-2°-50'-1
min. Earth dist.	1728 Oct 12 20:33	18°♃57'17	16.73009 AU	minimum elong	1736 May 13 06:27	22°♃40'12	2°50'02
direct	1728 Dec 27 10:03	16°♃39'51		retrograde	1736 Sep 03 06:21	28°♃09'49	
				opposition	1736 Nov 17 12:32	25°♃30'41	-3°-34'-26
conjunction	1729 Apr 10 20:31	20°♃54'16	0°44'26	min. Earth dist.	1736 Nov 21 14:51	25°♃16'53	13.75308 AU
minimum elong	1729 Apr 10 20:33	20°♃54'16	0°44'26	direct	1737 Jan 30 10:21	22°♃52'02	
max. Earth dist.	1729 Apr 09 17:49	20°♃50'05	18.63065 AU	max. Earth dist.	1737 May 14 05:35	27°♃57'16	15.47885 AU
retrograde	1729 Jul 29 14:24	25°♃20'38					
opposition	1729 Oct 16 08:21	22°♃56'47	0°33'59	conjunction	1737 May 19 10:29	28°♃21'33	-3°-24'-4
min. Earth dist.	1729 Oct 17 12:45	22°♃53'20	16.51613 AU	minimum elong	1737 May 19 10:20	28°♃21'31	3°24'06
direct	1729 Dec 31 10:47	20°♃35'55					
max. Earth dist.	1730 Apr 13 15:26	24°♃48'38	18.39482 AU	retrograde	1737 Jun 09 17:50	0°♂	
				opposition	1737 Sep 10 03:51	4°♂08'23	
conjunction	1730 Apr 15 04:42	24°♃54'34	0°16'36	min. Earth dist.	1737 Nov 23 14:45	1°♂25'57	-4°-15'-3
minimum elong	1730 Apr 15 04:43	24°♃54'34	0°16'35	direct	1737 Nov 28 02:14	1°♂10'22	13.18199 AU
retrograde	1730 Aug 03 06:23	29°♃25'39		retrograde	1737 Dec 19 13:23	30°♂	
opposition	1730 Oct 20 15:57	27°♃00'25	0°02'15	direct	1738 Feb 04 23:34	28°♂43'19	
min. Earth dist.	1730 Oct 22 05:28	26°♃55'49	16.25657 AU	max. Earth dist.	1738 Mar 23 16:12	0°♂	
desc. node	1730 Nov 15 10:33	25°♃47'57					
direct	1731 Jan 04 14:46	24°♃37'57		conjunction	1738 May 20 08:36	4°♂04'12	14.88689 AU
max. Earth dist.	1731 Apr 17 14:02	28°♃53'52	18.11330 AU	minimum elong	1738 May 26 02:54	4°♂32'24	-3°-58'-29
				retrograde	1738 May 26 02:43	4°♂32'22	3°58'30
conjunction	1731 Apr 19 15:51	29°♃01'56	0°-12'-13	retrograde	1738 Sep 17 16:55	10°♂39'48	
minimum elong	1731 Apr 19 15:51	29°♃01'56	0°12'13	opposition	1738 Nov 30 05:40	7°♂53'44	-4°-56'-31
behind sun begin	1731 Apr 19 11:23	29°♃01'13		min. Earth dist.	1738 Dec 05 03:49	7°♂35'59	12.57055 AU
behind sun end	1731 Apr 19 20:19	29°♃02'38		direct	1739 Feb 11 00:05	5°♂06'39	
	1731 May 04 16:43	0°♂		max. Earth dist.	1739 May 27 03:51	10°♂46'49	14.25574 AU
retrograde	1731 Aug 08 00:13	3°♂38'52					
opposition	1731 Oct 25 02:39	1°♂12'00	0°-30'-36	conjunction	1739 Jun 02 10:41	11°♂19'13	-4°-32'-43
min. Earth dist.	1731 Oct 27 02:43	1°♂06'00	15.95153 AU	minimum elong	1739 Jun 02 10:28	11°♂19'10	4°32'43
	1731 Nov 19 06:06	30°♃		retrograde	1739 Sep 26 01:53	17°♂51'08	
direct	1732 Jan 08 18:51	28°♃47'40		opposition	1739 Dec 07 11:45	15°♂01'07	-5°-38'-9
	1732 Feb 27 13:06	0°♂		min. Earth dist.	1739 Dec 12 18:11	14°♂41'23	11.92268 AU
max. Earth dist.	1732 Apr 20 18:21	3°♂08'09	17.78652 AU	direct	1740 Feb 17 14:02	12°♂09'11	
				max. Earth dist.	1740 Jun 02 16:44	18°♂12'31	13.59059 AU
conjunction	1732 Apr 23 07:00	3°♂18'11	0°-41'-52				
minimum elong	1732 Apr 23 06:58	3°♂18'10	0°41'54	conjunction	1740 Jun 09 13:07	18°♂49'57	-5°-5'-51
retrograde	1732 Aug 12 02:16	8°♂02'14		minimum elong	1740 Jun 09 12:53	18°♂49'54	5°05'52
opposition	1732 Oct 28 17:01	5°♂33'28	-1°-4'-42	retrograde	1740 Oct 04 05:59	25°♂51'05	
min. Earth dist.	1732 Oct 31 02:26	5°♂26'10	15.60145 AU	opposition	1740 Dec 14 12:40	22°♂56'55	-6°-18'-46
direct	1733 Jan 12 03:57	3°♂06'56		min. Earth dist.	1740 Dec 20 02:44	22°♂35'07	11.24467 AU
max. Earth dist.	1733 Apr 25 01:03	7°♂32'55	17.41449 AU	direct	1741 Feb 23 18:03	19°♂59'47	
				max. Earth dist.	1741 Jun 11 08:20	26°♂32'11	12.89935 AU
conjunction	1733 Apr 28 02:49	7°♂45'24	-1°-12'-30				
minimum elong	1733 Apr 28 02:46	7°♂45'24	1°12'31	conjunction	1741 Jun 18 14:25	27°♂14'32	-5°-36'-23
retrograde	1733 Aug 17 07:34	12°♂38'02		minimum elong	1741 Jun 18 14:11	27°♂14'29	5°36'25
opposition	1733 Nov 02 12:09	10°♂07'06	-1°-40'-6				
				retrograde	1741 Jul 17 09:12	0°♂	
					1741 Oct 14 14:03	4°♂50'28	

opposition	1741 Dec 23 12:35	1°♄52'04	-6°-56'-15	max. Earth dist.	1749 Oct 18 07:13	23°♃44'28	9.50748 AU
min. Earth dist.	1741 Dec 29 09:05	1°♄28'14	10.54676 AU		1749 Dec 02 21:38	0°♌	
	1742 Jan 22 01:10	30°♈		asc. node	1750 Jan 12 13:13	3°♌57'38	
direct	1742 Mar 03 21:39	28°♈49'31		retrograde	1750 Feb 16 22:05	5°♌10'18	
	1742 Apr 13 03:21	0°♄		min. Earth dist.	1750 Apr 20 02:55	2°♌07'50	7.65192 AU
max. Earth dist.	1742 Jun 21 05:48	5°♄57'33	12.19448 AU	opposition	1750 Apr 22 06:28	1°♌57'47	0°37'14
					1750 May 19 09:27	30°♌	
conjunction	1742 Jun 28 19:39	6°♄45'00	-6°-1'-57	direct	1750 Jun 27 10:49	28°♌42'41	
minimum elong	1742 Jun 28 19:27	6°♄44'57	6°01'58		1750 Aug 04 10:06	0°♌	
retrograde	1742 Oct 26 04:49	15°♄02'00					
opposition	1743 Jan 02 16:38	11°♄59'29	-7°-27'-7	conjunction	1750 Nov 02 20:48	10°♌21'53	1°24'54
min. Earth dist.	1743 Jan 08 14:55	11°♄34'18	9.84447 AU	minimum elong	1750 Nov 02 20:36	10°♌21'48	1°24'53
direct	1743 Mar 13 02:05	8°♄51'39		max. Earth dist.	1750 Nov 06 10:55	10°♌51'47	9.85121 AU
max. Earth dist.	1743 Jul 02 17:12	16°♄43'14	11.49528 AU	retrograde	1751 Mar 04 06:08	21°♌17'11	
				min. Earth dist.	1751 May 05 09:57	18°♌22'34	8.07979 AU
conjunction	1743 Jul 10 10:16	17°♄35'19	-6°-18'-52	opposition	1751 May 09 03:50	18°♌05'35	2°47'37
minimum elong	1743 Jul 10 10:10	17°♄35'17	6°18'53	direct	1751 Jul 15 11:17	14°♌53'19	
retrograde	1743 Nov 08 09:01	26°♄39'44					
opposition	1744 Jan 14 06:54	23°♄33'33	-7°-45'-48	conjunction	1751 Nov 18 06:16	25°♌37'14	3°00'37
min. Earth dist.	1744 Jan 20 02:15	23°♄07'49	9.16061 AU	minimum elong	1751 Nov 18 05:54	25°♌37'07	3°00'36
direct	1744 Mar 22 12:32	20°♄20'50		max. Earth dist.	1751 Nov 23 08:49	26°♌17'17	10.35453 AU
max. Earth dist.	1744 Jul 15 04:43	29°♄05'20	10.82929 AU		1751 Dec 22 21:47	0°♍	
				retrograde	1752 Mar 16 18:02	5°♍40'48	
conjunction	1744 Jul 22 15:58	29°♄59'49	-6°-21'-53	min. Earth dist.	1752 May 18 11:05	2°♍52'42	8.64345 AU
minimum elong	1744 Jul 22 16:01	29°♄59'50	6°21'53	opposition	1752 May 23 09:23	2°♍31'11	4°31'17
	1744 Jul 22 16:34	0°♌			1752 Jul 02 18:48	30°♌	
retrograde	1744 Nov 22 03:52	9°♌56'39		direct	1752 Jul 30 23:01	29°♌22'28	
opposition	1745 Jan 26 12:59	6°♌47'32	-7°-44'-11		1752 Aug 27 15:13	0°♍	
min. Earth dist.	1745 Jan 31 23:10	6°♌22'36	8.52734 AU				
direct	1745 Apr 03 17:19	3°♌30'57		conjunction	1752 Nov 30 20:27	9°♍08'11	4°15'48
max. Earth dist.	1745 Jul 30 23:51	13°♌16'55	10.23456 AU	minimum elong	1752 Nov 30 20:05	9°♍08'04	4°15'48
				max. Earth dist.	1752 Dec 06 23:19	9°♍52'55	10.96590 AU
conjunction	1745 Aug 06 16:54	14°♌09'39	-6°-4'-13	retrograde	1753 Mar 28 14:46	18°♍20'10	
minimum elong	1745 Aug 06 17:10	14°♌09'44	6°04'13	min. Earth dist.	1753 May 31 05:06	15°♍37'24	9.29287 AU
retrograde	1745 Dec 08 13:18	24°♌59'38		opposition	1753 Jun 05 21:44	15°♍13'32	5°46'47
opposition	1746 Feb 10 14:28	21°♌48'34	-7°-12'-8	direct	1753 Aug 14 16:25	12°♍09'00	
min. Earth dist.	1746 Feb 15 05:54	21°♌26'36	7.98743 AU				
direct	1746 Apr 17 18:52	18°♌29'37		conjunction	1753 Dec 12 18:22	21°♍00'17	5°10'50
max. Earth dist.	1746 Aug 18 04:14	29°♌20'55	9.75970 AU	minimum elong	1753 Dec 12 18:03	21°♍00'11	5°10'51
	1746 Aug 22 20:22	0°♎		max. Earth dist.	1753 Dec 19 12:00	21°♍46'01	11.64000 AU
				retrograde	1754 Apr 07 22:29	29°♍25'06	
conjunction	1746 Aug 23 12:01	0°♎05'28	-5°-19'-4	min. Earth dist.	1754 Jun 11 16:13	26°♍46'54	9.98705 AU
minimum elong	1746 Aug 23 12:29	0°♎05'38	5°19'05	opposition	1754 Jun 17 19:51	26°♍22'11	6°37'51
retrograde	1746 Dec 26 07:23	11°♎41'18		direct	1754 Aug 27 16:36	23°♍22'14	
opposition	1747 Feb 27 09:53	8°♎29'11	-6°00'-44		1754 Dec 09 16:38	0°♎	
min. Earth dist.	1747 Mar 02 18:57	8°♎12'56	7.59178 AU				
direct	1747 May 03 19:55	5°♎09'33		conjunction	1754 Dec 23 05:45	1°♎25'37	5°48'38
max. Earth dist.	1747 Sep 07 08:28	16°♎59'33	9.45732 AU	minimum elong	1754 Dec 23 05:31	1°♎25'33	5°48'38
				max. Earth dist.	1754 Dec 30 05:36	2°♎09'50	12.34197 AU
conjunction	1747 Sep 10 15:53	17°♎28'27	-4°-3'-11	retrograde	1755 Apr 17 00:54	9°♎09'11	
minimum elong	1747 Sep 10 16:26	17°♎28'38	4°03'11	min. Earth dist.	1755 Jun 21 22:43	6°♎35'02	10.69565 AU
retrograde	1748 Jan 13 17:39	29°♎31'58		opposition	1755 Jun 28 08:19	6°♎10'24	7°09'42
opposition	1748 Mar 16 12:35	26°♎19'24	-4°-8'-48	direct	1755 Sep 08 06:21	3°♎15'09	
min. Earth dist.	1748 Mar 18 04:51	26°♎11'18	7.38936 AU				
direct	1748 May 20 15:22	23°♎00'29		conjunction	1756 Jan 01 12:19	10°♎37'42	6°12'41
	1748 Aug 20 03:39	0°♏		minimum elong	1756 Jan 01 12:10	10°♎37'40	6°12'40
				max. Earth dist.	1756 Jan 08 12:35	11°♎19'09	13.04701 AU
conjunction	1748 Sep 28 10:01	5°♏36'04	-2°-21'-11	retrograde	1756 Apr 24 04:18	17°♎46'00	
minimum elong	1748 Sep 28 10:24	5°♏36'12	2°21'11	min. Earth dist.	1756 Jun 30 06:35	15°♎15'16	11.39760 AU
max. Earth dist.	1748 Sep 27 12:36	5°♏28'10	9.36892 AU	opposition	1756 Jul 06 16:45	14°♎51'28	7°27'12
retrograde	1749 Jan 30 21:31	17°♏40'41		direct	1756 Sep 17 11:31	12°♎00'56	
opposition	1749 Apr 04 03:05	14°♏27'58	-1°-48'-38				
min. Earth dist.	1749 Apr 03 20:53	14°♏29'12	7.41031 AU	conjunction	1757 Jan 08 18:55	18°♎49'04	6°26'09
direct	1749 Jun 08 12:30	11°♏10'39		minimum elong	1757 Jan 08 18:51	18°♎49'03	6°26'09
				max. Earth dist.	1757 Jan 15 18:04	19°♎27'43	13.73793 AU
conjunction	1749 Oct 16 18:28	23°♏31'09	0°-26'-23	retrograde	1757 May 01 11:06	25°♎27'30	
minimum elong	1749 Oct 16 18:33	23°♏31'10	0°26'24	min. Earth dist.	1757 Jul 08 19:00	22°♎59'39	12.07884 AU

opposition	1757 Jul 15 02:02	22°☾37'13	7°34'08	max. Earth dist.	1765 Feb 26 09:34	4°☿07'38	17.93706 AU
direct	1757 Sep 26 14:15	19°☾51'10		retrograde	1765 Jun 11 03:42	8°☿28'37	
conjunction	1758 Jan 16 06:04	26°☾10'29	6°31'37	min. Earth dist.	1765 Aug 25 10:50	6°☿13'00	16.11463 AU
minimum elong	1758 Jan 16 06:04	26°☾10'28	6°31'38	opposition	1765 Aug 29 05:43	6°☿01'57	5°49'56
max. Earth dist.	1758 Jan 22 23:57	26°☾45'49	14.40316 AU	direct	1765 Nov 13 17:01	3°☿39'40	
retrograde	1758 Mar 04 10:52	0°♁		conjunction	1766 Feb 26 14:48	8°☿04'48	5°02'28
	1758 May 08 03:40	2°♁23'45		minimum elong	1766 Feb 26 14:56	8°☿04'49	5°02'28
	1758 Jul 16 02:42	30°☾		max. Earth dist.	1766 Mar 02 12:21	8°☿20'02	18.26472 AU
min. Earth dist.	1758 Jul 16 12:27	29°☾58'37	12.72977 AU	retrograde	1766 Jun 15 09:42	12°☿36'15	
opposition	1758 Jul 22 15:53	29°☾37'29	7°33'24	min. Earth dist.	1766 Aug 30 09:27	10°☿20'57	16.41960 AU
direct	1758 Oct 04 19:07	26°☾55'36		opposition	1766 Sep 02 18:19	10°☿11'14	5°28'36
	1758 Dec 18 11:19	0°♁		direct	1766 Nov 18 08:59	7°☿50'34	
conjunction	1759 Jan 23 01:26	2°♁50'48	6°31'02	conjunction	1767 Mar 02 22:22	12°☿09'41	4°43'36
minimum elong	1759 Jan 23 01:28	2°♁50'49	6°31'01	minimum elong	1767 Mar 02 22:29	12°☿09'42	4°43'35
max. Earth dist.	1759 Jan 29 12:35	3°♁22'58	15.03504 AU	max. Earth dist.	1767 Mar 06 09:09	12°☿22'56	18.54808 AU
retrograde	1759 May 14 07:43	8°♁42'49		retrograde	1767 Jun 19 15:42	16°☿35'47	
min. Earth dist.	1759 Jul 23 17:18	6°♁19'51	13.34385 AU	min. Earth dist.	1767 Sep 04 02:31	14°☿20'50	16.68025 AU
opposition	1759 Jul 29 13:47	6°♁00'19	7°27'04	opposition	1767 Sep 07 03:19	14°☿12'11	5°06'23
direct	1759 Oct 12 05:35	3°♁22'19		direct	1767 Nov 22 20:23	11°☿52'52	
conjunction	1760 Jan 29 07:31	8°♁57'15	6°25'51	conjunction	1768 Mar 06 03:02	16°☿07'05	4°23'50
minimum elong	1760 Jan 29 07:35	8°♁57'16	6°25'51	minimum elong	1768 Mar 06 03:09	16°☿07'06	4°23'51
max. Earth dist.	1760 Feb 04 11:36	9°♁26'31	15.62799 AU	max. Earth dist.	1768 Mar 09 05:20	16°☿18'46	18.78719 AU
retrograde	1760 May 18 23:42	14°♁31'19		retrograde	1768 Jun 22 17:35	20°☿28'52	
min. Earth dist.	1760 Jul 29 09:25	12°♁10'15	13.91699 AU	min. Earth dist.	1768 Sep 07 18:34	18°☿13'53	16.89656 AU
opposition	1760 Aug 03 22:40	11°♁52'16	7°16'35	opposition	1768 Sep 10 09:28	18°☿06'28	4°43'25
direct	1760 Oct 18 00:31	9°♁17'45		direct	1768 Nov 26 04:07	15°☿48'17	
conjunction	1761 Feb 03 02:55	14°♁35'39	6°17'10	conjunction	1769 Mar 10 05:37	19°☿58'36	4°03'17
minimum elong	1761 Feb 03 03:01	14°♁35'40	6°17'10	minimum elong	1769 Mar 10 05:44	19°☿58'37	4°03'16
max. Earth dist.	1761 Feb 08 21:35	15°♁01'56	16.17895 AU	max. Earth dist.	1769 Mar 12 21:07	20°☿08'27	18.98223 AU
retrograde	1761 May 24 08:34	19°♁54'30		retrograde	1769 Jun 26 20:37	24°☿17'00	
min. Earth dist.	1761 Aug 04 14:49	17°♁35'06	14.44651 AU	min. Earth dist.	1769 Sep 12 06:45	22°☿01'56	17.06874 AU
opposition	1761 Aug 09 20:29	17°♁18'34	7°03'01	opposition	1769 Sep 14 13:14	21°☿55'34	4°19'43
direct	1761 Oct 24 09:29	14°♁47'10		direct	1769 Nov 30 09:06	19°☿38'16	
conjunction	1762 Feb 08 13:12	19°♁50'40	6°05'46	conjunction	1770 Mar 14 06:40	23°☿45'37	3°42'00
minimum elong	1762 Feb 08 13:18	19°♁50'41	6°05'45	minimum elong	1770 Mar 14 06:47	23°☿45'38	3°42'00
max. Earth dist.	1762 Feb 14 00:01	20°♁14'31	16.68584 AU	max. Earth dist.	1770 Mar 16 13:20	23°☿54'01	19.13296 AU
retrograde	1762 May 29 07:59	24°♁56'38		retrograde	1770 Jun 30 20:49	28°☿01'32	
min. Earth dist.	1762 Aug 10 12:54	22°♁38'24	14.93126 AU	min. Earth dist.	1770 Sep 16 18:50	25°☿46'01	17.19638 AU
opposition	1762 Aug 15 09:14	22°♁23'27	6°47'08	opposition	1770 Sep 18 15:18	25°☿40'51	3°55'22
direct	1762 Oct 30 05:10	19°♁54'48		direct	1770 Dec 04 11:17	23°☿24'14	
conjunction	1763 Feb 13 16:01	24°♁46'07	5°52'14	conjunction	1771 Mar 18 06:34	27°☿29'27	3°20'02
minimum elong	1763 Feb 13 16:09	24°♁46'08	5°52'14	minimum elong	1771 Mar 18 06:40	27°☿29'28	3°20'01
max. Earth dist.	1763 Feb 18 16:29	25°♁07'22	17.14786 AU	max. Earth dist.	1771 Mar 20 02:14	27°☿36'06	19.23920 AU
retrograde	1763 Jun 03 03:36	29°♁41'07		retrograde	1771 May 01 06:45	0°♁	
min. Earth dist.	1763 Aug 16 01:26	27°♁24'04	15.37070 AU	retrograde	1771 Jul 04 22:36	1°♁43'42	
opposition	1763 Aug 20 13:59	27°♁10'25	6°29'26		1771 Sep 09 09:55	30°☿	
direct	1763 Nov 04 16:47	24°♁44'10		min. Earth dist.	1771 Sep 21 04:20	29°☿27'40	17.27936 AU
conjunction	1764 Feb 18 12:33	29°♁25'12	5°36'59	opposition	1771 Sep 22 15:58	29°☿23'32	3°30'22
minimum elong	1764 Feb 18 12:40	29°♁25'14	5°36'58	direct	1771 Dec 08 11:59	27°☿07'20	
max. Earth dist.	1764 Feb 23 04:53	29°♁44'26	17.56484 AU		1772 Mar 01 10:01	0°♁	
retrograde	1764 Jun 06 16:32	4°☿10'57		conjunction	1772 Mar 21 05:57	1°♁11'16	2°57'24
min. Earth dist.	1764 Aug 20 09:55	1°☿54'36	15.76506 AU	minimum elong	1772 Mar 21 06:02	1°♁11'17	2°57'24
opposition	1764 Aug 24 12:35	1°☿42'24	6°10'17	max. Earth dist.	1772 Mar 22 16:11	1°♁16'28	19.30048 AU
	1764 Oct 01 21:45	30°♁		retrograde	1772 Jul 07 22:31	5°♁24'39	
direct	1764 Nov 08 20:02	29°♁18'17		opposition	1772 Sep 25 16:01	3°♁04'47	3°04'42
	1764 Dec 16 02:57	0°☿		min. Earth dist.	1772 Sep 24 14:30	3°♁07'45	17.31714 AU
conjunction	1765 Feb 22 03:42	3°☿50'39	5°20'19	direct	1772 Dec 11 11:17	0°♁48'46	
minimum elong	1765 Feb 22 03:50	3°☿50'40	5°20'18	conjunction	1773 Mar 25 05:03	4°♁52'11	2°34'08
				minimum elong	1773 Mar 25 05:07	4°♁52'11	2°34'08

