

conjunction	1600 Apr 12 11:53	22°♃44'15	-16°-40'-27		1608 Mar 28 22:24	0°♄	
minimum elong	1600 Apr 12 11:58	22°♃44'15	16°40'29				
max. Earth dist.	1600 Apr 14 03:52	22°♃46'34	49.60046 AU	conjunction	1608 Apr 20 09:42	0°♄30'17	-16°-14'-36
retrograde	1600 Jul 24 11:38	24°♃15'40		minimum elong	1608 Apr 20 09:50	0°♄30'17	16°14'37
min. Earth dist.	1600 Oct 14 19:17	23°♃16'49	47.72286 AU	max. Earth dist.	1608 Apr 21 17:15	0°♄32'06	50.05823 AU
opposition	1600 Oct 16 09:14	23°♃15'01	-17°-20'-37	retrograde	1608 Aug 01 05:25	2°♄00'29	
direct	1601 Jan 05 15:05	22°♃15'42		min. Earth dist.	1608 Oct 22 21:10	1°♄01'51	48.16109 AU
				opposition	1608 Oct 24 02:40	1°♄00'28	-16°-52'-15
conjunction	1601 Apr 13 17:45	23°♃43'07	-16°-38'-11	direct	1609 Jan 13 10:20	0°♄01'41	
minimum elong	1601 Apr 13 17:51	23°♃43'07	16°38'11				
max. Earth dist.	1601 Apr 15 08:49	23°♃45'23	49.66881 AU	conjunction	1609 Apr 21 15:27	1°♄28'06	-16°-10'-15
retrograde	1601 Jul 25 18:22	25°♃14'19		minimum elong	1609 Apr 21 15:36	1°♄28'07	16°10'17
min. Earth dist.	1601 Oct 16 02:29	24°♃15'27	47.78937 AU	max. Earth dist.	1609 Apr 22 22:28	1°♄29'53	50.09631 AU
opposition	1601 Oct 17 14:44	24°♃13'44	-17°-18'-3	retrograde	1609 Aug 02 10:19	2°♄58'11	
direct	1602 Jan 06 18:27	23°♃14'28		min. Earth dist.	1609 Oct 24 03:56	1°♄59'32	48.19572 AU
				opposition	1609 Oct 25 07:35	1°♄58'14	-16°-47'-35
conjunction	1602 Apr 14 23:38	24°♃41'42	-16°-35'-38	direct	1610 Jan 14 17:11	0°♄59'29	
minimum elong	1602 Apr 14 23:44	24°♃41'42	16°35'39				
max. Earth dist.	1602 Apr 16 14:35	24°♃43'57	49.73432 AU	conjunction	1610 Apr 22 21:02	2°♄25'48	-16°-5'-41
retrograde	1602 Jul 26 20:27	26°♃12'43		minimum elong	1610 Apr 22 21:10	2°♄25'48	16°05'41
min. Earth dist.	1602 Oct 17 07:57	25°♃13'54	47.85289 AU	max. Earth dist.	1610 Apr 24 02:08	2°♄27'28	50.12926 AU
opposition	1602 Oct 18 20:00	25°♃12'12	-17°-15'-11	retrograde	1610 Aug 03 18:04	3°♄55'45	
direct	1603 Jan 08 02:37	24°♃12'59		min. Earth dist.	1610 Oct 25 09:10	2°♄57'07	48.22533 AU
				opposition	1610 Oct 26 12:22	2°♄55'50	-16°-42'-41
conjunction	1603 Apr 16 05:22	25°♃40'04	-16°-32'-47	direct	1611 Jan 15 19:56	1°♄57'07	
minimum elong	1603 Apr 16 05:29	25°♃40'05	16°32'48				
max. Earth dist.	1603 Apr 17 18:26	25°♃42'13	49.79694 AU	conjunction	1611 Apr 24 02:34	3°♄23'20	-16°00'-52
retrograde	1603 Jul 28 00:59	27°♃10'55		minimum elong	1611 Apr 24 02:42	3°♄23'21	16°00'54
min. Earth dist.	1603 Oct 18 13:56	26°♃12'09	47.91362 AU	max. Earth dist.	1611 Apr 25 06:18	3°♄24'55	50.15725 AU
opposition	1603 Oct 20 01:11	26°♃10'28	-17°-12'-2	retrograde	1611 Aug 05 01:13	4°♄53'09	
direct	1604 Jan 09 09:10	25°♃11'20		opposition	1611 Oct 27 17:06	3°♄53'17	-16°-37'-32
				min. Earth dist.	1611 Oct 26 16:04	3°♄54'27	48.25036 AU
conjunction	1604 Apr 16 11:07	26°♃38'16	-16°-29'-40	direct	1612 Jan 16 22:04	2°♄54'35	
minimum elong	1604 Apr 16 11:13	26°♃38'17	16°29'41				
max. Earth dist.	1604 Apr 18 00:22	26°♃40'25	49.85669 AU	conjunction	1612 Apr 24 08:03	4°♄20'42	-15°-55'-50
retrograde	1604 Jul 28 06:58	28°♃08'59		minimum elong	1612 Apr 24 08:12	4°♄20'43	15°55'50
min. Earth dist.	1604 Oct 18 20:38	27°♃10'13	47.97125 AU	max. Earth dist.	1612 Apr 25 11:21	4°♄22'16	50.18115 AU
opposition	1604 Oct 20 06:26	27°♃08'37	-17°-8'-35	retrograde	1612 Aug 05 03:23	5°♄50'24	
direct	1605 Jan 09 15:22	26°♃09'33		opposition	1612 Oct 27 21:43	4°♄50'34	-16°-32'-9
				min. Earth dist.	1612 Oct 26 20:54	4°♄51'44	48.27144 AU
conjunction	1605 Apr 17 16:39	27°♃36'22	-16°-26'-17	direct	1613 Jan 17 04:55	3°♄51'53	
minimum elong	1605 Apr 17 16:47	27°♃36'22	16°26'18				
max. Earth dist.	1605 Apr 19 04:30	27°♃38'26	49.91339 AU	conjunction	1613 Apr 25 13:13	5°♄17'55	-15°-50'-32
retrograde	1605 Jul 29 14:35	29°♃06'56		minimum elong	1613 Apr 25 13:22	5°♄17'56	15°50'33
min. Earth dist.	1605 Oct 20 01:45	28°♃08'16	48.02551 AU	max. Earth dist.	1613 Apr 26 14:34	5°♄19'22	50.20137 AU
opposition	1605 Oct 21 11:33	28°♃06'40	-17°-4'-53	retrograde	1613 Aug 06 06:36	6°♄47'30	
direct	1606 Jan 10 18:28	27°♃07'41		min. Earth dist.	1613 Oct 28 02:44	5°♄48'49	48.28915 AU
				opposition	1613 Oct 29 02:25	5°♄47'42	-16°-26'-29
conjunction	1606 Apr 18 22:20	28°♃34'23	-16°-22'-38	direct	1614 Jan 18 11:32	4°♄49'03	
minimum elong	1606 Apr 18 22:27	28°♃34'24	16°22'38				
max. Earth dist.	1606 Apr 20 08:55	28°♃36'23	49.96626 AU	conjunction	1614 Apr 26 18:40	6°♄15'01	-15°-44'-59
	1606 Jul 09 06:53	0°♄		minimum elong	1614 Apr 26 18:50	6°♄15'01	15°45'00
retrograde	1606 Jul 30 20:48	0°♄04'50		max. Earth dist.	1614 Apr 27 20:05	6°♄16'28	50.21831 AU
	1606 Aug 21 10:04	30°♃		retrograde	1614 Aug 07 11:13	7°♄44'30	
min. Earth dist.	1606 Oct 21 09:00	29°♃06'09	48.07568 AU	min. Earth dist.	1614 Oct 29 08:34	6°♄45'48	48.30358 AU
opposition	1606 Oct 22 16:37	29°♃04'39	-17°00'-54	opposition	1614 Oct 30 06:54	6°♄44'45	-16°-20'-35
direct	1607 Jan 11 22:19	28°♃05'45		direct	1615 Jan 19 18:16	5°♄46'07	
conjunction	1607 Apr 20 04:11	29°♃32'22	-16°-18'-44	conjunction	1615 Apr 27 23:59	7°♄12'01	-15°-39'-11
minimum elong	1607 Apr 20 04:19	29°♃32'23	16°18'45	minimum elong	1615 Apr 28 00:08	7°♄12'01	15°39'13
max. Earth dist.	1607 Apr 21 14:13	29°♃34'19	50.01481 AU	max. Earth dist.	1615 Apr 28 23:50	7°♄13'22	50.23227 AU
	1607 May 10 13:01	0°♄		retrograde	1615 Aug 08 18:57	8°♄41'25	
retrograde	1607 Jul 31 23:49	1°♄02'41		opposition	1615 Oct 31 11:24	7°♄41'43	-16°-14'-24
opposition	1607 Oct 23 21:35	0°♄02'36	-16°-56'-42	min. Earth dist.	1615 Oct 30 13:02	7°♄42'46	48.31503 AU
min. Earth dist.	1607 Oct 22 14:43	0°♄04'03	48.12100 AU	direct	1616 Jan 20 20:57	6°♄43'07	
	1607 Oct 26 04:38	30°♃					
direct	1608 Jan 13 04:49	29°♃03'45		conjunction	1616 Apr 28 05:06	8°♄08'57	-15°-33'-8

minimum elong	1616 Apr 28 05:17	8°♃08'58	15°33'09	opposition	1624 Nov 08 03:12	16°♃12'49	-15°-8'-8
max. Earth dist.	1616 Apr 29 03:57	8°♃10'15	50.24309 AU	min. Earth dist.	1624 Nov 07 16:40	16°♃13'18	48.22563 AU
retrograde	1616 Aug 09 01:12	9°♃38'18		direct	1625 Jan 28 16:21	15°♃14'14	
opposition	1616 Oct 31 16:02	8°♃38'38	-16°-7'-58				
min. Earth dist.	1616 Oct 30 19:30	8°♃39'36	48.32329 AU	conjunction	1625 May 07 04:52	16°♃39'50	-14°-28'-20
direct	1617 Jan 20 23:31	7°♃40'05		minimum elong	1625 May 07 05:03	16°♃39'51	14°28'21
				max. Earth dist.	1625 May 07 16:08	16°♃40'28	50.14382 AU
conjunction	1617 Apr 29 10:27	9°♃05'53	-15°-26'-49	retrograde	1625 Aug 17 19:31	18°♃08'40	
minimum elong	1617 Apr 29 10:36	9°♃05'54	15°26'51	opposition	1625 Nov 09 07:19	17°♃09'09	-14°-59'-37
max. Earth dist.	1617 Apr 30 09:02	9°♃07'10	50.25076 AU	min. Earth dist.	1625 Nov 08 20:54	17°♃09'39	48.19325 AU
retrograde	1617 Aug 10 04:32	10°♃35'09		direct	1626 Jan 29 19:36	16°♃10'33	
opposition	1617 Nov 01 20:25	9°♃35'33	-16°-1'-16				
min. Earth dist.	1617 Nov 01 00:16	9°♃36'30	48.32804 AU	conjunction	1626 May 08 10:05	17°♃36'09	-14°-20'-1
direct	1618 Jan 22 04:18	8°♃37'02		minimum elong	1626 May 08 10:16	17°♃36'10	14°20'02
				max. Earth dist.	1626 May 08 20:12	17°♃36'43	50.11104 AU
conjunction	1618 Apr 30 15:41	10°♃02'49	-15°-20'-16	retrograde	1626 Aug 19 01:47	19°♃04'58	
minimum elong	1618 Apr 30 15:52	10°♃02'50	15°20'18	opposition	1626 Nov 10 11:38	18°♃05'27	-14°-50'-51
max. Earth dist.	1618 May 01 12:02	10°♃03'58	50.25464 AU	min. Earth dist.	1626 Nov 10 03:08	18°♃05'51	48.15774 AU
retrograde	1618 Aug 11 09:09	11°♃32'02		direct	1627 Jan 30 22:18	17°♃06'50	
min. Earth dist.	1618 Nov 02 06:12	10°♃33'21	48.32872 AU				
opposition	1618 Nov 03 00:54	10°♃32'29	-15°-54'-20	conjunction	1627 May 09 15:21	18°♃32'27	-14°-11'-26
direct	1619 Jan 23 09:27	9°♃33'59		minimum elong	1627 May 09 15:33	18°♃32'28	14°11'27
				max. Earth dist.	1627 May 10 01:17	18°♃33'01	50.07538 AU
conjunction	1619 May 01 21:09	10°♃59'45	-15°-13'-30	retrograde	1627 Aug 20 05:25	20°♃01'15	
minimum elong	1619 May 01 21:18	10°♃59'46	15°13'30	opposition	1627 Nov 11 15:43	19°♃01'45	-14°-41'-50
max. Earth dist.	1619 May 02 17:00	11°♃00'53	50.25397 AU	min. Earth dist.	1627 Nov 11 07:16	19°♃02'09	48.11931 AU
retrograde	1619 Aug 12 12:24	12°♃28'56		direct	1628 Feb 01 02:49	18°♃03'07	
opposition	1619 Nov 04 05:18	11°♃29'25	-15°-47'-11				
min. Earth dist.	1619 Nov 03 12:21	11°♃30'13	48.32444 AU	conjunction	1628 May 09 20:28	19°♃28'48	-14°-2'-37
direct	1620 Jan 24 16:25	10°♃30'57		minimum elong	1628 May 09 20:38	19°♃28'49	14°02'38
				max. Earth dist.	1628 May 10 04:20	19°♃29'15	50.03690 AU
conjunction	1620 May 02 02:31	11°♃56'41	-15°-6'-30	retrograde	1628 Aug 20 09:44	20°♃57'37	
minimum elong	1620 May 02 02:42	11°♃56'42	15°06'32	opposition	1628 Nov 11 20:00	19°♃58'08	-14°-32'-33
max. Earth dist.	1620 May 02 20:24	11°♃57'42	50.24830 AU	min. Earth dist.	1628 Nov 11 12:41	19°♃58'28	48.07812 AU
retrograde	1620 Aug 12 19:26	13°♃25'48		direct	1629 Feb 01 07:32	18°♃59'30	
opposition	1620 Nov 04 09:44	12°♃26'19	-15°-39'-49				
min. Earth dist.	1620 Nov 03 17:24	12°♃27'05	48.31492 AU	conjunction	1629 May 11 01:41	20°♃25'14	-13°-53'-33
direct	1621 Jan 24 20:08	11°♃27'51		minimum elong	1629 May 11 01:53	20°♃25'15	13°53'34
				max. Earth dist.	1629 May 11 09:34	20°♃25'41	49.99547 AU
conjunction	1621 May 03 07:47	12°♃53'33	-14°-59'-19	retrograde	1629 Aug 21 13:08	21°♃54'06	
minimum elong	1621 May 03 07:57	12°♃53'34	14°59'19	opposition	1629 Nov 13 00:17	20°♃54'38	-14°-23'-1
max. Earth dist.	1621 May 03 23:58	12°♃54'28	50.23710 AU	min. Earth dist.	1629 Nov 12 18:15	20°♃54'55	48.03363 AU
retrograde	1621 Aug 14 03:27	14°♃22'37		direct	1630 Feb 02 13:50	19°♃56'01	
opposition	1621 Nov 05 14:19	13°♃23'08	-15°-32'-14				
min. Earth dist.	1621 Nov 05 00:19	13°♃23'48	48.29985 AU	conjunction	1630 May 12 07:01	21°♃21'49	-13°-44'-14
direct	1622 Jan 25 22:10	12°♃24'40		minimum elong	1630 May 12 07:12	21°♃21'50	13°44'15
				max. Earth dist.	1630 May 12 13:16	21°♃22'11	49.95067 AU
conjunction	1622 May 04 13:16	13°♃50'20	-14°-51'-54	retrograde	1630 Aug 22 20:04	22°♃50'44	
minimum elong	1622 May 04 13:27	13°♃50'20	14°51'55	opposition	1630 Nov 14 04:22	21°♃51'18	-14°-13'-15
max. Earth dist.	1622 May 05 04:39	13°♃51'12	50.22060 AU	min. Earth dist.	1630 Nov 13 22:51	21°♃51'34	47.98547 AU
retrograde	1622 Aug 15 06:51	15°♃19'18		direct	1631 Feb 03 17:15	20°♃52'41	
opposition	1622 Nov 06 18:31	14°♃19'50	-15°-24'-25				
min. Earth dist.	1622 Nov 06 05:07	14°♃20'28	48.27953 AU	conjunction	1631 May 13 12:27	22°♃18'35	-13°-34'-42
direct	1623 Jan 27 03:16	13°♃21'19		minimum elong	1631 May 13 12:39	22°♃18'35	13°34'43
				max. Earth dist.	1631 May 13 17:08	22°♃18'50	49.90164 AU
conjunction	1623 May 05 18:31	14°♃46'57	-14°-44'-16	retrograde	1631 Aug 24 04:44	23°♃47'32	
minimum elong	1623 May 05 18:42	14°♃46'58	14°44'17	opposition	1631 Nov 15 08:46	22°♃48'08	-14°-3'-15
max. Earth dist.	1623 May 06 07:32	14°♃47'42	50.19911 AU	min. Earth dist.	1631 Nov 15 05:31	22°♃48'17	47.93280 AU
retrograde	1623 Aug 16 10:14	16°♃15'52		direct	1632 Feb 04 18:33	21°♃49'30	
opposition	1623 Nov 07 22:54	15°♃16'23	-15°-16'-24				
min. Earth dist.	1623 Nov 07 11:01	15°♃16'56	48.25464 AU	conjunction	1632 May 13 17:51	23°♃15'29	-13°-24'-57
direct	1624 Jan 28 08:59	14°♃17'50		minimum elong	1632 May 13 18:02	23°♃15'30	13°24'57
				max. Earth dist.	1632 May 13 21:49	23°♃15'42	49.84791 AU
conjunction	1624 May 05 23:41	15°♃43'27	-14°-36'-25	retrograde	1632 Aug 24 09:57	24°♃44'29	
minimum elong	1624 May 05 23:52	15°♃43'28	14°36'27	opposition	1632 Nov 15 13:06	23°♃45'05	-13°-53'-2
max. Earth dist.	1624 May 06 12:32	15°♃44'11	50.17327 AU	min. Earth dist.	1632 Nov 15 10:20	23°♃45'12	47.87501 AU
retrograde	1624 Aug 16 12:54	17°♃12'19		direct	1633 Feb 04 22:00	22°♃46'25	