max. Earth dist.	1773 Mar 26 04:01	4°♃55'39	19.31654 AU	max. Earth dist.	1781 Apr 23 04:39	5°♄49'11	17.81335 AU
retrograde	1773 Jul 12 01:14	9°♃05'28		conjunction	1781 Apr 25 22:19	6°♄00'01	0°-58'-10
opposition	1773 Sep 29 15:42	6°♃45'38	2°38'23	minimum elong	1781 Apr 25 22:17	6°♄00'01	0°58'11
min. Earth dist.	1773 Sep 28 23:21	6°♃47'32	17.30943 AU	retrograde	1781 Aug 14 18:28	10°♄43'46	
direct	1773 Dec 15 09:22	4°♃29'31		opposition	1781 Oct 31 07:03	8°♄15'19	-1°-22'-53
conjunction	1774 Mar 29 04:36	8°♃33'12	2°10'12	min. Earth dist.	1781 Nov 02 20:39	8°♄07'29	15.61961 AU
minimum elong	1774 Mar 29 04:40	8°♃33'13	2°10'12	direct	1782 Jan 14 17:15	5°♄48'58	
max. Earth dist.	1774 Mar 29 17:20	8°♃35'08	19.28675 AU	max. Earth dist.	1782 Apr 27 12:32	10°♄14'21	17.42455 AU
retrograde	1774 Jul 16 02:13	12°♃47'09		conjunction	1782 Apr 30 18:29	10°♄27'32	-1°-28'-28
opposition	1774 Oct 03 15:21	10°♃27'07	2°11'21	minimum elong	1782 Apr 30 18:25	10°♄27'31	1°28'28
min. Earth dist.	1774 Oct 03 09:11	10°♃27'50	17.25575 AU	retrograde	1782 Aug 20 00:55	15°♄20'17	
direct	1774 Dec 19 07:46	8°♃10'39		opposition	1782 Nov 05 02:07	12°♄49'38	-1°-57'-56
conjunction	1775 Apr 02 04:41	12°♃15'22	1°45'36	min. Earth dist.	1782 Nov 08 01:05	12°♄40'25	15.20805 AU
minimum elong	1775 Apr 02 04:44	12°♃15'22	1°45'37	direct	1783 Jan 19 04:36	10°♄20'45	
max. Earth dist.	1775 Apr 02 06:03	12°♃15'34	19.21127 AU	max. Earth dist.	1783 May 02 02:25	14°♄53'37	16.99143 AU
retrograde	1775 Jul 20 07:18	16°♃30'46		conjunction	1783 May 05 20:37	15°♄09'21	-1°-59'-40
opposition	1775 Oct 07 15:32	14°♃10'14	1°43'34	minimum elong	1783 May 05 20:33	15°♄09'20	1°59'41
min. Earth dist.	1775 Oct 07 18:42	14°♃09'52	17.15647 AU	retrograde	1783 Aug 25 15:35	20°♄12'50	
direct	1775 Dec 23 05:17	11°♃53'08		opposition	1783 Nov 10 03:19	17°♄39'42	-2°-34'-16
conjunction	1776 Apr 05 05:42	15°♃59'42	1°20'18	min. Earth dist.	1783 Nov 13 13:02	17°♄28'50	14.75231 AU
minimum elong	1776 Apr 05 05:44	15°♃59'43	1°20'17	direct	1784 Jan 23 21:03	15°♄07'55	
max. Earth dist.	1776 Apr 04 20:31	15°♃58'18	19.09014 AU	max. Earth dist.	1784 May 05 23:25	19°♄49'57	16.51385 AU
retrograde	1776 Jul 23 11:18	20°♃17'22		conjunction	1784 May 10 06:15	20°♄08'29	-2°-31'-43
opposition	1776 Oct 10 16:43	17°♃56'07	1°14'58	minimum elong	1784 May 10 06:08	20°♄08'27	2°31'43
min. Earth dist.	1776 Oct 11 05:49	17°♃54'34	17.01175 AU	retrograde	1784 Aug 30 15:07	25°♄24'40	
direct	1776 Dec 26 03:49	15°♃38'09		opposition	1784 Nov 14 11:46	22°♄48'46	-3°-11'-53
conjunction	1777 Apr 09 08:22	19°♃47'24	0°54'15	min. Earth dist.	1784 Nov 18 06:40	22°♄36'21	14.25245 AU
minimum elong	1777 Apr 09 08:24	19°♃47'24	0°54'15	direct	1785 Jan 27 19:52	20°♄13'44	
max. Earth dist.	1777 Apr 08 12:06	19°♃44'16	18.92400 AU	max. Earth dist.	1785 May 11 04:42	25°♄06'46	15.99232 AU
retrograde	1777 Jul 27 20:36	24°♃08'11		conjunction	1785 May 16 00:54	25°♄28'31	-3°-4'-30
opposition	1777 Oct 14 19:07	21°♃45'58	0°45'29	minimum elong	1785 May 16 00:46	25°♄28'30	3°04'31
min. Earth dist.	1777 Oct 15 17:40	21°♃43'17	16.82229 AU	retrograde	1785 Jul 24 23:19	0°♂	
direct	1777 Dec 30 02:56	19°♃26'51		retrograde	1785 Sep 06 01:41	0°♂59'46	
max. Earth dist.	1778 Apr 12 05:53	23°♃34'50	18.71299 AU		1785 Oct 19 07:47	30°♄	
conjunction	1778 Apr 13 13:12	23°♃39'43	0°27'26	opposition	1785 Nov 20 04:58	28°♄20'47	-3°-50'-42
minimum elong	1778 Apr 13 13:13	23°♃39'43	0°27'25	min. Earth dist.	1785 Nov 24 11:01	28°♄06'25	13.70915 AU
retrograde	1778 Aug 01 06:25	28°♃04'34		direct	1786 Feb 02 01:15	25°♄42'01	
opposition	1778 Oct 18 23:36	25°♃41'10	0°15'01	max. Earth dist.	1786 May 06 09:52	0°♂	
min. Earth dist.	1778 Oct 20 07:53	25°♃37'16	16.58809 AU	max. Earth dist.	1786 May 16 21:34	0°♂48'36	15.42748 AU
direct	1779 Jan 03 02:39	23°♃20'40		conjunction	1786 May 22 06:35	1°♂13'48	-3°-37'-50
desc. node	1779 Apr 14 14:21	27°♃25'44		minimum elong	1786 May 22 06:25	1°♂13'46	3°37'51
max. Earth dist.	1779 Apr 16 02:05	27°♃31'24	18.45752 AU	retrograde	1786 Sep 13 03:58	7°♂02'53	
conjunction	1779 Apr 17 20:33	27°♃38'08	0°00'-15	opposition	1786 Nov 26 08:51	4°♂20'28	-4°-30'-33
minimum elong	1779 Apr 17 20:34	27°♃38'08	0°00'15	min. Earth dist.	1786 Nov 30 23:56	4°♂04'19	13.12372 AU
behind sun begin	1779 Apr 17 13:55	27°♃37'06		direct	1787 Feb 07 16:28	1°♂37'36	
behind sun end	1779 Apr 18 03:14	27°♃39'10		max. Earth dist.	1787 May 23 01:43	7°♂00'15	14.82140 AU
retrograde	1779 May 27 00:07	0°♄		conjunction	1787 May 29 00:58	7°♂29'37	-4°-11'-21
	1779 Aug 05 22:13	2°♄08'06		minimum elong	1787 May 29 00:47	7°♂29'34	4°11'21
	1779 Oct 17 13:30	30°♃		retrograde	1787 Sep 20 18:28	13°♂39'55	
opposition	1779 Oct 23 06:32	29°♃43'15	0°-16'-28	opposition	1787 Dec 03 01:52	10°♂53'44	-5°-11'-1
min. Earth dist.	1779 Oct 25 00:29	29°♃38'06	16.30960 AU	min. Earth dist.	1787 Dec 08 02:51	10°♂35'29	12.49875 AU
direct	1780 Jan 07 05:21	27°♃21'04		direct	1788 Feb 13 17:09	8°♂06'16	
	1780 Mar 24 16:17	0°♄		max. Earth dist.	1788 May 29 00:29	13°♂49'01	14.17750 AU
max. Earth dist.	1780 Apr 19 01:19	1°♄35'33	18.15755 AU	conjunction	1788 Jun 04 11:24	14°♂22'33	-4°-44'-25
conjunction	1780 Apr 21 07:24	1°♄44'17	0°-28'-46	minimum elong	1788 Jun 04 11:12	14°♂22'31	4°44'27
minimum elong	1780 Apr 21 07:23	1°♄44'17	0°28'47	retrograde	1788 Sep 28 04:41	20°♂58'08	
retrograde	1780 Aug 09 16:50	6°♄20'29		opposition	1788 Dec 09 10:27	18°♂07'53	-5°-51'-19
opposition	1780 Oct 26 16:47	3°♄53'58	0°-49'-5	min. Earth dist.	1788 Dec 14 20:15	17°♂47'33	11.83915 AU
min. Earth dist.	1780 Oct 28 20:14	3°♄47'33	15.98672 AU	direct	1789 Feb 19 09:32	15°♂15'26	
direct	1781 Jan 10 09:07	1°♄29'51					

max. Earth dist.	1789 Jun 05 17:18	21°II22'18	13.50169 AU	opposition	1797 Mar 20 23:16	0°♁50'45	-3°-37'-16
				min. Earth dist.	1797 Mar 22 07:26	0°♁44'18	7.40800 AU
conjunction	1789 Jun 12 17:13	22°II00'53	-5°-16'-2		1797 Mar 31 15:11	30°♃	
minimum elong	1789 Jun 12 16:59	22°II00'50	5°16'04	direct	1797 May 25 02:58	27°♃32'32	
retrograde	1789 Oct 07 14:49	29°II06'32			1797 Jul 16 00:24	0°♁	
opposition	1789 Dec 17 14:35	26°II12'05	-6°-30'-7				
min. Earth dist.	1789 Dec 23 06:44	25°II49'49	11.15216 AU	conjunction	1797 Oct 02 19:49	10°♁03'59	-1°-55'-4
direct	1790 Feb 26 17:32	23°II14'20		minimum elong	1797 Oct 02 20:08	10°♁04'06	1°55'05
max. Earth dist.	1790 Jun 14 12:56	29°II51'12	12.80323 AU	max. Earth dist.	1797 Oct 02 09:23	10°♁00'09	9.40930 AU
	1790 Jun 16 00:51	0°♁		retrograde	1798 Feb 04 00:40	22°♁02'23	
				opposition	1798 Apr 08 11:10	18°♁50'12	-1°-14'-52
conjunction	1790 Jun 21 22:25	0°♁34'47	-5°-44'-33	min. Earth dist.	1798 Apr 07 20:51	18°♁53'02	7.46999 AU
minimum elong	1790 Jun 21 22:12	0°♁34'44	5°44'34	direct	1798 Jun 12 23:11	15°♁33'47	
retrograde	1790 Oct 18 01:35	8°♁16'12					
opposition	1790 Dec 26 18:31	5°♁17'28	-7°-5'-3	conjunction	1798 Oct 20 21:34	27°♁45'05	0°00'-26
min. Earth dist.	1791 Jan 01 16:19	4°♁53'17	10.44922 AU	minimum elong	1798 Oct 20 21:35	27°♁45'05	0°00'26
direct	1791 Mar 07 00:33	2°♁14'16		behind sun begin	1798 Oct 20 14:19	27°♁42'30	
max. Earth dist.	1791 Jun 24 17:21	9°♁28'18	12.09579 AU	behind sun end	1798 Oct 21 04:51	27°♁47'40	
				max. Earth dist.	1798 Oct 22 20:27	28°♁01'54	9.58696 AU
conjunction	1791 Jul 02 08:22	10°♁16'36	-6°-7'-20	asc. node	1798 Oct 22 07:55	27°♁57'24	
minimum elong	1791 Jul 02 08:12	10°♁16'33	6°07'21		1798 Nov 05 15:35	0°♃	
retrograde	1791 Oct 29 22:12	18°♁40'00		retrograde	1799 Feb 20 16:57	9°♃14'31	
opposition	1792 Jan 06 03:26	15°♁37'10	-7°-32'-15	min. Earth dist.	1799 Apr 23 21:42	6°♃14'00	7.74796 AU
min. Earth dist.	1792 Jan 12 02:39	15°♁11'42	9.74709 AU	opposition	1799 Apr 26 08:11	6°♃02'42	1°08'14
direct	1792 Mar 15 09:05	12°♁28'43		direct	1799 Jul 01 16:35	2°♃48'39	
max. Earth dist.	1792 Jul 05 12:17	20°♁27'49	11.39964 AU				
				conjunction	1799 Nov 06 15:22	14°♃15'50	1°47'41
conjunction	1792 Jul 13 04:39	21°♁20'16	-6°-20'-30	minimum elong	1799 Nov 06 15:07	14°♃15'45	1°47'41
minimum elong	1792 Jul 13 04:35	21°♁20'15	6°20'30	max. Earth dist.	1799 Nov 10 13:18	14°♃48'00	9.96250 AU
	1792 Oct 16 23:37	0°♃		retrograde	1800 Mar 07 15:55	24°♃59'46	
retrograde	1792 Nov 11 06:45	0°♃31'48		min. Earth dist.	1800 May 08 21:48	22°♃06'55	8.20355 AU
	1792 Dec 06 16:34	30°♁		opposition	1800 May 12 21:06	21°♃49'06	3°12'45
opposition	1793 Jan 16 23:24	27°♁25'23	-7°-45'-47	direct	1800 Jul 19 09:28	18°♃38'02	
min. Earth dist.	1793 Jan 22 18:02	26°♁59'41	9.06958 AU				
direct	1793 Mar 26 02:45	24°♁12'14		conjunction	1800 Nov 21 15:36	29°♃09'16	3°18'43
	1793 Jun 23 05:36	0°♃		minimum elong	1800 Nov 21 15:14	29°♃09'09	3°18'44
max. Earth dist.	1793 Jul 19 07:37	3°♃05'20	10.74379 AU	max. Earth dist.	1800 Nov 26 23:23	29°♃50'23	10.48838 AU
					1800 Nov 28 05:22	0°♃	
conjunction	1793 Jul 26 16:39	3°♃59'43	-6°-18'-30	retrograde	1801 Mar 20 19:21	9°♃01'29	
minimum elong	1793 Jul 26 16:46	3°♃59'45	6°18'31	min. Earth dist.	1801 May 22 15:36	6°♃15'01	8.78564 AU
retrograde	1793 Nov 26 07:16	14°♃03'43		opposition	1801 May 27 18:06	5°♃52'58	4°49'46
opposition	1794 Jan 30 11:44	10°♃54'32	-7°-37'-11	direct	1801 Aug 04 12:51	2°♃45'34	
min. Earth dist.	1794 Feb 04 18:47	10°♃30'06	8.45040 AU				
direct	1794 Apr 07 11:52	7°♃37'46		conjunction	1801 Dec 04 21:04	12°♃19'17	4°29'06
max. Earth dist.	1794 Aug 04 11:05	17°♃32'54	10.16802 AU	minimum elong	1801 Dec 04 20:42	12°♃19'10	4°29'07
				max. Earth dist.	1801 Dec 11 02:43	13°♃04'09	11.11374 AU
conjunction	1794 Aug 10 23:30	18°♃24'33	-5°-54'-36	retrograde	1802 Apr 01 06:56	21°♃20'51	
minimum elong	1794 Aug 10 23:49	18°♃24'39	5°54'37	min. Earth dist.	1802 Jun 04 02:26	18°♃39'32	9.44553 AU
retrograde	1794 Dec 12 21:55	29°♃20'34		opposition	1802 Jun 09 22:13	18°♃15'23	5°59'17
opposition	1795 Feb 14 19:26	26°♃09'37	-6°-56'-29	direct	1802 Aug 18 22:35	15°♃12'12	
min. Earth dist.	1795 Feb 19 05:34	25°♃48'39	7.93385 AU				
direct	1795 Apr 21 20:03	22°♃50'48		conjunction	1802 Dec 16 11:41	23°♃52'50	5°19'57
	1795 Jul 25 16:53	0°♃		minimum elong	1802 Dec 16 11:23	23°♃52'45	5°19'57
max. Earth dist.	1795 Aug 22 22:42	3°♃50'20	9.72184 AU	max. Earth dist.	1802 Dec 23 06:31	24°♃38'13	11.79504 AU
					1803 Feb 16 05:21	0°♃	
conjunction	1795 Aug 27 22:56	4°♃32'29	-5°-2'-34	retrograde	1803 Apr 11 09:48	2°♃08'24	
minimum elong	1795 Aug 27 23:26	4°♃32'40	5°02'35		1803 Jun 07 23:37	30°♃	
retrograde	1795 Dec 30 18:00	16°♃11'26		min. Earth dist.	1803 Jun 15 07:55	29°♃31'23	10.14416 AU
opposition	1796 Mar 02 19:18	12°♃59'36	-5°-36'-3	opposition	1803 Jun 21 12:48	29°♃06'43	6°45'37
min. Earth dist.	1796 Mar 05 21:20	12°♃44'47	7.57089 AU	direct	1803 Aug 31 15:10	26°♃08'05	
direct	1796 May 07 03:57	9°♃40'25			1803 Nov 16 05:31	0°♃	
max. Earth dist.	1796 Sep 11 06:54	21°♃35'31	9.45651 AU				
				conjunction	1803 Dec 26 16:43	4°♃02'18	5°54'24
conjunction	1796 Sep 14 04:25	22°♃00'49	-3°-40'-34	minimum elong	1803 Dec 26 16:31	4°♃02'15	5°54'24
minimum elong	1796 Sep 14 04:56	22°♃01'00	3°40'34	max. Earth dist.	1804 Jan 02 17:29	4°♃46'07	12.49920 AU
	1796 Nov 12 07:14	0°♁		retrograde	1804 Apr 19 05:33	11°♃37'52	
retrograde	1797 Jan 17 02:20	4°♁02'54		min. Earth dist.	1804 Jun 24 09:40	9°♃04'42	10.85303 AU

opposition	1804 Jun 30 19:17	8°☾40'18	7°13'58			1812 Jul 25 01:43	30°☾	
direct	1804 Sep 10 20:30	5°☾46'20		min. Earth dist.		1812 Aug 17 12:17	28°☾53'42	15.47586 AU
				opposition		1812 Aug 21 23:43	28°☾40'15	6°25'29
conjunction	1805 Jan 03 17:49	13°☾01'04	6°15'55	direct		1812 Nov 06 03:40	26°☾14'31	
minimum elong	1805 Jan 03 17:42	13°☾01'02	6°15'55			1813 Feb 06 18:55	0°☾	
max. Earth dist.	1805 Jan 10 18:03	13°☾41'55	13.20286 AU					
retrograde	1805 Apr 27 04:18	20°☾02'30		conjunction		1813 Feb 19 20:45	0°☾53'08	5°33'38
min. Earth dist.	1805 Jul 03 12:16	17°☾32'43	11.55220 AU	minimum elong		1813 Feb 19 20:53	0°☾53'09	5°33'37
opposition	1805 Jul 09 22:35	17°☾09'08	7°28'55	max. Earth dist.		1813 Feb 24 11:56	1°☾12'01	17.66734 AU
direct	1805 Sep 20 21:38	14°☾19'46		retrograde		1813 Jun 08 22:48	5°☾36'35	
				min. Earth dist.		1813 Aug 22 19:00	3°☾20'35	15.86483 AU
conjunction	1806 Jan 11 20:13	21°☾01'17	6°27'31	opposition		1813 Aug 26 20:47	3°☾08'33	6°06'07
minimum elong	1806 Jan 11 20:10	21°☾01'17	6°27'32	direct		1813 Nov 11 05:23	0°☾44'57	
max. Earth dist.	1806 Jan 18 18:07	21°☾39'10	13.88990 AU					
retrograde	1806 May 04 09:13	27°☾33'50		conjunction		1814 Feb 24 10:49	5°☾15'12	5°16'45
min. Earth dist.	1806 Jul 11 21:03	25°☾06'45	12.22835 AU	minimum elong		1814 Feb 24 10:57	5°☾15'13	5°16'46
opposition	1806 Jul 18 03:17	24°☾44'38	7°34'04	max. Earth dist.		1814 Feb 28 15:34	5°☾31'54	18.03445 AU
direct	1806 Sep 29 19:11	21°☾59'38		retrograde		1814 Jun 13 09:00	9°☾51'09	
				min. Earth dist.		1814 Aug 27 18:53	7°☾35'53	16.20950 AU
conjunction	1807 Jan 19 03:44	28°☾13'19	6°31'36	opposition		1814 Aug 31 12:33	7°☾25'01	5°45'36
minimum elong	1807 Jan 19 03:44	28°☾13'19	6°31'36	direct		1814 Nov 16 00:58	5°☾03'17	
max. Earth dist.	1807 Jan 25 20:41	28°☾48'02	14.54916 AU					
	1807 Feb 09 01:16	0°☾		conjunction		1815 Feb 28 20:54	9°☾26'35	4°58'43
retrograde	1807 May 10 21:25	4°☾21'32		minimum elong		1815 Feb 28 21:01	9°☾26'36	4°58'43
min. Earth dist.	1807 Jul 19 11:43	1°☾56'59	12.87241 AU	max. Earth dist.		1815 Mar 04 17:14	9°☾41'33	18.35736 AU
opposition	1807 Jul 25 13:33	1°☾36'14	7°32'03	retrograde		1815 Jun 17 15:00	13°☾56'16	
	1807 Aug 24 19:10	30°☾		min. Earth dist.		1815 Sep 01 16:07	11°☾41'25	16.50967 AU
direct	1807 Oct 07 18:47	28°☾55'18		opposition		1815 Sep 05 00:11	11°☾31'50	5°24'08
	1807 Nov 19 17:09	0°☾		direct		1815 Nov 20 15:54	9°☾11'44	
conjunction	1808 Jan 25 19:57	4°☾45'42	6°30'00	conjunction		1816 Mar 04 03:24	13°☾29'14	4°39'44
minimum elong	1808 Jan 25 20:00	4°☾45'42	6°29'59	minimum elong		1816 Mar 04 03:31	13°☾29'15	4°39'44
max. Earth dist.	1808 Feb 01 05:10	5°☾17'06	15.17351 AU	max. Earth dist.		1816 Mar 07 13:09	13°☾42'14	18.63593 AU
retrograde	1808 May 15 22:22	10°☾33'20		retrograde		1816 Jun 20 20:02	17°☾53'49	
min. Earth dist.	1808 Jul 25 12:55	8°☾10'55	13.47843 AU	min. Earth dist.		1816 Sep 05 08:56	15°☾39'16	16.76549 AU
opposition	1808 Jul 31 08:20	7°☾51'40	7°24'49	opposition		1816 Sep 08 08:29	15°☾30'48	5°01'50
direct	1808 Oct 14 03:45	5°☾14'29		direct		1816 Nov 24 02:01	13°☾12'04	
conjunction	1809 Jan 30 23:29	10°☾45'16	6°24'04	conjunction		1817 Mar 08 07:34	17°☾24'53	4°19'53
minimum elong	1809 Jan 30 23:34	10°☾45'17	6°24'05	minimum elong		1817 Mar 08 07:41	17°☾24'54	4°19'53
max. Earth dist.	1809 Feb 06 02:03	11°☾13'56	15.75837 AU	max. Earth dist.		1817 Mar 11 08:46	17°☾36'21	18.87013 AU
retrograde	1809 May 21 11:24	16°☾15'31		retrograde		1817 Jun 24 22:11	21°☾45'20	
min. Earth dist.	1809 Aug 01 03:11	13°☾54'48	14.04329 AU	min. Earth dist.		1817 Sep 09 23:54	19°☾30'48	16.97665 AU
opposition	1809 Aug 06 14:34	13°☾37'11	7°13'43	opposition		1817 Sep 12 13:51	19°☾23'32	4°38'49
direct	1809 Oct 20 20:04	11°☾03'21		direct		1817 Nov 28 09:33	17°☾05'56	
conjunction	1810 Feb 05 16:27	16°☾17'37	6°14'50	conjunction		1818 Mar 12 09:35	21°☾15'03	3°59'16
minimum elong	1810 Feb 05 16:33	16°☾17'38	6°14'50	minimum elong		1818 Mar 12 09:41	21°☾15'04	3°59'16
max. Earth dist.	1810 Feb 11 09:25	16°☾43'20	16.30120 AU	max. Earth dist.		1818 Mar 14 23:47	21°☾24'40	19.05968 AU
retrograde	1810 May 26 18:10	21°☾33'07		retrograde		1818 Jun 29 00:46	25°☾32'19	
min. Earth dist.	1810 Aug 07 05:39	19°☾14'03	14.56491 AU	min. Earth dist.		1818 Sep 14 12:16	23°☾17'37	17.14303 AU
opposition	1810 Aug 12 10:00	18°☾57'47	6°59'42	opposition		1818 Sep 16 17:07	23°☾11'28	4°15'06
direct	1810 Oct 27 01:10	16°☾26'57		direct		1818 Dec 02 12:58	20°☾54'45	
conjunction	1811 Feb 11 00:48	21°☾27'17	6°03'01	conjunction		1819 Mar 16 10:14	25°☾01'03	3°37'58
minimum elong	1811 Feb 11 00:55	21°☾27'18	6°03'01	minimum elong		1819 Mar 16 10:21	25°☾01'04	3°37'58
max. Earth dist.	1811 Feb 16 10:08	21°☾50'40	16.80059 AU	max. Earth dist.		1819 Mar 18 15:29	25°☾09'12	19.20420 AU
retrograde	1811 May 31 16:04	26°☾30'16		retrograde		1819 Jul 03 00:34	29°☾15'58	
min. Earth dist.	1811 Aug 13 01:37	24°☾12'20	15.04250 AU	min. Earth dist.		1819 Sep 18 23:25	27°☾00'52	17.26404 AU
opposition	1811 Aug 17 20:30	23°☾57'39	6°43'28	opposition		1819 Sep 20 18:36	26°☾55'51	3°50'46
direct	1811 Nov 01 18:21	21°☾29'31		direct		1819 Dec 06 15:51	24°☾39'46	
conjunction	1812 Feb 16 01:46	26°☾18'03	5°49'09	conjunction		1820 Mar 19 09:48	28°☾44'05	3°16'00
minimum elong	1812 Feb 16 01:53	26°☾18'05	5°49'09	minimum elong		1820 Mar 19 09:53	28°☾44'06	3°15'59
max. Earth dist.	1812 Feb 21 00:59	26°☾38'55	17.25600 AU	max. Earth dist.		1820 Mar 21 03:34	28°☾50'27	19.30338 AU
	1812 Apr 16 02:47	0°☾				1820 Apr 09 12:59	0°☾	
retrograde	1812 Jun 04 10:36	1°☾10'27		retrograde		1820 Jul 06 02:36	2°☾57'29	

min. Earth dist.	1820 Sep 22 09:21	0°♃41'43	17.33959 AU	behind sun end	1828 Apr 19 04:19	28°♃49'06	
opposition	1820 Sep 23 19:04	0°♃37'49	3°25'48		1828 May 08 00:40	0°♃	
	1820 Oct 07 14:35	30°♃		retrograde	1828 Aug 06 23:31	3°♃17'54	
direct	1820 Dec 09 15:00	28°♃22'05		opposition	1828 Oct 24 07:32	0°♃53'08	0°-20'-43
	1821 Feb 08 16:32	0°♃		min. Earth dist.	1828 Oct 26 02:43	0°♃47'51	16.31727 AU
					1828 Nov 11 19:42	30°♃	
conjunction	1821 Mar 23 08:53	2°♃25'14	2°53'23	direct	1829 Jan 08 06:28	28°♃31'01	
minimum elong	1821 Mar 23 08:58	2°♃25'15	2°53'24		1829 Mar 05 10:34	0°♃	
max. Earth dist.	1821 Mar 24 17:14	2°♃30'08	19.35683 AU	max. Earth dist.	1829 Apr 21 01:38	2°♃45'18	18.16311 AU
retrograde	1821 Jul 10 02:04	6°♃37'52					
opposition	1821 Sep 27 18:44	4°♃18'25	3°00'12	conjunction	1829 Apr 23 08:37	2°♃54'11	0°-32'-32
min. Earth dist.	1821 Sep 26 18:41	4°♃21'12	17.36914 AU	minimum elong	1829 Apr 23 08:36	2°♃54'11	0°32'34
direct	1821 Dec 13 15:15	2°♃02'46		retrograde	1829 Aug 11 18:36	7°♃30'22	
				opposition	1829 Oct 28 17:50	5°♃03'56	0°-53'-18
conjunction	1822 Mar 27 07:46	6°♃05'29	2°30'09	min. Earth dist.	1829 Oct 30 22:04	4°♃57'26	15.98997 AU
minimum elong	1822 Mar 27 07:51	6°♃05'30	2°30'09	direct	1830 Jan 12 11:23	2°♃39'55	
max. Earth dist.	1822 Mar 28 04:22	6°♃08'36	19.36446 AU	max. Earth dist.	1830 Apr 25 04:29	6°♃59'04	17.81442 AU
retrograde	1822 Jul 14 04:21	10°♃18'05					
opposition	1822 Oct 01 17:56	7°♃58'35	2°33'56	conjunction	1830 Apr 27 23:44	7°♃10'10	-1°-1'-53
min. Earth dist.	1822 Oct 01 03:38	8°♃00'15	17.35299 AU	minimum elong	1830 Apr 27 23:42	7°♃10'09	1°01'53
direct	1822 Dec 17 12:29	5°♃42'45		retrograde	1830 Aug 16 19:36	11°♃54'02	
				opposition	1830 Nov 02 08:11	9°♃25'41	-1°-27'-3
conjunction	1823 Mar 31 06:56	9°♃45'50	2°06'15	min. Earth dist.	1830 Nov 04 23:09	9°♃17'41	15.61830 AU
minimum elong	1823 Mar 31 07:00	9°♃45'50	2°06'16	direct	1831 Jan 16 18:16	6°♃59'24	
max. Earth dist.	1823 Mar 31 17:55	9°♃47'29	19.32645 AU	max. Earth dist.	1831 Apr 29 13:18	11°♃24'51	17.42096 AU
retrograde	1823 Jul 18 05:13	13°♃59'09					
opposition	1823 Oct 05 17:17	11°♃39'21	2°06'57	conjunction	1831 May 02 20:12	11°♃38'13	-1°-32'-8
min. Earth dist.	1823 Oct 05 12:26	11°♃39'55	17.29136 AU	minimum elong	1831 May 02 20:09	11°♃38'12	1°32'09
direct	1823 Dec 21 10:56	9°♃23'06		retrograde	1831 Aug 22 02:59	16°♃31'14	
				opposition	1831 Nov 07 03:39	14°♃00'42	-2°-2'-3
conjunction	1824 Apr 03 06:26	13°♃27'16	1°41'41	min. Earth dist.	1831 Nov 10 03:41	13°♃51'21	15.20189 AU
minimum elong	1824 Apr 03 06:30	13°♃27'16	1°41'41	direct	1832 Jan 21 06:34	11°♃31'53	
max. Earth dist.	1824 Apr 03 05:58	13°♃27'11	19.24340 AU	max. Earth dist.	1832 May 03 02:47	16°♃04'50	16.98269 AU
retrograde	1824 Jul 21 09:17	17°♃42'08					
opposition	1824 Oct 08 17:12	15°♃21'46	1°39'12	conjunction	1832 May 06 22:41	16°♃20'52	-2°-3'-15
min. Earth dist.	1824 Oct 08 22:03	15°♃21'12	17.18502 AU	minimum elong	1832 May 06 22:36	16°♃20'51	2°03'16
direct	1824 Dec 24 08:07	13°♃04'49		retrograde	1832 Aug 26 17:49	21°♃24'48	
				opposition	1832 Nov 11 05:18	18°♃51'45	-2°-38'-19
conjunction	1825 Apr 07 07:22	17°♃10'56	1°16'25	min. Earth dist.	1832 Nov 14 16:32	18°♃40'42	14.74065 AU
minimum elong	1825 Apr 07 07:24	17°♃10'56	1°16'25	direct	1833 Jan 24 22:31	16°♃20'00	
max. Earth dist.	1825 Apr 06 21:03	17°♃09'21	19.11566 AU	max. Earth dist.	1833 May 08 00:53	21°♃02'20	16.49924 AU
retrograde	1825 Jul 25 13:51	21°♃28'08					
opposition	1825 Oct 12 17:55	19°♃07'01	1°10'38	conjunction	1833 May 12 09:07	21°♃21'09	-2°-35'-13
min. Earth dist.	1825 Oct 13 08:01	19°♃05'21	17.03418 AU	minimum elong	1833 May 12 09:01	21°♃21'07	2°35'14
direct	1825 Dec 28 06:20	16°♃49'08		retrograde	1833 Sep 01 19:05	26°♃37'56	
max. Earth dist.	1826 Apr 10 11:54	20°♃54'39	18.94374 AU	opposition	1833 Nov 16 14:07	24°♃02'05	-3°-15'-51
				min. Earth dist.	1833 Nov 20 10:37	23°♃49'26	14.23461 AU
conjunction	1826 Apr 11 09:47	20°♃58'01	0°50'23	direct	1834 Jan 29 22:04	21°♃26'59	
minimum elong	1826 Apr 11 09:49	20°♃58'02	0°50'23	max. Earth dist.	1834 May 13 06:02	26°♃20'21	15.97115 AU
retrograde	1826 Jul 29 22:06	25°♃18'28					
opposition	1826 Oct 16 20:14	22°♃56'21	0°41'10	conjunction	1834 May 18 04:26	26°♃42'33	-3°-7'-55
min. Earth dist.	1826 Oct 17 20:12	22°♃53'29	16.83929 AU	minimum elong	1834 May 18 04:18	26°♃42'32	3°07'57
direct	1827 Jan 01 04:47	20°♃37'18			1834 Jul 03 19:20	0°♃	
max. Earth dist.	1827 Apr 14 06:08	24°♃44'53	18.72757 AU	retrograde	1834 Sep 08 06:40	2°♃14'36	
					1834 Nov 15 01:52	30°♃	
conjunction	1827 Apr 15 14:22	24°♃49'55	0°23'35	opposition	1834 Nov 22 08:06	29°♃35'34	-3°-54'-37
minimum elong	1827 Apr 15 14:23	24°♃49'55	0°23'35	min. Earth dist.	1834 Nov 26 15:36	29°♃20'59	13.68451 AU
retrograde	1827 Aug 03 08:24	29°♃14'31		direct	1835 Feb 04 03:18	26°♃56'41	
opposition	1827 Oct 21 00:32	26°♃51'11	0°10'44		1835 Apr 21 12:38	0°♃	
min. Earth dist.	1827 Oct 22 09:33	26°♃47'12	16.60023 AU	max. Earth dist.	1835 May 18 23:54	2°♃03'51	15.39949 AU
direct	1828 Jan 05 05:09	24°♃30'45					
desc. node	1828 Feb 25 08:33	25°♃44'17		conjunction	1835 May 24 10:35	2°♃29'26	-3°-41'-9
max. Earth dist.	1828 Apr 17 01:43	28°♃41'06	18.46747 AU	minimum elong	1835 May 24 10:25	2°♃29'24	3°41'09
				retrograde	1835 Sep 15 09:03	8°♃19'34	
conjunction	1828 Apr 18 21:40	28°♃48'04	0°-4'-7	opposition	1835 Nov 28 12:40	5°♃37'00	-4°-34'-23
minimum elong	1828 Apr 18 21:41	28°♃48'04	0°04'07	min. Earth dist.	1835 Dec 03 05:29	5°♃20'34	13.09233 AU
behind sun begin	1828 Apr 18 15:04	28°♃47'03		direct	1836 Feb 09 19:22	2°♃53'54	

max. Earth dist.	1836 May 24 04:47	8°II17'19	14.78689 AU	retrograde	1843 Dec 15 17:40	1°♃14'18	
					1844 Jan 21 23:35	30°♃	
conjunction	1836 May 30 05:55	8°II47'09	-4°-14'-31	opposition	1844 Feb 17 13:39	28°♃03'08	-6°-51'-40
minimum elong	1836 May 30 05:44	8°II47'07	4°14'33	min. Earth dist.	1844 Feb 21 21:47	27°♃42'31	7.89870 AU
retrograde	1836 Sep 22 00:24	14°II58'46		direct	1844 Apr 23 12:30	24°♃44'08	
opposition	1836 Dec 04 06:22	12°II12'21	-5°-14'-43		1844 Jul 12 01:20	0°♃	
min. Earth dist.	1836 Dec 09 08:22	11°II53'54	12.46130 AU	max. Earth dist.	1844 Aug 24 22:11	5°♃48'15	9.69194 AU
direct	1837 Feb 14 20:29	9°II24'35					
max. Earth dist.	1837 May 31 04:35	15°II08'23	14.13745 AU	conjunction	1844 Aug 29 19:37	6°♃29'35	-4°-57'-10
				minimum elong	1844 Aug 29 20:08	6°♃29'45	4°57'12
conjunction	1837 Jun 06 17:17	15°II42'26	-4°-47'-24	retrograde	1845 Jan 01 15:56	18°♃11'27	
minimum elong	1837 Jun 06 17:05	15°II42'23	4°47'26	opposition	1845 Mar 05 16:13	14°♃59'32	-5°-27'-59
retrograde	1837 Sep 30 11:29	22°II19'38		min. Earth dist.	1845 Mar 08 15:24	14°♃45'15	7.54692 AU
opposition	1837 Dec 11 15:59	19°II29'05	-5°-54'-51	direct	1845 May 09 23:03	11°♃40'20	
min. Earth dist.	1837 Dec 17 03:01	19°II08'30	11.79676 AU	max. Earth dist.	1845 Sep 14 09:33	23°♃39'22	9.43976 AU
direct	1838 Feb 21 13:55	16°II36'14					
max. Earth dist.	1838 Jun 07 23:21	22°II44'41	13.45729 AU	conjunction	1845 Sep 17 03:01	24°♃03'15	-3°-32'-53
				minimum elong	1845 Sep 17 03:32	24°♃03'26	3°32'54
conjunction	1838 Jun 15 00:12	23°II23'38	-5°-18'-45		1845 Oct 29 08:41	0°♃	
minimum elong	1838 Jun 14 23:58	23°II23'35	5°18'45	retrograde	1846 Jan 20 01:30	6°♃06'52	
	1838 Sep 12 03:41	0°♃		opposition	1846 Mar 23 22:15	2°♃54'43	-3°-26'-28
retrograde	1838 Oct 09 23:43	0°♃31'19		min. Earth dist.	1846 Mar 25 03:00	2°♃48'58	7.39850 AU
	1838 Nov 06 17:11	30°II			1846 May 07 14:39	30°♃	
opposition	1838 Dec 19 21:13	27°II36'29	-6°-33'-18	direct	1846 May 28 00:42	29°♃36'40	
min. Earth dist.	1838 Dec 25 14:12	27°II14'01	11.10627 AU		1846 Jun 17 06:25	0°♃	
direct	1839 Mar 01 00:18	24°II38'17					
	1839 Jun 03 13:54	0°♃		conjunction	1846 Oct 05 18:52	12°♃08'36	-1°-45'-55
max. Earth dist.	1839 Jun 16 20:05	1°♃17'04	12.75598 AU	minimum elong	1846 Oct 05 19:09	12°♃08'43	1°45'56
				max. Earth dist.	1846 Oct 05 13:12	12°♃06'32	9.40816 AU
conjunction	1839 Jun 24 06:50	2°♃01'08	-5°-46'-48	retrograde	1847 Feb 06 23:22	24°♃06'45	
minimum elong	1839 Jun 24 06:37	2°♃01'05	5°46'49	opposition	1847 Apr 11 10:36	20°♃54'38	-1°-2'-52
retrograde	1839 Oct 20 11:40	9°♃45'00		min. Earth dist.	1847 Apr 10 16:51	20°♃58'09	7.47649 AU
opposition	1839 Dec 29 02:41	6°♃45'52	-7°-7'-40	direct	1847 Jun 15 22:33	17°♃38'28	
min. Earth dist.	1840 Jan 04 00:39	6°♃21'34	10.40129 AU	asc. node	1847 Sep 23 15:01	25°♃33'12	
direct	1840 Mar 08 06:47	3°♃42'10					
max. Earth dist.	1840 Jun 26 02:54	10°♃58'43	12.04727 AU	conjunction	1847 Oct 23 19:57	29°♃48'18	0°09'01
				minimum elong	1847 Oct 23 19:56	29°♃48'17	0°09'01
conjunction	1840 Jul 03 18:31	11°♃47'25	-6°-8'-54	behind sun begin	1847 Oct 23 13:43	29°♃46'05	
minimum elong	1840 Jul 03 18:22	11°♃47'23	6°08'55	behind sun end	1847 Oct 24 02:09	29°♃50'30	
retrograde	1840 Oct 31 10:11	20°♃13'45			1847 Oct 25 04:37	0°♃	
opposition	1841 Jan 07 13:34	17°♃10'32	-7°-33'-57	max. Earth dist.	1847 Oct 25 23:22	0°♃06'43	9.60160 AU
min. Earth dist.	1841 Jan 13 13:08	16°♃44'54	9.69865 AU	retrograde	1848 Feb 23 13:48	11°♃15'49	
direct	1841 Mar 17 18:05	14°♃01'34		min. Earth dist.	1848 Apr 25 17:04	8°♃16'01	7.76959 AU
max. Earth dist.	1841 Jul 08 01:01	22°♃03'56	11.35153 AU	opposition	1848 Apr 28 06:35	8°♃04'09	1°19'37
				direct	1848 Jul 03 15:58	4°♃50'25	
conjunction	1841 Jul 15 17:07	22°♃56'36	-6°-21'-1				
minimum elong	1841 Jul 15 17:04	22°♃56'35	6°21'02	conjunction	1848 Nov 08 11:50	16°♃14'41	1°56'11
	1841 Sep 22 05:13	0°♃		minimum elong	1848 Nov 08 11:34	16°♃14'35	1°56'11
retrograde	1841 Nov 13 21:27	2°♃11'30		max. Earth dist.	1848 Nov 12 13:39	16°♃48'05	9.99098 AU
	1842 Jan 06 22:00	30°♃		retrograde	1849 Mar 09 10:06	26°♃55'44	
opposition	1842 Jan 19 11:47	29°♃04'43	-7°-46'-1	min. Earth dist.	1849 May 10 16:08	24°♃03'29	8.23777 AU
min. Earth dist.	1842 Jan 25 06:24	28°♃38'57	9.02270 AU	opposition	1849 May 14 17:49	23°♃45'16	3°22'18
direct	1842 Mar 28 13:48	25°♃51'07		direct	1849 Jul 21 07:31	20°♃34'34	
	1842 Jun 10 03:38	0°♃			1849 Nov 15 07:43	0°♃	
max. Earth dist.	1842 Jul 21 23:48	4°♃48'15	10.69848 AU				
				conjunction	1849 Nov 23 09:26	1°♃02'08	3°25'42
conjunction	1842 Jul 29 07:42	5°♃42'34	-6°-17'-31	minimum elong	1849 Nov 23 09:04	1°♃02'00	3°25'42
minimum elong	1842 Jul 29 07:49	5°♃42'36	6°17'33	max. Earth dist.	1849 Nov 28 20:11	1°♃44'00	10.52761 AU
retrograde	1842 Nov 29 00:24	15°♃50'17		retrograde	1850 Mar 22 11:06	10°♃51'04	
opposition	1843 Feb 02 02:58	12°♃40'48	-7°-35'-15	min. Earth dist.	1850 May 24 08:04	8°♃05'06	8.82912 AU
min. Earth dist.	1843 Feb 07 09:04	12°♃16'29	8.40775 AU	opposition	1850 May 29 12:22	7°♃42'48	4°57'02
direct	1843 Apr 10 01:38	9°♃23'42		direct	1850 Aug 06 08:30	4°♃35'46	
max. Earth dist.	1843 Aug 07 06:42	19°♃23'19	10.12863 AU				
				conjunction	1850 Dec 06 12:27	14°♃05'44	4°34'24
conjunction	1843 Aug 13 17:16	20°♃14'36	-5°-51'-36	minimum elong	1850 Dec 06 12:06	14°♃05'37	4°34'23
minimum elong	1843 Aug 13 17:36	20°♃14'43	5°51'37	max. Earth dist.	1850 Dec 12 19:55	14°♃50'54	11.16038 AU
	1843 Nov 09 06:05	0°♃		retrograde	1851 Apr 02 19:40	23°♃03'58	

min. Earth dist.	1851 Jun 05 16:22	20° $\overline{\text{A}}$ 23'09	9.49488 AU	retrograde	1859 May 27 18:44	22° \approx 45'46	
opposition	1851 Jun 11 13:42	19° $\overline{\text{A}}$ 58'49	6°04'25	min. Earth dist.	1859 Aug 08 08:44	20° \approx 26'36	14.59477 AU
direct	1851 Aug 20 15:49	16° $\overline{\text{A}}$ 55'59		opposition	1859 Aug 13 12:21	20° \approx 10'27	6°58'11
				direct	1859 Oct 28 03:28	17° \approx 39'37	
conjunction	1851 Dec 18 00:42	25° $\overline{\text{A}}$ 33'07	5°23'42				
minimum elong	1851 Dec 18 00:25	25° $\overline{\text{A}}$ 33'02	5°23'42	conjunction	1860 Feb 12 02:27	22° \approx 38'59	6°01'38
max. Earth dist.	1851 Dec 24 20:02	26° $\overline{\text{A}}$ 18'25	11.84597 AU	minimum elong	1860 Feb 12 02:34	22° \approx 39'00	6°01'38
	1852 Jan 29 09:39	0° $\overline{\text{B}}$		max. Earth dist.	1860 Feb 17 10:58	23° \approx 02'10	16.82887 AU
retrograde	1852 Apr 11 20:27	3° $\overline{\text{B}}$ 45'37		retrograde	1860 May 31 17:03	27° \approx 41'04	
min. Earth dist.	1852 Jun 15 20:10	1° $\overline{\text{B}}$ 08'58	10.19639 AU	min. Earth dist.	1860 Aug 13 03:44	25° \approx 23'36	15.06928 AU
opposition	1852 Jun 22 02:01	0° $\overline{\text{B}}$ 44'13	6°48'59	opposition	1860 Aug 17 22:10	25° \approx 08'29	6°41'40
	1852 Jul 03 08:40	30° $\overline{\text{A}}$		direct	1860 Nov 01 20:43	22° \approx 40'23	
direct	1852 Sep 01 06:58	27° $\overline{\text{A}}$ 45'57					
	1852 Oct 28 06:57	0° $\overline{\text{B}}$		conjunction	1861 Feb 16 02:39	27° \approx 28'07	5°47'30
conjunction	1852 Dec 27 03:31	5° $\overline{\text{B}}$ 37'00	5°56'53	minimum elong	1861 Feb 16 02:46	27° \approx 28'08	5°47'30
minimum elong	1852 Dec 27 03:19	5° $\overline{\text{B}}$ 36'57	5°56'53	max. Earth dist.	1861 Feb 21 01:27	27° \approx 48'52	17.28139 AU
max. Earth dist.	1853 Jan 03 04:41	6° $\overline{\text{B}}$ 20'42	12.55169 AU		1861 Mar 26 06:05	0° $\overline{\text{K}}$	
retrograde	1853 Apr 20 14:17	13° $\overline{\text{B}}$ 09'50		retrograde	1861 Jun 05 10:50	2° $\overline{\text{K}}$ 19'48	
min. Earth dist.	1853 Jun 25 20:59	10° $\overline{\text{B}}$ 36'52	10.90556 AU	min. Earth dist.	1861 Aug 18 14:03	0° $\overline{\text{K}}$ 03'00	15.49986 AU
opposition	1853 Jul 02 06:23	10° $\overline{\text{B}}$ 12'33	7°15'56		1861 Aug 19 14:03	30° \approx	
direct	1853 Sep 12 08:51	7° $\overline{\text{B}}$ 18'54		opposition	1861 Aug 23 00:45	29° \approx 49'38	6°23'26
				direct	1861 Nov 07 04:32	27° \approx 23'58	
conjunction	1854 Jan 05 02:50	14° $\overline{\text{B}}$ 30'53	6°17'23		1862 Jan 21 00:31	0° $\overline{\text{K}}$	
minimum elong	1854 Jan 05 02:43	14° $\overline{\text{B}}$ 30'51	6°17'24	conjunction	1862 Feb 20 21:16	2° $\overline{\text{K}}$ 01'55	5°31'45
max. Earth dist.	1854 Jan 12 03:10	15° $\overline{\text{B}}$ 11'34	13.25443 AU	minimum elong	1862 Feb 20 21:24	2° $\overline{\text{K}}$ 01'57	5°31'46
retrograde	1854 Apr 28 11:24	21° $\overline{\text{B}}$ 29'57		max. Earth dist.	1862 Feb 25 11:36	2° $\overline{\text{K}}$ 20'39	17.69002 AU
min. Earth dist.	1854 Jul 04 21:43	19° $\overline{\text{B}}$ 00'16	11.60279 AU	retrograde	1862 Jun 09 23:34	6° $\overline{\text{K}}$ 44'47	
opposition	1854 Jul 11 07:38	18° $\overline{\text{B}}$ 36'50	7°29'50	min. Earth dist.	1862 Aug 23 19:40	4° $\overline{\text{K}}$ 28'49	15.88601 AU
direct	1854 Sep 22 08:15	15° $\overline{\text{B}}$ 47'42		opposition	1862 Aug 27 21:03	4° $\overline{\text{K}}$ 16'49	6°03'50
				direct	1862 Nov 12 06:59	1° $\overline{\text{K}}$ 53'18	
conjunction	1855 Jan 13 03:39	22° $\overline{\text{B}}$ 26'55	6°28'11	conjunction	1863 Feb 25 10:52	6° $\overline{\text{K}}$ 23'02	5°14'40
minimum elong	1855 Jan 13 03:35	22° $\overline{\text{B}}$ 26'54	6°28'11	minimum elong	1863 Feb 25 11:00	6° $\overline{\text{K}}$ 23'03	5°14'40
max. Earth dist.	1855 Jan 20 00:22	23° $\overline{\text{B}}$ 04'23	13.93857 AU	max. Earth dist.	1863 Mar 01 15:09	6° $\overline{\text{K}}$ 39'38	18.05427 AU
retrograde	1855 May 05 15:21	28° $\overline{\text{B}}$ 57'27		retrograde	1863 Jun 14 09:14	10° $\overline{\text{K}}$ 58'32	
min. Earth dist.	1855 Jul 13 04:51	26° $\overline{\text{B}}$ 30'27	12.27518 AU	min. Earth dist.	1863 Aug 28 19:51	8° $\overline{\text{K}}$ 43'14	16.22772 AU
opposition	1855 Jul 19 10:41	26° $\overline{\text{B}}$ 08'25	7°34'13	opposition	1863 Sep 01 12:39	8° $\overline{\text{K}}$ 32'28	5°43'07
direct	1855 Oct 01 03:45	23° $\overline{\text{B}}$ 23'37		direct	1863 Nov 17 01:30	6° $\overline{\text{K}}$ 10'50	
conjunction	1856 Jan 20 09:42	29° $\overline{\text{B}}$ 35'22	6°31'39	conjunction	1864 Feb 29 20:33	10° $\overline{\text{K}}$ 33'42	4°56'28
minimum elong	1856 Jan 20 09:42	29° $\overline{\text{B}}$ 35'22	6°31'39	minimum elong	1864 Feb 29 20:40	10° $\overline{\text{K}}$ 33'44	4°56'28
	1856 Jan 25 04:15	0° \approx		max. Earth dist.	1864 Mar 04 16:07	10° $\overline{\text{K}}$ 48'32	18.37410 AU
max. Earth dist.	1856 Jan 27 01:51	0° \approx 09'46	14.59362 AU	retrograde	1864 Jun 17 15:28	15° $\overline{\text{K}}$ 03'03	
retrograde	1856 May 11 00:55	5° \approx 41'51		min. Earth dist.	1864 Sep 01 16:23	12° $\overline{\text{K}}$ 48'13	16.52459 AU
min. Earth dist.	1856 Jul 19 18:50	3° \approx 17'14	12.91468 AU	opposition	1864 Sep 05 00:04	12° $\overline{\text{K}}$ 38'41	5°21'29
opposition	1856 Jul 25 19:33	2° \approx 56'41	7°31'39	direct	1864 Nov 20 17:16	10° $\overline{\text{K}}$ 18'39	
direct	1856 Oct 08 02:13	0° \approx 15'52					
conjunction	1857 Jan 26 00:39	6° \approx 04'37	6°29'35	conjunction	1865 Mar 05 03:01	14° $\overline{\text{K}}$ 35'52	4°37'19
minimum elong	1857 Jan 26 00:42	6° \approx 04'37	6°29'35	minimum elong	1865 Mar 05 03:08	14° $\overline{\text{K}}$ 35'53	4°37'19
max. Earth dist.	1857 Feb 01 08:49	6° \approx 35'41	15.21339 AU	max. Earth dist.	1865 Mar 08 12:10	14° $\overline{\text{K}}$ 48'46	18.64915 AU
retrograde	1857 May 17 01:04	11° \approx 50'46		retrograde	1865 Jun 21 20:26	19° $\overline{\text{K}}$ 00'11	
min. Earth dist.	1857 Jul 26 18:14	9° \approx 28'18	13.51617 AU	min. Earth dist.	1865 Sep 06 09:46	16° $\overline{\text{K}}$ 45'33	16.77667 AU
opposition	1857 Aug 01 13:02	9° \approx 09'10	7°23'58	opposition	1865 Sep 09 08:08	16° $\overline{\text{K}}$ 37'14	4°59'02
direct	1857 Oct 15 10:23	6° \approx 32'01		direct	1865 Nov 25 02:11	14° $\overline{\text{K}}$ 18'33	
conjunction	1858 Feb 01 03:00	12° \approx 01'25	6°23'17	conjunction	1866 Mar 09 07:10	18° $\overline{\text{K}}$ 31'10	4°17'20
minimum elong	1858 Feb 01 03:04	12° \approx 01'26	6°23'17	minimum elong	1866 Mar 09 07:17	18° $\overline{\text{K}}$ 31'11	4°17'19
max. Earth dist.	1858 Feb 07 04:39	12° \approx 29'48	15.79389 AU	max. Earth dist.	1866 Mar 12 07:13	18° $\overline{\text{K}}$ 42'27	18.87927 AU
retrograde	1858 May 22 12:50	17° \approx 30'23		retrograde	1866 Jun 25 22:37	22° $\overline{\text{K}}$ 51'27	
min. Earth dist.	1858 Aug 02 07:35	15° \approx 09'33	14.07679 AU	min. Earth dist.	1866 Sep 11 00:13	20° $\overline{\text{K}}$ 36'51	16.98334 AU
opposition	1858 Aug 07 18:01	14° \approx 52'05	7°12'30	opposition	1866 Sep 13 13:23	20° $\overline{\text{K}}$ 29'41	4°35'53
direct	1858 Oct 22 01:04	12° \approx 18'15		direct	1866 Nov 29 10:25	18° $\overline{\text{K}}$ 12'06	
conjunction	1859 Feb 06 18:57	17° \approx 31'20	6°13'44	conjunction	1867 Mar 13 09:07	22° $\overline{\text{K}}$ 21'05	3°56'37
minimum elong	1859 Feb 06 19:03	17° \approx 31'22	6°13'44	minimum elong	1867 Mar 13 09:14	22° $\overline{\text{K}}$ 21'06	3°56'37
max. Earth dist.	1859 Feb 12 11:13	17° \approx 56'51	16.33275 AU	max. Earth dist.	1867 Mar 15 22:10	22° $\overline{\text{K}}$ 30'31	19.06391 AU