conjunction	1633 May 14 23:19	24° ♁ 12'29	-13°-14'-59	direct	1641 Feb 12 15:16	0° ♁ 22'30	
minimum elong	1633 May 14 23:31	24° ♁ 12'30	13°15'00				
max. Earth dist.	1633 May 15 00:43	24° ♁ 12'34	49.78893 AU	conjunction	1641 May 22 19:49	1° ♁ 49'19	-11°-47'-5
retrograde	1633 Aug 25 14:03	25° ♁ 41'31		minimum elong	1641 May 22 20:00	1° ♁ 49'20	11°47'06
opposition	1633 Nov 16 17:28	24° ♁ 42'06	-13°-42'-35	max. Earth dist.	1641 May 22 12:08	1° ♁ 48'53	49.16687 AU
min. Earth dist.	1633 Nov 16 16:34	24° ♁ 42'09	47.81204 AU	retrograde	1641 Sep 02 06:44	3° ♁ 18'51	
direct	1634 Feb 06 03:28	23° ♁ 43'24		opposition	1641 Nov 24 04:38	2° ♁ 19'06	-12°-10'-31
				min. Earth dist.	1641 Nov 24 12:23	2° ♁ 18'44	47.16403 AU
conjunction	1634 May 16 04:58	25° ♁ 09'32	-13°-4'-48	direct	1642 Feb 13 18:09	1° ♁ 19'52	
minimum elong	1634 May 16 05:10	25° ♁ 09'33	13°04'49				
max. Earth dist.	1634 May 16 05:43	25° ♁ 09'35	49.72474 AU	conjunction	1642 May 24 01:45	2° ♁ 46'51	-11°-35'00
retrograde	1634 Aug 26 15:34	26° ♁ 38'37		minimum elong	1642 May 24 01:57	2° ♁ 46'52	11°35'01
opposition	1634 Nov 17 21:51	25° ♁ 39'09	-13°-31'-56	max. Earth dist.	1642 May 23 17:42	2° ♁ 46'24	49.07476 AU
min. Earth dist.	1634 Nov 17 22:27	25° ♁ 39'08	47.74385 AU	retrograde	1642 Sep 03 13:36	4° ♁ 16'31	
direct	1635 Feb 07 11:59	24° ♁ 40'24		opposition	1642 Nov 25 09:09	3° ♁ 16'45	-11°-57'-52
				min. Earth dist.	1642 Nov 25 17:14	3° ♁ 16'21	47.06841 AU
conjunction	1635 May 17 10:26	26° ♁ 06'36	-12°-54'-25	direct	1643 Feb 14 21:09	2° ♁ 17'28	
minimum elong	1635 May 17 10:38	26° ♁ 06'36	12°54'26				
max. Earth dist.	1635 May 17 09:18	26° ♁ 06'32	49.65571 AU	conjunction	1643 May 25 07:37	3° ♁ 44'38	-11°-22'-41
retrograde	1635 Aug 27 21:49	27° ♁ 35'42		minimum elong	1643 May 25 07:49	3° ♁ 44'39	11°22'42
opposition	1635 Nov 19 02:04	26° ♁ 36'12	-13°-21'-3	max. Earth dist.	1643 May 24 21:10	3° ♁ 44'02	48.97853 AU
min. Earth dist.	1635 Nov 19 03:11	26° ♁ 36'09	47.67114 AU	retrograde	1643 Sep 04 19:50	5° ♁ 14'26	
direct	1636 Feb 08 16:17	25° ♁ 37'22		opposition	1643 Nov 26 13:50	4° ♁ 14'38	-11°-44'-59
				min. Earth dist.	1643 Nov 26 23:47	4° ♁ 14'10	46.96846 AU
conjunction	1636 May 17 15:56	27° ♁ 03'39	-12°-43'-48	direct	1644 Feb 16 01:24	3° ♁ 15'18	
minimum elong	1636 May 17 16:07	27° ♁ 03'39	12°43'48				
max. Earth dist.	1636 May 17 13:26	27° ♁ 03'30	49.58232 AU	conjunction	1644 May 25 13:48	4° ♁ 42'40	-11°-10'-9
retrograde	1636 Aug 28 04:55	28° ♁ 32'48		minimum elong	1644 May 25 14:00	4° ♁ 42'40	11°10'10
opposition	1636 Nov 19 06:29	27° ♁ 33'15	-13°-9'-56	max. Earth dist.	1644 May 25 02:43	4° ♁ 42'02	48.87757 AU
min. Earth dist.	1636 Nov 19 09:39	27° ♁ 33'06	47.59443 AU	retrograde	1644 Sep 04 22:28	6° ♁ 12'37	
direct	1637 Feb 08 18:57	26° ♁ 34'20		opposition	1644 Nov 26 18:38	5° ♁ 12'46	-11°-31'-52
				min. Earth dist.	1644 Nov 27 06:02	5° ♁ 12'14	46.86341 AU
conjunction	1637 May 18 21:26	28° ♁ 00'41	-12°-32'-56	direct	1645 Feb 16 09:20	4° ♁ 13'22	
minimum elong	1637 May 18 21:37	28° ♁ 00'42	12°32'57				
max. Earth dist.	1637 May 18 18:36	28° ♁ 00'31	49.50531 AU	conjunction	1645 May 26 19:56	5° ♁ 40'55	-10°-57'-23
retrograde	1637 Aug 29 09:58	29° ♁ 29'52		minimum elong	1645 May 26 20:07	5° ♁ 40'56	10°57'23
opposition	1637 Nov 20 10:47	28° ♁ 30'16	-12°-58'-33	max. Earth dist.	1645 May 26 06:43	5° ♁ 40'09	48.77149 AU
min. Earth dist.	1637 Nov 20 14:07	28° ♁ 30'07	47.51421 AU	retrograde	1645 Sep 06 04:51	7° ♁ 11'01	
direct	1638 Feb 09 23:09	27° ♁ 31'17		opposition	1645 Nov 27 23:28	6° ♁ 11'07	-11°-18'-31
				min. Earth dist.	1645 Nov 28 11:40	6° ♁ 10'32	46.75310 AU
conjunction	1638 May 20 02:58	28° ♁ 57'44	-12°-21'-51	direct	1646 Feb 17 14:21	5° ♁ 11'38	
minimum elong	1638 May 20 03:10	28° ♁ 57'44	12°21'51	max. Earth dist.	1646 May 27 11:18	6° ♁ 38'30	48.65996 AU
max. Earth dist.	1638 May 19 21:58	28° ♁ 57'27	49.42498 AU				
retrograde	1638 Jul 09 15:23	0° ♁		conjunction	1646 May 28 02:17	6° ♁ 39'22	-10°-44'-24
opposition	1638 Aug 30 14:44	0° ♁ 26'58		minimum elong	1646 May 28 02:29	6° ♁ 39'22	10°44'25
min. Earth dist.	1638 Oct 22 02:53	30° ♁		retrograde	1646 Sep 07 12:40	8° ♁ 09'36	
direct	1638 Nov 21 15:07	29° ♁ 27'19	-12°-46'-56	opposition	1646 Nov 29 04:22	7° ♁ 09'39	-11°-4'-57
				min. Earth dist.	1646 Nov 29 18:59	7° ♁ 08'57	46.63752 AU
conjunction	1639 May 21 08:38	29° ♁ 54'49	-12°-10'-30	direct	1647 Feb 18 17:36	6° ♁ 10'03	
minimum elong	1639 May 21 08:50	29° ♁ 54'50	12°10'32				
max. Earth dist.	1639 May 21 03:37	29° ♁ 54'32	49.34172 AU	conjunction	1647 May 29 08:41	7° ♁ 37'58	-10°-31'-12
retrograde	1639 May 25 04:00	0° ♁		minimum elong	1647 May 29 08:53	7° ♁ 37'59	10°31'12
opposition	1639 Aug 31 17:32	1° ♁ 24'08		max. Earth dist.	1647 May 28 16:56	7° ♁ 37'04	48.54351 AU
min. Earth dist.	1639 Nov 22 19:36	0° ♁ 24'26	-12°-35'-3	retrograde	1647 Sep 08 18:50	9° ♁ 08'22	
direct	1639 Nov 23 01:15	0° ♁ 24'10	47.34483 AU	opposition	1647 Nov 30 09:16	8° ♁ 08'19	-10°-51'-8
				min. Earth dist.	1647 Dec 01 00:13	8° ♁ 07'37	46.51718 AU
conjunction	1640 Feb 12 10:18	29° ♁ 25'19		direct	1648 Feb 19 22:24	7° ♁ 08'37	
minimum elong	1640 Apr 10 18:08	0° ♁					
max. Earth dist.	1640 May 21 14:04	0° ♁ 51'59	-11°-58'-55	conjunction	1648 May 29 14:49	8° ♁ 36'44	-10°-17'-45
retrograde	1640 May 21 14:17	0° ♁ 52'00	11°58'56	minimum elong	1648 May 29 15:00	8° ♁ 36'45	10°17'47
opposition	1640 May 21 07:42	0° ♁ 51'38	49.25578 AU	max. Earth dist.	1648 May 28 20:42	8° ♁ 35'42	48.42253 AU
min. Earth dist.	1640 Aug 31 22:55	2° ♁ 21'24		retrograde	1648 Sep 09 01:11	10° ♁ 07'16	
direct	1640 Nov 23 00:05	1° ♁ 21'41	-12°-22'-55	opposition	1648 Nov 30 14:19	9° ♁ 07'09	-10°-37'-4
				min. Earth dist.	1648 Dec 01 06:57	9° ♁ 06'21	46.39273 AU
conjunction	1640 Nov 23 05:54	1° ♁ 21'24	47.25598 AU	direct	1649 Feb 20 03:06	8° ♁ 07'20	
				conjunction	1649 May 30 21:21	9° ♁ 35'40	-10°-4'-5

minimum elong	1649 May 30 21:32	9°II35'41	10°04'05	opposition	1657 Dec 09 15:14	18°II07'55	-8°-18'-41
max. Earth dist.	1649 May 30 03:03	9°II34'37	48.29761 AU	min. Earth dist.	1657 Dec 10 17:11	18°II06'39	45.12417 AU
retrograde	1649 Sep 10 04:37	11°II06'22		direct	1658 Mar 01 05:48	17°II06'59	
opposition	1649 Dec 01 19:18	10°II06'09	-10°-22'-46	max. Earth dist.	1658 Jun 08 05:29	18°II36'00	47.02543 AU
min. Earth dist.	1649 Dec 02 13:02	10°II05'17	46.26455 AU				
direct	1650 Feb 21 10:56	9°II06'12		conjunction	1658 Jun 09 12:14	18°II37'49	-7°-49'-39
max. Earth dist.	1650 May 31 07:51	10°II33'36	48.16935 AU	minimum elong	1658 Jun 09 12:23	18°II37'49	7°49'40
				retrograde	1658 Sep 19 21:27	20°II10'37	
conjunction	1650 Jun 01 03:50	10°II34'45	-9°-50'-9	opposition	1658 Dec 10 21:21	19°II09'33	-8°-2'00
minimum elong	1650 Jun 01 04:01	10°II34'46	9°50'11	min. Earth dist.	1658 Dec 12 01:20	19°II08'11	44.96263 AU
retrograde	1650 Sep 11 10:08	12°II05'38		direct	1659 Mar 02 10:05	18°II08'27	
opposition	1650 Dec 03 00:24	11°II05'20	-10°-8'-11				
min. Earth dist.	1650 Dec 03 18:32	11°II04'27	46.13328 AU	conjunction	1659 Jun 10 19:57	19°II39'35	-7°-33'-29
direct	1651 Feb 22 16:48	10°II05'16		minimum elong	1659 Jun 10 20:07	19°II39'36	7°33'30
				max. Earth dist.	1659 Jun 09 12:50	19°II37'45	46.86287 AU
conjunction	1651 Jun 02 10:21	11°II34'03	-9°-35'-59	retrograde	1659 Sep 21 03:09	21°II12'38	
minimum elong	1651 Jun 02 10:33	11°II34'03	9°35'59	opposition	1659 Dec 12 03:30	20°II11'26	-7°-45'-4
max. Earth dist.	1651 Jun 01 13:10	11°II32'49	48.03797 AU	min. Earth dist.	1659 Dec 13 08:33	20°II10'00	44.79652 AU
retrograde	1651 Sep 12 17:44	13°II05'08		direct	1660 Mar 02 18:28	19°II10'08	
opposition	1651 Dec 04 05:41	12°II04'45	-9°-53'-20	max. Earth dist.	1660 Jun 09 18:36	20°II39'38	46.69620 AU
min. Earth dist.	1651 Dec 05 01:30	12°II03'47	45.99911 AU				
direct	1652 Feb 23 21:10	11°II04'34		conjunction	1660 Jun 11 03:42	20°II41'36	-7°-17'-4
				minimum elong	1660 Jun 11 03:51	20°II41'37	7°17'04
conjunction	1652 Jun 02 17:02	12°II33'36	-9°-21'-32	retrograde	1660 Sep 21 09:46	22°II14'55	
minimum elong	1652 Jun 02 17:13	12°II33'36	9°21'34	opposition	1660 Dec 12 09:39	21°II13'33	-7°-27'-52
max. Earth dist.	1652 Jun 01 19:38	12°II32'21	47.90400 AU	min. Earth dist.	1660 Dec 13 15:28	21°II12'05	44.62669 AU
retrograde	1652 Sep 13 02:46	14°II04'53		direct	1661 Mar 04 01:20	20°II12'04	
opposition	1652 Dec 04 10:55	13°II04'25	-9°-38'-13	max. Earth dist.	1661 Jun 11 01:19	21°II41'50	46.52581 AU
min. Earth dist.	1652 Dec 05 06:42	13°II03'28	45.86230 AU				
direct	1653 Feb 23 23:43	12°II04'08		conjunction	1661 Jun 12 11:39	21°II43'52	-7°00'-23
				minimum elong	1661 Jun 12 11:48	21°II43'53	7°00'24
conjunction	1653 Jun 03 23:43	13°II33'26	-9°-6'-51	retrograde	1661 Sep 22 16:05	23°II17'29	
minimum elong	1653 Jun 03 23:54	13°II33'27	9°06'52	opposition	1661 Dec 13 16:07	22°II15'58	-7°-10'-24
max. Earth dist.	1653 Jun 03 00:15	13°II32'05	47.76728 AU	min. Earth dist.	1661 Dec 14 23:43	22°II14'24	44.45345 AU
retrograde	1653 Sep 14 10:58	15°II04'58		direct	1662 Mar 05 08:51	21°II14'17	
opposition	1653 Dec 05 16:25	14°II04'25	-9°-22'-50	max. Earth dist.	1662 Jun 12 09:02	22°II44'22	46.35241 AU
min. Earth dist.	1653 Dec 06 13:49	14°II03'23	45.72268 AU				
direct	1654 Feb 25 03:32	13°II04'01		conjunction	1662 Jun 13 19:47	22°II46'26	-6°-43'-27
max. Earth dist.	1654 Jun 04 07:03	14°II32'14	47.62744 AU	minimum elong	1662 Jun 13 19:56	22°II46'27	6°43'27
				retrograde	1662 Sep 24 01:10	24°II20'21	
conjunction	1654 Jun 05 06:48	14°II33'37	-8°-51'-54	opposition	1662 Dec 14 22:29	23°II18'41	-6°-52'-38
minimum elong	1654 Jun 05 06:58	14°II33'38	8°51'55	min. Earth dist.	1662 Dec 16 06:04	23°II17'07	44.27743 AU
retrograde	1654 Sep 15 14:24	16°II05'23		direct	1663 Mar 06 13:59	22°II16'49	
opposition	1654 Dec 06 21:51	15°II04'46	-9°-7'-11	max. Earth dist.	1663 Jun 13 15:10	23°II47'09	46.17635 AU
min. Earth dist.	1654 Dec 07 20:18	15°II03'40	45.57959 AU				
direct	1655 Feb 26 12:10	14°II04'15		conjunction	1663 Jun 15 03:57	23°II49'21	-6°-26'-15
				minimum elong	1663 Jun 15 04:05	23°II49'21	6°26'16
conjunction	1655 Jun 06 13:53	15°II34'10	-8°-36'-42	retrograde	1663 Sep 25 11:30	25°II23'36	
minimum elong	1655 Jun 06 14:04	15°II34'10	8°36'43	opposition	1663 Dec 16 05:15	24°II21'47	-6°-34'-35
max. Earth dist.	1655 Jun 05 12:18	15°II32'40	47.48396 AU	min. Earth dist.	1663 Dec 17 14:26	24°II20'08	44.09911 AU
retrograde	1655 Sep 16 20:07	17°II06'11		direct	1664 Mar 06 18:00	23°II19'44	
opposition	1655 Dec 08 03:30	16°II05'28	-8°-51'-16	max. Earth dist.	1664 Jun 13 23:36	24°II50'28	45.99808 AU
min. Earth dist.	1655 Dec 09 02:44	16°II04'21	45.43260 AU				
direct	1656 Feb 27 19:16	15°II04'51		conjunction	1664 Jun 15 12:16	24°II52'40	-6°-8'-47
				minimum elong	1664 Jun 15 12:24	24°II52'41	6°08'47
conjunction	1656 Jun 06 21:04	16°II35'04	-8°-21'-15	retrograde	1664 Sep 25 18:14	26°II27'17	
minimum elong	1656 Jun 06 21:13	16°II35'04	8°21'16	opposition	1664 Dec 16 12:09	25°II25'19	-6°-16'-15
max. Earth dist.	1656 Jun 05 17:57	16°II33'28	47.33599 AU	min. Earth dist.	1664 Dec 17 21:42	25°II23'39	43.91855 AU
retrograde	1656 Sep 17 03:43	18°II07'21		direct	1665 Mar 08 02:43	24°II23'06	
opposition	1656 Dec 08 09:26	17°II06'33	-8°-35'-6	max. Earth dist.	1665 Jun 15 06:29	25°II54'10	45.81768 AU
min. Earth dist.	1656 Dec 09 10:56	17°II05'18	45.28087 AU				
direct	1657 Feb 28 00:40	16°II05'47		conjunction	1665 Jun 16 20:49	25°II56'29	-5°-51'-2
max. Earth dist.	1657 Jun 07 00:32	17°II34'38	47.18324 AU	minimum elong	1665 Jun 16 20:56	25°II56'29	5°51'03
				retrograde	1665 Sep 27 01:48	27°II31'28	
conjunction	1657 Jun 08 04:36	17°II36'17	-8°-5'-34	opposition	1665 Dec 17 19:03	26°II29'23	-5°-57'-38
minimum elong	1657 Jun 08 04:47	17°II36'18	8°05'36	min. Earth dist.	1665 Dec 19 05:18	26°II27'40	43.73585 AU
retrograde	1657 Sep 18 11:44	19°II08'50		direct	1666 Mar 09 10:50	25°II27'00	