retrograde	1867 Jun 30 00:49	26° H 38'15		conjunction	1875 Apr 12 09:19	22° V 03'36	0°46'57
min. Earth dist.	1867 Sep 15 13:13	24° H 23'22	17.14451 AU	minimum elong	1875 Apr 12 09:20	22° V 03'36	0°46'56
opposition	1867 Sep 17 16:37	24° H 17'23	4°12'05	retrograde	1875 Jul 30 22:39	26° V 24'36	
direct	1867 Dec 03 13:16	22° H 00'38		opposition	1875 Oct 17 19:55	24° V 02'19	0°37'15
				min. Earth dist.	1875 Oct 18 20:34	23° V 59'22	16.80668 AU
conjunction	1868 Mar 16 09:52	26° H 06'53	3°35'13	direct	1876 Jan 02 04:01	21° V 43'06	
minimum elong	1868 Mar 16 09:58	26° H 06'54	3°35'13	max. Earth dist.	1876 Apr 14 05:38	25° V 51'15	18.69394 AU
max. Earth dist.	1868 Mar 18 13:35	26° H 14'48	19.20296 AU				
	1868 Jun 04 09:09	0° V		conjunction	1876 Apr 15 14:18	25° V 56'21	0°20'02
retrograde	1868 Jul 03 01:07	0° V 21'45		minimum elong	1876 Apr 15 14:19	25° V 56'21	0°20'03
	1868 Jul 31 20:36	30° H			1876 Jul 06 06:30	0° H	
min. Earth dist.	1868 Sep 18 23:54	28° H 06'28	17.25974 AU	retrograde	1876 Aug 03 09:20	0° H 21'39	
opposition	1868 Sep 20 18:09	28° H 01'34	3°47'40		1876 Aug 31 12:18	30° V	
direct	1868 Dec 06 16:22	25° H 45'22		opposition	1876 Oct 21 00:30	27° V 58'12	0°06'41
				min. Earth dist.	1876 Oct 22 09:51	27° V 54'10	16.56540 AU
conjunction	1869 Mar 20 09:22	29° H 49'41	3°13'10	direct	1877 Jan 05 05:07	25° V 37'38	
minimum elong	1869 Mar 20 09:28	29° H 49'42	3°13'11	desc. node	1877 Jan 08 04:56	25° V 37'54	
max. Earth dist.	1869 Mar 22 01:40	29° H 55'48	19.29615 AU	max. Earth dist.	1877 Apr 18 01:08	29° V 48'35	18.43145 AU
	1869 Mar 23 05:16	0° V					
retrograde	1869 Jul 07 01:57	4° V 03'05		conjunction	1877 Apr 19 22:02	29° V 55'43	0°-7'-45
min. Earth dist.	1869 Sep 23 10:25	1° V 47'00	17.32921 AU	minimum elong	1877 Apr 19 22:02	29° V 55'43	0°07'47
opposition	1869 Sep 24 18:37	1° V 43'16	3°22'37	behind sun begin	1877 Apr 19 15:59	29° V 54'47	
	1869 Nov 06 00:11	30° H		behind sun end	1877 Apr 20 04:05	29° V 56'40	
direct	1869 Dec 10 15:36	29° H 27'22			1877 Apr 21 00:59	0° H	
	1870 Jan 13 21:22	0° V		retrograde	1877 Aug 08 01:19	4° H 26'24	
				opposition	1877 Oct 25 08:00	2° H 01'32	0°-24'-54
conjunction	1870 Mar 24 08:31	3° V 30'33	2°50'29	min. Earth dist.	1877 Oct 27 03:58	1° H 56'08	16.27980 AU
minimum elong	1870 Mar 24 08:36	3° V 30'34	2°50'29		1877 Dec 13 19:24	30° V	
max. Earth dist.	1870 Mar 25 15:27	3° V 35'14	19.34367 AU	direct	1878 Jan 09 06:14	29° V 39'19	
retrograde	1870 Jul 11 02:17	7° V 43'13			1878 Feb 04 12:54	0° H	
opposition	1870 Sep 28 17:59	5° V 23'34	2°56'56	max. Earth dist.	1878 Apr 22 02:03	3° H 54'25	18.12419 AU
min. Earth dist.	1870 Sep 27 18:52	5° V 26'14	17.35306 AU				
direct	1870 Dec 14 15:23	3° V 07'41		conjunction	1878 Apr 24 09:38	4° H 03'24	0°-36'-18
				minimum elong	1878 Apr 24 09:36	4° H 03'24	0°36'18
conjunction	1871 Mar 28 07:12	7° V 10'31	2°27'09	retrograde	1878 Aug 12 20:38	8° H 40'35	
minimum elong	1871 Mar 28 07:17	7° V 10'31	2°27'09	opposition	1878 Oct 29 18:44	6° H 14'05	0°-57'-36
max. Earth dist.	1871 Mar 29 02:40	7° V 13'27	19.34597 AU	min. Earth dist.	1878 Oct 31 23:40	6° H 07'28	15.94931 AU
retrograde	1871 Jul 15 03:11	11° V 23'14		direct	1879 Jan 13 11:48	3° H 49'56	
opposition	1871 Oct 02 17:17	9° V 03'29	2°30'33	max. Earth dist.	1879 Apr 26 04:57	8° H 09'56	17.77189 AU
min. Earth dist.	1871 Oct 02 04:11	9° V 05'00	17.33209 AU				
direct	1871 Dec 18 12:36	6° V 47'24		conjunction	1879 Apr 29 01:25	8° H 21'16	-1°-5'-44
				minimum elong	1879 Apr 29 01:23	8° H 21'16	1°05'45
conjunction	1872 Mar 31 06:10	10° V 50'38	2°03'10	retrograde	1879 Aug 17 22:19	13° H 06'18	
minimum elong	1872 Mar 31 06:14	10° V 50'39	2°03'10	opposition	1879 Nov 03 09:57	10° H 37'51	-1°-31'-28
max. Earth dist.	1872 Mar 31 16:26	10° V 52'12	19.30365 AU	min. Earth dist.	1879 Nov 06 01:58	10° H 29'43	15.57357 AU
retrograde	1872 Jul 18 05:14	15° V 04'11		direct	1880 Jan 17 18:45	8° H 11'26	
opposition	1872 Oct 05 16:35	12° V 44'07	2°03'27	max. Earth dist.	1880 Apr 29 14:47	12° H 37'55	17.37386 AU
min. Earth dist.	1872 Oct 05 12:16	12° V 44'38	17.26664 AU				
direct	1872 Dec 21 11:03	10° V 27'37		conjunction	1880 May 02 22:43	12° H 51'30	-1°-36'-4
				minimum elong	1880 May 02 22:39	12° H 51'29	1°36'05
conjunction	1873 Apr 04 05:50	14° V 32'03	1°38'29	retrograde	1880 Aug 22 07:10	17° H 45'51	
minimum elong	1873 Apr 04 05:54	14° V 32'04	1°38'29	opposition	1880 Nov 07 06:15	15° H 15'10	-2°-6'-35
max. Earth dist.	1873 Apr 04 04:30	14° V 31'51	19.21713 AU	min. Earth dist.	1880 Nov 10 07:33	15° H 05'38	15.15204 AU
retrograde	1873 Jul 22 08:42	18° V 47'15		direct	1881 Jan 21 08:05	12° H 46'08	
opposition	1873 Oct 09 16:26	16° V 26'39	1°35'35	max. Earth dist.	1881 May 04 04:32	17° H 20'07	16.92983 AU
min. Earth dist.	1873 Oct 09 22:13	16° V 25'58	17.15725 AU				
direct	1873 Dec 25 07:30	14° V 09'27		conjunction	1881 May 08 02:25	17° H 36'33	-2°-7'-16
				minimum elong	1881 May 08 02:20	17° H 36'32	2°07'16
conjunction	1874 Apr 08 06:53	18° V 15'57	1°13'05	retrograde	1881 Aug 27 23:05	22° H 41'58	
minimum elong	1874 Apr 08 06:55	18° V 15'58	1°13'06	opposition	1881 Nov 12 08:47	20° H 08'42	-2°-42'-58
max. Earth dist.	1874 Apr 07 19:59	18° V 14'17	19.08665 AU	min. Earth dist.	1881 Nov 15 21:25	19° H 57'25	14.68452 AU
retrograde	1874 Jul 26 14:00	22° V 33'35		direct	1882 Jan 26 00:08	17° H 36'37	
opposition	1874 Oct 13 17:19	20° V 12'16	1°06'52	max. Earth dist.	1882 May 09 03:52	22° H 20'11	16.43975 AU
min. Earth dist.	1874 Oct 14 07:46	20° V 10'33	17.00388 AU				
direct	1874 Dec 29 06:23	17° V 54'12		conjunction	1882 May 13 13:55	22° H 39'24	-2°-39'-18
max. Earth dist.	1875 Apr 11 10:36	22° V 00'05	18.91229 AU	minimum elong	1882 May 13 13:48	22° H 39'23	2°39'19
				retrograde	1882 Sep 03 02:56	27° H 57'54	

opposition	1882 Nov 17 18:46	25°♄21'42	-3°-20'-38	conjunction	1890 Jul 17 19:12	25°♅04'57	-6°-21'-7
min. Earth dist.	1882 Nov 21 16:56	25°♄08'47	14.17156 AU	minimum elong	1890 Jul 17 19:10	25°♅04'56	6°21'09
direct	1883 Jan 31 01:03	22°♄46'11			1890 Aug 30 23:05	0°♄	
max. Earth dist.	1883 May 14 09:42	27°♄40'55	15.90461 AU	retrograde	1890 Nov 16 05:10	4°♄26'44	
				opposition	1891 Jan 21 14:40	1°♄19'39	-7°-45'-29
conjunction	1883 May 19 10:14	28°♄03'37	-3°-12'-3	min. Earth dist.	1891 Jan 27 08:17	0°♄53'57	8.93896 AU
minimum elong	1883 May 19 10:05	28°♄03'36	3°12'04		1891 Feb 08 20:12	30°♅	
	1883 Jun 14 14:14	0°♄		direct	1891 Mar 30 12:31	28°♅05'41	
retrograde	1883 Sep 09 14:52	3°♄37'40			1891 May 17 18:00	0°♄	
opposition	1883 Nov 23 13:57	0°♄58'11	-3°-59'-31	max. Earth dist.	1891 Jul 24 10:32	7°♄11'01	10.61962 AU
min. Earth dist.	1883 Nov 27 22:39	0°♄43'22	13.61445 AU				
	1883 Dec 11 01:57	30°♄		conjunction	1891 Jul 31 15:28	8°♄04'57	-6°-15'00
direct	1884 Feb 05 06:55	28°♄18'46		minimum elong	1891 Jul 31 15:37	8°♄05'00	6°15'01
	1884 Mar 31 06:49	0°♄		retrograde	1891 Dec 01 13:55	18°♄19'58	
max. Earth dist.	1884 May 19 05:17	3°♄27'37	15.32618 AU	opposition	1892 Feb 04 11:42	15°♄10'24	-7°-30'-51
				min. Earth dist.	1892 Feb 09 15:23	14°♄46'31	8.33594 AU
conjunction	1884 May 24 17:52	3°♄53'44	-3°-45'-17	direct	1892 Apr 11 06:51	11°♄53'16	
minimum elong	1884 May 24 17:43	3°♄53'42	3°45'19	max. Earth dist.	1892 Aug 09 01:46	22°♄02'00	10.06542 AU
retrograde	1884 Sep 15 18:01	9°♄46'14					
opposition	1884 Nov 28 19:49	7°♄03'07	-4°-39'-21	conjunction	1892 Aug 15 07:19	22°♄52'03	-5°-45'-30
min. Earth dist.	1884 Dec 03 14:24	6°♄46'21	13.01581 AU	minimum elong	1892 Aug 15 07:41	22°♄52'10	5°45'32
direct	1885 Feb 10 00:46	4°♄19'22			1892 Oct 11 02:16	0°♄	
max. Earth dist.	1885 May 25 12:08	9°♄44'56	14.70735 AU	retrograde	1892 Dec 17 12:17	3°♄58'22	
				opposition	1893 Feb 19 04:17	0°♄47'24	-6°-42'-6
conjunction	1885 May 31 15:00	10°♄15'19	-4°-18'-38	min. Earth dist.	1893 Feb 23 07:59	0°♄27'39	7.84629 AU
minimum elong	1885 May 31 14:48	10°♄15'17	4°18'39		1893 Mar 01 05:36	30°♄	
retrograde	1885 Sep 23 11:49	16°♄29'45		direct	1893 Apr 25 23:51	27°♄28'44	
opposition	1885 Dec 05 15:15	13°♄42'44	-5°-19'-42		1893 Jun 18 06:05	0°♄	
min. Earth dist.	1885 Dec 10 18:23	13°♄24'02	12.37906 AU	max. Earth dist.	1893 Aug 28 01:00	8°♄41'38	9.65257 AU
direct	1886 Feb 16 03:46	10°♄54'16					
max. Earth dist.	1886 Jun 01 13:42	16°♄40'40	14.05260 AU	conjunction	1893 Sep 01 14:51	9°♄20'31	-4°-46'-59
				minimum elong	1893 Sep 01 15:22	9°♄20'42	4°47'00
conjunction	1886 Jun 08 04:18	17°♄15'23	-4°-51'-21	retrograde	1894 Jan 04 13:50	21°♄06'48	
minimum elong	1886 Jun 08 04:05	17°♄15'20	4°51'22	opposition	1894 Mar 08 11:53	17°♄55'17	-5°-12'-55
retrograde	1886 Oct 02 02:01	23°♄56'01		min. Earth dist.	1894 Mar 11 04:40	17°♄42'18	7.52207 AU
opposition	1886 Dec 13 03:03	21°♄04'50	-5°-59'-40	direct	1894 May 12 16:10	14°♄36'45	
min. Earth dist.	1886 Dec 18 15:16	20°♄43'57	11.70981 AU	max. Earth dist.	1894 Sep 17 17:04	26°♄42'03	9.43185 AU
direct	1887 Feb 22 23:30	18°♄11'14					
max. Earth dist.	1887 Jun 09 12:06	24°♄23'09	13.36838 AU	conjunction	1894 Sep 20 00:54	27°♄02'28	-3°-19'-5
				minimum elong	1894 Sep 20 01:24	27°♄02'39	3°19'07
conjunction	1887 Jun 16 13:51	25°♄02'38	-5°-22'-21		1894 Oct 10 10:00	0°♄	
minimum elong	1887 Jun 16 13:37	25°♄02'35	5°22'21	retrograde	1895 Jan 22 23:11	9°♄06'42	
	1887 Aug 13 09:47	0°♄		opposition	1895 Mar 26 20:08	5°♄55'04	-3°-7'-25
retrograde	1887 Oct 11 16:40	2°♄14'30		min. Earth dist.	1895 Mar 27 17:15	5°♄50'51	7.40752 AU
	1887 Dec 11 00:04	30°♄		direct	1895 May 30 22:04	2°♄37'52	
opposition	1887 Dec 21 11:00	29°♄19'01	-6°-37'-43				
min. Earth dist.	1887 Dec 27 05:00	28°♄56'16	11.01616 AU	conjunction	1895 Oct 08 16:20	15°♄07'55	-1°-30'-17
direct	1888 Mar 01 11:44	26°♄20'03		minimum elong	1895 Oct 08 16:35	15°♄08'00	1°30'19
	1888 May 16 01:24	0°♄		max. Earth dist.	1895 Oct 08 20:39	15°♄09'29	9.43590 AU
max. Earth dist.	1888 Jun 17 11:53	3°♄03'03	12.66467 AU	retrograde	1896 Feb 09 17:27	27°♄02'21	
				min. Earth dist.	1896 Apr 12 05:36	23°♄55'53	7.52131 AU
conjunction	1888 Jun 24 23:50	3°♄47'50	-5°-49'-46	opposition	1896 Apr 13 07:08	23°♄50'51	0°-42'-58
minimum elong	1888 Jun 24 23:38	3°♄47'47	5°49'47	direct	1896 Jun 17 20:49	20°♄35'40	
retrograde	1888 Oct 21 09:57	11°♄36'45		asc. node	1896 Aug 04 21:13	22°♄39'23	
opposition	1888 Dec 29 19:58	8°♄37'01	-7°-11'-14		1896 Oct 06 19:15	0°♄	
min. Earth dist.	1889 Jan 04 17:54	8°♄12'35	10.30990 AU				
direct	1889 Mar 09 20:39	5°♄32'37		conjunction	1896 Oct 25 13:31	2°♄39'15	0°24'05
max. Earth dist.	1889 Jun 27 23:14	12°♄54'25	11.95594 AU	minimum elong	1896 Oct 25 13:27	2°♄39'13	0°24'05
				max. Earth dist.	1896 Oct 28 01:54	3°♄00'44	9.66416 AU
conjunction	1889 Jul 05 15:41	13°♄43'48	-6°-10'-46	retrograde	1897 Feb 25 02:20	13°♄59'44	
minimum elong	1889 Jul 05 15:32	13°♄43'46	6°10'47	min. Earth dist.	1897 Apr 28 02:29	11°♄01'56	7.84738 AU
retrograde	1889 Nov 02 11:54	22°♄16'09		opposition	1897 Apr 30 22:58	10°♄48'49	1°37'11
opposition	1890 Jan 09 11:09	19°♄12'27	-7°-35'-59	direct	1897 Jul 06 11:25	7°♄36'11	
min. Earth dist.	1890 Jan 15 10:20	18°♄46'44	9.60889 AU				
direct	1890 Mar 19 12:19	16°♄02'53		conjunction	1897 Nov 10 23:09	18°♄51'27	2°08'55
max. Earth dist.	1890 Jul 10 04:09	24°♄12'02	11.26385 AU	minimum elong	1897 Nov 10 22:51	18°♄51'21	2°08'55
				max. Earth dist.	1897 Nov 15 08:26	19°♄27'02	10.08363 AU

retrograde	1898 Mar 11 15:24	29°♄23'43		conjunction	1906 Jan 27 21:01	7°♁02'53	6°24'03
min. Earth dist.	1898 May 12 20:48	26°♄33'19	8.34282 AU	minimum elong	1906 Jan 27 21:04	7°♁02'53	6°24'03
opposition	1898 May 17 03:56	26°♄14'15	3°35'43	max. Earth dist.	1906 Feb 03 08:07	7°♁34'05	15.41128 AU
direct	1898 Jul 23 21:29	23°♄04'48		retrograde	1906 May 18 15:52	12°♁43'13	
	1898 Oct 29 13:21	0°♁		min. Earth dist.	1906 Jul 28 10:06	10°♁22'35	13.71960 AU
				opposition	1906 Aug 03 07:56	10°♁03'18	7°16'24
conjunction	1898 Nov 25 14:06	3°♁22'29	3°35'15	direct	1906 Oct 17 08:16	7°♁27'47	
minimum elong	1898 Nov 25 13:44	3°♁22'22	3°35'15				
max. Earth dist.	1898 Dec 01 06:51	4°♁05'44	10.64424 AU	conjunction	1907 Feb 02 20:19	12°♁51'36	6°17'10
retrograde	1899 Mar 24 08:43	13°♁02'13		minimum elong	1907 Feb 02 20:24	12°♁51'37	6°17'09
min. Earth dist.	1899 May 26 07:05	10°♁18'04	8.95541 AU	max. Earth dist.	1907 Feb 09 00:55	13°♁20'08	16.00483 AU
opposition	1899 May 31 15:34	9°♁55'15	5°05'58	retrograde	1907 May 24 01:12	18°♁14'55	
direct	1899 Aug 08 15:56	6°♁49'41		min. Earth dist.	1907 Aug 03 19:52	15°♁56'03	14.29402 AU
				opposition	1907 Aug 09 09:36	15°♁38'22	7°04'29
conjunction	1899 Dec 08 10:40	16°♁10'07	4°40'40	direct	1907 Oct 23 19:40	13°♁06'16	
minimum elong	1899 Dec 08 10:20	16°♁10'01	4°40'39				
max. Earth dist.	1899 Dec 14 22:33	16°♁55'58	11.29541 AU	conjunction	1908 Feb 08 09:21	18°♁13'58	6°07'16
retrograde	1900 Apr 04 12:20	24°♁59'36		minimum elong	1908 Feb 08 09:27	18°♁13'59	6°07'16
min. Earth dist.	1900 Jun 07 09:56	22°♁20'37	9.63716 AU	max. Earth dist.	1908 Feb 14 05:17	18°♁39'46	16.55837 AU
opposition	1900 Jun 13 10:47	21°♁55'59	6°09'08	retrograde	1908 May 28 04:25	23°♁22'55	
direct	1900 Aug 22 16:22	18°♁54'49		min. Earth dist.	1908 Aug 08 17:58	21°♁05'48	14.82748 AU
				opposition	1908 Aug 14 01:08	20°♁49'25	6°49'56
conjunction	1900 Dec 19 17:07	27°♁23'08	5°26'51	direct	1908 Oct 28 18:58	18°♁20'25	
minimum elong	1900 Dec 19 16:51	27°♁23'04	5°26'51				
max. Earth dist.	1900 Dec 26 15:11	28°♁08'33	11.99469 AU	conjunction	1909 Feb 12 14:00	23°♁14'31	5°55'01
	1901 Jan 13 01:16	0°♁		minimum elong	1909 Feb 12 14:06	23°♁14'32	5°55'01
retrograde	1901 Apr 14 06:59	5°♁27'36		max. Earth dist.	1909 Feb 18 02:00	23°♁37'58	17.07060 AU
min. Earth dist.	1901 Jun 18 08:31	2°♁52'50	10.35035 AU	retrograde	1909 Jun 02 00:01	28°♁11'13	
opposition	1901 Jun 24 17:28	2°♁27'52	6°50'03	min. Earth dist.	1909 Aug 14 09:37	25°♁55'28	15.31864 AU
	1901 Aug 08 17:01	30°♁		opposition	1909 Aug 19 08:01	25°♁40'33	6°33'26
direct	1901 Sep 04 01:26	29°♁31'19		direct	1909 Nov 03 09:55	23°♁14'21	
	1901 Sep 30 00:12	0°♁					
conjunction	1901 Dec 29 15:11	7°♁14'27	5°57'19	conjunction	1910 Feb 17 11:38	27°♁56'55	5°40'57
minimum elong	1901 Dec 29 15:01	7°♁14'24	5°57'20	minimum elong	1910 Feb 17 11:46	27°♁56'56	5°40'57
max. Earth dist.	1902 Jan 05 18:19	7°♁58'02	12.71072 AU	max. Earth dist.	1910 Feb 22 14:31	28°♁18'02	17.54029 AU
retrograde	1902 Apr 22 21:27	14°♁39'53			1910 Mar 20 08:33	0°♁	
min. Earth dist.	1902 Jun 28 05:14	12°♁08'40	11.06867 AU	retrograde	1910 Jun 06 15:18	2°♁43'14	
opposition	1902 Jul 04 16:42	11°♁44'19	7°14'05	min. Earth dist.	1910 Aug 19 17:16	0°♁28'42	15.76691 AU
direct	1902 Sep 14 23:18	8°♁52'24		opposition	1910 Aug 24 07:43	0°♁15'05	6°15'24
					1910 Aug 29 10:13	30°♁	
conjunction	1903 Jan 07 10:10	15°♁57'11	6°15'37	direct	1910 Nov 08 14:46	27°♁51'24	
minimum elong	1903 Jan 07 10:04	15°♁57'10	6°15'38		1911 Jan 15 09:27	0°♁	
max. Earth dist.	1903 Jan 14 12:52	16°♁37'51	13.42221 AU	conjunction	1911 Feb 22 03:36	2°♁24'13	5°25'25
retrograde	1903 Apr 30 13:59	22°♁49'26		minimum elong	1911 Feb 22 03:43	2°♁24'14	5°25'26
min. Earth dist.	1903 Jul 07 01:47	20°♁21'29	11.77438 AU	max. Earth dist.	1911 Feb 26 21:44	2°♁43'16	17.96698 AU
opposition	1903 Jul 13 13:40	19°♁58'01	7°25'47	retrograde	1911 Jun 11 01:10	7°♁01'42	
direct	1903 Sep 24 16:30	17°♁10'34		min. Earth dist.	1911 Aug 24 19:50	4°♁48'09	16.17156 AU
				opposition	1911 Aug 29 01:29	4°♁35'50	5°56'12
conjunction	1904 Jan 15 06:58	23°♁43'10	6°24'46	direct	1911 Nov 13 15:07	2°♁14'23	
minimum elong	1904 Jan 15 06:56	23°♁43'10	6°24'45				
max. Earth dist.	1904 Jan 22 05:40	24°♁20'31	14.11515 AU	conjunction	1912 Feb 26 14:27	6°♁38'56	5°08'43
	1904 Apr 22 12:40	0°♁		minimum elong	1912 Feb 26 14:34	6°♁38'58	5°08'43
retrograde	1904 May 06 13:03	0°♁07'18		max. Earth dist.	1912 Mar 01 23:09	6°♁55'58	18.35000 AU
	1904 May 20 14:56	30°♁		retrograde	1912 Jun 14 08:13	11°♁09'00	
min. Earth dist.	1904 Jul 14 04:20	27°♁42'04	12.45588 AU	min. Earth dist.	1912 Aug 28 17:37	8°♁56'11	16.53246 AU
opposition	1904 Jul 20 12:45	27°♁19'56	7°28'33	opposition	1912 Sep 01 14:29	8°♁45'07	5°36'03
direct	1904 Oct 02 09:20	24°♁36'46		direct	1912 Nov 17 07:05	6°♁25'37	
	1905 Jan 13 01:49	0°♁					
conjunction	1905 Jan 21 09:31	0°♁42'19	6°27'00	conjunction	1913 Mar 01 21:40	10°♁43'14	4°51'03
minimum elong	1905 Jan 21 09:32	0°♁42'20	6°27'01	minimum elong	1913 Mar 01 21:47	10°♁43'15	4°51'04
max. Earth dist.	1905 Jan 28 04:14	1°♁16'46	14.78014 AU	max. Earth dist.	1913 Mar 05 21:18	10°♁58'26	18.68921 AU
retrograde	1905 May 12 19:27	6°♁42'43		retrograde	1913 Jun 18 11:50	15°♁07'01	
min. Earth dist.	1905 Jul 21 14:52	4°♁19'50	13.10593 AU	min. Earth dist.	1913 Sep 02 11:03	12°♁54'45	16.84904 AU
opposition	1905 Jul 27 17:54	3°♁59'11	7°24'51	opposition	1913 Sep 05 23:02	12°♁44'53	5°15'08
direct	1905 Oct 10 04:53	1°♁20'01		direct	1913 Nov 21 20:11	10°♁27'02	

conjunction	1914 Mar 06 01:29	14° ✕ 38'51	4°32'35	conjunction	1922 Apr 03 22:52	13° ∇ 23'45	1°43'14
minimum elong	1914 Mar 06 01:35	14° ✕ 38'52	4°32'34	minimum elong	1922 Apr 03 22:55	13° ∇ 23'45	1°43'14
max. Earth dist.	1914 Mar 09 15:03	14° ✕ 52'12	18.98399 AU	max. Earth dist.	1922 Apr 04 05:14	13° ∇ 24'41	19.75332 AU
retrograde	1914 Jun 22 12:55	18° ✕ 57'27		retrograde	1922 Jul 21 14:18	17° ∇ 29'52	
min. Earth dist.	1914 Sep 07 01:53	16° ✕ 45'25	17.12113 AU	opposition	1922 Oct 09 07:07	15° ∇ 12'16	1°41'29
opposition	1914 Sep 10 04:23	16° ✕ 36'46	4°53'34	min. Earth dist.	1922 Oct 09 05:37	15° ∇ 12'26	17.71057 AU
direct	1914 Nov 26 03:05	14° ✕ 20'19		direct	1922 Dec 25 06:02	12° ∇ 58'07	
conjunction	1915 Mar 10 02:45	18° ✕ 27'21	4°13'25	conjunction	1923 Apr 07 18:45	16° ∇ 55'31	1°19'31
minimum elong	1915 Mar 10 02:51	18° ✕ 27'22	4°13'25	minimum elong	1923 Apr 07 18:47	16° ∇ 55'32	1°19'30
max. Earth dist.	1915 Mar 13 07:02	18° ✕ 39'03	19.23418 AU	max. Earth dist.	1923 Apr 07 16:12	16° ∇ 55'09	19.65653 AU
retrograde	1915 Jun 26 12:46	22° ✕ 41'39		retrograde	1923 Jul 25 13:45	21° ∇ 03'25	
min. Earth dist.	1915 Sep 11 13:04	20° ✕ 29'45	17.34821 AU	opposition	1923 Oct 13 03:08	18° ∇ 45'18	1°14'47
opposition	1915 Sep 14 06:44	20° ✕ 22'11	4°31'25	min. Earth dist.	1923 Oct 13 09:58	18° ∇ 44'31	17.59172 AU
direct	1915 Nov 30 08:31	18° ✕ 06'51		direct	1923 Dec 29 00:15	16° ∇ 30'31	
conjunction	1916 Mar 13 01:46	22° ✕ 10'00	3°53'37	conjunction	1924 Apr 10 15:53	20° ∇ 30'04	0°55'11
minimum elong	1916 Mar 13 01:52	22° ✕ 10'01	3°53'37	minimum elong	1924 Apr 10 15:55	20° ∇ 30'04	0°55'11
max. Earth dist.	1916 Mar 15 19:32	22° ✕ 19'57	19.43949 AU	max. Earth dist.	1924 Apr 10 02:00	20° ∇ 28'00	19.51738 AU
retrograde	1916 Jun 29 10:01	26° ✕ 20'54		retrograde	1924 Jul 28 16:02	24° ∇ 40'31	
min. Earth dist.	1916 Sep 14 23:02	24° ✕ 08'45	17.53060 AU	opposition	1924 Oct 16 00:22	22° ∇ 21'41	0°47'23
opposition	1916 Sep 17 06:57	24° ✕ 02'21	4°08'45	min. Earth dist.	1924 Oct 16 17:07	22° ∇ 19'45	17.43044 AU
direct	1916 Dec 03 08:59	21° ✕ 47'52		direct	1924 Dec 31 17:14	20° ∇ 06'03	
conjunction	1917 Mar 16 23:12	25° ✕ 47'57	3°33'16	conjunction	1925 Apr 14 15:02	24° ∇ 08'35	0°30'13
minimum elong	1917 Mar 16 23:18	25° ✕ 47'57	3°33'16	minimum elong	1925 Apr 14 15:03	24° ∇ 08'35	0°30'12
max. Earth dist.	1917 Mar 19 07:52	25° ✕ 56'26	19.60028 AU	max. Earth dist.	1925 Apr 13 15:33	24° ∇ 05'03	19.33541 AU
retrograde	1917 Jul 03 07:03	29° ✕ 56'12		retrograde	1925 Aug 01 20:49	28° ∇ 22'24	
min. Earth dist.	1917 Sep 19 05:55	27° ✕ 43'43	17.66838 AU	opposition	1925 Oct 09 23:10	26° ∇ 02'41	0°19'12
opposition	1917 Sep 21 05:07	27° ✕ 38'21	3°45'35	min. Earth dist.	1925 Oct 21 00:36	25° ∇ 59'42	17.22601 AU
direct	1917 Dec 07 09:16	25° ✕ 24'27		direct	1926 Jan 04 12:54	23° ∇ 45'58	
conjunction	1918 Mar 20 19:13	29° ✕ 22'15	3°12'21	conjunction	1926 Apr 18 16:18	27° ∇ 52'20	0°04'38
minimum elong	1918 Mar 20 19:18	29° ✕ 22'15	3°12'22	minimum elong	1926 Apr 18 16:18	27° ∇ 52'20	0°04'38
max. Earth dist.	1918 Mar 22 17:06	29° ✕ 29'03	19.71678 AU	behind sun begin	1926 Apr 18 09:45	27° ∇ 51'21	
	1918 Mar 31 10:45	0° ∇		behind sun end	1926 Apr 18 22:51	27° ∇ 53'18	
retrograde	1918 Jul 07 03:04	3° ∇ 28'38			1926 May 25 01:54	0° ∇	
min. Earth dist.	1918 Sep 23 12:24	1° ∇ 15'27	17.76236 AU		1926 Jun 22 06:37	1° ∇ 17'49	
opposition	1918 Sep 25 01:51	1° ∇ 11'13	3°21'53	desc. node	1926 Jun 22 06:37	1° ∇ 17'49	
	1918 Oct 22 16:40	30° ✕		retrograde	1926 Aug 06 04:43	2° ∇ 10'26	
direct	1918 Dec 11 05:16	28° ✕ 57'40			1926 Oct 20 07:55	30° ∇	
	1919 Jan 28 17:46	0° ∇		opposition	1926 Oct 24 00:07	29° ∇ 49'34	0°-9'-49
conjunction	1919 Mar 24 14:28	2° ∇ 53'56	2°50'54	min. Earth dist.	1926 Oct 25 11:57	29° ∇ 45'20	16.97799 AU
minimum elong	1919 Mar 24 14:33	2° ∇ 53'56	2°50'54	direct	1927 Jan 08 08:29	27° ∇ 31'31	
max. Earth dist.	1919 Mar 26 03:32	2° ∇ 59'24	19.78988 AU		1927 Mar 25 11:16	0° ∇	
retrograde	1919 Jul 10 22:27	6° ∇ 59'09		max. Earth dist.	1927 Apr 20 22:52	1° ∇ 35'35	18.84067 AU
opposition	1919 Sep 28 21:34	4° ∇ 41'59	2°57'40	conjunction	1927 Apr 22 20:38	1° ∇ 42'40	0°-21'-47
min. Earth dist.	1919 Sep 27 16:30	4° ∇ 45'16	17.81308 AU	minimum elong	1927 Apr 22 20:38	1° ∇ 42'40	0°21'48
direct	1919 Dec 15 01:55	2° ∇ 28'35		retrograde	1927 Aug 10 16:25	6° ∇ 06'00	
conjunction	1920 Mar 27 08:59	6° ∇ 24'02	2°28'55	opposition	1927 Oct 28 03:49	3° ∇ 43'46	0°-39'-44
minimum elong	1920 Mar 27 09:03	6° ∇ 24'03	2°28'55	min. Earth dist.	1927 Oct 30 00:34	3° ∇ 38'23	16.68556 AU
max. Earth dist.	1920 Mar 28 11:13	6° ∇ 27'54	19.82006 AU	direct	1928 Jan 12 07:53	1° ∇ 24'06	
retrograde	1920 Jul 13 19:27	10° ∇ 28'51		max. Earth dist.	1928 Apr 23 18:02	5° ∇ 31'51	18.52661 AU
opposition	1920 Oct 01 16:52	8° ∇ 11'42	2°32'53	conjunction	1928 Apr 26 04:16	5° ∇ 41'03	0°-48'-51
min. Earth dist.	1920 Sep 30 21:23	8° ∇ 13'55	17.82125 AU	minimum elong	1928 Apr 26 04:14	5° ∇ 41'03	0°48'52
direct	1920 Dec 17 19:13	5° ∇ 58'15		retrograde	1928 Aug 14 08:38	10° ∇ 10'42	
conjunction	1921 Mar 31 03:49	9° ∇ 53'37	2°06'21	opposition	1928 Oct 31 10:58	7° ∇ 46'47	-1°-10'-37
minimum elong	1921 Mar 31 03:52	9° ∇ 53'38	2°06'21	min. Earth dist.	1928 Nov 02 18:32	7° ∇ 40'00	16.34820 AU
max. Earth dist.	1921 Mar 31 21:18	9° ∇ 56'12	19.80782 AU	direct	1929 Jan 15 08:13	5° ∇ 25'10	
retrograde	1921 Jul 17 15:30	13° ∇ 58'43		max. Earth dist.	1929 Apr 27 18:52	9° ∇ 37'53	18.16721 AU
opposition	1921 Oct 05 11:44	11° ∇ 41'26	2°07'30	conjunction	1929 Apr 30 16:24	9° ∇ 49'07	-1°-16'-40
min. Earth dist.	1921 Oct 05 00:35	11° ∇ 42'42	17.78699 AU	minimum elong	1929 Apr 30 16:21	9° ∇ 49'06	1°16'40
direct	1921 Dec 21 13:53	9° ∇ 27'44		retrograde	1929 Aug 19 05:32	14° ∇ 26'14	
				opposition	1929 Nov 04 21:52	12° ∇ 00'22	-1°-42'-33

min. Earth dist.	1929 Nov 07 14:31	11°♄52'19	15.96551 AU			1937 Nov 23 02:10	30°♄		
direct	1930 Jan 19 13:37	9°♄36'28		opposition		1937 Dec 20 15:20	28°♄20'39	-6°-29'-31	
max. Earth dist.	1930 May 01 22:46	13°♄55'01	17.76259 AU	min. Earth dist.		1937 Dec 26 09:53	27°♄58'23	11.39897 AU	
				direct		1938 Mar 02 02:22	25°♄25'00		
conjunction	1930 May 05 09:15	14°♄08'42	-1°-45'-17			1938 May 28 12:36	0°♄		
minimum elong	1930 May 05 09:11	14°♄08'41	1°45'18	max. Earth dist.		1938 Jun 17 08:27	1°♄50'58	13.04676 AU	
retrograde	1930 Aug 24 08:34	18°♄54'42							
opposition	1930 Nov 09 13:48	16°♄26'33	-2°-15'-35	conjunction		1938 Jun 24 18:30	2°♄33'42	-5°-43'-59	
min. Earth dist.	1930 Nov 12 17:28	16°♄16'55	15.53782 AU	minimum elong		1938 Jun 24 18:19	2°♄33'40	5°44'00	
direct	1931 Jan 23 21:08	13°♄59'59		retrograde		1938 Oct 20 11:07	10°♄02'48		
max. Earth dist.	1931 May 06 09:59	18°♄26'01	17.31303 AU	opposition		1938 Dec 29 11:27	7°♄06'06	-7°-1'-35	
				min. Earth dist.		1939 Jan 04 10:24	6°♄42'08	10.68852 AU	
conjunction	1931 May 10 08:00	18°♄42'04	-2°-14'-39	direct		1939 Mar 10 00:27	4°♄05'10		
minimum elong	1931 May 10 07:55	18°♄42'03	2°14'40	max. Earth dist.		1939 Jun 27 01:32	11°♄06'15	12.33115 AU	
retrograde	1931 Aug 29 19:26	23°♄38'32							
opposition	1931 Nov 14 11:24	21°♄07'47	-2°-49'-46	conjunction		1939 Jul 04 19:18	11°♄54'08	-6°-4'-45	
min. Earth dist.	1931 Nov 17 23:57	20°♄56'45	15.06578 AU	minimum elong		1939 Jul 04 19:09	11°♄54'06	6°04'47	
direct	1932 Jan 28 11:05	18°♄38'13		retrograde		1939 Oct 31 23:10	20°♄03'47		
max. Earth dist.	1932 May 10 02:27	23°♄12'59	16.81950 AU	opposition		1940 Jan 08 11:42	17°♄03'08	-7°-26'-27	
				min. Earth dist.		1940 Jan 14 12:06	16°♄37'50	9.97637 AU	
conjunction	1932 May 14 13:51	23°♄31'57	-2°-44'-46	direct		1940 Mar 17 23:03	13°♄57'01		
minimum elong	1932 May 14 13:44	23°♄31'56	2°44'48	max. Earth dist.		1940 Jul 07 10:21	21°♄41'31	11.62353 AU	
retrograde	1932 Sep 03 14:29	28°♄40'47							
opposition	1932 Nov 18 15:56	26°♄07'07	-3°-25'-4	conjunction		1940 Jul 15 05:22	22°♄33'31	-6°-16'-34	
min. Earth dist.	1932 Nov 22 15:20	25°♄54'18	14.55038 AU	minimum elong		1940 Jul 15 05:18	22°♄33'30	6°16'35	
direct	1933 Feb 01 04:41	23°♄34'08		retrograde		1940 Sep 30 03:39	0°♄		
max. Earth dist.	1933 May 15 05:15	28°♄19'51	16.28294 AU	retrograde		1940 Nov 12 20:31	1°♄29'55		
						1940 Dec 27 05:05	30°♄		
conjunction	1933 May 20 04:23	28°♄41'41	-3°-15'-31	opposition		1941 Jan 18 21:31	28°♄25'45	-7°-38'-44	
minimum elong	1933 May 20 04:15	28°♄41'40	3°15'32	min. Earth dist.		1941 Jan 24 19:43	27°♄59'49	9.28462 AU	
	1933 Jun 07 02:21	0°♄		direct		1941 Mar 28 08:00	25°♄14'59		
retrograde	1933 Sep 09 22:23	4°♄05'07				1941 Jun 16 18:31	0°♄		
opposition	1933 Nov 24 04:47	1°♄28'13	-4°-1'-27	max. Earth dist.		1941 Jul 20 18:15	3°♄51'54	10.95062 AU	
min. Earth dist.	1933 Nov 28 13:08	1°♄13'46	13.99299 AU						
	1933 Dec 22 07:42	30°♄		conjunction		1941 Jul 28 06:06	4°♄45'56	-6°-14'-23	
direct	1934 Feb 06 07:21	28°♄51'27		minimum elong		1941 Jul 28 06:12	4°♄45'58	6°14'24	
	1934 Mar 23 14:02	0°♄		retrograde		1941 Nov 27 09:48	14°♄33'57		
max. Earth dist.	1934 May 20 15:58	3°♄49'59	15.70500 AU	opposition		1942 Jan 31 22:47	11°♄26'59	-7°-30'-45	
				min. Earth dist.		1942 Feb 06 11:15	11°♄01'57	8.64477 AU	
conjunction	1934 May 26 04:56	4°♄15'25	-3°-46'-40	direct		1942 Apr 09 06:15	8°♄12'35		
minimum elong	1934 May 26 04:47	4°♄15'24	3°46'41	max. Earth dist.		1942 Aug 05 07:42	17°♄49'56	10.34997 AU	
retrograde	1934 Sep 16 16:23	9°♄56'09							
opposition	1934 Nov 30 03:57	7°♄15'42	-4°-38'-40	conjunction		1942 Aug 12 01:07	18°♄42'10	-5°-51'-56	
min. Earth dist.	1934 Dec 04 22:04	6°♄59'21	13.39539 AU	minimum elong		1942 Aug 12 01:24	18°♄42'15	5°51'57	
direct	1935 Feb 11 15:59	4°♄34'45		retrograde		1942 Dec 13 14:23	29°♄22'36		
max. Earth dist.	1935 May 26 17:42	9°♄49'18	15.08796 AU	opposition		1943 Feb 15 18:57	26°♄13'46	-6°-53'-10	
				min. Earth dist.		1943 Feb 20 11:29	25°♄51'54	8.09898 AU	
conjunction	1935 Jun 01 18:03	10°♄18'18	-4°-17'-54	direct		1943 Apr 23 00:56	22°♄57'09		
minimum elong	1935 Jun 01 17:52	10°♄18'16	4°17'56			1943 Jul 26 22:39	0°♄		
retrograde	1935 Sep 24 01:53	16°♄19'32		max. Earth dist.		1943 Aug 23 05:37	3°♄38'45	9.86942 AU	
opposition	1935 Dec 06 15:22	13°♄35'15	-5°-16'-20						
min. Earth dist.	1935 Dec 11 18:32	13°♄16'59	12.76073 AU	conjunction		1943 Aug 28 13:52	4°♄22'56	-5°-3'-6	
direct	1936 Feb 17 13:49	10°♄49'43		minimum elong		1943 Aug 28 14:20	4°♄23'06	5°03'07	
max. Earth dist.	1936 Jun 01 08:31	16°♄23'15	14.43529 AU	retrograde		1943 Dec 31 02:51	15°♄48'45		
				opposition		1944 Mar 03 08:20	12°♄38'56	-5°-38'-6	
conjunction	1936 Jun 07 22:19	16°♄56'41	-4°-48'-36	min. Earth dist.		1944 Mar 06 18:03	12°♄22'46	7.69735 AU	
minimum elong	1936 Jun 07 22:07	16°♄56'38	4°48'37	direct		1944 May 07 19:34	9°♄21'41		
retrograde	1936 Oct 01 05:30	23°♄22'16		max. Earth dist.		1944 Sep 11 03:09	21°♄01'24	9.56043 AU	
opposition	1936 Dec 12 18:05	20°♄33'58	-5°-53'-43						
min. Earth dist.	1936 Dec 18 04:45	20°♄13'48	12.09302 AU	conjunction		1944 Sep 14 11:22	21°♄30'15	-3°-45'-17	
direct	1937 Feb 22 23:13	17°♄43'31		minimum elong		1944 Sep 14 11:52	21°♄30'26	3°45'18	
max. Earth dist.	1937 Jun 08 20:27	23°♄40'36	13.75225 AU	retrograde		1944 Nov 18 03:20	0°♄		
				retrograde		1945 Jan 17 07:44	3°♄24'04		
conjunction	1937 Jun 15 21:03	24°♄18'32	-5°-17'-49	opposition		1945 Mar 21 05:11	0°♄13'50	-3°-45'-10	
minimum elong	1937 Jun 15 20:51	24°♄18'29	5°17'49	min. Earth dist.		1945 Mar 22 22:17	0°♄05'40	7.48771 AU	
	1937 Aug 27 17:14	0°♄				1945 Mar 24 02:54	30°♄		
retrograde	1937 Oct 10 07:11	1°♄13'08		direct		1945 May 25 08:18	26°♄57'19		

	1945 Jul 22 16:28	0°♅		minimum elong	1953 Jan 04 14:18	13°♁57'18	6°12'10
				max. Earth dist.	1953 Jan 11 18:04	14°♁39'20	13.12837 AU
conjunction	1945 Oct 02 23:20	9°♁23'23	-2°-3'-20	retrograde	1953 Apr 28 04:14	21°♁02'30	
minimum elong	1945 Oct 02 23:40	9°♁23'30	2°03'21	min. Earth dist.	1953 Jul 04 06:05	18°♁32'59	11.48390 AU
max. Earth dist.	1945 Oct 02 00:37	9°♁15'05	9.46328 AU	opposition	1953 Jul 10 17:53	18°♁09'08	7°24'59
retrograde	1946 Feb 04 07:45	21°♁19'51		direct	1953 Sep 21 13:19	15°♁19'39	
opposition	1946 Apr 08 14:42	18°♁09'29	-1°-26'-35				
min. Earth dist.	1946 Apr 08 09:48	18°♁10'27	7.49918 AU	conjunction	1954 Jan 12 19:22	22°♁04'33	6°23'51
direct	1946 Jun 12 22:55	14°♁54'35		minimum elong	1954 Jan 12 19:19	22°♁04'32	6°23'50
				max. Earth dist.	1954 Jan 19 21:07	22°♁43'31	13.83081 AU
conjunction	1946 Oct 21 03:21	27°♁07'39	0°-10'-15	retrograde	1954 May 05 09:47	28°♁39'34	
minimum elong	1946 Oct 21 03:23	27°♁07'40	0°10'16	min. Earth dist.	1954 Jul 12 14:05	26°♁13'09	12.17789 AU
behind sun begin	1946 Oct 20 21:35	27°♁05'36		opposition	1954 Jul 19 01:07	25°♁50'19	7°30'02
behind sun end	1946 Oct 21 09:10	27°♁09'43		direct	1954 Sep 30 14:38	23°♁05'14	
max. Earth dist.	1946 Oct 22 14:19	27°♁20'13	9.59093 AU				
	1946 Nov 10 07:12	0°♆		conjunction	1955 Jan 20 04:45	29°♁21'05	6°27'51
asc. node	1946 Nov 24 17:25	1°♆57'51		minimum elong	1955 Jan 20 04:45	29°♁21'06	6°27'51
retrograde	1947 Feb 21 06:29	8°♆40'57		max. Earth dist.	1955 Jan 27 01:37	29°♁56'48	14.51047 AU
min. Earth dist.	1947 Apr 24 12:36	5°♆40'24	7.73018 AU		1955 Jan 27 16:29	0°♁	
opposition	1947 Apr 26 14:25	5°♆30'49	0°55'57	retrograde	1955 May 11 23:29	5°♁30'37	
direct	1947 Jul 01 16:13	2°♆18'06		min. Earth dist.	1955 Jul 20 06:07	3°♁06'50	12.84435 AU
				opposition	1955 Jul 26 12:40	2°♁45'23	7°27'46
conjunction	1947 Nov 07 03:27	13°♆52'20	1°38'22	direct	1955 Oct 08 18:09	0°♁04'32	
minimum elong	1947 Nov 07 03:13	13°♆52'15	1°38'21				
max. Earth dist.	1947 Nov 10 16:15	14°♆21'36	9.92439 AU	conjunction	1956 Jan 26 21:50	5°♁56'01	6°26'04
retrograde	1948 Mar 07 14:34	24°♆43'45		minimum elong	1956 Jan 26 21:53	5°♁56'02	6°26'04
min. Earth dist.	1948 May 08 17:55	21°♆50'56	8.14958 AU	max. Earth dist.	1956 Feb 02 13:58	6°♁28'52	15.15958 AU
opposition	1948 May 12 10:03	21°♆34'28	3°02'12	retrograde	1956 May 16 22:14	11°♁44'02	
direct	1948 Jul 18 14:01	18°♆24'28		min. Earth dist.	1956 Jul 26 07:40	9°♁22'35	13.47730 AU
				opposition	1956 Aug 01 08:28	9°♁02'38	7°20'12
conjunction	1948 Nov 21 11:43	29°♆05'02	3°10'55	direct	1956 Oct 15 02:38	6°♁25'43	
minimum elong	1948 Nov 21 11:22	29°♆04'55	3°10'55				
max. Earth dist.	1948 Nov 26 14:22	29°♆44'54	10.42113 AU	conjunction	1957 Feb 01 01:39	11°♁56'43	6°19'56
	1948 Nov 28 12:58	0°♁		minimum elong	1957 Feb 01 01:44	11°♁56'43	6°19'55
retrograde	1949 Mar 21 03:16	9°♁05'51		max. Earth dist.	1957 Feb 07 09:36	12°♁26'25	15.77314 AU
min. Earth dist.	1949 May 22 17:52	6°♁19'26	8.70899 AU	retrograde	1957 May 22 13:12	17°♁26'33	
opposition	1949 May 27 15:01	5°♁58'19	4°41'38	min. Earth dist.	1957 Aug 01 19:55	15°♁07'16	14.07238 AU
direct	1949 Aug 04 00:55	2°♁51'38		opposition	1957 Aug 07 14:49	14°♁48'42	7°08'46
				direct	1957 Oct 21 21:04	12°♁15'23	
conjunction	1949 Dec 05 01:18	12°♁34'41	4°22'56				
minimum elong	1949 Dec 05 00:56	12°♁34'35	4°22'56	conjunction	1958 Feb 06 18:42	17°♁29'09	6°10'30
max. Earth dist.	1949 Dec 11 05:10	13°♁19'31	11.03055 AU	minimum elong	1958 Feb 06 18:48	17°♁29'10	6°10'30
retrograde	1950 Apr 01 20:12	21°♁44'16		max. Earth dist.	1958 Feb 12 19:57	17°♁56'20	16.34771 AU
min. Earth dist.	1950 Jun 04 09:31	19°♁03'11	9.35851 AU	retrograde	1958 May 27 17:30	22°♁43'32	
opposition	1950 Jun 10 02:37	18°♁39'27	5°53'11	min. Earth dist.	1958 Aug 07 23:47	20°♁25'57	14.62700 AU
direct	1950 Aug 18 19:30	15°♁36'37		opposition	1958 Aug 13 10:06	20°♁09'00	6°54'29
				direct	1958 Oct 28 00:50	17°♁38'59	
conjunction	1950 Dec 16 22:44	24°♁25'23	5°15'01				
minimum elong	1950 Dec 16 22:26	24°♁25'18	5°15'01	conjunction	1959 Feb 12 02:37	22°♁38'10	5°58'33
max. Earth dist.	1950 Dec 23 16:47	25°♁11'01	11.70690 AU	minimum elong	1959 Feb 12 02:43	22°♁38'11	5°58'33
	1951 Feb 09 01:25	0°♁		max. Earth dist.	1959 Feb 17 18:26	23°♁02'37	16.88100 AU
retrograde	1951 Apr 12 03:01	2°♁47'42		retrograde	1959 Jun 01 17:03	27°♁39'28	
min. Earth dist.	1951 Jun 15 17:51	0°♁11'09	10.05641 AU	min. Earth dist.	1959 Aug 13 16:58	25°♁23'33	15.13933 AU
	1951 Jun 18 13:13	30°♁		opposition	1959 Aug 18 20:21	25°♁07'55	6°38'05
opposition	1951 Jun 21 23:40	29°♁46'18	6°40'49	direct	1959 Nov 02 18:06	22°♁40'52	
direct	1951 Aug 31 21:22	26°♁47'46					
	1951 Nov 08 16:22	0°♁		conjunction	1960 Feb 17 03:03	27°♁27'42	5°44'39
				minimum elong	1960 Feb 17 03:10	27°♁27'43	5°44'39
conjunction	1951 Dec 27 09:14	4°♁48'29	5°50'15	max. Earth dist.	1960 Feb 22 11:04	27°♁49'57	17.37157 AU
minimum elong	1951 Dec 27 09:01	4°♁48'26	5°50'16		1960 Mar 26 13:40	0°♁	
max. Earth dist.	1952 Jan 03 09:51	5°♁32'42	12.41462 AU	retrograde	1960 Jun 05 08:55	2°♁17'52	
retrograde	1952 Apr 20 03:56	12°♁29'17		min. Earth dist.	1960 Aug 18 05:05	0°♁03'09	15.60808 AU
min. Earth dist.	1952 Jun 24 23:45	9°♁56'30	10.77191 AU		1960 Aug 19 06:30	30°♁	
opposition	1952 Jul 01 10:59	9°♁31'45	7°09'50	opposition	1960 Aug 22 23:01	29°♁49'00	6°20'05
direct	1952 Sep 11 09:07	6°♁37'46		direct	1960 Nov 07 03:44	27°♁24'37	
					1961 Jan 21 01:50	0°♁	
conjunction	1953 Jan 04 14:26	13°♁57'20	6°12'09				