max. Earth dist.	1666 Jun 16 14:27	26°II58'28	45.63470 AU	min. Earth dist.	1673 Dec 28 07:18	5°☾20'34	42.14147 AU
				direct	1674 Mar 17 22:32	4°☾18'44	
conjunction	1666 Jun 18 05:44	27°II00'51	-5°-33'-1	max. Earth dist.	1674 Jun 25 11:17	5°☾53'32	44.03258 AU
minimum elong	1666 Jun 18 05:52	27°II00'51	5°33'02				
retrograde	1666 Sep 28 09:39	28°II36'15		conjunction	1674 Jun 27 12:46	5°☾56'38	-2°-59'-25
opposition	1666 Dec 19 02:22	27°II34'03	-5°-38'-43	minimum elong	1674 Jun 27 12:50	5°☾56'38	2°59'27
min. Earth dist.	1666 Dec 20 14:25	27°II32'14	43.55034 AU	retrograde	1674 Oct 07 18:20	7°☾35'37	
direct	1667 Mar 10 18:22	26°II31'30		opposition	1674 Dec 27 19:40	6°☾31'56	-2°-57'-19
max. Earth dist.	1667 Jun 17 22:40	28°II03'23	45.44872 AU	min. Earth dist.	1674 Dec 29 16:22	6°☾29'37	41.92644 AU
				direct	1675 Mar 19 08:14	5°☾27'32	
conjunction	1667 Jun 19 14:42	28°II05'49	-5°-14'-44	max. Earth dist.	1675 Jun 26 20:08	7°☾02'46	43.81716 AU
minimum elong	1667 Jun 19 14:49	28°II05'49	5°14'45				
retrograde	1667 Sep 29 19:24	29°II41'39		conjunction	1675 Jun 28 23:28	7°☾06'00	-2°-39'-1
opposition	1667 Dec 20 09:43	28°II39'20	-5°-19'-32	minimum elong	1675 Jun 28 23:32	7°☾06'00	2°39'02
min. Earth dist.	1667 Dec 21 21:57	28°II37'30	43.36148 AU	retrograde	1675 Oct 09 06:44	8°☾45'29	
direct	1668 Mar 11 00:29	27°II36'37		opposition	1675 Dec 29 04:51	7°☾41'34	-2°-35'-51
max. Earth dist.	1668 Jun 18 05:36	29°II08'50	45.25889 AU	min. Earth dist.	1675 Dec 31 02:30	7°☾39'12	41.70951 AU
				direct	1676 Mar 19 17:13	6°☾36'54	
conjunction	1668 Jun 19 23:58	29°II11'25	-4°-56'-11	max. Earth dist.	1676 Jun 27 07:00	8°☾12'42	43.59981 AU
minimum elong	1668 Jun 20 00:06	29°II11'25	4°56'13				
	1668 Jul 24 15:36	0°☾		conjunction	1676 Jun 29 10:41	8°☾15'58	-2°-18'-21
retrograde	1668 Sep 30 07:45	0°☾47'42		minimum elong	1676 Jun 29 10:44	8°☾15'58	2°18'23
	1668 Dec 08 09:56	30°II		retrograde	1676 Oct 09 16:34	9°☾55'59	
opposition	1668 Dec 20 17:24	29°II45'13	-5°00'-3	opposition	1676 Dec 29 14:19	8°☾51'51	-2°-14'-5
min. Earth dist.	1668 Dec 22 07:48	29°II43'17	43.16862 AU	min. Earth dist.	1676 Dec 31 13:07	8°☾49'24	41.49083 AU
direct	1669 Mar 12 05:13	28°II42'19		direct	1677 Mar 21 04:23	7°☾46'55	
	1669 Jun 09 08:34	0°☾		max. Earth dist.	1677 Jun 28 17:31	9°☾23'15	43.38089 AU
max. Earth dist.	1669 Jun 19 14:49	0°☾15'01	45.06476 AU				
				conjunction	1677 Jun 30 22:08	9°☾26'36	-1°-57'-25
conjunction	1669 Jun 21 09:39	0°☾17'38	-4°-37'-23	minimum elong	1677 Jun 30 22:11	9°☾26'37	1°57'26
minimum elong	1669 Jun 21 09:45	0°☾17'38	4°37'23	retrograde	1677 Oct 11 02:51	11°☾07'11	
retrograde	1669 Oct 01 17:53	1°☾54'20		opposition	1677 Dec 30 23:59	10°☾02'50	-1°-52'-2
opposition	1669 Dec 22 01:18	0°☾51'42	-4°-40'-19	min. Earth dist.	1678 Jan 01 22:48	10°☾00'23	41.27050 AU
min. Earth dist.	1669 Dec 23 16:34	0°☾49'43	42.97119 AU	direct	1678 Mar 22 14:29	8°☾57'39	
	1670 Feb 09 20:18	30°II		max. Earth dist.	1678 Jun 30 03:38	10°☾34'31	43.15992 AU
direct	1670 Mar 13 13:46	29°II48'35					
	1670 Apr 14 04:38	0°☾		conjunction	1678 Jul 02 09:56	10°☾38'00	-1°-36'-13
max. Earth dist.	1670 Jun 20 22:09	1°☾21'37	44.86607 AU	minimum elong	1678 Jul 02 09:58	10°☾38'00	1°36'14
				retrograde	1678 Oct 12 14:43	12°☾19'10	
conjunction	1670 Jun 22 19:25	1°☾24'25	-4°-18'-19	opposition	1679 Jan 01 10:02	11°☾14'37	-1°-29'-41
minimum elong	1670 Jun 22 19:32	1°☾24'25	4°18'20	min. Earth dist.	1679 Jan 03 10:45	11°☾12'03	41.04805 AU
retrograde	1670 Oct 03 04:16	3°☾01'33		direct	1679 Mar 23 22:45	10°☾09'11	
opposition	1670 Dec 23 09:19	1°☾58'44	-4°-20'-17	max. Earth dist.	1679 Jul 01 15:48	11°☾46'42	42.93659 AU
min. Earth dist.	1670 Dec 25 01:53	1°☾56'40	42.76940 AU				
direct	1671 Mar 14 21:42	0°☾55'23		conjunction	1679 Jul 03 22:08	11°☾50'12	-1°-14'-45
max. Earth dist.	1671 Jun 22 07:03	2°☾28'50	44.66297 AU	minimum elong	1679 Jul 03 22:10	11°☾50'13	1°14'45
				retrograde	1679 Oct 14 04:12	13°☾32'00	
conjunction	1671 Jun 24 05:29	2°☾31'43	-3°-58'-59	opposition	1680 Jan 02 20:22	12°☾27'15	-1°-7'-3
minimum elong	1671 Jun 24 05:35	2°☾31'43	3°59'00	min. Earth dist.	1680 Jan 04 21:20	12°☾24'39	40.82294 AU
retrograde	1671 Oct 04 10:16	4°☾09'18		direct	1680 Mar 24 07:32	11°☾21'33	
opposition	1671 Dec 24 17:41	3°☾06'17	-3°-59'-58	max. Earth dist.	1680 Jul 02 01:44	12°☾59'37	42.71017 AU
min. Earth dist.	1671 Dec 26 11:56	3°☾04'07	42.56345 AU				
direct	1672 Mar 15 08:45	2°☾02'41		conjunction	1680 Jul 04 10:28	13°☾03'17	0°-53'-1
max. Earth dist.	1672 Jun 22 16:13	3°☾36'34	44.45609 AU	minimum elong	1680 Jul 04 10:30	13°☾03'17	0°53'02
				retrograde	1680 Oct 14 18:59	14°☾45'44	
conjunction	1672 Jun 24 15:32	3°☾39'31	-3°-39'-24	opposition	1681 Jan 03 07:05	13°☾40'44	0°-44'-8
minimum elong	1672 Jun 24 15:38	3°☾39'31	3°39'25	min. Earth dist.	1681 Jan 05 09:48	13°☾38'03	40.59455 AU
retrograde	1672 Oct 04 19:34	5°☾17'33		direct	1681 Mar 25 16:06	12°☾34'46	
opposition	1672 Dec 25 02:06	4°☾14'19	-3°-39'-23	max. Earth dist.	1681 Jul 03 14:03	14°☾13'29	42.47999 AU
min. Earth dist.	1672 Dec 26 20:37	4°☾12'08	42.35397 AU				
direct	1673 Mar 16 17:17	3°☾10'28		conjunction	1681 Jul 05 23:32	14°☾17'14	0°-31'-2
max. Earth dist.	1673 Jun 24 00:34	4°☾44'44	44.24573 AU	minimum elong	1681 Jul 05 23:33	14°☾17'14	0°31'03
				retrograde	1681 Oct 16 06:51	16°☾00'19	
conjunction	1673 Jun 26 01:59	4°☾47'49	-3°-19'-33	opposition	1682 Jan 04 18:06	14°☾55'06	0°-20'-56
minimum elong	1673 Jun 26 02:05	4°☾47'49	3°19'33	min. Earth dist.	1682 Jan 06 22:07	14°☾52'19	40.36228 AU
retrograde	1673 Oct 06 07:44	6°☾26'20		direct	1682 Mar 27 05:04	13°☾48'49	
opposition	1673 Dec 26 10:45	5°☾22'52	-3°-18'-30	max. Earth dist.	1682 Jul 05 01:37	15°☾28'09	42.24601 AU

conjunction	1682 Jul 07 12:48	15° \mathring{E} 32'02	0°-8'-49	max. Earth dist.	1690 Jul 15 15:45	25° \mathring{E} 57'31	40.28377 AU
minimum elong	1682 Jul 07 12:48	15° \mathring{E} 32'02	0°08'50				
behind sun begin	1682 Jul 07 07:13	15° \mathring{E} 31'42		conjunction	1690 Jul 18 11:12	26° \mathring{E} 02'12	2°57'55
behind sun end	1682 Jul 07 18:23	15° \mathring{E} 32'23		minimum elong	1690 Jul 18 11:06	26° \mathring{E} 02'12	2°57'55
retrograde	1682 Oct 17 19:37	17° \mathring{E} 15'47		retrograde	1690 Oct 28 18:25	27° \mathring{E} 52'01	
asc. node	1682 Nov 28 01:37	16° \mathring{E} 55'45		opposition	1691 Jan 16 13:00	26° \mathring{E} 44'10	3°19'55
opposition	1683 Jan 06 05:27	16° \mathring{E} 10'18	0°02'31	min. Earth dist.	1691 Jan 19 01:01	26° \mathring{E} 40'48	38.16092 AU
min. Earth dist.	1683 Jan 08 10:08	16° \mathring{E} 07'28	40.12633 AU	direct	1691 Apr 07 19:09	25° \mathring{E} 34'47	
direct	1683 Mar 28 17:31	15° \mathring{E} 03'43		max. Earth dist.	1691 Jul 17 08:42	27° \mathring{E} 20'58	40.03361 AU
max. Earth dist.	1683 Jul 06 13:23	16° \mathring{E} 43'39	42.00818 AU				
conjunction	1683 Jul 09 02:17	16° \mathring{E} 47'41	0°13'45	conjunction	1691 Jul 20 03:50	27° \mathring{E} 25'39	3°22'14
minimum elong	1683 Jul 09 02:16	16° \mathring{E} 47'41	0°13'45	minimum elong	1691 Jul 20 03:44	27° \mathring{E} 25'39	3°22'14
behind sun begin	1683 Jul 08 22:59	16° \mathring{E} 47'29		retrograde	1691 Oct 30 11:55	29° \mathring{E} 16'22	
behind sun end	1683 Jul 09 05:34	16° \mathring{E} 47'53		opposition	1692 Jan 18 03:49	28° \mathring{E} 08'13	3°45'41
retrograde	1683 Oct 19 08:02	18° \mathring{E} 32'06		min. Earth dist.	1692 Jan 20 15:56	28° \mathring{E} 04'50	37.91098 AU
opposition	1684 Jan 07 17:14	17° \mathring{E} 26'21	0°26'17	direct	1692 Apr 08 09:39	26° \mathring{E} 58'29	
min. Earth dist.	1684 Jan 10 00:00	17° \mathring{E} 23'24	39.88686 AU	max. Earth dist.	1692 Jul 17 23:53	28° \mathring{E} 45'30	39.78204 AU
direct	1684 Mar 29 04:15	16° \mathring{E} 19'26		conjunction	1692 Jul 20 21:02	28° \mathring{E} 50'22	3°46'45
max. Earth dist.	1684 Jul 07 02:52	18° \mathring{E} 00'04	41.76716 AU	minimum elong	1692 Jul 20 20:55	28° \mathring{E} 50'22	3°46'45
conjunction	1684 Jul 09 16:12	18° \mathring{E} 04'09	0°36'29		1692 Sep 03 02:30	0° \mathring{O}	
minimum elong	1684 Jul 09 16:11	18° \mathring{E} 04'09	0°36'29	retrograde	1692 Oct 31 08:49	0° \mathring{O} 41'59	
retrograde	1684 Oct 19 21:35	19° \mathring{E} 49'16			1692 Dec 29 18:25	30° \mathring{E}	
opposition	1685 Jan 08 05:05	18° \mathring{E} 43'14	0°50'18	opposition	1693 Jan 18 19:02	29° \mathring{E} 33'32	4°11'39
min. Earth dist.	1685 Jan 10 11:56	18° \mathring{E} 40'15	39.64450 AU	min. Earth dist.	1693 Jan 21 08:23	29° \mathring{E} 30'04	37.65954 AU
direct	1685 Mar 30 15:52	17° \mathring{E} 35'58		direct	1693 Apr 09 23:23	28° \mathring{E} 23'25	
max. Earth dist.	1685 Jul 08 14:51	19° \mathring{E} 17'13	41.52337 AU	max. Earth dist.	1693 Jul 13 00:15	0° \mathring{O}	
conjunction	1685 Jul 11 06:25	19° \mathring{E} 21'28	0°59'29		1693 Jul 19 17:19	0° \mathring{O} 11'24	39.52842 AU
minimum elong	1685 Jul 11 06:23	19° \mathring{E} 21'28	0°59'28	conjunction	1693 Jul 22 14:59	0° \mathring{O} 16'21	4°11'27
retrograde	1685 Oct 21 14:33	21° \mathring{E} 07'18		minimum elong	1693 Jul 22 14:51	0° \mathring{O} 16'20	4°11'26
opposition	1686 Jan 09 17:27	20° \mathring{E} 00'57	1°14'36	retrograde	1693 Nov 02 02:51	2° \mathring{O} 08'54	
min. Earth dist.	1686 Jan 12 01:59	19° \mathring{E} 57'53	39.39985 AU	opposition	1694 Jan 20 11:00	1° \mathring{O} 00'07	4°37'50
direct	1686 Apr 01 01:35	18° \mathring{E} 53'20		min. Earth dist.	1694 Jan 23 01:37	0° \mathring{O} 56'33	37.40593 AU
max. Earth dist.	1686 Jul 10 05:35	20° \mathring{E} 35'24	41.27741 AU	direct	1694 Mar 14 04:01	30° \mathring{E}	
conjunction	1686 Jul 12 21:03	20° \mathring{E} 39'40	1°22'43		1694 Apr 11 15:38	29° \mathring{E} 49'36	
minimum elong	1686 Jul 12 21:01	20° \mathring{E} 39'40	1°22'43	max. Earth dist.	1694 May 09 23:44	0° \mathring{O}	
retrograde	1686 Oct 23 05:40	22° \mathring{E} 26'14			1694 Jul 21 10:21	1° \mathring{O} 38'30	39.27266 AU
opposition	1687 Jan 11 06:08	21° \mathring{E} 19'34	1°39'10	conjunction	1694 Jul 24 09:14	1° \mathring{O} 43'35	4°36'19
min. Earth dist.	1687 Jan 13 15:09	21° \mathring{E} 16'27	39.15342 AU	minimum elong	1694 Jul 24 09:05	1° \mathring{O} 43'34	4°36'19
direct	1687 Apr 02 14:57	20° \mathring{E} 11'36		retrograde	1694 Nov 03 20:59	3° \mathring{O} 37'03	
max. Earth dist.	1687 Jul 11 18:57	21° \mathring{E} 54'22	41.03008 AU	opposition	1695 Jan 22 03:17	2° \mathring{O} 27'55	5°04'13
conjunction	1687 Jul 14 11:53	21° \mathring{E} 58'46	1°46'11	min. Earth dist.	1695 Jan 24 18:12	2° \mathring{O} 24'19	37.15033 AU
minimum elong	1687 Jul 14 11:50	21° \mathring{E} 58'46	1°46'10	direct	1695 Apr 13 09:04	1° \mathring{O} 17'00	
retrograde	1687 Oct 24 21:34	23° \mathring{E} 46'05		max. Earth dist.	1695 Jul 23 03:35	3° \mathring{O} 06'47	39.01474 AU
opposition	1688 Jan 12 19:11	22° \mathring{E} 39'08	2°04'00	conjunction	1695 Jul 26 04:05	3° \mathring{O} 12'02	5°01'20
min. Earth dist.	1688 Jan 15 04:37	22° \mathring{E} 35'58	38.90612 AU	minimum elong	1695 Jul 26 03:56	3° \mathring{O} 12'01	5°01'20
direct	1688 Apr 03 03:45	21° \mathring{E} 30'47		retrograde	1695 Nov 05 14:31	5° \mathring{O} 06'28	
max. Earth dist.	1688 Jul 12 09:32	23° \mathring{E} 14'21	40.78181 AU	opposition	1696 Jan 23 20:14	3° \mathring{O} 56'58	5°30'46
conjunction	1688 Jul 15 03:09	23° \mathring{E} 18'51	2°09'53	min. Earth dist.	1696 Jan 26 12:55	3° \mathring{O} 53'14	36.89293 AU
minimum elong	1688 Jul 15 03:05	23° \mathring{E} 18'50	2°09'53	direct	1696 Apr 14 01:17	2° \mathring{O} 45'37	
retrograde	1688 Oct 25 10:26	25° \mathring{E} 06'57		max. Earth dist.	1696 Jul 23 22:52	4° \mathring{O} 36'26	38.75525 AU
opposition	1689 Jan 13 08:47	23° \mathring{E} 59'41	2°29'04	conjunction	1696 Jul 26 23:23	4° \mathring{O} 41'43	5°26'30
min. Earth dist.	1689 Jan 15 19:25	23° \mathring{E} 56'26	38.65812 AU	minimum elong	1696 Jul 26 23:12	4° \mathring{O} 41'42	5°26'31
direct	1689 Apr 04 18:52	22° \mathring{E} 51'00		retrograde	1696 Nov 06 08:57	6° \mathring{O} 37'07	
max. Earth dist.	1689 Jul 14 01:09	24° \mathring{E} 35'25	40.53309 AU	opposition	1697 Jan 24 13:34	5° \mathring{O} 27'15	5°57'29
conjunction	1689 Jul 16 18:56	24° \mathring{E} 39'58	2°33'48	min. Earth dist.	1697 Jan 27 06:05	5° \mathring{O} 23'30	36.63419 AU
minimum elong	1689 Jul 16 18:52	24° \mathring{E} 39'57	2°33'47	direct	1697 Apr 15 17:54	4° \mathring{O} 15'26	
retrograde	1689 Oct 27 01:16	26° \mathring{E} 28'53		max. Earth dist.	1697 Jul 25 16:49	6° \mathring{O} 07'10	38.49453 AU
opposition	1690 Jan 14 22:33	25° \mathring{E} 21'20	2°54'22	conjunction	1697 Jul 28 19:14	6° \mathring{O} 12'38	5°51'47
min. Earth dist.	1690 Jan 17 08:52	25° \mathring{E} 18'05	38.40979 AU	minimum elong	1697 Jul 28 19:03	6° \mathring{O} 12'37	5°51'47
direct	1690 Apr 06 08:18	24° \mathring{E} 12'18		retrograde	1697 Nov 08 05:51	8° \mathring{O} 09'03	
				opposition	1698 Jan 26 07:24	6° \mathring{O} 58'46	6°24'20

min. Earth dist.	1698 Jan 29 01:25	6°Ω54'55	36.37480 AU	conjunction	1706 Aug 14 08:53	20°Ω58'28	9°40'27
direct	1698 Apr 17 09:32	5°Ω46'30		minimum elong	1706 Aug 14 08:33	20°Ω58'27	9°40'27
max. Earth dist.	1698 Jul 27 13:40	7°Ω39'21	38.23331 AU	retrograde	1706 Nov 25 04:16	23°Ω05'28	
				opposition	1707 Feb 11 04:44	21°Ω51'46	10°27'24
conjunction	1698 Jul 30 15:44	7°Ω44'50	6°17'11	min. Earth dist.	1707 Feb 14 01:31	21°Ω47'32	34.08506 AU
minimum elong	1698 Jul 30 15:31	7°Ω44'49	6°17'11	direct	1707 May 02 22:10	20°Ω35'33	
retrograde	1698 Nov 10 02:48	9°Ω42'16		max. Earth dist.	1707 Aug 13 05:16	22°Ω39'29	35.92785 AU
opposition	1699 Jan 28 01:55	8°Ω31'36	6°51'18				
min. Earth dist.	1699 Jan 30 20:06	8°Ω27'42	36.11535 AU	conjunction	1707 Aug 16 11:12	22°Ω45'46	10°05'27
direct	1699 Apr 19 04:13	7°Ω18'52		minimum elong	1707 Aug 16 10:53	22°Ω45'44	10°05'27
max. Earth dist.	1699 Jul 29 09:12	9°Ω12'45	37.97241 AU	retrograde	1707 Nov 27 07:07	24°Ω54'02	
				opposition	1708 Feb 13 05:28	23°Ω39'56	10°54'00
conjunction	1699 Aug 01 12:23	9°Ω18'22	6°42'38	min. Earth dist.	1708 Feb 16 03:20	23°Ω35'36	33.83533 AU
minimum elong	1699 Aug 01 12:10	9°Ω18'21	6°42'38	direct	1708 May 03 23:15	22°Ω23'15	
retrograde	1699 Nov 12 02:17	11°Ω16'52		max. Earth dist.	1708 Aug 14 08:21	24°Ω28'32	35.67594 AU
opposition	1700 Jan 29 20:55	10°Ω05'47	7°18'20				
min. Earth dist.	1700 Feb 01 15:13	10°Ω01'52	35.85675 AU	conjunction	1708 Aug 17 14:18	24°Ω34'53	10°30'15
direct	1700 Apr 20 22:42	8°Ω52'36		minimum elong	1708 Aug 17 13:57	24°Ω34'51	10°30'14
max. Earth dist.	1700 Jul 31 06:40	10°Ω47'39	37.71236 AU	retrograde	1708 Nov 28 12:06	26°Ω44'27	
				opposition	1709 Feb 14 06:39	25°Ω29'56	11°20'23
conjunction	1700 Aug 03 09:56	10°Ω53'19	7°08'08	min. Earth dist.	1709 Feb 17 03:56	25°Ω25'35	33.58679 AU
minimum elong	1700 Aug 03 09:41	10°Ω53'18	7°08'08	direct	1709 May 06 01:22	24°Ω12'44	
retrograde	1700 Nov 13 23:17	12°Ω52'55		max. Earth dist.	1709 Aug 16 11:17	26°Ω19'19	35.42525 AU
opposition	1701 Jan 31 16:33	11°Ω41'27	7°45'26				
min. Earth dist.	1701 Feb 03 11:44	11°Ω37'27	35.59942 AU	conjunction	1709 Aug 19 18:12	26°Ω25'49	10°54'47
direct	1701 Apr 22 18:17	10°Ω27'49		minimum elong	1709 Aug 19 17:52	26°Ω25'47	10°54'47
max. Earth dist.	1701 Aug 02 04:50	12°Ω24'03	37.45390 AU	retrograde	1709 Nov 30 15:28	28°Ω36'42	
				opposition	1710 Feb 16 08:51	27°Ω21'44	11°46'29
conjunction	1701 Aug 05 08:02	12°Ω29'47	7°33'39	min. Earth dist.	1710 Feb 19 07:24	27°Ω17'16	33.33995 AU
minimum elong	1701 Aug 05 07:48	12°Ω29'46	7°33'39	direct	1710 May 08 01:15	26°Ω04'02	
retrograde	1701 Nov 15 21:35	14°Ω30'31		max. Earth dist.	1710 Aug 18 16:49	28°Ω12'04	35.17661 AU
opposition	1702 Feb 02 12:47	13°Ω18'42	8°12'33				
min. Earth dist.	1702 Feb 05 07:17	13°Ω14'42	35.34386 AU	conjunction	1710 Aug 21 22:42	28°Ω18'33	11°19'01
direct	1702 Apr 24 14:47	12°Ω04'38		minimum elong	1710 Aug 21 22:19	28°Ω18'31	11°19'01
max. Earth dist.	1702 Aug 04 02:31	14°Ω02'02	37.19700 AU		1710 Oct 18 12:08	0°♄	
				retrograde	1710 Dec 02 18:34	0°♄30'45	
conjunction	1702 Aug 07 06:44	14°Ω07'54	7°59'09		1711 Jan 18 03:22	30°Ω	
minimum elong	1702 Aug 07 06:28	14°Ω07'53	7°59'09	opposition	1711 Feb 18 11:44	29°Ω15'20	12°12'15
retrograde	1702 Nov 17 20:24	16°Ω09'50		min. Earth dist.	1711 Feb 21 09:20	29°Ω10'54	33.09555 AU
opposition	1703 Feb 04 09:48	14°Ω57'38	8°39'39	direct	1711 May 10 04:11	27°Ω57'08	
min. Earth dist.	1703 Feb 07 05:32	14°Ω53'33	35.09005 AU		1711 Aug 17 15:31	0°♄	
direct	1703 Apr 26 08:39	13°Ω43'10		max. Earth dist.	1711 Aug 20 21:04	0°♄06'30	34.93078 AU
max. Earth dist.	1703 Aug 06 02:45	15°Ω41'54	36.94173 AU				
				conjunction	1711 Aug 24 03:52	0°♄13'07	11°42'52
conjunction	1703 Aug 09 06:10	15°Ω47'46	8°24'36	minimum elong	1711 Aug 24 03:30	0°♄13'05	11°42'53
minimum elong	1703 Aug 09 05:54	15°Ω47'44	8°24'36	retrograde	1711 Dec 05 00:24	2°♄26'39	
retrograde	1703 Nov 19 19:47	17°Ω50'56		opposition	1712 Feb 20 15:22	1°♄10'47	12°37'37
opposition	1704 Feb 06 07:21	16°Ω38'23	9°06'43	min. Earth dist.	1712 Feb 23 13:20	1°♄06'18	32.85458 AU
min. Earth dist.	1704 Feb 09 02:31	16°Ω34'18	34.83769 AU		1712 Apr 17 22:41	30°Ω	
direct	1704 Apr 27 05:00	15°Ω23'30		direct	1712 May 11 04:30	29°Ω52'03	
max. Earth dist.	1704 Aug 07 01:18	17°Ω23'26	36.68754 AU		1712 Jun 03 08:18	0°♄	
				max. Earth dist.	1712 Aug 22 04:37	2°♄02'58	34.68861 AU
conjunction	1704 Aug 10 06:13	17°Ω29'27	8°49'59	conjunction	1712 Aug 25 09:54	2°♄09'32	12°06'17
minimum elong	1704 Aug 10 05:55	17°Ω29'26	8°50'00	minimum elong	1712 Aug 25 09:31	2°♄09'30	12°06'17
retrograde	1704 Nov 20 22:07	19°Ω33'53		retrograde	1712 Dec 06 06:04	4°♄24'26	
opposition	1705 Feb 07 05:44	18°Ω20'59	9°33'43	opposition	1713 Feb 21 19:58	3°♄08'06	13°02'29
min. Earth dist.	1705 Feb 10 01:58	18°Ω16'49	34.58631 AU	min. Earth dist.	1713 Feb 24 17:18	3°♄03'38	32.61755 AU
direct	1705 Apr 29 00:33	17°Ω05'40		direct	1713 May 13 07:42	1°♄48'53	
max. Earth dist.	1705 Aug 09 02:49	19°Ω06'59	36.43387 AU	max. Earth dist.	1713 Aug 24 11:07	4°♄01'14	34.45085 AU
conjunction	1705 Aug 12 07:16	19°Ω13'02	9°15'17	conjunction	1713 Aug 27 16:37	4°♄07'52	12°29'12
minimum elong	1705 Aug 12 06:58	19°Ω13'01	9°15'17	minimum elong	1713 Aug 27 16:14	4°♄07'50	12°29'12
retrograde	1705 Nov 23 00:09	21°Ω18'44		retrograde	1713 Dec 08 15:12	6°♄24'09	
opposition	1706 Feb 09 04:51	20°Ω05'27	10°00'37	opposition	1714 Feb 24 01:15	5°♄07'24	13°26'48
min. Earth dist.	1706 Feb 12 01:33	20°Ω01'14	34.33538 AU	min. Earth dist.	1714 Feb 26 21:54	5°♄02'57	32.38533 AU
direct	1706 Apr 30 23:25	18°Ω49'41		direct	1714 May 15 12:06	3°♄47'42	
max. Earth dist.	1706 Aug 11 03:13	20°Ω52'16	36.18067 AU				

max. Earth dist.	1714 Aug 26 19:56	6° <u>01</u> '37	34.21794 AU	minimum elong	1722 Sep 16 17:58	23° <u>27</u> '55	15°22'03
				retrograde	1722 Dec 29 01:24	25° <u>56</u> '44	
conjunction	1714 Aug 30 00:16	6° <u>08</u> '13	12°51'32	opposition	1723 Mar 15 17:52	24° <u>36</u> '31	16°29'20
minimum elong	1714 Aug 29 23:53	6° <u>08</u> '11	12°51'32	min. Earth dist.	1723 Mar 18 08:34	24° <u>32</u> '14	30.51127 AU
retrograde	1714 Dec 10 23:50	8° <u>25</u> '54		direct	1723 Jun 03 18:44	23° <u>13</u> '01	
opposition	1715 Feb 26 07:39	7° <u>08</u> '44	13°50'30	max. Earth dist.	1723 Sep 16 12:55	25° <u>40</u> '38	32.34119 AU
min. Earth dist.	1715 Mar 01 04:15	7° <u>04</u> '16	32.15808 AU				
direct	1715 May 17 18:10	5° <u>48</u> '36		conjunction	1723 Sep 19 08:56	25° <u>47</u> '01	15°36'17
max. Earth dist.	1715 Aug 29 04:49	8° <u>04</u> '04	33.99023 AU	minimum elong	1723 Sep 19 08:38	25° <u>47</u> '00	15°36'17
				retrograde	1723 Dec 31 16:11	28° <u>17</u> '04	
conjunction	1715 Sep 01 08:27	8° <u>10</u> '40	13°13'14	opposition	1724 Mar 17 08:07	26° <u>56</u> '28	16°44'09
minimum elong	1715 Sep 01 08:05	8° <u>10</u> '38	13°13'14	min. Earth dist.	1724 Mar 19 22:14	26° <u>52</u> '12	30.33062 AU
retrograde	1715 Dec 13 10:36	10° <u>29</u> '47		direct	1724 Jun 05 08:55	25° <u>32</u> '35	
opposition	1716 Feb 28 14:41	9° <u>12</u> '14	14°13'29	max. Earth dist.	1724 Sep 18 05:44	28° <u>01</u> '36	32.16224 AU
min. Earth dist.	1716 Mar 02 09:53	9° <u>07</u> '49	31.93587 AU				
direct	1716 May 19 01:16	7° <u>51</u> '40		conjunction	1724 Sep 21 00:12	28° <u>07</u> '54	15°49'12
max. Earth dist.	1716 Aug 30 14:25	10° <u>08</u> '39	33.76724 AU	minimum elong	1724 Sep 20 23:54	28° <u>07</u> '53	15°49'12
					1724 Nov 15 02:57	0° <u>00</u> '	
conjunction	1716 Sep 02 17:45	10° <u>15</u> '18	13°34'14	retrograde	1725 Jan 02 09:11	0° <u>39</u> '10	
minimum elong	1716 Sep 02 17:21	10° <u>15</u> '15	13°34'13		1725 Feb 21 09:54	30° <u>00</u> '	
retrograde	1716 Dec 14 20:31	12° <u>35</u> '50		opposition	1725 Mar 19 22:56	29° <u>18</u> '12	16°57'32
opposition	1717 Mar 01 22:40	11° <u>17</u> '55	14°35'44	min. Earth dist.	1725 Mar 22 10:29	29° <u>14</u> '06	30.15796 AU
min. Earth dist.	1717 Mar 04 18:28	11° <u>13</u> '26	31.71831 AU	direct	1725 Jun 08 00:21	27° <u>53</u> '57	
direct	1717 May 21 07:22	9° <u>56</u> '56			1725 Sep 10 06:31	0° <u>00</u> '	
max. Earth dist.	1717 Sep 02 01:59	12° <u>15</u> '32	33.54890 AU	max. Earth dist.	1725 Sep 20 23:41	0° <u>24</u> '23	31.99176 AU
conjunction	1717 Sep 05 03:53	12° <u>22</u> '07	13°54'29	conjunction	1725 Sep 23 16:15	0° <u>30</u> '33	16°00'44
minimum elong	1717 Sep 05 03:31	12° <u>22</u> '05	13°54'29	minimum elong	1725 Sep 23 15:59	0° <u>30</u> '32	16°00'43
retrograde	1717 Dec 17 08:20	14° <u>44</u> '05		retrograde	1726 Jan 05 01:58	3° <u>03</u> '00	
opposition	1718 Mar 04 07:38	13° <u>25</u> '47	14°57'09	opposition	1726 Mar 22 14:52	1° <u>41</u> '43	17°09'22
min. Earth dist.	1718 Mar 07 02:03	13° <u>21</u> '23	31.50515 AU	min. Earth dist.	1726 Mar 25 01:35	1° <u>37</u> '39	29.99406 AU
direct	1718 May 23 16:11	12° <u>04</u> '23		direct	1726 Jun 10 14:41	0° <u>17</u> '08	
max. Earth dist.	1718 Sep 04 12:30	14° <u>24</u> '27	33.33488 AU	max. Earth dist.	1726 Sep 23 18:54	2° <u>49</u> '01	31.83075 AU
conjunction	1718 Sep 07 14:42	14° <u>31</u> '08	14°13'55	conjunction	1726 Sep 26 08:42	2° <u>54</u> '58	16°10'46
minimum elong	1718 Sep 07 14:18	14° <u>31</u> '06	14°13'54	minimum elong	1726 Sep 26 08:27	2° <u>54</u> '56	16°10'46
retrograde	1718 Dec 19 19:59	16° <u>54</u> '31		retrograde	1727 Jan 07 20:59	5° <u>28</u> '33	
opposition	1719 Mar 06 17:35	15° <u>35</u> '50	15°17'41	opposition	1727 Mar 25 07:25	4° <u>06</u> '58	17°19'35
min. Earth dist.	1719 Mar 09 12:19	15° <u>31</u> '23	31.29640 AU	min. Earth dist.	1727 Mar 27 15:09	4° <u>03</u> '05	29.83947 AU
direct	1719 May 25 22:56	14° <u>14</u> '01		direct	1727 Jun 13 08:07	2° <u>42</u> '06	
max. Earth dist.	1719 Sep 07 02:07	16° <u>35</u> '42	33.12542 AU	max. Earth dist.	1727 Sep 26 13:46	5° <u>15</u> '17	31.67937 AU
conjunction	1719 Sep 10 02:30	16° <u>42</u> '17	14°32'28	conjunction	1727 Sep 29 01:55	5° <u>21</u> '07	16°19'15
minimum elong	1719 Sep 10 02:09	16° <u>42</u> '15	14°32'28	minimum elong	1727 Sep 29 01:44	5° <u>21</u> '06	16°19'15
retrograde	1719 Dec 22 07:04	19° <u>07</u> '03		retrograde	1728 Jan 10 14:28	7° <u>55</u> '48	
opposition	1720 Mar 08 04:19	17° <u>48</u> '00	15°37'16	opposition	1728 Mar 27 00:39	6° <u>33</u> '57	17°28'05
min. Earth dist.	1720 Mar 10 21:51	17° <u>43</u> '35	31.09212 AU	min. Earth dist.	1728 Mar 29 07:21	6° <u>30</u> '08	29.69442 AU
direct	1720 May 27 09:25	16° <u>25</u> '45		direct	1728 Jun 14 23:14	5° <u>08</u> '51	
max. Earth dist.	1720 Sep 08 14:16	18° <u>48</u> '50	32.92076 AU	max. Earth dist.	1728 Sep 28 10:52	7° <u>43</u> '24	31.53777 AU
conjunction	1720 Sep 11 15:00	18° <u>55</u> '31	14°50'03	conjunction	1728 Sep 30 19:50	7° <u>48</u> '58	16°26'06
minimum elong	1720 Sep 11 14:37	18° <u>55</u> '29	14°50'03	minimum elong	1728 Sep 30 19:38	7° <u>48</u> '57	16°26'07
retrograde	1720 Dec 23 20:43	21° <u>21</u> '39		retrograde	1729 Jan 12 08:51	10° <u>24</u> '40	
opposition	1721 Mar 10 15:58	20° <u>02</u> '13	15°55'47	opposition	1729 Mar 29 18:43	9° <u>02</u> '37	17°34'50
min. Earth dist.	1721 Mar 13 09:00	19° <u>57</u> '49	30.89283 AU	min. Earth dist.	1729 Mar 31 22:46	8° <u>58</u> '58	29.55859 AU
direct	1721 May 29 18:41	18° <u>39</u> '32		direct	1729 Jun 17 17:28	7° <u>37</u> '18	
max. Earth dist.	1721 Sep 11 05:44	21° <u>04</u> '13	32.72131 AU	max. Earth dist.	1729 Oct 01 06:28	10° <u>12</u> '58	31.40555 AU
conjunction	1721 Sep 14 04:23	21° <u>10</u> '46	15°06'37	conjunction	1729 Oct 03 14:09	10° <u>18</u> '27	16°31'18
minimum elong	1721 Sep 14 04:03	21° <u>10</u> '44	15°06'37	minimum elong	1729 Oct 03 14:01	10° <u>18</u> '26	16°31'18
retrograde	1721 Dec 26 09:31	23° <u>38</u> '14		retrograde	1730 Jan 15 05:00	12° <u>55</u> '07	
opposition	1722 Mar 13 04:33	22° <u>18</u> '25	16°13'11	opposition	1730 Apr 01 13:31	11° <u>32</u> '50	17°39'45
min. Earth dist.	1722 Mar 15 20:51	22° <u>14</u> '03	30.69887 AU	min. Earth dist.	1730 Apr 03 15:58	11° <u>29</u> '18	29.43190 AU
direct	1722 Jun 01 05:47	20° <u>55</u> '20		direct	1730 Jun 20 09:46	10° <u>07</u> '20	
max. Earth dist.	1722 Sep 13 20:12	23° <u>21</u> '25	32.52790 AU	max. Earth dist.	1730 Oct 04 04:54	12° <u>44</u> '15	31.28264 AU
conjunction	1722 Sep 16 18:19	23° <u>27</u> '57	15°22'03	conjunction	1730 Oct 06 09:09	12° <u>49</u> '25	16°34'47