conjunction	1961 Feb 20 21:16	2°♄00'58	5°29'14	conjunction	1969 Mar 23 14:39	2°♃47'33	2°55'04
minimum elong	1961 Feb 20 21:23	2°♄01'00	5°29'15	minimum elong	1969 Mar 23 14:45	2°♃47'34	2°55'04
max. Earth dist.	1961 Feb 25 19:15	2°♄20'52	17.81822 AU	max. Earth dist.	1969 Mar 25 07:34	2°♃53'36	19.78795 AU
retrograde	1961 Jun 09 21:51	6°♄41'42		retrograde	1969 Jul 09 22:12	6°♃52'45	
min. Earth dist.	1961 Aug 23 09:13	4°♄28'05	16.03248 AU	opposition	1969 Sep 27 21:37	4°♃35'37	3°02'18
opposition	1961 Aug 27 19:09	4°♄15'12	6°00'53	min. Earth dist.	1969 Sep 26 12:21	4°♃39'23	17.82209 AU
direct	1961 Nov 12 04:26	1°♄53'08		direct	1969 Dec 14 00:41	2°♃22'19	
conjunction	1962 Feb 25 10:30	6°♄20'39	5°12'37	conjunction	1970 Mar 27 09:22	6°♃17'38	2°33'06
minimum elong	1962 Feb 25 10:37	6°♄20'40	5°12'36	minimum elong	1970 Mar 27 09:26	6°♃17'38	2°33'07
max. Earth dist.	1962 Mar 01 23:47	6°♄38'34	18.22029 AU	max. Earth dist.	1970 Mar 28 17:38	6°♃22'22	19.83953 AU
retrograde	1962 Jun 14 04:57	10°♄53'20		retrograde	1970 Jul 13 17:07	10°♃22'08	
min. Earth dist.	1962 Aug 28 09:42	8°♄40'27	16.41166 AU	opposition	1970 Oct 01 16:43	8°♃05'12	2°37'33
opposition	1962 Sep 01 09:54	8°♄28'55	5°40'44	min. Earth dist.	1970 Sep 30 16:20	8°♃07'58	17.85168 AU
direct	1962 Nov 17 00:52	6°♄08'53		direct	1970 Dec 17 19:53	5°♃52'02	
conjunction	1963 Mar 01 19:06	10°♄28'53	4°55'01	conjunction	1971 Mar 31 03:38	9°♃46'59	2°10'38
minimum elong	1963 Mar 01 19:13	10°♄28'54	4°55'01	minimum elong	1971 Mar 31 03:42	9°♃47'00	2°10'37
max. Earth dist.	1963 Mar 05 21:50	10°♄44'42	18.57710 AU	max. Earth dist.	1971 Apr 01 01:02	9°♃50'08	19.84884 AU
retrograde	1963 Jun 18 10:20	14°♄54'48		retrograde	1971 Jul 17 15:20	13°♃51'31	
min. Earth dist.	1963 Sep 02 04:40	12°♄42'30	16.74556 AU	opposition	1971 Oct 05 11:40	11°♃34'37	2°12'16
opposition	1963 Sep 05 20:14	12°♄32'10	5°19'48	min. Earth dist.	1971 Oct 04 20:17	11°♃36'21	17.83899 AU
direct	1963 Nov 21 14:03	10°♄13'50		direct	1971 Dec 21 12:25	9°♃21'21	
conjunction	1964 Mar 05 00:18	14°♄27'32	4°36'36	conjunction	1972 Apr 02 22:31	13°♃16'40	1°47'37
minimum elong	1964 Mar 05 00:25	14°♄27'33	4°36'35	minimum elong	1972 Apr 02 22:34	13°♃16'41	1°47'37
max. Earth dist.	1964 Mar 08 18:12	14°♄41'39	18.88883 AU	max. Earth dist.	1972 Apr 03 10:55	13°♃18'29	19.81563 AU
retrograde	1964 Jun 21 11:26	18°♄47'46		retrograde	1972 Jul 20 11:49	17°♃21'56	
min. Earth dist.	1964 Sep 05 20:36	16°♄35'44	17.03424 AU	opposition	1972 Oct 08 06:40	15°♃04'51	1°46'24
opposition	1964 Sep 09 02:39	16°♄26'38	4°58'14	min. Earth dist.	1972 Oct 08 00:22	15°♃05'34	17.78357 AU
direct	1964 Nov 25 00:44	14°♄09'44		direct	1972 Dec 24 06:29	12°♃51'18	
conjunction	1965 Mar 09 02:14	18°♄18'10	4°17'29	conjunction	1973 Apr 06 18:00	16°♃47'42	1°24'04
minimum elong	1965 Mar 09 02:21	18°♄18'11	4°17'29	minimum elong	1973 Apr 06 18:02	16°♃47'43	1°24'03
max. Earth dist.	1965 Mar 12 09:29	18°♄30'23	19.15570 AU	max. Earth dist.	1973 Apr 06 19:17	16°♃47'54	19.73963 AU
retrograde	1965 Jun 25 11:32	22°♄33'43		retrograde	1973 Jul 24 12:21	20°♃54'26	
min. Earth dist.	1965 Sep 10 08:47	20°♄21'47	17.27843 AU	opposition	1973 Oct 12 02:17	18°♃36'58	1°19'56
opposition	1965 Sep 13 05:56	20°♄13'48	4°36'05	min. Earth dist.	1973 Oct 12 05:25	18°♃36'37	17.68510 AU
direct	1965 Nov 29 05:38	17°♄58'03		direct	1973 Dec 27 22:54	16°♃22'53	
conjunction	1966 Mar 13 01:54	22°♄02'13	3°57'43	conjunction	1974 Apr 10 14:47	20°♃21'08	0°59'57
minimum elong	1966 Mar 13 02:00	22°♄02'14	3°57'44	minimum elong	1974 Apr 10 14:49	20°♃21'08	0°59'57
max. Earth dist.	1966 Mar 16 00:32	22°♄12'57	19.37842 AU	max. Earth dist.	1974 Apr 10 06:17	20°♃19'52	19.62004 AU
retrograde	1966 Jun 29 08:55	26°♄13'57		retrograde	1974 Jul 28 12:28	24°♃30'03	
min. Earth dist.	1966 Sep 14 18:26	24°♄01'55	17.47861 AU	opposition	1974 Oct 15 22:50	22°♃11'59	0°52'48
opposition	1966 Sep 17 06:22	23°♄55'03	4°13'25	min. Earth dist.	1974 Oct 16 11:20	22°♃10'33	17.54272 AU
direct	1966 Dec 03 08:44	21°♄40'13		direct	1974 Dec 31 16:55	19°♃57'09	
conjunction	1967 Mar 16 23:25	25°♄40'59	3°37'23	conjunction	1975 Apr 14 13:04	23°♃57'58	0°35'15
minimum elong	1967 Mar 16 23:31	25°♄41'00	3°37'23	minimum elong	1975 Apr 14 13:05	23°♃57'58	0°35'15
max. Earth dist.	1967 Mar 19 11:26	25°♄49'59	19.55765 AU	max. Earth dist.	1975 Apr 13 17:08	23°♃55'00	19.45648 AU
retrograde	1967 Jul 03 06:01	29°♄49'46		retrograde	1975 Aug 01 16:45	28°♃09'52	
min. Earth dist.	1967 Sep 19 01:50	27°♄37'28	17.63574 AU	opposition	1975 Oct 19 20:56	25°♃50'57	0°24'58
opposition	1967 Sep 21 04:57	27°♄31'38	3°50'13	min. Earth dist.	1975 Oct 20 19:12	25°♃48'22	17.35613 AU
direct	1967 Dec 07 07:49	25°♄17'32		direct	1976 Jan 04 11:17	23°♃35'04	
conjunction	1968 Mar 19 19:32	29°♄15'43	3°16'29	conjunction	1976 Apr 16 06:49	27°♃34'41	19.24822 AU
minimum elong	1968 Mar 19 19:37	29°♄15'43	3°16'30	conjunction	1976 Apr 17 13:26	27°♃39'18	0°09'57
max. Earth dist.	1968 Mar 21 23:11	29°♄23'23	19.69405 AU	minimum elong	1976 Apr 17 13:26	27°♃39'18	0°09'57
retrograde	1968 Apr 01 07:08	0°♃		behind sun begin	1976 Apr 17 08:02	27°♃38'31	
retrograde	1968 Jul 06 01:30	3°♃22'19		behind sun end	1976 Apr 17 18:50	27°♃40'06	
min. Earth dist.	1968 Sep 22 07:42	1°♃09'35	17.75006 AU		1976 May 28 11:11	0°♄	
opposition	1968 Sep 24 01:53	1°♃04'47	3°26'31	retrograde	1976 Aug 04 22:17	1°♄55'00	
retrograde	1968 Oct 18 22:35	30°♄		desc. node	1976 Sep 06 11:29	1°♄27'06	
direct	1968 Dec 10 05:50	28°♄51'11			1976 Oct 13 22:45	30°♃	
	1969 Jan 30 08:13	0°♃		opposition	1976 Oct 22 20:55	29°♃34'58	0°-3'-38
				min. Earth dist.	1976 Oct 24 04:40	29°♃31'15	17.12463 AU

direct	1977 Jan 07 07:22	27°♃17'47		min. Earth dist.	1984 Dec 02 12:07	5°♃39'01	13.69537 AU
	1977 Mar 28 19:06	0°♃		direct	1985 Feb 09 19:52	3°♃15'28	
max. Earth dist.	1977 Apr 19 22:00	1°♃19'47	18.99520 AU	max. Earth dist.	1985 May 24 11:41	8°♃21'45	15.39764 AU
conjunction	1977 Apr 21 16:19	1°♃26'17	0°-16'-5	conjunction	1985 May 30 07:03	8°♃49'04	-4°-8'-37
minimum elong	1977 Apr 21 16:18	1°♃26'17	0°16'05	minimum elong	1985 May 30 06:53	8°♃49'02	4°08'38
retrograde	1977 Aug 09 08:21	5°♃46'41		retrograde	1985 Sep 21 04:21	14°♃39'46	
opposition	1977 Oct 26 23:04	3°♃25'16	0°-33'-5	opposition	1985 Dec 04 04:22	11°♃57'32	-5°-4'-28
min. Earth dist.	1977 Oct 28 16:56	3°♃20'17	16.84845 AU	min. Earth dist.	1985 Dec 09 03:14	11°♃40'11	13.07970 AU
direct	1978 Jan 11 04:56	1°♃06'28		direct	1986 Feb 15 09:46	9°♃14'21	
max. Earth dist.	1978 Apr 23 16:41	5°♃11'52	18.69735 AU	max. Earth dist.	1986 May 30 20:54	14°♃38'24	14.76309 AU
conjunction	1978 Apr 25 22:17	5°♃20'14	0°-42'-45	conjunction	1986 Jun 06 03:43	15°♃09'30	-4°-39'-9
minimum elong	1978 Apr 25 22:16	5°♃20'14	0°42'46	minimum elong	1986 Jun 06 03:31	15°♃09'28	4°39'11
retrograde	1978 Aug 13 21:07	9°♃46'21		retrograde	1986 Sep 28 23:46	21°♃22'42	
opposition	1978 Oct 31 04:16	7°♃23'17	-1°-3'-28	opposition	1986 Dec 10 23:19	18°♃36'37	-5°-41'-29
min. Earth dist.	1978 Nov 02 07:26	7°♃17'05	16.52768 AU	min. Earth dist.	1986 Dec 16 06:44	18°♃17'21	12.42854 AU
direct	1979 Jan 15 05:09	5°♃02'35		direct	1987 Feb 21 13:12	15°♃48'47	
max. Earth dist.	1979 Apr 27 14:27	9°♃12'17	18.35526 AU	max. Earth dist.	1987 Jun 06 21:01	21°♃33'54	14.09477 AU
conjunction	1979 Apr 30 07:41	9°♃22'42	-1°-10'-9	conjunction	1987 Jun 13 17:08	22°♃09'43	-5°-8'-36
minimum elong	1979 Apr 30 07:38	9°♃22'42	1°10'10	minimum elong	1987 Jun 13 16:56	22°♃09'40	5°08'37
retrograde	1979 Aug 18 15:53	13°♃55'41		retrograde	1987 Oct 07 13:58	28°♃49'39	
opposition	1979 Nov 04 13:02	11°♃30'42	-1°-34'-50	opposition	1987 Dec 18 11:20	25°♃59'31	-6°-17'-29
min. Earth dist.	1979 Nov 07 02:27	11°♃23'07	16.16295 AU	min. Earth dist.	1987 Dec 24 02:07	25°♃38'19	11.74655 AU
direct	1980 Jan 19 07:32	9°♃07'47		direct	1988 Feb 28 06:10	23°♃06'42	
max. Earth dist.	1980 Apr 30 16:57	13°♃22'58	17.96909 AU	max. Earth dist.	1988 Jun 13 21:02	29°♃18'00	13.39878 AU
conjunction	1980 May 03 21:51	13°♃35'32	-1°-38'-19	conjunction	1988 Jun 21 03:19	29°♃58'31	-5°-35'-44
minimum elong	1980 May 03 21:48	13°♃35'31	1°38'20	minimum elong	1988 Jun 21 03:08	29°♃58'29	5°35'44
retrograde	1980 Aug 22 15:19	18°♃16'40		retrograde	1988 Jun 21 09:40	0°♃	
opposition	1980 Nov 08 02:01	15°♃49'30	-2°-7'-15	retrograde	1988 Oct 16 05:11	7°♃10'13	
min. Earth dist.	1980 Nov 11 00:29	15°♃40'37	15.75449 AU	opposition	1988 Dec 25 19:59	4°♃15'55	-6°-50'-46
direct	1981 Jan 22 14:09	13°♃24'05		min. Earth dist.	1988 Dec 31 18:06	3°♃52'36	11.04166 AU
max. Earth dist.	1981 May 05 00:21	17°♃45'56	17.53948 AU	direct	1989 Mar 06 19:52	1°♃17'49	
conjunction	1981 May 08 17:20	18°♃00'54	-2°-7'-13	max. Earth dist.	1989 Jun 22 23:54	8°♃01'09	12.68468 AU
minimum elong	1981 May 08 17:15	18°♃00'53	2°07'14	conjunction	1989 Jun 30 14:45	8°♃46'40	-5°-58'-35
retrograde	1981 Aug 27 22:09	22°♃51'44		minimum elong	1989 Jun 30 14:35	8°♃46'37	5°58'36
opposition	1981 Nov 12 20:22	20°♃22'06	-2°-40'-45	retrograde	1989 Oct 27 00:19	16°♃35'55	
min. Earth dist.	1981 Nov 16 05:23	20°♃11'39	15.30285 AU	opposition	1990 Jan 04 06:09	13°♃37'27	-7°-18'-33
direct	1982 Jan 27 00:10	17°♃53'50		min. Earth dist.	1990 Jan 10 07:33	13°♃12'34	10.32587 AU
max. Earth dist.	1982 May 09 14:18	22°♃23'55	17.06658 AU	direct	1990 Mar 15 06:55	10°♃34'03	
conjunction	1982 May 13 19:19	22°♃41'26	-2°-36'-50	max. Earth dist.	1990 Jul 03 11:37	17°♃56'20	11.96755 AU
minimum elong	1982 May 13 19:13	22°♃41'25	2°36'50	conjunction	1990 Jul 11 08:12	18°♃46'52	-6°-14'-12
retrograde	1982 Sep 02 12:33	27°♃43'42		minimum elong	1990 Jul 11 08:06	18°♃46'50	6°14'13
opposition	1982 Nov 17 21:02	25°♃11'20	-3°-15'-21	retrograde	1990 Nov 08 06:24	27°♃19'58	
min. Earth dist.	1982 Nov 21 14:44	24°♃59'27	14.80845 AU	opposition	1991 Jan 14 23:20	24°♃17'38	-7°-36'-24
direct	1983 Jan 31 16:20	22°♃39'54		min. Earth dist.	1991 Jan 21 00:03	23°♃51'45	9.61730 AU
max. Earth dist.	1983 May 14 11:19	27°♃19'49	16.55135 AU	direct	1991 Mar 24 21:24	21°♃09'10	
conjunction	1983 May 19 05:02	27°♃40'17	-3°-7'-4	max. Earth dist.	1991 Jul 15 19:04	29°♃19'16	11.26981 AU
minimum elong	1983 May 19 04:54	27°♃40'15	3°07'05	conjunction	1991 Jul 21 15:54	0°♃	
retrograde	1983 Jun 21 13:54	0°♃		minimum elong	1991 Jul 23 13:46	0°♃13'18	-6°-18'-15
opposition	1983 Sep 08 12:30	2°♃56'05		retrograde	1991 Jul 23 13:47	0°♃13'19	6°18'16
min. Earth dist.	1983 Nov 23 05:30	0°♃20'41	-3°-50'-57	retrograde	1991 Nov 22 00:46	9°♃36'05	
direct	1983 Nov 29 13:19	30°♃		opposition	1992 Jan 27 05:08	6°♃30'29	-7°-37'-43
max. Earth dist.	1984 Feb 05 13:39	27°♃45'42		min. Earth dist.	1992 Feb 02 00:16	6°♃04'37	8.94308 AU
conjunction	1984 Apr 11 04:19	0°♃		direct	1992 Apr 04 01:37	3°♃17'42	
minimum elong	1984 May 18 18:33	2°♃37'42	15.99449 AU	max. Earth dist.	1992 Jul 29 06:20	12°♃24'51	10.62412 AU
conjunction	1984 May 24 00:23	3°♃01'15	-3°-37'-45	conjunction	1992 Aug 05 12:23	13°♃19'15	-6°-4'-57
minimum elong	1984 May 24 00:14	3°♃01'14	3°37'46	minimum elong	1992 Aug 05 12:36	13°♃19'18	6°04'58
retrograde	1984 Sep 14 02:00	8°♃33'01		retrograde	1992 Dec 06 10:20	23°♃35'02	
opposition	1984 Nov 27 23:14	5°♃54'21	-4°-27'-26	opposition	1993 Feb 09 04:46	20°♃27'01	-7°-13'-43
				min. Earth dist.	1993 Feb 14 09:36	20°♃03'03	8.34110 AU

direct	1993 Apr 16 23:25	17°♏11'12		conjunction	2000 Dec 11 23:12	20°♏13'49	4°55'38
max. Earth dist.	1993 Aug 15 02:06	27°♏22'03	10.07468 AU	minimum elong	2000 Dec 11 22:52	20°♏13'43	4°55'38
				max. Earth dist.	2000 Dec 18 13:25	20°♏59'48	11.40582 AU
conjunction	1993 Aug 21 05:50	28°♏11'34	-5°-27'-50	retrograde	2001 Apr 07 18:01	28°♏55'26	
minimum elong	1993 Aug 21 06:14	28°♏11'42	5°27'50	min. Earth dist.	2001 Jun 10 22:24	26°♏16'42	9.74961 AU
	1993 Sep 03 17:32	0°♐		opposition	2001 Jun 16 23:47	25°♏52'04	6°23'45
retrograde	1993 Dec 23 09:10	9°♐17'43		direct	2001 Aug 26 09:16	22°♏51'18	
opposition	1994 Feb 24 23:39	6°♐08'15	-6°-15'-15		2001 Dec 11 23:05	0°♑	
min. Earth dist.	1994 Mar 01 02:50	5°♐48'46	7.85961 AU				
direct	1994 May 01 19:24	2°♐51'00		conjunction	2001 Dec 22 23:25	1°♑11'28	5°37'32
max. Earth dist.	1994 Sep 03 03:55	14°♐05'04	9.67402 AU	minimum elong	2001 Dec 22 23:11	1°♑11'24	5°37'32
				max. Earth dist.	2001 Dec 29 23:14	1°♑56'47	12.10703 AU
conjunction	1994 Sep 07 13:43	14°♐42'30	-4°-22'-11	retrograde	2002 Apr 17 06:40	9°♑08'58	
minimum elong	1994 Sep 07 14:13	14°♐42'41	4°22'11	min. Earth dist.	2002 Jun 21 13:59	6°♑34'32	10.46407 AU
retrograde	1995 Jan 10 09:18	26°♐26'36		opposition	2002 Jun 28 00:23	6°♑09'30	6°59'54
opposition	1995 Mar 14 07:59	23°♐16'26	-4°-37'-44	direct	2002 Sep 07 13:22	3°♑13'18	
min. Earth dist.	1995 Mar 16 22:04	23°♐04'07	7.55094 AU				
direct	1995 May 18 13:33	19°♐59'19		conjunction	2003 Jan 01 16:10	10°♑49'25	6°04'34
	1995 Sep 09 14:28	0°♒		minimum elong	2003 Jan 01 16:00	10°♑49'23	6°04'34
max. Earth dist.	1995 Sep 23 19:16	2°♒03'14	9.47184 AU	max. Earth dist.	2003 Jan 08 19:10	11°♑32'29	12.82410 AU
				retrograde	2003 Apr 25 17:12	18°♑08'51	
conjunction	1995 Sep 25 22:06	2°♒21'45	-2°-49'-11	min. Earth dist.	2003 Jul 01 05:16	15°♑38'02	11.18288 AU
minimum elong	1995 Sep 25 22:31	2°♒21'55	2°49'12	opposition	2003 Jul 07 18:17	15°♑13'34	7°20'16
retrograde	1996 Jan 28 14:54	14°♒21'07		direct	2003 Sep 18 05:33	12°♑22'06	
opposition	1996 Mar 31 14:57	11°♒10'39	-2°-27'-35				
min. Earth dist.	1996 Apr 01 07:39	11°♒07'20	7.45711 AU	conjunction	2004 Jan 10 06:45	19°♑20'56	6°20'08
direct	1996 Jun 04 19:31	7°♒54'44		minimum elong	2004 Jan 10 06:40	19°♑20'55	6°20'08
				max. Earth dist.	2004 Jan 17 10:27	20°♑01'23	13.53635 AU
conjunction	1996 Oct 13 08:58	20°♒18'08	0°-58'-40	retrograde	2004 May 02 05:13	26°♑07'58	
minimum elong	1996 Oct 13 09:07	20°♒18'11	0°58'41	min. Earth dist.	2004 Jul 08 23:13	23°♑40'21	11.88905 AU
max. Earth dist.	1996 Oct 13 18:12	20°♒21'29	9.49727 AU	opposition	2004 Jul 15 10:59	23°♑17'01	7°29'03
	1996 Dec 29 11:16	0°♓		direct	2004 Sep 26 17:21	20°♑30'10	
retrograde	1997 Feb 14 03:01	2°♓05'18					
	1997 Apr 04 16:49	30°♑		conjunction	2005 Jan 16 23:43	26°♑57'40	6°27'02
opposition	1997 Apr 18 22:18	28°♑54'43	0°-3'-33	minimum elong	2005 Jan 16 23:42	26°♑57'40	6°27'02
min. Earth dist.	1997 Apr 17 15:32	29°♑00'43	7.59262 AU	max. Earth dist.	2005 Jan 23 23:36	27°♑34'53	14.22971 AU
asc. node	1997 Apr 28 11:08	28°♑10'34			2005 Feb 21 17:35	0°♒	
direct	1997 Jun 23 15:55	25°♑40'40		retrograde	2005 May 09 01:47	3°♒17'24	
	1997 Sep 03 03:25	0°♓		min. Earth dist.	2005 Jul 16 20:59	0°♒52'46	12.57085 AU
				opposition	2005 Jul 23 06:31	0°♒30'38	7°29'29
conjunction	1997 Oct 30 23:37	7°♓35'03	0°53'51		2005 Aug 01 03:45	30°♑	
minimum elong	1997 Oct 30 23:29	7°♓35'00	0°53'51	direct	2005 Oct 05 05:32	27°♑48'09	
max. Earth dist.	1997 Nov 02 16:02	7°♓57'46	9.74544 AU		2005 Dec 06 01:05	0°♒	
retrograde	1998 Mar 02 03:55	18°♓46'50					
min. Earth dist.	1998 May 03 06:42	15°♓50'34	7.93713 AU	conjunction	2006 Jan 23 23:28	3°♒49'27	6°27'25
opposition	1998 May 06 08:11	15°♓36'37	2°11'53	minimum elong	2006 Jan 23 23:29	3°♒49'27	6°27'25
direct	1998 Jul 12 01:33	12°♓24'54		max. Earth dist.	2006 Jan 30 17:42	4°♒23'30	14.89493 AU
				retrograde	2006 May 15 08:36	9°♒46'05	
conjunction	1998 Nov 16 02:00	23°♓29'59	2°34'22	min. Earth dist.	2006 Jul 24 04:56	7°♒23'54	13.22053 AU
minimum elong	1998 Nov 16 01:40	23°♓29'52	2°34'21	opposition	2006 Jul 30 08:27	7°♒03'18	7°23'52
max. Earth dist.	1998 Nov 20 14:03	24°♓06'06	10.18008 AU	direct	2006 Oct 12 21:11	4°♒24'57	
	1999 Jan 07 10:29	0°♏					
retrograde	1999 Mar 16 10:25	3°♏53'12		conjunction	2007 Jan 30 08:42	10°♒04'13	6°22'55
min. Earth dist.	1999 May 17 19:21	1°♏03'53	8.44526 AU	minimum elong	2007 Jan 30 08:45	10°♒04'14	6°22'55
opposition	1999 May 22 06:16	0°♏44'15	4°03'30	max. Earth dist.	2007 Feb 05 20:53	10°♒35'22	15.52550 AU
	1999 Jun 01 09:50	30°♓		retrograde	2007 May 21 01:49	15°♒41'22	
direct	1999 Jul 29 04:54	27°♓35'32		min. Earth dist.	2007 Jul 30 23:08	13°♒21'22	13.83315 AU
	1999 Sep 22 02:32	0°♏		opposition	2007 Aug 05 20:22	13°♒02'17	7°13'53
				direct	2007 Oct 19 20:09	10°♒27'41	
conjunction	1999 Nov 30 09:34	7°♏43'11	3°55'21				
minimum elong	1999 Nov 30 09:12	7°♏43'04	3°55'20	conjunction	2008 Feb 05 06:06	15°♒48'25	6°14'46
max. Earth dist.	1999 Dec 06 04:21	8°♏26'34	10.75007 AU	minimum elong	2008 Feb 05 06:11	15°♒48'26	6°14'46
retrograde	2000 Mar 27 22:27	17°♏14'18		max. Earth dist.	2008 Feb 11 09:33	16°♒16'32	16.11739 AU
min. Earth dist.	2000 May 30 00:59	14°♏30'40	9.06479 AU	retrograde	2008 May 25 11:42	21°♒09'02	
opposition	2000 Jun 04 11:08	14°♏07'41	5°26'39	min. Earth dist.	2008 Aug 05 06:05	18°♒50'59	14.40505 AU
direct	2000 Aug 12 15:54	11°♏02'39		opposition	2008 Aug 10 20:16	18°♒33'21	7°00'43
				direct	2008 Oct 25 08:13	16°♒02'10	