minimum elong	1730 Oct 06 09:02	12°♁49'24	16°34'47	minimum elong	1738 Oct 27 02:39	3°♁29'11	15°56'47
retrograde	1731 Jan 17 23:09	15°♁26'57		retrograde	1739 Feb 07 18:08	6°♁10'07	
opposition	1731 Apr 04 09:02	14°♁04'29	17°42'49	opposition	1739 Apr 25 12:17	4°♁46'35	16°55'50
min. Earth dist.	1731 Apr 06 09:22	14°♁01'05	29.31404 AU	min. Earth dist.	1739 Apr 26 16:01	4°♁44'38	28.71675 AU
direct	1731 Jun 23 04:37	12°♁38'49		direct	1739 Jul 14 07:27	3°♁20'18	
max. Earth dist.	1731 Oct 07 01:29	15°♁16'39	31.16890 AU				
conjunction	1731 Oct 09 04:23	15°♁21'43	16°36'30	conjunction	1739 Oct 29 22:50	6°♁05'36	15°43'28
minimum elong	1731 Oct 09 04:19	15°♁21'42	16°36'30	minimum elong	1739 Oct 29 23:04	6°♁05'38	15°43'27
retrograde	1732 Jan 20 19:09	18°♁00'02		max. Earth dist.	1739 Oct 28 20:47	6°♁02'58	30.62292 AU
opposition	1732 Apr 06 05:04	16°♁37'23	17°43'59	retrograde	1740 Feb 10 14:38	8°♁46'32	
min. Earth dist.	1732 Apr 08 03:07	16°♁34'09	29.20508 AU	opposition	1740 Apr 27 10:35	7°♁23'03	16°40'41
direct	1732 Jun 24 23:36	15°♁11'33		min. Earth dist.	1740 Apr 28 10:23	7°♁21'22	28.69271 AU
max. Earth dist.	1732 Oct 09 00:46	17°♁50'25	31.06428 AU	direct	1740 Jul 16 06:57	5°♁56'53	
conjunction	1732 Oct 11 00:18	17°♁55'10	16°36'26	conjunction	1740 Oct 31 19:03	8°♁42'00	15°28'16
minimum elong	1732 Oct 11 00:15	17°♁55'09	16°36'26	minimum elong	1740 Oct 31 19:19	8°♁42'02	15°28'16
retrograde	1733 Jan 22 14:04	20°♁34'10		max. Earth dist.	1740 Oct 30 19:37	8°♁39'38	30.60759 AU
opposition	1733 Apr 09 01:40	19°♁11'20	17°43'12	retrograde	1741 Feb 12 12:28	11°♁22'51	
min. Earth dist.	1733 Apr 10 22:07	19°♁08'12	29.10492 AU	opposition	1741 Apr 30 08:53	9°♁59'25	16°23'31
direct	1733 Jun 27 19:19	17°♁45'22		min. Earth dist.	1741 May 01 05:49	9°♁57'57	28.68087 AU
max. Earth dist.	1733 Oct 11 22:33	20°♁24'58	30.96910 AU	direct	1741 Jul 19 04:36	8°♁33'24	
conjunction	1733 Oct 13 20:21	20°♁29'33	16°34'33	conjunction	1741 Nov 03 15:14	11°♁18'15	15°11'14
minimum elong	1733 Oct 13 20:22	20°♁29'33	16°34'32	minimum elong	1741 Nov 03 15:31	11°♁18'17	15°11'14
retrograde	1734 Jan 25 11:14	23°♁09'08		max. Earth dist.	1741 Nov 02 20:12	11°♁16'20	30.60452 AU
opposition	1734 Apr 11 22:42	21°♁46'08	17°40'26	retrograde	1742 Feb 15 08:05	13°♁58'54	
min. Earth dist.	1734 Apr 13 16:01	21°♁43'13	29.01406 AU	opposition	1742 May 03 07:18	12°♁35'35	16°04'25
direct	1734 Jun 30 15:51	20°♁20'02		min. Earth dist.	1742 May 04 01:01	12°♁34'21	28.68065 AU
max. Earth dist.	1734 Oct 14 22:09	23°♁00'26	30.88357 AU	direct	1742 Jul 22 03:51	11°♁09'46	
conjunction	1734 Oct 16 16:38	23°♁04'42	16°30'48	conjunction	1742 Nov 06 10:56	13°♁54'12	14°52'27
minimum elong	1734 Oct 16 16:40	23°♁04'42	16°30'49	minimum elong	1742 Nov 06 11:14	13°♁54'14	14°52'27
retrograde	1735 Jan 28 06:21	25°♁44'45		max. Earth dist.	1742 Nov 05 18:15	13°♁52'31	30.61308 AU
opposition	1735 Apr 14 20:15	24°♁21'36	17°35'39	retrograde	1743 Feb 18 04:29	16°♁34'35	
min. Earth dist.	1735 Apr 16 12:00	24°♁18'47	28.93276 AU	opposition	1743 May 06 05:30	15°♁11'23	15°43'26
direct	1735 Jul 03 13:34	22°♁55'24		min. Earth dist.	1743 May 06 19:54	15°♁10'23	28.69172 AU
max. Earth dist.	1735 Oct 17 21:01	25°♁36'22	30.80839 AU	direct	1743 Jul 25 01:33	13°♁45'46	
conjunction	1735 Oct 19 13:01	25°♁40'24	16°25'10	conjunction	1743 Nov 09 06:40	16°♁29'43	14°31'58
minimum elong	1735 Oct 19 13:07	25°♁40'24	16°25'10	minimum elong	1743 Nov 09 07:00	16°♁29'45	14°31'57
retrograde	1736 Jan 31 03:42	28°♁20'49		max. Earth dist.	1743 Nov 08 18:17	16°♁28'28	30.63279 AU
opposition	1736 Apr 16 17:44	26°♁57'31	17°28'49	retrograde	1744 Feb 20 22:50	19°♁09'42	
min. Earth dist.	1736 Apr 18 05:51	26°♁54'58	28.86170 AU	opposition	1744 May 08 03:28	17°♁46'39	15°20'40
direct	1736 Jul 05 12:20	25°♁31'13		min. Earth dist.	1744 May 08 15:27	17°♁45'48	28.71338 AU
max. Earth dist.	1736 Oct 19 20:48	28°♁12'45	30.74395 AU	direct	1744 Jul 26 23:48	16°♁21'15	
conjunction	1736 Oct 21 09:36	28°♁16'28	16°17'38	conjunction	1744 Nov 11 01:57	19°♁04'34	14°09'53
minimum elong	1736 Oct 21 09:42	28°♁16'29	16°17'39	minimum elong	1744 Nov 11 02:19	19°♁04'37	14°09'53
retrograde	1736 Dec 06 15:00	0°♁		max. Earth dist.	1744 Nov 10 15:36	19°♁03'32	30.66316 AU
retrograde	1737 Feb 01 23:43	0°♁57'09		retrograde	1745 Feb 22 19:17	21°♁44'05	
opposition	1737 Apr 03 22:09	30°♁		opposition	1745 May 11 01:17	20°♁21'10	14°56'12
min. Earth dist.	1737 Apr 19 15:49	29°♁33'44	17°19'55	min. Earth dist.	1745 May 11 09:29	20°♁20'36	28.74544 AU
direct	1737 Apr 21 02:08	29°♁31'19	28.80154 AU	direct	1745 Jul 29 21:14	18°♁56'00	
max. Earth dist.	1737 Oct 02 02:50	0°♁		conjunction	1745 Nov 13 20:53	21°♁38'36	13°46'16
conjunction	1737 Oct 24 06:00	0°♁52'46	16°08'10	minimum elong	1745 Nov 13 21:15	21°♁38'38	13°46'15
minimum elong	1737 Oct 24 06:10	0°♁52'47	16°08'10	max. Earth dist.	1745 Nov 13 14:32	21°♁37'58	30.70381 AU
retrograde	1738 Feb 04 21:21	3°♁33'37		retrograde	1746 Feb 25 11:33	24°♁17'32	
opposition	1738 Apr 22 13:59	2°♁10'08	17°08'55	opposition	1746 May 13 22:57	22°♁54'46	14°30'07
min. Earth dist.	1738 Apr 23 20:10	2°♁07'59	28.75300 AU	min. Earth dist.	1746 May 14 05:04	22°♁54'20	28.78749 AU
direct	1738 Jul 11 09:43	0°♁43'47		direct	1746 Aug 01 19:24	21°♁29'50	
max. Earth dist.	1738 Oct 25 20:18	3°♁26'07	30.65068 AU	conjunction	1746 Nov 16 15:19	24°♁11'36	13°21'11
conjunction	1738 Oct 27 02:28	3°♁29'10	15°56'47	minimum elong	1746 Nov 16 15:42	24°♁11'38	13°21'12
				max. Earth dist.	1746 Nov 16 11:11	24°♁11'11	30.75463 AU
				retrograde	1747 Feb 28 06:11	26°♁49'52	
				opposition	1747 May 16 19:54	25°♁27'14	14°02'31

opposition	1763 Jun 24 10:16	2°☾30'13	4°36'09	opposition	1771 Jul 10 20:38	18°☾14'17	0°-19'-13
direct	1763 Sep 12 20:57	1°☾11'15		direct	1771 Sep 29 13:07	16°☾58'39	
conjunction	1763 Dec 25 11:55	3°☾31'49	4°01'34	conjunction	1772 Jan 09 18:09	19°☾09'02	0°-34'-36
minimum elong	1763 Dec 25 12:04	3°☾31'50	4°01'33	minimum elong	1772 Jan 09 18:07	19°☾09'01	0°34'37
max. Earth dist.	1763 Dec 27 07:40	3°☾35'44	33.09448 AU	max. Earth dist.	1772 Jan 12 02:56	19°☾13'48	34.89703 AU
retrograde	1764 Apr 06 19:26	5°☾52'09		retrograde	1772 Apr 22 01:33	21°☾20'28	
min. Earth dist.	1764 Jun 24 00:01	4°☾36'51	31.20040 AU	min. Earth dist.	1772 Jul 09 13:41	20°☾08'42	33.01606 AU
opposition	1764 Jun 25 20:04	4°☾34'03	3°58'08	opposition	1772 Jul 12 00:56	20°☾05'07	0°-54'-9
direct	1764 Sep 14 09:55	3°☾15'29		direct	1772 Sep 30 17:21	18°☾49'51	
conjunction	1764 Dec 26 17:48	5°☾34'43	3°26'01	conjunction	1773 Jan 10 19:12	20°☾59'01	-1°-7'-17
minimum elong	1764 Dec 26 17:56	5°☾34'44	3°26'02	minimum elong	1773 Jan 10 19:09	20°☾59'01	1°07'17
max. Earth dist.	1764 Dec 28 14:49	5°☾38'43	33.30133 AU	max. Earth dist.	1773 Jan 13 06:11	21°☾03'56	35.13745 AU
retrograde	1765 Apr 09 02:24	7°☾53'53		retrograde	1773 Apr 24 00:21	23°☾09'23	
min. Earth dist.	1765 Jun 26 05:33	6°☾39'07	31.40932 AU	min. Earth dist.	1773 Jul 11 17:16	21°☾57'55	33.25787 AU
opposition	1765 Jun 28 05:03	6°☾36'07	3°20'19	opposition	1773 Jul 14 04:43	21°☾54'20	-1°-28'-32
direct	1765 Sep 16 20:04	5°☾17'58		direct	1773 Oct 02 23:43	20°☾39'26	
conjunction	1765 Dec 28 23:11	7°☾35'52	2°50'40	conjunction	1774 Jan 12 19:38	22°☾47'24	-1°-39'-27
minimum elong	1765 Dec 28 23:18	7°☾35'53	2°50'40	minimum elong	1774 Jan 12 19:34	22°☾47'24	1°39'29
max. Earth dist.	1765 Dec 30 23:18	7°☾40'06	33.51489 AU	max. Earth dist.	1774 Jan 15 07:00	22°☾52'19	35.37997 AU
retrograde	1766 Apr 11 05:25	9°☾53'54		retrograde	1774 Apr 25 23:54	24°☾56'42	
min. Earth dist.	1766 Jun 28 12:45	8°☾39'32	31.62496 AU	min. Earth dist.	1774 Jul 13 17:55	23°☾45'38	33.50205 AU
opposition	1766 Jun 30 13:24	8°☾36'29	2°42'45	opposition	1774 Jul 16 07:33	23°☾41'56	-2°-2'-19
direct	1766 Sep 19 05:05	7°☾18'46		direct	1774 Oct 05 04:07	22°☾27'23	
conjunction	1766 Dec 31 03:49	9°☾35'22	2°15'34	conjunction	1775 Jan 14 19:24	24°☾34'11	-2°-11'-5
minimum elong	1766 Dec 31 03:55	9°☾35'22	2°15'34	minimum elong	1775 Jan 14 19:19	24°☾34'10	2°11'06
max. Earth dist.	1767 Jan 02 05:22	9°☾39'42	33.73465 AU	max. Earth dist.	1775 Jan 17 08:31	24°☾39'12	35.62474 AU
retrograde	1767 Apr 13 08:57	11°☾52'15		retrograde	1775 Apr 27 22:49	26°☾42'27	
min. Earth dist.	1767 Jun 30 17:18	10°☾38'25	31.84650 AU	min. Earth dist.	1775 Jul 15 19:40	25°☾31'41	33.74898 AU
opposition	1767 Jul 02 20:53	10°☾35'12	2°05'31	opposition	1775 Jul 18 09:55	25°☾27'58	-2°-35'-29
direct	1767 Sep 21 13:19	9°☾17'55		direct	1775 Oct 07 06:27	24°☾13'47	
conjunction	1768 Jan 02 07:49	11°☾33'14	1°40'45	conjunction	1776 Jan 16 18:37	26°☾19'25	-2°-42'-10
minimum elong	1768 Jan 02 07:53	11°☾33'14	1°40'45	minimum elong	1776 Jan 16 18:31	26°☾19'25	2°42'12
max. Earth dist.	1768 Jan 04 11:31	11°☾37'43	33.95957 AU	max. Earth dist.	1776 Jan 19 09:10	26°☾24'31	35.87232 AU
retrograde	1768 Apr 14 12:54	13°☾49'02		retrograde	1776 Apr 28 21:11	28°☾26'41	
min. Earth dist.	1768 Jul 01 22:58	12°☾35'36	32.07325 AU	min. Earth dist.	1776 Jul 16 19:27	27°☾16'19	33.99884 AU
opposition	1768 Jul 04 03:49	12°☾32'20	1°28'39	opposition	1776 Jul 19 11:29	27°☾12'31	-3°-8'-1
direct	1768 Sep 22 18:34	11°☾15'29		direct	1776 Oct 08 08:56	25°☾58'41	
conjunction	1769 Jan 03 11:19	13°☾29'32	1°06'18	conjunction	1777 Jan 17 17:13	28°☾03'13	-3°-12'-39
minimum elong	1769 Jan 03 11:22	13°☾29'32	1°06'18	minimum elong	1777 Jan 17 17:06	28°☾03'13	3°12'40
max. Earth dist.	1769 Jan 05 16:52	13°☾34'08	34.18916 AU	max. Earth dist.	1777 Jan 20 08:37	28°☾08'21	36.12279 AU
retrograde	1769 Apr 16 15:59	15°☾44'14			1777 Apr 04 21:58	0°≈	
min. Earth dist.	1769 Jul 04 03:23	14°☾31'15	32.30428 AU	retrograde	1777 Apr 30 22:15	0°≈09'31	
opposition	1769 Jul 06 10:06	14°☾27'53	0°52'13		1777 May 27 09:12	30°☾	
direct	1769 Sep 25 02:00	13°☾11'27		min. Earth dist.	1777 Jul 18 19:01	28°☾59'31	34.25196 AU
conjunction	1770 Jan 05 14:02	15°☾24'15	0°32'14	opposition	1777 Jul 21 12:39	28°☾55'40	-3°-39'-54
minimum elong	1770 Jan 05 14:03	15°☾24'16	0°32'14	direct	1777 Oct 10 07:35	27°☾42'12	
max. Earth dist.	1770 Jan 07 20:30	15°☾28'54	34.42236 AU	conjunction	1778 Jan 19 15:21	29°☾45'41	-3°-42'-33
retrograde	1770 Apr 18 20:53	17°☾37'52		minimum elong	1778 Jan 19 15:14	29°☾45'40	3°42'34
min. Earth dist.	1770 Jul 06 07:24	16°☾25'19	32.53897 AU	max. Earth dist.	1778 Jan 22 08:53	29°☾50'56	36.37624 AU
opposition	1770 Jul 08 15:48	16°☾21'52	0°16'14		1778 Jan 27 02:13	0°≈	
direct	1770 Sep 27 06:43	15°☾05'51		retrograde	1778 May 02 19:56	1°≈51'02	
desc. node	1770 Dec 23 02:01	16°☾46'02		min. Earth dist.	1778 Jul 20 18:54	0°≈41'23	34.50780 AU
conjunction	1771 Jan 07 16:28	17°☾17'26	0°-1'-27	opposition	1778 Jul 23 13:09	0°≈37'30	-4°-11'-7
minimum elong	1771 Jan 07 16:28	17°☾17'26	0°01'28	direct	1778 Aug 20 11:49	30°☾	
behind sun begin	1771 Jan 07 10:06	17°☾16'55			1778 Oct 12 08:32	29°☾24'26	
behind sun end	1771 Jan 07 22:49	17°☾17'56			1778 Dec 01 23:39	0°≈	
max. Earth dist.	1771 Jan 10 01:07	17°☾22'14	34.65856 AU	conjunction	1779 Jan 21 12:57	1°≈26'53	-4°-11'-49
retrograde	1771 Apr 20 23:00	19°☾29'57		minimum elong	1779 Jan 21 12:49	1°≈26'52	4°11'49
min. Earth dist.	1771 Jul 08 11:37	18°☾17'45	32.77633 AU	max. Earth dist.	1779 Jan 24 06:35	1°≈32'06	36.63210 AU

retrograde	1779 May 04 18:52	3°31'18		direct	1787 Oct 27 16:43	13°51'57	
min. Earth dist.	1779 Jul 22 16:39	2°22'06	34.76602 AU				
opposition	1779 Jul 25 12:53	2°18'07	-4°-41'-39	conjunction	1788 Feb 04 19:48	15°45'57	-8°-7'-4
direct	1779 Oct 14 08:18	1°05'27		minimum elong	1788 Feb 04 19:35	15°45'56	8°07'05
				max. Earth dist.	1788 Feb 07 18:51	15°51'16	38.94622 AU
conjunction	1780 Jan 23 10:09	3°06'54	-4°-40'-28	retrograde	1788 May 17 22:46	17°42'44	
minimum elong	1780 Jan 23 10:01	3°06'53	4°40'30	min. Earth dist.	1788 Aug 05 12:48	16°36'11	37.09462 AU
max. Earth dist.	1780 Jan 26 05:53	3°12'15	36.88982 AU	opposition	1788 Aug 08 13:28	16°32'07	-8°-45'-35
retrograde	1780 May 05 15:02	5°10'26		direct	1788 Oct 28 13:59	15°22'22	
min. Earth dist.	1780 Jul 23 16:12	4°01'32	35.02588 AU				
opposition	1780 Jul 26 12:23	3°57'35	-5°-11'-30	conjunction	1789 Feb 05 12:51	17°15'30	-8°-30'-3
direct	1780 Oct 15 09:38	2°45'18		minimum elong	1789 Feb 05 12:39	17°15'29	8°30'03
				max. Earth dist.	1789 Feb 08 12:31	17°20'50	39.20028 AU
conjunction	1781 Jan 24 06:44	4°45'47	-5°-8'-30	retrograde	1789 May 19 15:22	19°11'32	
minimum elong	1781 Jan 24 06:34	4°45'46	5°08'30	min. Earth dist.	1789 Aug 07 07:44	18°05'12	37.35097 AU
max. Earth dist.	1781 Jan 27 02:34	4°51'06	37.14880 AU	opposition	1789 Aug 10 08:34	18°01'09	-9°-9'-15
retrograde	1781 May 07 11:22	6°48'27		direct	1789 Oct 30 09:29	16°51'41	
min. Earth dist.	1781 Jul 25 13:19	5°39'58	35.28667 AU				
opposition	1781 Jul 28 11:15	5°35'56	-5°-40'-39	conjunction	1790 Feb 07 05:48	18°43'59	-8°-52'-22
direct	1781 Oct 17 09:26	4°24'02		minimum elong	1790 Feb 07 05:35	18°43'58	8°52'23
				max. Earth dist.	1790 Feb 10 06:32	18°49'22	39.45464 AU
conjunction	1782 Jan 26 03:02	6°23'33	-5°-35'-54	retrograde	1790 May 21 07:52	20°39'16	
minimum elong	1782 Jan 26 02:52	6°23'32	5°35'55	min. Earth dist.	1790 Aug 09 01:44	19°33'11	37.60738 AU
max. Earth dist.	1782 Jan 28 23:51	6°28'55	37.40812 AU	opposition	1790 Aug 12 02:55	19°29'08	-9°-32'-14
retrograde	1782 May 09 06:46	8°25'22		direct	1790 Nov 01 04:09	18°19'58	
min. Earth dist.	1782 Jul 27 11:54	7°17'11	35.54773 AU				
opposition	1782 Jul 30 09:38	7°13'11	-6°-9'-8	conjunction	1791 Feb 08 22:11	20°11'29	-9°-14'-4
direct	1782 Oct 19 07:58	6°01'39		minimum elong	1791 Feb 08 21:58	20°11'28	9°14'05
				max. Earth dist.	1791 Feb 11 22:33	20°16'47	39.70896 AU
conjunction	1783 Jan 27 22:59	8°00'13	-6°-2'-40	retrograde	1791 May 23 02:22	22°06'02	
minimum elong	1783 Jan 27 22:49	8°00'12	6°02'41	min. Earth dist.	1791 Aug 10 18:45	21°00'16	37.86377 AU
max. Earth dist.	1783 Jan 30 20:26	8°05'36	37.66726 AU	opposition	1791 Aug 13 21:00	20°56'10	-9°-54'-31
retrograde	1783 May 11 02:17	10°01'11		direct	1791 Nov 02 20:19	19°47'18	
min. Earth dist.	1783 Jul 29 09:06	8°53'20	35.80809 AU				
opposition	1783 Aug 01 07:27	8°49'19	-6°-36'-55	conjunction	1792 Feb 10 14:15	21°38'03	-9°-35'-8
direct	1783 Oct 21 06:11	7°38'07		minimum elong	1792 Feb 10 14:02	21°38'02	9°35'09
				max. Earth dist.	1792 Feb 13 16:05	21°43'25	39.96294 AU
conjunction	1784 Jan 29 18:21	9°35'45	-6°-28'-48	retrograde	1792 May 23 18:28	23°31'54	
minimum elong	1784 Jan 29 18:10	9°35'45	6°28'50	min. Earth dist.	1792 Aug 11 13:07	22°26'22	38.11952 AU
max. Earth dist.	1784 Feb 01 15:32	9°41'04	37.92530 AU	opposition	1792 Aug 14 14:45	22°22'19	-10°-16'-9
retrograde	1784 May 11 23:49	11°35'53		direct	1792 Nov 03 14:18	21°13'46	
min. Earth dist.	1784 Jul 30 05:54	10°28'19	36.06743 AU				
opposition	1784 Aug 02 04:55	10°24'18	-7°-4'-1	conjunction	1793 Feb 11 06:00	23°03'47	-9°-55'-35
direct	1784 Oct 22 01:09	9°13'25		minimum elong	1793 Feb 11 05:48	23°03'46	9°55'36
				max. Earth dist.	1793 Feb 14 07:10	23°09'04	40.21617 AU
conjunction	1785 Jan 30 13:31	11°10'08	-6°-54'-19	retrograde	1793 May 25 10:54	24°56'57	
minimum elong	1785 Jan 30 13:20	11°10'07	6°54'20	min. Earth dist.	1793 Aug 13 05:16	23°51'44	38.37425 AU
max. Earth dist.	1785 Feb 02 11:53	11°15'30	38.18212 AU	opposition	1793 Aug 16 08:02	23°47'39	-10°-37'-7
retrograde	1785 May 13 18:28	13°09'25		direct	1793 Nov 05 07:25	22°39'23	
min. Earth dist.	1785 Aug 01 03:19	12°02'04	36.32539 AU				
opposition	1785 Aug 04 01:53	11°58'05	-7°-30'-26	conjunction	1794 Feb 12 21:28	24°28'42	-10°-15'-25
direct	1785 Oct 23 23:20	10°47'31		minimum elong	1794 Feb 12 21:15	24°28'41	10°15'26
				max. Earth dist.	1794 Feb 15 23:20	24°34'00	40.46790 AU
conjunction	1786 Feb 01 07:59	12°43'18	-7°-19'-12	retrograde	1794 May 27 01:42	26°21'13	
minimum elong	1786 Feb 01 07:47	12°43'17	7°19'14	min. Earth dist.	1794 Aug 14 23:17	25°16'12	38.62724 AU
max. Earth dist.	1786 Feb 04 05:38	12°48'34	38.43762 AU	opposition	1794 Aug 18 01:05	25°12'11	-10°-57'-27
retrograde	1786 May 15 14:09	14°41'44		direct	1794 Nov 07 01:03	24°04'14	
min. Earth dist.	1786 Aug 02 22:26	13°34'41	36.58229 AU				
opposition	1786 Aug 05 22:17	13°30'39	-7°-56'-10	conjunction	1795 Feb 14 12:47	25°52'50	-10°-34'-40
direct	1786 Oct 25 19:41	12°20'21		minimum elong	1795 Feb 14 12:35	25°52'49	10°34'41
				max. Earth dist.	1795 Feb 17 14:33	25°58'07	40.71758 AU
conjunction	1787 Feb 03 02:09	14°15'14	-7°-43'-27	retrograde	1795 May 28 15:12	27°44'43	
minimum elong	1787 Feb 03 01:57	14°15'13	7°43'28	min. Earth dist.	1795 Aug 16 15:23	26°39'58	38.87770 AU
max. Earth dist.	1787 Feb 06 01:09	14°20'34	38.69209 AU	opposition	1795 Aug 19 17:28	26°35'57	-11°-17'-9
retrograde	1787 May 17 07:26	16°12'50		direct	1795 Nov 08 19:20	25°28'17	
min. Earth dist.	1787 Aug 04 18:53	15°05'58	36.83853 AU				
opposition	1787 Aug 07 18:06	15°01'58	-8°-21'-13	conjunction	1796 Feb 16 03:40	27°16'12	-10°-53'-20

minimum elong	1796 Feb 16 03:27	27° 16 '11	10°53'20	conjunction	1804 Feb 27 15:28	7° 53 '24	-13°-2'-27
max. Earth dist.	1796 Feb 19 04:38	27° 21 '24	40.96445 AU	minimum elong	1804 Feb 27 15:18	7° 53 '23	13°02'28
retrograde	1796 May 29 08:06	29° 07 '27		max. Earth dist.	1804 Mar 01 16:59	7° 58 '24	42.85251 AU
min. Earth dist.	1796 Aug 17 07:57	28° 02 '55	39.12533 AU	retrograde	1804 Jun 09 20:51	9° 39 '51	
opposition	1796 Aug 20 09:49	27° 58 '56	-11°-36'-15	min. Earth dist.	1804 Aug 29 06:09	8° 36 '49	41.02203 AU
direct	1796 Nov 09 10:09	26° 51 '33		opposition	1804 Sep 01 06:29	8° 33 '02	-13°-47'-37
				direct	1804 Nov 21 06:41	7° 27 '31	
conjunction	1797 Feb 16 18:19	28° 38 '46	-11°-11'-26	conjunction	1805 Feb 28 03:35	9° 09 '44	-13°-16'-7
minimum elong	1797 Feb 16 18:07	28° 38 '45	11°11'27	minimum elong	1805 Feb 28 03:24	9° 09 '43	13°16'08
max. Earth dist.	1797 Feb 19 19:56	28° 43 '59	41.20831 AU	max. Earth dist.	1805 Mar 03 04:17	9° 14 '39	43.08125 AU
	1797 Apr 11 15:20	0° 0 '		retrograde	1805 Jun 11 08:35	10° 55 '40	
retrograde	1797 May 30 22:57	0° 29 '23		min. Earth dist.	1805 Aug 30 18:32	9° 52 '53	41.25151 AU
	1797 Jul 20 22:56	30° 0 '		opposition	1805 Sep 02 19:39	9° 49 '04	-14°-1'-26
min. Earth dist.	1797 Aug 19 00:48	29° 25 '01	39.36967 AU	direct	1805 Nov 22 19:40	8° 43 '47	
opposition	1797 Aug 22 01:43	29° 21 '06	-11°-54'-45				
direct	1797 Nov 11 01:53	28° 13 '57		conjunction	1806 Mar 01 15:36	10° 25 '29	-13°-29'-16
conjunction	1798 Feb 18 08:35	0° 00 '30	-11°-28'-58	minimum elong	1806 Mar 01 15:27	10° 25 '28	13°29'16
minimum elong	1798 Feb 18 08:23	0° 00 '29	11°28'58	max. Earth dist.	1806 Mar 04 16:21	10° 30 '22	43.30754 AU
	1798 Feb 18 01:30	0° 0 '		retrograde	1806 Jun 12 19:30	12° 10 '53	
max. Earth dist.	1798 Feb 21 08:56	0° 05 '35	41.44904 AU	min. Earth dist.	1806 Sep 01 08:40	11° 08 '16	41.47834 AU
retrograde	1798 Jun 01 14:42	1° 50 '28		opposition	1806 Sep 04 08:31	11° 04 '31	-14°-14'-43
min. Earth dist.	1798 Aug 20 15:28	0° 46 '19	39.61110 AU	direct	1806 Nov 24 09:27	9° 59 '29	
opposition	1798 Aug 23 17:03	0° 42 '23	-12°-12'-39				
	1798 Sep 28 07:46	30° 0 '		conjunction	1807 Mar 03 03:33	11° 40 '39	-13°-41'-55
direct	1798 Nov 12 15:53	29° 35 '28		minimum elong	1807 Mar 03 03:23	11° 40 '38	13°41'56
	1798 Dec 26 16:51	0° 0 '		max. Earth dist.	1807 Mar 06 04:03	11° 45 '30	43.53094 AU
conjunction	1799 Feb 19 22:34	1° 21 '21	-11°-45'-57	retrograde	1807 Jun 14 05:30	13° 25 '34	
minimum elong	1799 Feb 19 22:22	1° 21 '20	11°45'59	min. Earth dist.	1807 Sep 02 21:35	12° 23 '07	41.70171 AU
max. Earth dist.	1799 Feb 22 23:41	1° 26 '27	41.68698 AU	opposition	1807 Sep 05 21:06	12° 19 '24	-14°-27'-30
retrograde	1799 Jun 03 03:21	3° 10 '41		direct	1807 Nov 26 00:04	11° 14 '36	
min. Earth dist.	1799 Aug 22 07:48	2° 06 '40	39.85004 AU	conjunction	1808 Mar 03 15:02	12° 55 '14	-13°-54'-5
opposition	1799 Aug 25 08:11	2° 02 '48	-12°-29'-58	minimum elong	1808 Mar 03 14:53	12° 55 '13	13°54'06
direct	1799 Nov 14 08:16	0° 56 '07		max. Earth dist.	1808 Mar 06 14:12	12° 59 '59	43.75059 AU
conjunction	1800 Feb 21 12:03	2° 41 '20	-12°-2'-22	retrograde	1808 Jun 14 18:31	14° 39 '40	
minimum elong	1800 Feb 21 11:51	2° 41 '19	12°02'23	min. Earth dist.	1808 Sep 03 10:34	13° 37 '23	41.92122 AU
max. Earth dist.	1800 Feb 24 12:41	2° 46 '23	41.92286 AU	opposition	1808 Sep 06 09:38	13° 33 '42	-14°-39'-46
retrograde	1800 Jun 04 14:52	4° 30 '02		direct	1808 Nov 26 11:52	12° 29 '06	
min. Earth dist.	1800 Aug 23 21:34	3° 26 '15	40.08709 AU	conjunction	1809 Mar 05 02:37	14° 09 '13	-14°-5'-47
opposition	1800 Aug 26 22:51	3° 22 '21	-12°-46'-40	minimum elong	1809 Mar 05 02:27	14° 09 '12	14°05'48
direct	1800 Nov 16 00:21	2° 15 '53		max. Earth dist.	1809 Mar 08 02:08	14° 13 '58	43.96619 AU
conjunction	1801 Feb 23 01:16	4° 00 '28	-12°-18'-14	retrograde	1809 Jun 16 06:44	15° 53 '09	
minimum elong	1801 Feb 23 01:04	4° 00 '27	12°18'15	min. Earth dist.	1809 Sep 05 00:11	14° 50 '58	42.13638 AU
max. Earth dist.	1801 Feb 26 01:58	4° 05 '29	42.15711 AU	opposition	1809 Sep 07 21:49	14° 47 '23	-14°-51'-35
retrograde	1801 Jun 06 03:39	5° 48 '35		direct	1809 Nov 27 23:49	13° 42 '58	
min. Earth dist.	1801 Aug 25 12:29	4° 44 '58	40.32288 AU	conjunction	1810 Mar 06 13:50	15° 22 '34	-14°-17'-2
opposition	1801 Aug 28 13:18	4° 41 '06	-13°-2'-47	minimum elong	1810 Mar 06 13:42	15° 22 '33	14°17'03
direct	1801 Nov 17 15:38	3° 34 '52		max. Earth dist.	1810 Mar 09 11:40	15° 27 '10	44.17759 AU
conjunction	1802 Feb 24 14:20	5° 18 '49	-12°-33'-31	retrograde	1810 Jun 17 19:59	17° 05 '59	
minimum elong	1802 Feb 24 14:09	5° 18 '48	12°33'32	min. Earth dist.	1810 Sep 06 11:45	16° 03 '58	42.34738 AU
max. Earth dist.	1802 Feb 27 15:47	5° 23 '52	42.39024 AU	opposition	1810 Sep 09 09:39	16° 00 '23	-15°-2'-54
retrograde	1802 Jun 07 15:46	7° 06 '22		direct	1810 Nov 29 09:37	14° 56 '09	
min. Earth dist.	1802 Aug 27 02:28	6° 02 '57	40.55731 AU	conjunction	1811 Mar 08 00:46	16° 35 '14	-14°-27'-50
opposition	1802 Aug 30 03:18	5° 59 '06	-13°-18'-19	minimum elong	1811 Mar 08 00:37	16° 35 '13	14°27'51
direct	1802 Nov 19 07:06	4° 53 '05		max. Earth dist.	1811 Mar 10 22:33	16° 39 '49	44.38494 AU
conjunction	1803 Feb 26 02:58	6° 36 '26	-12°-48'-16	retrograde	1811 Jun 19 05:20	18° 18 '09	
minimum elong	1803 Feb 26 02:47	6° 36 '26	12°48'17	min. Earth dist.	1811 Sep 08 00:59	17° 16 '12	42.55466 AU
max. Earth dist.	1803 Mar 01 03:27	6° 41 '24	42.62206 AU	opposition	1811 Sep 10 21:14	17° 12 '43	-15°-13'-45
retrograde	1803 Jun 09 07:39	8° 23 '26		direct	1811 Nov 30 22:03	16° 08 '39	
min. Earth dist.	1803 Aug 28 15:32	7° 20 '15	40.79050 AU	conjunction	1812 Mar 08 11:30	17° 47 '14	-14°-38'-11
opposition	1803 Aug 31 16:57	7° 16 '23	-13°-33'-15	minimum elong	1812 Mar 08 11:23	17° 47 '13	14°38'12
direct	1803 Nov 20 17:47	6° 10 '37		max. Earth dist.	1812 Mar 11 08:58	17° 51 '47	44.58908 AU