conjunction	2009 Feb 09 17:51	21° 07 '15	6°03'49	conjunction	2017 Mar 15 02:41	24° 42 '10	3°46'12
minimum elong	2009 Feb 09 17:56	21° 07 '16	6°03'50	minimum elong	2017 Mar 15 02:47	24° 42 '11	3°46'12
max. Earth dist.	2009 Feb 15 13:57	21° 32 '52	16.66762 AU	max. Earth dist.	2017 Mar 17 20:39	24° 52 '06	19.48878 AU
retrograde	2009 May 30 11:12	26° 13 '49		retrograde	2017 Jul 01 07:09	28° 51 '55	
min. Earth dist.	2009 Aug 11 04:58	23° 57 '14	14.93417 AU	min. Earth dist.	2017 Sep 17 00:13	26° 39 '45	17.57820 AU
opposition	2009 Aug 16 10:16	23° 41 '11	6°45'11	opposition	2017 Sep 19 07:32	26° 33 '26	4°00'13
direct	2009 Oct 31 05:47	21° 13 '03		direct	2017 Dec 05 09:47	24° 19 '00	
conjunction	2010 Feb 14 21:27	26° 04 '51	5°50'44	conjunction	2018 Mar 18 23:15	28° 18 '03	3°25'30
minimum elong	2010 Feb 14 21:34	26° 04 '53	5°50'44	minimum elong	2018 Mar 18 23:20	28° 18 '04	3°25'30
max. Earth dist.	2010 Feb 20 07:22	26° 27 '46	17.17442 AU	max. Earth dist.	2018 Mar 21 06:44	28° 26 '19	19.64737 AU
	2010 Apr 20 06:31	0° 00 '			2018 Apr 17 08:10	0° 00 '	
retrograde	2010 Jun 04 07:04	0° 59 '28		retrograde	2018 Jul 05 04:46	2° 25 '20	
	2010 Jul 20 09:42	30° 00 '		min. Earth dist.	2018 Sep 21 05:49	0° 12 '58	17.71479 AU
min. Earth dist.	2010 Aug 16 18:07	28° 44 '18	15.41890 AU	opposition	2018 Sep 23 05:01	0° 07 '37	3°36'41
opposition	2010 Aug 21 15:53	28° 29 '34	6°27'53		2018 Sep 26 00:11	30° 00 '	
direct	2010 Nov 05 18:42	26° 04 '07		direct	2018 Dec 09 07:52	27° 53 '53	
	2011 Feb 08 19:57	0° 00 '			2019 Feb 18 09:08	0° 00 '	
conjunction	2011 Feb 19 18:09	0° 44 '40	5°35'59	conjunction	2019 Mar 22 18:38	1° 50 '50	3°04'16
minimum elong	2011 Feb 19 18:16	0° 44 '41	5°36'00	minimum elong	2019 Mar 22 18:43	1° 50 '50	3°04'15
max. Earth dist.	2011 Feb 24 20:03	1° 05 '28	17.63673 AU	max. Earth dist.	2019 Mar 24 17:29	1° 57 '45	19.76329 AU
retrograde	2011 Jun 08 19:07	5° 29 '05		retrograde	2019 Jul 08 23:40	5° 56 '26	
min. Earth dist.	2011 Aug 22 02:41	3° 14 '51	15.85883 AU	min. Earth dist.	2019 Sep 25 11:52	3° 43 '31	17.80858 AU
opposition	2011 Aug 26 14:39	3° 01 '36	6°09'15	opposition	2019 Sep 27 01:22	3° 39 '17	3°12'39
direct	2011 Nov 10 23:14	0° 38 '30		direct	2019 Dec 13 03:48	1° 26 '02	
conjunction	2012 Feb 24 09:06	5° 09 '28	5°19'55	conjunction	2020 Mar 25 13:27	5° 21 '37	2°42'30
minimum elong	2012 Feb 24 09:13	5° 09 '29	5°19'54	minimum elong	2020 Mar 25 13:32	5° 21 '37	2°42'31
max. Earth dist.	2012 Feb 29 00:33	5° 27 '57	18.05448 AU	max. Earth dist.	2020 Mar 27 01:48	5° 26 '58	19.83651 AU
retrograde	2012 Jun 12 05:12	9° 45 '14		retrograde	2020 Jul 11 21:09	9° 26 '15	
min. Earth dist.	2012 Aug 26 03:09	7° 31 '55	16.25418 AU	opposition	2020 Sep 29 20:44	7° 09 '28	2°48'08
opposition	2012 Aug 30 07:24	7° 19 '50	5°49'33	min. Earth dist.	2020 Sep 28 15:40	7° 12 '44	17.85948 AU
direct	2012 Nov 14 20:37	4° 58 '46		direct	2020 Dec 15 22:16	4° 56 '28	
conjunction	2013 Feb 27 19:17	9° 21 '38	5°02'46	conjunction	2021 Mar 29 08:09	8° 51 '26	2°20'15
minimum elong	2013 Feb 27 19:24	9° 21 '39	5°02'46	minimum elong	2021 Mar 29 08:13	8° 51 '26	2°20'15
max. Earth dist.	2013 Mar 04 02:39	9° 38 '21	18.42795 AU	max. Earth dist.	2021 Mar 30 11:00	8° 55 '22	19.86641 AU
retrograde	2013 Jun 16 09:17	13° 50 '04		retrograde	2021 Jul 15 16:41	12° 55 '48	
min. Earth dist.	2013 Aug 31 00:51	11° 37 '14	16.60532 AU	opposition	2021 Oct 03 15:51	10° 39 '09	2°23'06
opposition	2013 Sep 03 19:14	11° 26 '30	5°28'59	min. Earth dist.	2021 Oct 02 20:47	10° 41 '19	17.86676 AU
direct	2013 Nov 19 13:08	9° 07 '14		direct	2021 Dec 19 16:32	8° 26 '12	
conjunction	2014 Mar 04 01:26	13° 23 '15	4°44'42	conjunction	2022 Apr 02 02:56	12° 21 '13	1°57'30
minimum elong	2014 Mar 04 01:33	13° 23 '17	4°44'42	minimum elong	2022 Apr 02 03:00	12° 21 '14	1°57'30
max. Earth dist.	2014 Mar 07 22:17	13° 37 '57	18.75762 AU	max. Earth dist.	2022 Apr 02 19:04	12° 23 '35	19.85261 AU
retrograde	2014 Jun 20 12:44	17° 45 '32		retrograde	2022 Jul 19 15:21	16° 26 '01	
min. Earth dist.	2014 Sep 04 16:09	15° 33 '13	16.91289 AU	opposition	2022 Oct 07 10:48	14° 09 '18	1°57'31
opposition	2014 Sep 08 02:44	15° 23 '32	5°07'41	min. Earth dist.	2022 Oct 07 00:28	14° 10 '28	17.83009 AU
direct	2014 Nov 23 23:45	13° 05 '48		direct	2022 Dec 23 09:31	11° 56 '06	
conjunction	2015 Mar 08 04:21	17° 16 '10	4°25'52	conjunction	2023 Apr 05 22:18	15° 51 '54	1°34'13
minimum elong	2015 Mar 08 04:28	17° 16 '11	4°25'52	minimum elong	2023 Apr 05 22:21	15° 51 '54	1°34'13
max. Earth dist.	2015 Mar 11 17:04	17° 29 '18	19.04406 AU	max. Earth dist.	2023 Apr 06 04:07	15° 52 '45	19.79451 AU
retrograde	2015 Jun 24 11:36	21° 33 '20		retrograde	2023 Jul 23 12:42	19° 57 '48	
min. Earth dist.	2015 Sep 09 06:04	19° 21 '10	17.17733 AU	opposition	2023 Oct 11 06:21	17° 40 '45	1°31'22
opposition	2015 Sep 12 07:00	19° 12 '43	4°45'46	min. Earth dist.	2023 Oct 11 06:05	17° 40 '47	17.74898 AU
direct	2015 Nov 28 06:43	16° 56 '18		direct	2023 Dec 27 03:10	15° 27 '06	
conjunction	2016 Mar 11 04:27	21° 01 '58	4°06'20	conjunction	2024 Apr 08 18:28	19° 24 '20	1°10'24
minimum elong	2016 Mar 11 04:33	21° 01 '59	4°06'21	minimum elong	2024 Apr 08 18:31	19° 24 '21	1°10'24
max. Earth dist.	2016 Mar 14 06:45	21° 13 '19	19.28774 AU	max. Earth dist.	2024 Apr 08 13:41	19° 23 '38	19.69215 AU
retrograde	2016 Jun 27 11:10	25° 15 '00		retrograde	2024 Jul 26 13:59	23° 32 '04	
min. Earth dist.	2016 Sep 12 15:26	23° 03 '01	17.39910 AU	opposition	2024 Oct 14 02:28	21° 14 '26	1°04'35
opposition	2016 Sep 15 08:27	22° 55 '33	4°23'15	min. Earth dist.	2024 Oct 14 11:04	21° 13 '27	17.62356 AU
direct	2016 Dec 01 09:53	20° 40 '13		direct	2024 Dec 29 21:13	19° 00 '03	

conjunction	2025 Apr 12 16:00	22° Υ 59'29	0°46'00	min. Earth dist.	2032 Nov 18 23:36	23° ♁ 24'37	15.05174 AU
minimum elong	2025 Apr 12 16:01	22° Υ 59'29	0°46'01	direct	2033 Jan 29 08:13	21° ♁ 06'04	
max. Earth dist.	2025 Apr 12 00:17	22° Υ 57'09	19.54535 AU	max. Earth dist.	2033 May 12 01:54	25° ♁ 41'15	16.80495 AU
retrograde	2025 Jul 30 14:42	27° Υ 09'46					
opposition	2025 Oct 17 23:40	24° Υ 51'19	0°37'07	conjunction	2033 May 16 13:35	26° ♁ 00'16	-2°-53'-36
min. Earth dist.	2025 Oct 18 18:23	24° Υ 49'09	17.45391 AU	minimum elong	2033 May 16 13:28	26° ♁ 00'15	2°53'37
direct	2026 Jan 02 14:37	22° Υ 35'56			2033 Jul 19 13:36	0° ♁	
				retrograde	2033 Sep 05 15:44	1° ♁ 09'34	
conjunction	2026 Apr 16 15:10	26° Υ 38'21	0°21'00		2033 Oct 23 22:20	30° ♁	
minimum elong	2026 Apr 16 15:11	26° Υ 38'21	0°21'00	opposition	2033 Nov 20 14:57	28° ♁ 35'54	-3°-34'-58
max. Earth dist.	2026 Apr 15 13:04	26° Υ 34'26	19.35470 AU	min. Earth dist.	2033 Nov 24 13:48	28° ♁ 23'09	14.53606 AU
	2026 Jun 19 21:18	0° ♁		direct	2034 Feb 03 02:54	26° ♁ 02'55	
retrograde	2026 Aug 03 20:10	0° ♁ 52'01			2034 May 05 21:51	0° ♁	
	2026 Sep 18 01:53	30° Υ		max. Earth dist.	2034 May 17 04:39	0° ♁ 49'08	16.26818 AU
opposition	2026 Oct 21 22:26	28° Υ 32'30	0°08'53				
min. Earth dist.	2026 Oct 23 02:02	28° Υ 29'16	17.24063 AU	conjunction	2034 May 22 04:31	1° ♁ 11'10	-3°-24'-2
direct	2027 Jan 06 11:01	26° Υ 15'52		minimum elong	2034 May 22 04:23	1° ♁ 11'09	3°24'02
desc. node	2027 Feb 12 23:37	26° Υ 55'06		retrograde	2034 Sep 11 22:35	6° ♁ 35'19	
	2027 Apr 14 14:56	0° ♁		opposition	2034 Nov 26 04:30	3° ♁ 58'31	-4°-10'-59
max. Earth dist.	2027 Apr 19 02:55	0° ♁ 16'26	19.12033 AU	min. Earth dist.	2034 Nov 30 14:00	3° ♁ 43'55	13.97819 AU
				direct	2035 Feb 08 05:16	1° ♁ 21'50	
conjunction	2027 Apr 20 16:21	0° ♁ 22'08	0°-4'-44	max. Earth dist.	2035 May 22 16:56	6° ♁ 21'15	15.68929 AU
minimum elong	2027 Apr 20 16:21	0° ♁ 22'08	0°04'45				
behind sun begin	2027 Apr 20 09:48	0° ♁ 21'09		conjunction	2035 May 28 06:04	6° ♁ 46'47	-3°-54'-46
behind sun end	2027 Apr 20 22:54	0° ♁ 23'06		minimum elong	2035 May 28 05:55	6° ♁ 46'46	3°54'47
retrograde	2027 Aug 08 02:55	4° ♁ 40'04		retrograde	2035 Sep 18 18:52	12° ♁ 28'28	
opposition	2027 Oct 25 23:27	2° ♁ 19'15	0°-20'-9	opposition	2035 Dec 02 04:31	9° ♁ 48'15	-4°-47'-43
min. Earth dist.	2027 Oct 27 12:57	2° ♁ 14'48	16.98381 AU	min. Earth dist.	2035 Dec 06 22:43	9° ♁ 31'54	13.37921 AU
direct	2028 Jan 10 06:41	0° ♁ 01'08		direct	2036 Feb 13 16:37	7° ♁ 07'28	
max. Earth dist.	2028 Apr 21 20:39	4° ♁ 04'46	18.84268 AU	max. Earth dist.	2036 May 27 18:01	12° ♁ 22'47	15.07023 AU
conjunction	2028 Apr 23 20:32	4° ♁ 12'10	0°-31'-2	conjunction	2036 Jun 02 20:25	12° ♁ 52'16	-4°-25'-28
minimum elong	2028 Apr 23 20:31	4° ♁ 12'10	0°31'04	minimum elong	2036 Jun 02 20:13	12° ♁ 52'13	4°25'29
retrograde	2028 Aug 11 15:11	8° ♁ 35'21		retrograde	2036 Sep 25 06:03	18° ♁ 54'42	
opposition	2028 Oct 29 02:50	6° ♁ 13'00	0°-50'-6	opposition	2036 Dec 07 17:08	16° ♁ 10'44	-5°-24'-45
min. Earth dist.	2028 Oct 31 01:26	6° ♁ 07'24	16.68383 AU	min. Earth dist.	2036 Dec 12 21:34	15° ♁ 52'16	12.74164 AU
direct	2029 Jan 13 06:09	3° ♁ 53'08		direct	2037 Feb 18 14:10	13° ♁ 25'23	
max. Earth dist.	2029 Apr 25 16:10	8° ♁ 00'34	18.52162 AU	max. Earth dist.	2037 Jun 03 11:53	19° ♁ 00'16	14.41404 AU
conjunction	2029 Apr 28 04:07	8° ♁ 10'02	0°-58'-6	conjunction	2037 Jun 10 02:16	19° ♁ 33'55	-4°-55'-29
minimum elong	2029 Apr 28 04:05	8° ♁ 10'02	0°58'07	minimum elong	2037 Jun 10 02:04	19° ♁ 33'52	4°55'29
retrograde	2029 Aug 16 06:29	12° ♁ 39'32		retrograde	2037 Oct 03 12:50	26° ♁ 01'02	
opposition	2029 Nov 02 09:45	10° ♁ 15'27	-1°-21'00	opposition	2037 Dec 14 21:08	23° ♁ 13'01	-6°-1'-20
min. Earth dist.	2029 Nov 04 18:10	10° ♁ 08'32	16.34050 AU	min. Earth dist.	2037 Dec 20 09:28	22° ♁ 52'36	12.06993 AU
direct	2030 Jan 17 06:39	7° ♁ 53'34		direct	2038 Feb 25 01:32	20° ♁ 22'44	
max. Earth dist.	2030 Apr 29 17:06	12° ♁ 06'05	18.15734 AU	max. Earth dist.	2038 Jun 10 23:23	26° ♁ 21'03	13.72649 AU
conjunction	2030 May 02 15:45	12° ♁ 17'29	-1°-25'-54	conjunction	2038 Jun 18 02:33	26° ♁ 59'40	-5°-23'-49
minimum elong	2030 May 02 15:42	12° ♁ 17'29	1°25'55	minimum elong	2038 Jun 18 02:22	26° ♁ 59'37	5°23'50
retrograde	2030 Aug 21 04:52	16° ♁ 54'35			2038 Jul 22 05:49	0° ♁	
opposition	2030 Nov 06 20:34	14° ♁ 28'29	-1°-52'-55	retrograde	2038 Oct 12 14:48	3° ♁ 56'07	
min. Earth dist.	2030 Nov 09 14:22	14° ♁ 20'16	15.95406 AU	opposition	2038 Dec 22 20:07	1° ♁ 03'52	-6°-36'-6
direct	2031 Jan 21 11:10	12° ♁ 04'18		min. Earth dist.	2038 Dec 28 15:13	0° ♁ 41'30	11.37106 AU
max. Earth dist.	2031 May 03 21:17	16° ♁ 22'51	17.74973 AU		2039 Jan 08 17:06	30° ♁	
				direct	2039 Mar 04 03:55	28° ♁ 08'20	
conjunction	2031 May 07 08:30	16° ♁ 36'38	-1°-54'-26		2039 Apr 26 06:27	0° ♁	
minimum elong	2031 May 07 08:26	16° ♁ 36'37	1°54'28	max. Earth dist.	2039 Jun 19 13:56	4° ♁ 35'57	13.01631 AU
retrograde	2031 Aug 26 07:51	21° ♁ 22'43					
opposition	2031 Nov 11 12:25	18° ♁ 54'22	-2°-25'-52	conjunction	2039 Jun 27 01:47	5° ♁ 19'19	-5°-48'-53
min. Earth dist.	2031 Nov 14 15:50	18° ♁ 44'44	15.52440 AU	minimum elong	2039 Jun 27 01:36	5° ♁ 19'17	5°48'55
direct	2032 Jan 25 19:02	16° ♁ 27'36		retrograde	2039 Oct 22 20:53	12° ♁ 50'34	
max. Earth dist.	2032 May 07 08:49	20° ♁ 53'46	17.29900 AU	opposition	2039 Dec 31 17:57	9° ♁ 54'03	-7°-6'-49
				min. Earth dist.	2040 Jan 06 18:52	9° ♁ 29'43	10.65601 AU
conjunction	2032 May 11 07:20	21° ♁ 09'55	-2°-23'-41	direct	2040 Mar 11 05:38	6° ♁ 53'05	
minimum elong	2032 May 11 07:14	21° ♁ 09'55	2°23'42	max. Earth dist.	2040 Jun 28 10:38	13° ♁ 56'31	12.29649 AU
retrograde	2032 Aug 30 20:02	26° ♁ 06'40					
opposition	2032 Nov 15 10:07	23° ♁ 35'47	-2°-59'-54	conjunction	2040 Jul 06 04:55	14° ♁ 44'45	-6°-8'-15

minimum elong	2040 Jul 06 04:46	14°☿44'42	6°08'16	max. Earth dist.	2047 Oct 25 08:32	0°♁28'02	9.61151 AU
retrograde	2040 Nov 02 09:08	22°♁56'52		retrograde	2048 Feb 23 16:16	11°♁43'32	
opposition	2041 Jan 09 20:02	19°♁56'13	-7°-29'-53	min. Earth dist.	2048 Apr 25 21:54	8°♁43'26	7.76008 AU
min. Earth dist.	2041 Jan 15 21:56	19°♁30'39	9.94047 AU	opposition	2048 Apr 28 03:54	8°♁33'03	1°10'31
direct	2041 Mar 20 07:39	16°♁49'58		direct	2048 Jul 03 10:22	5°♁20'07	
max. Earth dist.	2041 Jul 09 20:40	24°♁36'54	11.58636 AU	conjunction	2048 Nov 08 13:26	16°♁49'11	1°49'10
conjunction	2041 Jul 17 17:04	25°♁29'30	-6°-18'-13	minimum elong	2048 Nov 08 13:11	16°♁49'06	1°49'10
minimum elong	2041 Jul 17 17:01	25°♁29'30	6°18'13	max. Earth dist.	2048 Nov 12 05:51	17°♁19'33	9.96341 AU
	2041 Aug 28 10:14	0°♁		retrograde	2049 Mar 09 18:35	27°♁35'30	
retrograde	2041 Nov 15 10:15	4°♁28'38		min. Earth dist.	2049 May 10 22:58	24°♁43'11	8.19657 AU
opposition	2042 Jan 21 08:07	1°♁24'19	-7°-39'-43	opposition	2049 May 14 19:20	24°♁25'57	3°14'16
min. Earth dist.	2042 Jan 27 05:59	0°♁58'23	9.24738 AU	direct	2049 Jul 21 04:34	21°♁15'52	
	2042 Feb 10 04:08	30°♁			2049 Nov 09 10:07	0°♁	
direct	2042 Mar 30 16:28	28°♁13'17		conjunction	2049 Nov 23 17:02	1°♁50'27	3°19'40
	2042 May 16 22:51	0°♁		minimum elong	2049 Nov 23 16:40	1°♁50'20	3°19'40
max. Earth dist.	2042 Jul 23 06:45	6°♁52'50	10.91370 AU	max. Earth dist.	2049 Nov 28 22:02	2°♁30'50	10.47511 AU
conjunction	2042 Jul 30 19:49	7°♁47'27	-6°-13'-40	retrograde	2050 Mar 23 01:31	11°♁45'47	
minimum elong	2042 Jul 30 19:56	7°♁47'29	6°13'40	min. Earth dist.	2050 May 24 18:52	8°♁59'52	8.76882 AU
retrograde	2042 Nov 30 02:05	17°♁38'14		opposition	2050 May 29 19:30	8°♁38'12	4°50'39
opposition	2043 Feb 03 11:32	14°♁31'00	-7°-28'-30	direct	2050 Aug 06 10:47	5°♁31'36	
min. Earth dist.	2043 Feb 08 23:13	14°♁06'03	8.60921 AU	conjunction	2050 Dec 07 02:10	15°♁08'51	4°29'26
direct	2043 Apr 11 17:39	11°♁16'12		minimum elong	2050 Dec 07 01:49	15°♁08'44	4°29'26
max. Earth dist.	2043 Aug 07 23:23	20°♁56'32	10.31671 AU	max. Earth dist.	2050 Dec 13 07:44	15°♁53'51	11.09518 AU
conjunction	2043 Aug 14 16:52	21°♁48'58	-5°-48'-17	retrograde	2051 Apr 03 17:31	24°♁13'12	
minimum elong	2043 Aug 14 17:11	21°♁49'04	5°48'17	min. Earth dist.	2051 Jun 06 07:46	21°♁32'32	9.42706 AU
	2043 Oct 23 16:48	0°♁		opposition	2051 Jun 12 02:43	21°♁08'35	5°59'21
retrograde	2043 Dec 16 07:50	2°♁31'51		direct	2051 Aug 20 22:45	18°♁06'05	
	2044 Feb 10 08:53	30°♁		conjunction	2051 Dec 18 19:44	26°♁49'39	5°19'30
opposition	2044 Feb 18 09:47	29°♁22'40	-6°-46'-57	minimum elong	2051 Dec 18 19:27	26°♁49'34	5°19'30
min. Earth dist.	2044 Feb 23 01:33	29°♁00'54	8.06871 AU	max. Earth dist.	2051 Dec 25 15:56	27°♁35'32	11.77859 AU
direct	2044 Apr 24 16:39	26°♁05'37			2052 Jan 16 22:17	0°♁	
	2044 Jul 01 17:11	0°♁		retrograde	2052 Apr 12 19:54	5°♁07'20	
max. Earth dist.	2044 Aug 25 00:03	6°♁50'07	9.84360 AU	min. Earth dist.	2052 Jun 16 13:57	2°♁31'14	10.13069 AU
conjunction	2044 Aug 30 07:01	7°♁33'59	-4°-56'-11	opposition	2052 Jun 22 20:14	2°♁06'23	6°44'37
minimum elong	2044 Aug 30 07:30	7°♁34'09	4°56'11		2052 Jul 28 09:26	30°♁	
retrograde	2045 Jan 01 20:33	19°♁01'26		direct	2052 Sep 01 19:02	29°♁08'23	
opposition	2045 Mar 06 00:53	15°♁51'15	-5°-27'-37		2052 Oct 06 12:04	0°♁	
min. Earth dist.	2045 Mar 09 09:15	15°♁35'20	7.67644 AU	conjunction	2052 Dec 28 02:59	7°♁04'40	5°53'02
direct	2045 May 10 13:31	12°♁33'37		minimum elong	2052 Dec 28 02:47	7°♁04'37	5°53'01
max. Earth dist.	2045 Sep 13 23:12	24°♁15'26	9.54625 AU	max. Earth dist.	2053 Jan 04 05:17	7°♁48'58	12.49068 AU
conjunction	2045 Sep 17 04:53	24°♁43'24	-3°-35'-21	retrograde	2053 Apr 21 18:46	14°♁41'33	
minimum elong	2045 Sep 17 05:23	24°♁43'35	3°35'21	min. Earth dist.	2053 Jun 26 16:17	12°♁09'26	10.84953 AU
	2045 Oct 24 20:53	0°♁		opposition	2053 Jul 03 04:38	11°♁44'40	7°11'46
retrograde	2046 Jan 20 00:42	6°♁37'29		direct	2053 Sep 13 04:59	8°♁51'20	
opposition	2046 Mar 23 22:19	3°♁26'51	-3°-31'-12	conjunction	2054 Jan 06 05:54	16°♁07'14	6°13'34
min. Earth dist.	2046 Mar 25 13:02	3°♁19'10	7.48058 AU	minimum elong	2054 Jan 06 05:47	16°♁07'12	6°13'33
direct	2046 May 28 03:39	0°♁10'01		max. Earth dist.	2054 Jan 13 08:59	16°♁48'50	13.20667 AU
conjunction	2046 Oct 05 16:00	12°♁35'18	-1°-51'-29	retrograde	2054 Apr 29 18:24	23°♁09'08	
minimum elong	2046 Oct 05 16:18	12°♁35'25	1°51'30	min. Earth dist.	2054 Jul 05 20:25	20°♁40'21	11.56251 AU
max. Earth dist.	2046 Oct 04 20:51	12°♁28'19	9.46500 AU	opposition	2054 Jul 12 08:58	20°♁16'30	7°25'32
retrograde	2047 Feb 06 22:09	24°♁30'03		direct	2054 Sep 23 06:03	17°♁27'48	
opposition	2047 Apr 11 06:50	21°♁19'19	-1°-11'-8	conjunction	2055 Jan 14 09:11	24°♁09'42	6°24'13
min. Earth dist.	2047 Apr 10 22:30	21°♁20'57	7.50980 AU	minimum elong	2055 Jan 14 09:08	24°♁09'41	6°24'13
direct	2047 Jun 15 18:35	18°♁04'09		max. Earth dist.	2055 Jan 21 11:05	24°♁48'27	13.90917 AU
asc. node	2047 Oct 17 10:38	29°♁19'58			2055 Apr 03 10:59	0°♁	
	2047 Oct 22 02:20	0°♁		retrograde	2055 May 06 20:48	0°♁41'58	
conjunction	2047 Oct 23 17:25	0°♁14'01	0°01'54		2055 Jun 10 03:39	30°♁	
minimum elong	2047 Oct 23 17:25	0°♁14'01	0°01'54	min. Earth dist.	2055 Jul 14 04:43	28°♁16'06	12.25544 AU
behind sun begin	2047 Oct 23 10:08	0°♁11'26		opposition	2055 Jul 20 14:32	27°♁53'32	7°29'34
behind sun end	2047 Oct 24 00:43	0°♁16'36		direct	2055 Oct 02 05:02	25°♁09'17	