retrograde	1812 Jun 19 13:02	19° ✕ 29'40		direct	1820 Dec 10 20:31	26° ✕ 38'02	
min. Earth dist.	1812 Sep 08 11:59	18° ✕ 27'53	42.75886 AU				
opposition	1812 Sep 11 08:28	18° ✕ 24'23	-15°-24'-8	conjunction	1821 Mar 19 03:03	28° ✕ 12'52	-15°-51'-21
direct	1812 Dec 01 11:52	17° ✕ 20'30		minimum elong	1821 Mar 19 03:00	28° ✕ 12'52	15°51'21
				max. Earth dist.	1821 Mar 21 19:44	28° ✕ 16'56	46.30499 AU
conjunction	1813 Mar 09 21:47	18° ✕ 58'36	-14°-48'-4	retrograde	1821 Jun 30 08:43	29° ✕ 51'42	
minimum elong	1813 Mar 09 21:39	18° ✕ 58'35	14°48'04	min. Earth dist.	1821 Sep 19 14:13	28° ✕ 51'09	44.47172 AU
max. Earth dist.	1813 Mar 12 18:20	19° ✕ 03'04	44.79040 AU	opposition	1821 Sep 22 04:07	28° ✕ 48'04	-16°-36'-53
retrograde	1813 Jun 21 00:01	20° ✕ 40'34		direct	1821 Dec 12 05:21	27° ✕ 45'52	
min. Earth dist.	1813 Sep 09 23:34	19° ✕ 38'56	42.96060 AU				
opposition	1813 Sep 12 19:35	19° ✕ 35'27	-15°-34'-1	conjunction	1822 Mar 20 12:09	29° ✕ 20'19	-15°-57'-29
direct	1813 Dec 02 23:15	18° ✕ 31'46		minimum elong	1822 Mar 20 12:05	29° ✕ 20'19	15°57'30
				max. Earth dist.	1822 Mar 23 03:21	29° ✕ 24'17	46.47649 AU
conjunction	1814 Mar 11 08:10	20° ✕ 09'23	-14°-57'-29		1822 Apr 16 15:09	0° ∩	
minimum elong	1814 Mar 11 08:04	20° ✕ 09'23	14°57'30	retrograde	1822 Jul 01 16:25	0° ∩ 58'45	
max. Earth dist.	1814 Mar 14 05:21	20° ✕ 13'52	44.98944 AU		1822 Sep 19 13:14	30° ✕	
retrograde	1814 Jun 22 09:49	21° ✕ 50'55		min. Earth dist.	1822 Sep 20 23:20	29° ✕ 58'18	44.64174 AU
min. Earth dist.	1814 Sep 11 11:04	20° ✕ 49'24	43.15993 AU	opposition	1822 Sep 23 13:07	29° ✕ 55'14	-16°-42'-57
opposition	1814 Sep 14 06:12	20° ✕ 45'59	-15°-43'-26	direct	1822 Dec 13 14:26	28° ✕ 53'11	
direct	1814 Dec 04 10:48	19° ✕ 42'29			1823 Mar 03 11:03	0° ∩	
conjunction	1815 Mar 12 18:09	21° ✕ 19'40	-15°-6'-27	conjunction	1823 Mar 21 20:54	0° ∩ 27'14	-16°-3'-16
minimum elong	1815 Mar 12 18:03	21° ✕ 19'39	15°06'27	minimum elong	1823 Mar 21 20:51	0° ∩ 27'14	16°03'17
max. Earth dist.	1815 Mar 15 13:59	21° ✕ 24'02	45.18629 AU	max. Earth dist.	1823 Mar 24 11:00	0° ∩ 31'07	46.64320 AU
retrograde	1815 Jun 23 22:18	23° ✕ 00'46		retrograde	1823 Jul 02 23:27	2° ∩ 05'17	
min. Earth dist.	1815 Sep 12 21:04	21° ✕ 59'27	43.35709 AU	min. Earth dist.	1823 Sep 22 09:56	1° ∩ 04'52	44.80735 AU
opposition	1815 Sep 15 16:44	21° ✕ 56'02	-15°-52'-22	opposition	1823 Sep 24 22:11	1° ∩ 01'53	-16°-48'-37
direct	1815 Dec 05 18:34	20° ✕ 52'43			1823 Dec 12 20:12	30° ✕	
				direct	1823 Dec 15 00:22	29° ✕ 59'57	
conjunction	1816 Mar 13 03:53	22° ✕ 29'29	-15°-14'-58		1823 Dec 17 04:26	0° ∩	
minimum elong	1816 Mar 13 03:47	22° ✕ 29'29	15°15'00	conjunction	1824 Mar 22 05:25	1° ∩ 33'37	-16°-8'-41
max. Earth dist.	1816 Mar 16 00:14	22° ✕ 33'52	45.38084 AU	minimum elong	1824 Mar 22 05:21	1° ∩ 33'36	16°08'42
retrograde	1816 Jun 24 08:48	24° ✕ 10'12		max. Earth dist.	1824 Mar 24 19:31	1° ∩ 37'29	46.80591 AU
min. Earth dist.	1816 Sep 13 08:58	23° ✕ 08'59	43.55177 AU	retrograde	1824 Jul 03 05:21	3° ∩ 11'16	
opposition	1816 Sep 16 03:13	23° ✕ 05'38	-16°00'-51	min. Earth dist.	1824 Sep 22 19:17	2° ∩ 10'56	44.96907 AU
direct	1816 Dec 06 03:50	22° ✕ 02'32		opposition	1824 Sep 25 06:56	2° ∩ 07'59	-16°-53'-55
				direct	1824 Dec 15 11:57	1° ∩ 06'09	
conjunction	1817 Mar 14 13:37	23° ✕ 38'54	-15°-23'-3				
minimum elong	1817 Mar 14 13:31	23° ✕ 38'54	15°23'04	conjunction	1825 Mar 23 13:45	2° ∩ 39'26	-16°-13'-44
max. Earth dist.	1817 Mar 17 09:14	23° ✕ 43'14	45.57297 AU	minimum elong	1825 Mar 23 13:43	2° ∩ 39'26	16°13'45
retrograde	1817 Jun 25 17:02	25° ✕ 19'13		max. Earth dist.	1825 Mar 26 02:17	2° ∩ 43'11	46.96515 AU
min. Earth dist.	1817 Sep 14 18:41	24° ✕ 18'13	43.74367 AU	retrograde	1825 Jul 04 14:52	4° ∩ 16'43	
opposition	1817 Sep 17 13:14	24° ✕ 14'52	-16°-8'-53	min. Earth dist.	1825 Sep 24 04:04	3° ∩ 16'29	45.12771 AU
direct	1817 Dec 07 14:02	23° ✕ 11'58		opposition	1825 Sep 26 15:26	3° ∩ 13'33	-16°-58'-50
				direct	1825 Dec 16 20:24	2° ∩ 11'50	
conjunction	1818 Mar 15 23:06	24° ✕ 47'56	-15°-30'-43				
minimum elong	1818 Mar 15 23:00	24° ✕ 47'56	15°30'45	conjunction	1826 Mar 24 22:03	3° ∩ 44'45	-16°-18'-24
max. Earth dist.	1818 Mar 18 17:47	24° ✕ 52'12	45.76200 AU	minimum elong	1826 Mar 24 22:00	3° ∩ 44'45	16°18'25
retrograde	1818 Jun 27 01:51	26° ✕ 27'53		max. Earth dist.	1826 Mar 27 10:58	3° ∩ 48'31	47.12146 AU
min. Earth dist.	1818 Sep 16 06:00	25° ✕ 27'01	43.93227 AU	retrograde	1826 Jul 06 00:24	5° ∩ 21'40	
opposition	1818 Sep 18 23:17	25° ✕ 23'44	-16°-16'-29	min. Earth dist.	1826 Sep 25 13:52	4° ∩ 21'29	45.28342 AU
direct	1818 Dec 09 01:31	24° ✕ 21'02		opposition	1826 Sep 27 23:50	4° ∩ 18'37	-17°-3'-21
				direct	1826 Dec 18 04:07	3° ∩ 17'02	
conjunction	1819 Mar 17 08:36	25° ✕ 56'38	-15°-37'-58				
minimum elong	1819 Mar 17 08:32	25° ✕ 56'37	15°37'59	conjunction	1827 Mar 26 06:04	4° ∩ 49'36	-16°-22'-41
max. Earth dist.	1819 Mar 20 03:26	26° ✕ 00'53	45.94743 AU	minimum elong	1827 Mar 26 06:03	4° ∩ 49'36	16°22'43
retrograde	1819 Jun 28 10:18	27° ✕ 36'13		max. Earth dist.	1827 Mar 28 17:51	4° ∩ 53'17	47.27515 AU
min. Earth dist.	1819 Sep 17 16:41	26° ✕ 35'28	44.11675 AU	retrograde	1827 Jul 07 09:35	6° ∩ 26'11	
opposition	1819 Sep 20 08:57	26° ✕ 32'15	-16°-23'-40	min. Earth dist.	1827 Sep 26 21:28	5° ∩ 26'08	45.43648 AU
direct	1819 Dec 10 13:20	25° ✕ 29'44		opposition	1827 Sep 29 07:54	5° ∩ 23'16	-17°-7'-29
				direct	1827 Dec 19 10:02	4° ∩ 21'48	
conjunction	1820 Mar 17 17:52	27° ✕ 04'57	-15°-44'-50				
minimum elong	1820 Mar 17 17:47	27° ✕ 04'57	15°44'52	conjunction	1828 Mar 26 13:55	5° ∩ 54'03	-16°-26'-37
max. Earth dist.	1820 Mar 20 10:41	27° ✕ 09'03	46.12860 AU	minimum elong	1828 Mar 26 13:54	5° ∩ 54'03	16°26'37
retrograde	1820 Jun 28 22:48	28° ✕ 44'10		max. Earth dist.	1828 Mar 29 01:07	5° ∩ 57'41	47.42620 AU
min. Earth dist.	1820 Sep 18 02:37	27° ✕ 43'34	44.29677 AU	retrograde	1828 Jul 07 16:11	7° ∩ 30'19	
opposition	1820 Sep 20 18:36	27° ✕ 40'22	-16°-30'-28				

min. Earth dist.	1828 Sep 27 07:01	6°♃30'20	45.58694 AU	conjunction	1837 Apr 05 08:30	15°♃21'02	-16°-47'00
opposition	1828 Sep 29 16:02	6°♃27'32	-17°-11'-14	minimum elong	1837 Apr 05 08:32	15°♃21'02	16°47'01
direct	1828 Dec 19 18:46	5°♃26'13		max. Earth dist.	1837 Apr 07 11:10	15°♃24'04	48.61475 AU
				retrograde	1837 Jul 17 11:27	16°♃54'46	
conjunction	1829 Mar 27 21:44	6°♃58'10	-16°-30'-10	min. Earth dist.	1837 Oct 07 08:35	15°♃55'29	46.76020 AU
minimum elong	1829 Mar 27 21:43	6°♃58'10	16°30'11	opposition	1837 Oct 09 09:34	15°♃53'08	-17°-29'-52
max. Earth dist.	1829 Mar 30 09:03	7°♃01'48	47.57466 AU	direct	1837 Dec 29 13:09	14°♃52'55	
retrograde	1829 Jul 08 20:59	8°♃34'07					
min. Earth dist.	1829 Sep 28 15:12	7°♃34'15	45.73438 AU	conjunction	1838 Apr 06 15:18	16°♃22'26	-16°-47'-44
opposition	1829 Sep 30 23:50	7°♃31'29	-17°-14'-36	minimum elong	1838 Apr 06 15:21	16°♃22'26	16°47'44
direct	1829 Dec 21 05:13	6°♃30'20		max. Earth dist.	1838 Apr 08 17:24	16°♃25'24	48.72616 AU
				retrograde	1838 Jul 18 17:28	17°♃55'53	
conjunction	1830 Mar 29 05:23	8°♃01'59	-16°-33'-22	min. Earth dist.	1838 Oct 08 16:52	16°♃56'37	46.87032 AU
minimum elong	1830 Mar 29 05:23	8°♃01'59	16°33'22	opposition	1838 Oct 10 16:04	16°♃54'21	-17°-30'-21
max. Earth dist.	1830 Mar 31 14:54	8°♃05'29	47.71996 AU	direct	1838 Dec 30 18:57	15°♃54'14	
retrograde	1830 Jul 10 06:10	9°♃37'39					
min. Earth dist.	1830 Sep 29 23:23	8°♃37'54	45.87851 AU	conjunction	1839 Apr 07 22:01	17°♃23'31	-16°-48'-8
opposition	1830 Oct 02 07:25	8°♃35'10	-17°-17'-38	minimum elong	1839 Apr 07 22:04	17°♃23'31	16°48'08
direct	1830 Dec 22 12:23	7°♃34'10		max. Earth dist.	1839 Apr 09 23:55	17°♃26'29	48.83483 AU
				retrograde	1839 Jul 19 20:18	18°♃56'43	
conjunction	1831 Mar 30 13:05	9°♃05'33	-16°-36'-14	min. Earth dist.	1839 Oct 09 23:13	17°♃57'33	46.97759 AU
minimum elong	1831 Mar 30 13:05	9°♃05'33	16°36'15	opposition	1839 Oct 11 22:27	17°♃55'17	-17°-30'-31
max. Earth dist.	1831 Apr 01 22:42	9°♃09'07	47.86160 AU	direct	1840 Jan 01 03:43	16°♃55'16	
retrograde	1831 Jul 11 14:35	10°♃40'56					
min. Earth dist.	1831 Oct 01 08:50	9°♃41'16	46.01856 AU	conjunction	1840 Apr 08 04:21	18°♃24'19	-16°-48'-13
opposition	1831 Oct 03 15:02	9°♃38'37	-17°-20'-18	minimum elong	1840 Apr 08 04:24	18°♃24'20	16°48'14
direct	1831 Dec 23 20:07	8°♃37'46		max. Earth dist.	1840 Apr 10 04:39	18°♃27'11	48.94073 AU
				retrograde	1840 Jul 20 02:11	19°♃57'18	
conjunction	1832 Mar 30 20:31	10°♃08'53	-16°-38'-47	min. Earth dist.	1840 Oct 10 06:25	18°♃58'12	47.08216 AU
minimum elong	1832 Mar 30 20:32	10°♃08'53	16°38'47	opposition	1840 Oct 12 04:52	18°♃55'58	-17°-30'-21
max. Earth dist.	1832 Apr 02 04:30	10°♃12'16	47.99905 AU	direct	1841 Jan 01 11:18	17°♃56'04	
retrograde	1832 Jul 11 23:19	11°♃44'00					
min. Earth dist.	1832 Oct 01 16:24	10°♃44'28	46.15404 AU	conjunction	1841 Apr 09 10:55	19°♃24'54	-16°-48'00
opposition	1832 Oct 03 22:30	10°♃41'50	-17°-22'-40	minimum elong	1841 Apr 09 10:59	19°♃24'55	16°48'00
direct	1832 Dec 24 01:20	9°♃41'07		max. Earth dist.	1841 Apr 11 11:30	19°♃27'47	49.04383 AU
				retrograde	1841 Jul 21 08:15	20°♃57'40	
conjunction	1833 Apr 01 04:02	11°♃11'58	-16°-41'-1	min. Earth dist.	1841 Oct 11 13:55	19°♃58'38	47.18360 AU
minimum elong	1833 Apr 01 04:01	11°♃11'58	16°41'02	opposition	1841 Oct 13 11:01	19°♃56'28	-17°-29'-52
max. Earth dist.	1833 Apr 03 10:52	11°♃15'17	48.13157 AU	direct	1842 Jan 02 19:00	18°♃56'40	
retrograde	1833 Jul 13 06:30	12°♃46'48					
min. Earth dist.	1833 Oct 03 01:54	11°♃47'17	46.28448 AU	conjunction	1842 Apr 10 17:21	20°♃25'18	-16°-47'-28
opposition	1833 Oct 05 05:53	11°♃44'46	-17°-24'-43	minimum elong	1842 Apr 10 17:25	20°♃25'18	16°47'30
direct	1833 Dec 25 08:04	10°♃44'11		max. Earth dist.	1842 Apr 12 16:20	20°♃28'04	49.14381 AU
				retrograde	1842 Jul 22 17:08	21°♃57'51	
conjunction	1834 Apr 02 11:32	12°♃14'46	-16°-42'-58	min. Earth dist.	1842 Oct 12 20:06	20°♃58'55	47.28164 AU
minimum elong	1834 Apr 02 11:34	12°♃14'46	16°42'58	opposition	1842 Oct 14 17:06	20°♃56'46	-17°-29'-4
max. Earth dist.	1834 Apr 04 17:38	12°♃18'01	48.25913 AU	direct	1843 Jan 03 23:01	19°♃57'05	
retrograde	1834 Jul 14 10:57	13°♃49'19					
min. Earth dist.	1834 Oct 04 09:40	12°♃49'53	46.40974 AU	conjunction	1843 Apr 11 23:37	21°♃25'31	-16°-46'-39
opposition	1834 Oct 06 13:01	12°♃47'23	-17°-26'-29	minimum elong	1843 Apr 11 23:42	21°♃25'32	16°46'40
direct	1834 Dec 26 17:39	11°♃46'54		max. Earth dist.	1843 Apr 13 21:48	21°♃28'14	49.23993 AU
				retrograde	1843 Jul 24 01:16	22°♃57'52	
conjunction	1835 Apr 03 18:35	13°♃17'13	-16°-44'-37	min. Earth dist.	1843 Oct 14 04:14	21°♃58'57	47.37554 AU
minimum elong	1835 Apr 03 18:35	13°♃17'13	16°44'38	opposition	1843 Oct 15 23:14	21°♃56'54	-17°-28'00
max. Earth dist.	1835 Apr 05 22:40	13°♃20'20	48.38173 AU	direct	1844 Jan 05 02:54	20°♃57'20	
retrograde	1835 Jul 15 17:56	14°♃51'29					
min. Earth dist.	1835 Oct 05 17:45	13°♃52'06	46.53042 AU	conjunction	1844 Apr 12 06:03	22°♃25'35	-16°-45'-34
opposition	1835 Oct 07 20:03	13°♃49'40	-17°-27'-56	minimum elong	1844 Apr 12 06:07	22°♃25'35	16°45'36
direct	1835 Dec 28 01:45	12°♃49'17		max. Earth dist.	1844 Apr 14 03:27	22°♃28'15	49.33178 AU
				retrograde	1844 Jul 24 05:44	23°♃57'44	
conjunction	1836 Apr 04 01:40	14°♃19'18	-16°-45'-58	min. Earth dist.	1844 Oct 14 10:41	22°♃58'53	47.46468 AU
minimum elong	1836 Apr 04 01:43	14°♃19'18	16°45'59	opposition	1844 Oct 16 05:06	22°♃56'52	-17°-26'-39
max. Earth dist.	1836 Apr 06 05:56	14°♃22'26	48.50004 AU	direct	1845 Jan 05 09:08	21°♃57'23	
retrograde	1836 Jul 16 01:36	15°♃53'19					
min. Earth dist.	1836 Oct 06 02:06	14°♃53'56	46.64701 AU	conjunction	1845 Apr 13 12:18	23°♃25'27	-16°-44'-14
opposition	1836 Oct 08 02:55	14°♃51'34	-17°-29'-4	minimum elong	1845 Apr 13 12:24	23°♃25'28	16°44'14
direct	1836 Dec 28 09:25	13°♃51'17		max. Earth dist.	1845 Apr 15 07:29	23°♃27'59	49.41856 AU