	2056 Jan 05 15:42	0°♁		direct	2063 Nov 18 08:54	7°♁54'30	
conjunction	2056 Jan 21 17:00	1°♁22'38	6°27'26	conjunction	2064 Mar 02 00:40	12°♁13'49	4°52'51
minimum elong	2056 Jan 21 17:00	1°♁22'38	6°27'27	minimum elong	2064 Mar 02 00:46	12°♁13'50	4°52'51
max. Earth dist.	2056 Jan 28 13:16	1°♁57'59	14.58651 AU	max. Earth dist.	2064 Mar 06 03:21	12°♁29'35	18.59304 AU
retrograde	2056 May 12 09:42	7°♁29'56		retrograde	2064 Jun 18 13:17	16°♁39'05	
min. Earth dist.	2056 Jul 20 18:40	5°♁06'45	12.91852 AU	min. Earth dist.	2064 Sep 02 11:10	14°♁26'26	16.75973 AU
opposition	2056 Jul 27 00:57	4°♁45'29	7°26'36	opposition	2064 Sep 06 01:24	14°♁16'16	5°17'16
direct	2056 Oct 09 07:40	2°♁05'21		direct	2064 Nov 21 21:14	11°♁57'47	
conjunction	2057 Jan 27 09:15	7°♁54'48	6°25'06	conjunction	2065 Mar 06 05:07	16°♁10'56	4°34'17
minimum elong	2057 Jan 27 09:17	7°♁54'49	6°25'06	minimum elong	2065 Mar 06 05:14	16°♁10'57	4°34'17
max. Earth dist.	2057 Feb 02 23:27	8°♁27'07	15.23103 AU	max. Earth dist.	2065 Mar 09 21:45	16°♁24'49	18.90196 AU
retrograde	2057 May 18 09:54	13°♁40'57		retrograde	2065 Jun 22 15:14	20°♁30'38	
min. Earth dist.	2057 Jul 27 20:18	11°♁19'53	13.54557 AU	min. Earth dist.	2065 Sep 07 00:38	18°♁18'31	17.04652 AU
opposition	2057 Aug 02 19:25	11°♁00'15	7°18'34	opposition	2065 Sep 10 07:03	18°♁09'23	4°55'32
direct	2057 Oct 16 14:34	8°♁23'57		direct	2065 Nov 26 06:00	15°♁52'22	
conjunction	2058 Feb 02 12:15	13°♁53'16	6°18'35	conjunction	2066 Mar 10 06:40	20°♁00'26	4°15'00
minimum elong	2058 Feb 02 12:20	13°♁53'17	6°18'36	minimum elong	2066 Mar 10 06:46	20°♁00'27	4°15'00
max. Earth dist.	2058 Feb 08 19:00	14°♁22'37	15.83760 AU	max. Earth dist.	2066 Mar 13 14:32	20°♁12'43	19.16765 AU
retrograde	2058 May 23 22:58	19°♁21'32		retrograde	2066 Jun 26 13:57	24°♁15'35	
min. Earth dist.	2058 Aug 03 08:16	17°♁02'27	14.13286 AU	min. Earth dist.	2066 Sep 11 13:30	22°♁03'33	17.29008 AU
opposition	2058 Aug 09 00:56	16°♁44'15	7°06'51	opposition	2066 Sep 14 09:58	21°♁55'39	4°33'12
direct	2058 Oct 23 05:54	14°♁11'25		direct	2066 Nov 30 10:04	19°♁39'54	
conjunction	2059 Feb 08 04:27	19°♁23'44	6°08'55	conjunction	2067 Mar 14 05:49	23°♁43'48	3°55'05
minimum elong	2059 Feb 08 04:32	19°♁23'45	6°08'55	minimum elong	2067 Mar 14 05:56	23°♁43'49	3°55'04
max. Earth dist.	2059 Feb 14 02:37	19°♁50'16	16.40356 AU	max. Earth dist.	2067 Mar 17 03:41	23°♁54'24	19.39017 AU
retrograde	2059 May 29 04:26	24°♁36'48		retrograde	2067 Jun 30 12:53	27°♁55'18	
min. Earth dist.	2059 Aug 09 10:39	22°♁19'20	14.67818 AU	min. Earth dist.	2067 Sep 15 21:51	25°♁43'23	17.49018 AU
opposition	2059 Aug 14 19:24	22°♁02'37	6°52'25	opposition	2067 Sep 18 10:22	25°♁36'28	4°10'22
direct	2059 Oct 29 11:58	19°♁32'55		direct	2067 Dec 04 12:33	23°♁21'44	
conjunction	2060 Feb 13 11:33	24°♁30'51	5°56'49	conjunction	2068 Mar 17 03:24	27°♁22'22	3°34'35
minimum elong	2060 Feb 13 11:40	24°♁30'52	5°56'48	minimum elong	2068 Mar 17 03:30	27°♁22'23	3°34'36
max. Earth dist.	2060 Feb 19 01:55	24°♁54'57	16.92727 AU	max. Earth dist.	2068 Mar 19 15:58	27°♁31'26	19.56907 AU
retrograde	2060 Jun 02 00:44	29°♁30'59		retrograde	2068 May 03 14:09	0°♁	
min. Earth dist.	2060 Aug 14 04:25	27°♁14'52	15.18089 AU	retrograde	2068 Jul 03 09:03	1°♁31'03	
opposition	2060 Aug 19 04:53	26°♁59'36	6°35'55	min. Earth dist.	2068 Sep 03 19:34	30°♁	
direct	2060 Nov 03 04:25	24°♁32'41		opposition	2068 Sep 19 06:40	29°♁18'47	17.64657 AU
conjunction	2061 Feb 17 11:14	29°♁18'26	5°42'49	direct	2068 Sep 21 08:55	29°♁13'05	3°47'01
minimum elong	2061 Feb 17 11:21	29°♁18'27	5°42'49	direct	2068 Dec 07 10:48	26°♁59'07	
max. Earth dist.	2061 Feb 22 16:08	29°♁40'05	17.40831 AU	direct	2069 Mar 04 18:50	0°♁	
retrograde	2061 Feb 27 11:42	0°♁		conjunction	2069 Mar 20 23:47	0°♁57'16	3°13'35
min. Earth dist.	2061 Jun 06 17:04	4°♁07'34		minimum elong	2069 Mar 20 23:52	0°♁57'17	3°13'34
opposition	2061 Aug 19 13:49	1°♁52'41	15.64033 AU	max. Earth dist.	2069 Mar 23 02:13	1°♁04'46	19.70420 AU
direct	2061 Aug 24 06:30	1°♁38'42	6°17'52	retrograde	2069 Jul 07 06:44	5°♁03'53	
direct	2061 Sep 29 19:07	30°♁		min. Earth dist.	2069 Sep 23 11:56	2°♁51'18	17.75882 AU
direct	2061 Nov 08 14:18	29°♁14'17		opposition	2069 Sep 25 05:55	2°♁46'33	3°23'13
direct	2061 Dec 17 12:59	0°♁		direct	2069 Dec 11 09:11	0°♁33'06	
conjunction	2062 Feb 22 04:37	3°♁49'43	5°27'18	conjunction	2070 Mar 24 19:11	4°♁29'33	2°52'04
minimum elong	2062 Feb 22 04:44	3°♁49'44	5°27'18	minimum elong	2070 Mar 24 19:16	4°♁29'34	2°52'05
max. Earth dist.	2062 Feb 27 01:25	4°♁09'20	17.84619 AU	max. Earth dist.	2070 Mar 26 11:32	4°♁35'30	19.79492 AU
retrograde	2062 Jun 11 02:36	8°♁29'31		retrograde	2070 Jul 11 01:50	8°♁34'49	
min. Earth dist.	2062 Aug 24 18:19	6°♁15'30	16.05663 AU	min. Earth dist.	2070 Sep 27 18:25	6°♁21'26	17.82665 AU
opposition	2062 Aug 29 01:48	6°♁02'55	5°58'36	opposition	2070 Sep 29 02:01	6°♁17'52	2°58'56
direct	2062 Nov 13 14:09	3°♁40'43		direct	2070 Dec 15 04:15	4°♁04'42	
conjunction	2063 Feb 26 16:52	8°♁07'24	5°10'35	conjunction	2071 Mar 28 14:10	8°♁00'08	2°30'04
minimum elong	2063 Feb 26 16:59	8°♁07'26	5°10'35	minimum elong	2071 Mar 28 14:15	8°♁00'09	2°30'03
max. Earth dist.	2063 Mar 03 03:49	8°♁24'55	18.24116 AU	max. Earth dist.	2071 Mar 29 20:32	8°♁04'36	19.84146 AU
retrograde	2063 Jun 15 10:16	12°♁39'18		retrograde	2071 Jul 14 23:08	12°♁04'45	
min. Earth dist.	2063 Aug 29 15:53	10°♁26'12	16.42973 AU	opposition	2071 Oct 02 21:22	9°♁47'57	2°34'09
opposition	2063 Sep 02 15:45	10°♁14'43	5°38'20	min. Earth dist.	2071 Oct 01 22:01	9°♁50'35	17.85023 AU

direct	2071 Dec 18 23:50	7°♄34'49		retrograde	2079 Aug 15 02:12	11°♄30'19	
				opposition	2079 Nov 01 09:25	9°♄07'01	-1°-7'-30
conjunction	2072 Mar 31 08:50	11°♄29'56	2°07'33	min. Earth dist.	2079 Nov 03 12:10	9°♄00'51	16.48671 AU
minimum elong	2072 Mar 31 08:54	11°♄29'56	2°07'33	direct	2080 Jan 16 09:48	6°♄46'05	
max. Earth dist.	2072 Apr 01 04:38	11°♄32'50	19.84381 AU	max. Earth dist.	2080 Apr 27 19:29	10°♄56'33	18.31456 AU
retrograde	2072 Jul 17 19:15	15°♄34'37					
opposition	2072 Oct 05 16:33	13°♄17'42	2°08'50	conjunction	2080 Apr 30 13:05	11°♄07'03	-1°-13'-46
min. Earth dist.	2072 Oct 05 03:30	13°♄19'11	17.82988 AU	minimum elong	2080 Apr 30 13:03	11°♄07'02	1°13'47
direct	2072 Dec 21 17:19	11°♄04'23		retrograde	2080 Aug 18 20:43	15°♄40'57	
				opposition	2080 Nov 04 18:45	13°♄15'52	-1°-38'-57
conjunction	2073 Apr 04 03:55	14°♄59'52	1°44'31	min. Earth dist.	2080 Nov 07 08:06	13°♄08'16	16.12270 AU
minimum elong	2073 Apr 04 03:58	14°♄59'53	1°44'31	direct	2081 Jan 19 11:31	10°♄52'50	
max. Earth dist.	2073 Apr 04 14:02	15°♄01'21	19.80258 AU	max. Earth dist.	2081 May 01 23:34	15°♄09'07	17.92909 AU
retrograde	2073 Jul 21 17:18	19°♄05'17					
opposition	2073 Oct 09 11:29	16°♄48'05	1°42'57	conjunction	2081 May 05 03:55	15°♄21'38	-1°-41'-58
min. Earth dist.	2073 Oct 09 06:40	16°♄48'38	17.76616 AU	minimum elong	2081 May 05 03:51	15°♄21'37	1°41'59
direct	2073 Dec 25 11:32	14°♄34'19		retrograde	2081 Aug 23 23:02	20°♄03'55	
				opposition	2081 Nov 09 08:21	17°♄36'45	-2°-11'-26
conjunction	2074 Apr 07 23:27	18°♄30'56	1°20'56	min. Earth dist.	2081 Nov 12 06:57	17°♄27'50	15.71458 AU
minimum elong	2074 Apr 07 23:29	18°♄30'56	1°20'56	direct	2082 Jan 23 18:25	15°♄11'19	
max. Earth dist.	2074 Apr 07 22:39	18°♄30'49	19.71813 AU	max. Earth dist.	2082 May 06 06:26	19°♄34'16	17.49911 AU
retrograde	2074 Jul 25 15:52	22°♄37'50					
opposition	2074 Oct 13 07:14	20°♄20'07	1°16'26	conjunction	2082 May 10 00:17	19°♄49'24	-2°-10'-54
min. Earth dist.	2074 Oct 13 12:31	20°♄19'31	17.65953 AU	minimum elong	2082 May 10 00:12	19°♄49'23	2°10'54
direct	2074 Dec 29 04:10	18°♄05'44		retrograde	2082 Aug 29 07:08	24°♄41'35	
				opposition	2082 Nov 14 03:47	22°♄12'03	-2°-44'-58
conjunction	2075 Apr 11 20:01	22°♄04'11	0°56'46	min. Earth dist.	2082 Nov 17 12:59	22°♄01'33	15.26184 AU
minimum elong	2075 Apr 11 20:03	22°♄04'12	0°56'46	direct	2083 Jan 28 04:27	19°♄43'51	
max. Earth dist.	2075 Apr 11 09:54	22°♄02'41	19.59102 AU	max. Earth dist.	2083 May 10 22:08	24°♄15'16	17.02446 AU
retrograde	2075 Jul 29 17:04	26°♄13'20					
opposition	2075 Oct 17 03:47	23°♄54'55	0°49'14	conjunction	2083 May 15 03:26	24°♄32'54	-2°-40'-30
min. Earth dist.	2075 Oct 17 17:10	23°♄53'22	17.51030 AU	minimum elong	2083 May 15 03:20	24°♄32'53	2°40'31
direct	2076 Jan 01 23:05	21°♄39'40		retrograde	2083 Sep 04 01:04	29°♄36'45	
				opposition	2083 Nov 19 05:40	27°♄04'30	-3°-19'-34
conjunction	2076 Apr 14 18:10	25°♄40'47	0°32'00	min. Earth dist.	2083 Nov 23 00:37	26°♄52'26	14.76467 AU
minimum elong	2076 Apr 14 18:11	25°♄40'47	0°31'59	direct	2084 Feb 01 21:37	24°♄33'06	
max. Earth dist.	2076 Apr 13 20:42	25°♄37'34	19.42128 AU	max. Earth dist.	2084 May 14 19:16	29°♄14'19	16.50534 AU
retrograde	2076 Aug 01 19:39	29°♄52'58					
opposition	2076 Oct 20 01:46	27°♄33'38	0°21'18	conjunction	2084 May 19 14:44	29°♄35'10	-3°-10'-43
min. Earth dist.	2076 Oct 21 01:21	27°♄30'54	17.31855 AU	minimum elong	2084 May 19 14:37	29°♄35'08	3°10'43
direct	2077 Jan 04 16:07	25°♄17'19			2084 May 25 08:09	0°♂	
max. Earth dist.	2077 Apr 17 11:26	29°♄17'14	19.20903 AU	retrograde	2084 Sep 09 02:38	4°♂52'44	
				opposition	2084 Nov 23 15:26	2°♂17'25	-3°-55'-11
conjunction	2077 Apr 18 18:29	29°♄21'56	0°06'37	min. Earth dist.	2084 Nov 27 20:25	2°♂03'37	14.22362 AU
minimum elong	2077 Apr 18 18:29	29°♄21'56	0°06'38		2085 Jan 14 02:25	30°♂	
behind sun begin	2077 Apr 18 12:13	29°♄21'00		direct	2085 Feb 05 20:10	29°♂42'27	
behind sun end	2077 Apr 19 00:45	29°♄22'51			2085 Feb 28 13:51	0°♂	
	2077 Apr 29 06:15	0°♂		max. Earth dist.	2085 May 20 04:14	4°♂35'55	15.94303 AU
desc. node	2077 Jul 21 13:28	3°♂31'31					
retrograde	2077 Aug 06 02:28	3°♂38'01		conjunction	2085 May 25 11:39	4°♂59'55	-3°-41'-21
opposition	2077 Oct 24 01:36	1°♂17'35	0°-7'-25	minimum elong	2085 May 25 11:31	4°♂59'53	3°41'22
min. Earth dist.	2077 Oct 25 09:26	1°♂13'50	17.08419 AU	retrograde	2085 Sep 15 16:18	10°♂33'42	
	2077 Nov 22 04:37	30°♄		opposition	2085 Nov 29 10:41	7°♂54'58	-4°-31'-39
direct	2078 Jan 08 13:05	28°♄59'59		min. Earth dist.	2085 Dec 04 01:51	7°♂39'18	13.64061 AU
	2078 Feb 24 03:04	0°♂		direct	2086 Feb 11 04:10	5°♂15'58	
max. Earth dist.	2078 Apr 21 02:09	3°♂02'23	18.95398 AU	max. Earth dist.	2086 May 25 22:49	10°♂23'56	15.33952 AU
conjunction	2078 Apr 22 21:07	3°♂08'59	0°-19'-31	conjunction	2086 May 31 19:59	10°♂51'44	-4°-12'-8
minimum elong	2078 Apr 22 21:06	3°♂08'59	0°19'33	minimum elong	2086 May 31 19:49	10°♂51'42	4°12'09
retrograde	2078 Aug 10 11:15	7°♂29'57		retrograde	2086 Sep 22 19:38	16°♂44'44	
opposition	2078 Oct 28 04:04	5°♂08'11	0°-37'00	opposition	2086 Dec 05 17:31	14°♂02'17	-5°-8'-39
min. Earth dist.	2078 Oct 29 22:12	5°♂03'09	16.80698 AU	min. Earth dist.	2086 Dec 10 17:10	13°♂44'48	13.01818 AU
direct	2079 Jan 12 09:12	2°♂49'03		direct	2087 Feb 16 21:20	11°♂18'50	
max. Earth dist.	2079 Apr 24 22:14	6°♂55'10	18.65600 AU	max. Earth dist.	2087 Jun 01 09:06	16°♂44'38	14.69826 AU
conjunction	2079 Apr 27 03:11	7°♂03'28	0°-46'-17	conjunction	2087 Jun 07 18:24	17°♂16'26	-4°-42'-33
minimum elong	2079 Apr 27 03:10	7°♂03'28	0°46'18	minimum elong	2087 Jun 07 18:12	17°♂16'24	4°42'34

retrograde	2087 Sep 30 16:22	23° Π 32'14		conjunction	2095 Sep 10 01:48	17° Υ 41'07	-4°-12'-47
opposition	2087 Dec 12 14:13	20° Π 45'47	-5°-45'-34	minimum elong	2095 Sep 10 02:19	17° Υ 41'18	4°12'48
min. Earth dist.	2087 Dec 17 23:31	20° Π 26'09	12.36044 AU	retrograde	2096 Jan 12 22:08	29° Υ 27'15	
direct	2088 Feb 23 02:50	17° Π 57'26		opposition	2096 Mar 15 20:18	26° Υ 16'42	-4°-24'-11
max. Earth dist.	2088 Jun 07 13:02	23° Π 44'59	14.02376 AU	min. Earth dist.	2096 Mar 18 07:06	26° Υ 05'00	7.53059 AU
				direct	2096 May 20 02:26	22° Υ 59'17	
conjunction	2088 Jun 14 10:05	24° Π 21'14	-5°-11'-47		2096 Aug 20 08:12	0° Ω	
minimum elong	2088 Jun 14 09:53	24° Π 21'11	5°11'48	max. Earth dist.	2096 Sep 25 12:08	5° Ω 05'50	9.46128 AU
	2088 Aug 28 05:07	0° Θ					
retrograde	2088 Oct 08 10:28	1° Θ 04'08		conjunction	2096 Sep 27 10:46	5° Ω 22'50	-2°-37'-8
	2088 Nov 18 16:48	30° Π		minimum elong	2096 Sep 27 11:11	5° Ω 22'59	2°37'08
opposition	2088 Dec 19 04:04	28° Π 13'27	-6°-21'-20	retrograde	2097 Jan 30 03:03	17° Ω 22'18	
min. Earth dist.	2088 Dec 24 20:10	27° Π 51'55	11.67318 AU	opposition	2097 Apr 03 03:51	14° Ω 11'35	-2°-11'-15
direct	2089 Feb 28 22:47	25° Π 19'56		min. Earth dist.	2097 Apr 03 17:28	14° Ω 08'53	7.45531 AU
	2089 May 29 11:02	0° Θ		direct	2097 Jun 07 09:39	10° Ω 55'35	
max. Earth dist.	2089 Jun 15 13:51	1° Θ 33'48	13.32326 AU				
				conjunction	2097 Oct 15 20:36	23° Ω 17'54	0°-45'-21
conjunction	2089 Jun 22 22:21	2° Θ 15'05	-5°-38'-31	minimum elong	2097 Oct 15 20:44	23° Ω 17'57	0°45'22
minimum elong	2089 Jun 22 22:09	2° Θ 15'02	5°38'32	max. Earth dist.	2097 Oct 16 10:01	23° Ω 22'46	9.50447 AU
retrograde	2089 Oct 18 02:17	9° Θ 30'11			2097 Dec 03 14:12	0° Υ	
opposition	2089 Dec 27 15:04	6° Θ 35'12	-6°-54'-9	retrograde	2098 Feb 16 13:28	5° Υ 03'31	
min. Earth dist.	2090 Jan 02 13:02	6° Θ 11'47	10.96497 AU	asc. node	2098 Mar 16 20:21	4° Υ 18'58	
direct	2090 Mar 08 12:00	3° Θ 36'17		min. Earth dist.	2098 Apr 20 00:58	1° Υ 59'21	7.60736 AU
max. Earth dist.	2090 Jun 24 20:41	10° Θ 23'01	12.60732 AU	opposition	2098 Apr 21 10:15	1° Υ 52'52	0°13'17
					2098 May 17 06:44	30° Ω	
conjunction	2090 Jul 02 12:02	11° Θ 09'00	-6°00'-42	direct	2098 Jun 26 05:09	28° Ω 38'53	
minimum elong	2090 Jul 02 11:51	11° Θ 08'58	6°00'43		2098 Aug 04 00:11	0° Υ	
retrograde	2090 Oct 29 00:20	19° Θ 02'13					
opposition	2091 Jan 06 03:45	16° Θ 02'59	-7°-21'-2	conjunction	2098 Nov 02 09:16	10° Υ 30'43	1°06'49
min. Earth dist.	2091 Jan 12 05:39	15° Θ 37'51	10.24896 AU	minimum elong	2098 Nov 02 09:06	10° Υ 30'40	1°06'49
direct	2091 Mar 17 03:00	12° Θ 58'40		max. Earth dist.	2098 Nov 05 04:58	10° Υ 54'32	9.76698 AU
max. Earth dist.	2091 Jul 05 13:20	20° Θ 25'27	11.89165 AU	retrograde	2099 Mar 04 12:25	21° Υ 39'59	
				min. Earth dist.	2099 May 05 14:47	18° Υ 44'11	7.96425 AU
conjunction	2091 Jul 13 08:33	21° Θ 15'59	-6°-15'-14	opposition	2099 May 08 18:11	18° Υ 29'55	2°27'12
minimum elong	2091 Jul 13 08:28	21° Θ 15'58	6°15'14	direct	2099 Jul 14 12:56	15° Υ 18'26	
retrograde	2091 Nov 10 08:20	29° Θ 53'31					
opposition	2092 Jan 16 23:47	26° Θ 50'23	-7°-37'-20	conjunction	2099 Nov 18 09:18	26° Υ 20'24	2°45'47
min. Earth dist.	2092 Jan 23 00:07	26° Θ 24'28	9.54399 AU	minimum elong	2099 Nov 18 08:57	26° Υ 20'17	2°45'47
direct	2092 Mar 25 21:25	23° Θ 41'03		max. Earth dist.	2099 Nov 22 23:16	26° Υ 57'02	10.21129 AU
	2092 Jun 30 00:25	0° Ω			2099 Dec 16 10:41	0° Υ	
max. Earth dist.	2092 Jul 17 00:12	1° Ω 56'11	11.19944 AU				
conjunction	2092 Jul 24 17:26	2° Ω 50'11	-6°-17'-36				
minimum elong	2092 Jul 24 17:29	2° Ω 50'11	6°17'37				
retrograde	2092 Nov 23 06:27	12° Ω 17'40					
opposition	2093 Jan 28 08:58	9° Ω 11'18	-7°-36'-13				
min. Earth dist.	2093 Feb 03 01:47	8° Ω 45'43	8.87745 AU				
direct	2093 Apr 06 02:54	5° Ω 57'43					
max. Earth dist.	2093 Jul 31 15:04	15° Ω 10'09	10.56370 AU				
conjunction	2093 Aug 07 19:19	16° Ω 04'20	-6°-1'-55				
minimum elong	2093 Aug 07 19:34	16° Ω 04'25	6°01'56				
retrograde	2093 Dec 08 20:06	26° Ω 24'38					
opposition	2094 Feb 11 12:03	23° Ω 15'56	-7°-8'-43				
min. Earth dist.	2094 Feb 16 13:30	22° Ω 52'30	8.28731 AU				
direct	2094 Apr 19 03:48	19° Ω 59'27					
	2094 Aug 15 16:28	0° Υ					
max. Earth dist.	2094 Aug 17 14:46	0° Υ 15'32	10.02832 AU				
conjunction	2094 Aug 23 15:44	1° Υ 04'23	-5°-21'-44				
minimum elong	2094 Aug 23 16:10	1° Υ 04'32	5°21'44				
retrograde	2094 Dec 25 21:16	12° Υ 14'10					
opposition	2095 Feb 27 09:56	9° Υ 04'09	-6°-5'-56				
min. Earth dist.	2095 Mar 03 09:41	8° Υ 45'16	7.82130 AU				
direct	2095 May 04 04:34	5° Υ 46'24					
max. Earth dist.	2095 Sep 05 19:36	17° Υ 04'50	9.64482 AU				