retrograde	1845 Jul 25 11:07	24° Υ 57'24		minimum elong	1853 Apr 21 11:43	1° Υ 15'31	16°24'16
min. Earth dist.	1845 Oct 15 18:14	23° Υ 58'34	47.54859 AU	max. Earth dist.	1853 Apr 22 22:55	1° Υ 17'32	49.95148 AU
opposition	1845 Oct 17 11:05	23° Υ 56'37	-17°-25'-3	retrograde	1853 Aug 02 09:59	2° Υ 46'00	
direct	1846 Jan 06 16:19	22° Υ 57'13		min. Earth dist.	1853 Oct 23 21:55	1° Υ 47'19	48.06241 AU
conjunction	1846 Apr 14 18:43	24° Υ 25'06	-16°-42'-39	opposition	1853 Oct 25 06:16	1° Υ 45'48	-17°-2'-42
minimum elong	1846 Apr 14 18:48	24° Υ 25'06	16°42'40	direct	1854 Jan 14 12:30	0° Υ 46'53	
max. Earth dist.	1846 Apr 16 13:29	24° Υ 27'36	49.49997 AU	conjunction	1854 Apr 22 17:17	2° Υ 13'32	-16°-20'-32
retrograde	1846 Jul 26 15:30	25° Υ 56'50		minimum elong	1854 Apr 22 17:25	2° Υ 13'32	16°20'32
min. Earth dist.	1846 Oct 17 01:36	24° Υ 58'00	47.62697 AU	max. Earth dist.	1854 Apr 24 03:59	2° Υ 15'31	50.00276 AU
opposition	1846 Oct 18 16:45	24° Υ 56'08	-17°-23'-12	retrograde	1854 Aug 03 14:36	3° Υ 43'53	
direct	1847 Jan 08 00:56	23° Υ 56'47		min. Earth dist.	1854 Oct 25 02:59	2° Υ 45'18	48.11110 AU
conjunction	1847 Apr 16 00:50	25° Υ 24'28	-16°-40'-49	opposition	1854 Oct 26 11:08	2° Υ 43'47	-16°-58'-40
minimum elong	1847 Apr 16 00:57	25° Υ 24'28	16°40'49	direct	1855 Jan 15 16:26	1° Υ 44'57	
max. Earth dist.	1847 Apr 17 17:29	25° Υ 26'50	49.57623 AU	conjunction	1855 Apr 23 22:48	3° Υ 11'31	-16°-16'-34
retrograde	1847 Jul 27 23:46	26° Υ 55'59		minimum elong	1855 Apr 23 22:56	3° Υ 11'31	16°16'36
min. Earth dist.	1847 Oct 18 07:33	25° Υ 57'12	47.70042 AU	max. Earth dist.	1855 Apr 25 07:34	3° Υ 13'23	50.05018 AU
opposition	1847 Oct 19 22:22	25° Υ 55'21	-17°-21'-6	retrograde	1855 Aug 04 19:38	4° Υ 41'46	
direct	1848 Jan 09 05:02	24° Υ 56'04		min. Earth dist.	1855 Oct 26 09:41	3° Υ 43'11	48.15577 AU
conjunction	1848 Apr 16 06:44	26° Υ 23'33	-16°-38'-43	opposition	1855 Oct 27 16:12	3° Υ 41'45	-16°-54'-23
minimum elong	1848 Apr 16 06:49	26° Υ 23'33	16°38'44	direct	1856 Jan 16 22:09	2° Υ 43'00	
max. Earth dist.	1848 Apr 17 22:33	26° Υ 25'52	49.64768 AU	conjunction	1856 Apr 24 04:23	4° Υ 09'27	-16°-12'-22
retrograde	1848 Jul 28 06:34	27° Υ 54'52		minimum elong	1856 Apr 24 04:32	4° Υ 09'28	16°12'22
min. Earth dist.	1848 Oct 18 15:22	26° Υ 56'02	47.76938 AU	max. Earth dist.	1856 Apr 25 12:57	4° Υ 11'20	50.09320 AU
opposition	1848 Oct 20 04:02	26° Υ 54'17	-17°-18'-44	retrograde	1856 Aug 04 22:25	5° Υ 39'37	
direct	1849 Jan 09 09:22	25° Υ 55'03		opposition	1856 Oct 27 21:12	4° Υ 39'41	-16°-49'-51
conjunction	1849 Apr 17 12:46	27° Υ 22'21	-16°-36'-22	min. Earth dist.	1856 Oct 26 16:07	4° Υ 41'03	48.19554 AU
minimum elong	1849 Apr 17 12:54	27° Υ 22'22	16°36'23	direct	1857 Jan 17 06:42	3° Υ 40'59	
max. Earth dist.	1849 Apr 19 04:02	27° Υ 24'38	49.71510 AU	conjunction	1857 Apr 25 10:03	5° Υ 07'21	-16°-7'-56
retrograde	1849 Jul 29 09:50	28° Υ 53'28		minimum elong	1857 Apr 25 10:11	5° Υ 07'22	16°07'57
min. Earth dist.	1849 Oct 19 20:47	27° Υ 54'41	47.83443 AU	max. Earth dist.	1857 Apr 26 16:17	5° Υ 09'05	50.13119 AU
opposition	1849 Oct 21 09:16	27° Υ 52'57	-17°-16'-5	retrograde	1857 Aug 06 06:20	6° Υ 37'23	
direct	1850 Jan 10 16:01	26° Υ 53'45		min. Earth dist.	1857 Oct 27 21:40	5° Υ 38'51	48.23006 AU
conjunction	1850 Apr 18 18:35	28° Υ 20'54	-16°-33'-45	opposition	1857 Oct 29 02:00	5° Υ 37'31	-16°-45'-5
minimum elong	1850 Apr 18 18:41	28° Υ 20'54	16°33'46	direct	1858 Jan 18 10:39	4° Υ 38'52	
max. Earth dist.	1850 Apr 20 07:55	28° Υ 23'04	49.77884 AU	conjunction	1858 Apr 26 15:43	6° Υ 05'09	-16°-3'-16
retrograde	1850 Jul 30 14:19	29° Υ 51'50		minimum elong	1858 Apr 26 15:52	6° Υ 05'09	16°03'17
min. Earth dist.	1850 Oct 21 03:21	28° Υ 53'03	47.89613 AU	max. Earth dist.	1858 Apr 27 20:44	6° Υ 06'48	50.16368 AU
opposition	1850 Oct 22 14:40	28° Υ 51'23	-17°-13'-10	retrograde	1858 Aug 07 14:19	7° Υ 35'03	
direct	1851 Jan 11 22:29	27° Υ 52'14		min. Earth dist.	1858 Oct 29 05:00	6° Υ 36'27	48.25906 AU
conjunction	1851 Apr 20 00:19	29° Υ 19'14	-16°-30'-52	opposition	1858 Oct 30 06:58	6° Υ 35'14	-16°-40'-7
minimum elong	1851 Apr 20 00:26	29° Υ 19'15	16°30'53	direct	1859 Jan 19 13:35	5° Υ 36'36	
max. Earth dist.	1851 Apr 21 13:55	29° Υ 21'25	49.83937 AU	conjunction	1859 Apr 27 21:09	7° Υ 02'46	-15°-58'-24
retrograde	1851 May 20 11:46	0° Υ		minimum elong	1859 Apr 27 21:17	7° Υ 02'46	15°58'25
min. Earth dist.	1851 Jul 31 18:37	0° Υ 50'01		max. Earth dist.	1859 Apr 29 01:10	7° Υ 04'22	50.19094 AU
opposition	1851 Oct 14 15:42	30° Υ		retrograde	1859 Aug 08 17:54	8° Υ 32'32	
direct	1851 Oct 22 09:42	29° Υ 51'15	47.95458 AU	min. Earth dist.	1859 Oct 30 10:03	7° Υ 33'56	48.28290 AU
conjunction	1851 Oct 23 19:56	29° Υ 49'38	-17°-9'-58	opposition	1859 Oct 31 11:41	7° Υ 32'44	-16°-34'-54
minimum elong	1852 Jan 13 05:53	28° Υ 50'34		direct	1860 Jan 20 18:40	6° Υ 34'07	
max. Earth dist.	1852 Apr 07 13:45	0° Υ		conjunction	1860 Apr 28 02:30	8° Υ 00'10	-15°-53'-18
retrograde	1852 Apr 20 05:58	0° Υ 17'25	-16°-27'-41	minimum elong	1860 Apr 28 02:40	8° Υ 00'11	15°53'19
min. Earth dist.	1852 Apr 20 06:04	0° Υ 17'26	16°27'42	max. Earth dist.	1860 Apr 29 04:23	8° Υ 01'39	50.21332 AU
opposition	1852 Apr 21 17:56	0° Υ 19'30	49.89697 AU	retrograde	1860 Aug 08 21:17	9° Υ 29'48	
conjunction	1852 Aug 01 02:22	1° Υ 48'03		opposition	1860 Oct 31 16:23	8° Υ 30'01	-16°-29'-28
minimum elong	1852 Oct 22 14:51	0° Υ 49'23	48.01012 AU	min. Earth dist.	1860 Oct 30 16:22	8° Υ 31'09	48.30230 AU
opposition	1852 Oct 24 01:03	0° Υ 47'45	-17°-6'-28	direct	1861 Jan 21 00:11	7° Υ 31'24	
direct	1852 Dec 11 23:09	30° Υ		conjunction	1861 Apr 29 07:56	8° Υ 57'21	-15°-47'-57
conjunction	1853 Jan 13 09:36	29° Υ 48'46		minimum elong	1861 Apr 29 08:04	8° Υ 57'22	15°47'58
minimum elong	1853 Feb 14 09:45	0° Υ		max. Earth dist.	1861 Apr 30 09:47	8° Υ 58'50	50.23153 AU
max. Earth dist.	1853 Apr 21 11:35	1° Υ 15'30	-16°-24'-15	retrograde	1861 Aug 09 23:30	10° Υ 26'51	

opposition	1861 Nov 01 20:58	9°♄27'05	-16°-23'-46	conjunction	1870 May 08 07:02	17°♄27'18	-14°-48'-47
min. Earth dist.	1861 Oct 31 22:08	9°♄28'09	48.31765 AU	minimum elong	1870 May 08 07:12	17°♄27'18	14°48'48
direct	1862 Jan 22 08:06	8°♄28'28		max. Earth dist.	1870 May 08 21:43	17°♄28'08	50.24382 AU
conjunction	1862 Apr 30 13:11	9°♄54'19	-15°-42'-22	retrograde	1870 Aug 18 23:40	18°♄56'13	
minimum elong	1862 Apr 30 13:21	9°♄54'19	15°42'23	opposition	1870 Nov 10 12:35	17°♄56'48	-15°-21'-7
max. Earth dist.	1862 May 01 13:15	9°♄55'41	50.24611 AU	min. Earth dist.	1870 Nov 09 23:21	17°♄57'25	48.30299 AU
retrograde	1862 Aug 11 05:17	11°♄23'42		direct	1871 Jan 30 21:46	16°♄58'21	
min. Earth dist.	1862 Nov 02 02:46	10°♄25'00	48.32967 AU	conjunction	1871 May 09 12:24	18°♄23'58	-14°-41'-4
opposition	1862 Nov 03 01:20	10°♄23'57	-16°-17'-49	minimum elong	1871 May 09 12:36	18°♄23'58	14°41'05
direct	1863 Jan 23 12:45	9°♄25'19		max. Earth dist.	1871 May 10 02:46	18°♄24'46	50.22348 AU
conjunction	1863 May 01 18:24	10°♄51'05	-15°-36'-32	retrograde	1871 Aug 20 01:41	19°♄52'51	
minimum elong	1863 May 01 18:33	10°♄51'06	15°36'33	opposition	1871 Nov 11 16:56	18°♄53'26	-15°-13'00
max. Earth dist.	1863 May 02 17:44	10°♄52'25	50.25746 AU	min. Earth dist.	1871 Nov 11 04:59	18°♄54'00	48.27887 AU
retrograde	1863 Aug 12 12:04	12°♄20'22		direct	1872 Feb 01 05:27	17°♄54'59	
min. Earth dist.	1863 Nov 03 09:02	11°♄21'38	48.33864 AU	conjunction	1872 May 09 17:30	19°♄20'34	-14°-33'-9
opposition	1863 Nov 04 05:54	11°♄20'39	-16°-11'-37	minimum elong	1872 May 09 17:40	19°♄20'35	14°33'10
direct	1864 Jan 24 16:16	10°♄22'02		max. Earth dist.	1872 May 10 05:44	19°♄21'16	50.19833 AU
conjunction	1864 May 01 23:32	11°♄47'44	-15°-30'-27	retrograde	1872 Aug 20 07:22	20°♄49'26	
minimum elong	1864 May 01 23:43	11°♄47'45	15°30'28	opposition	1872 Nov 11 21:12	19°♄50'01	-15°-4'-40
max. Earth dist.	1864 May 02 22:30	11°♄49'02	50.26607 AU	min. Earth dist.	1872 Nov 11 09:54	19°♄50'33	48.25021 AU
retrograde	1864 Aug 12 17:33	13°♄16'55		direct	1873 Feb 01 09:54	18°♄51'32	
opposition	1864 Nov 04 10:19	12°♄17'13	-16°-5'-8	conjunction	1873 May 10 22:47	20°♄17'07	-14°-25'00
min. Earth dist.	1864 Nov 03 13:23	12°♄18'12	48.34473 AU	minimum elong	1873 May 10 22:59	20°♄17'08	14°25'01
direct	1865 Jan 24 19:03	11°♄18'38		max. Earth dist.	1873 May 11 10:00	20°♄17'45	50.16873 AU
conjunction	1865 May 03 04:43	12°♄44'17	-15°-24'-6	retrograde	1873 Aug 21 13:56	21°♄45'57	
minimum elong	1865 May 03 04:52	12°♄44'18	15°24'06	opposition	1873 Nov 13 01:25	20°♄46'32	-14°-56'-5
max. Earth dist.	1865 May 04 01:51	12°♄45'29	50.27176 AU	min. Earth dist.	1873 Nov 12 16:07	20°♄46'58	48.21744 AU
retrograde	1865 Aug 13 22:37	14°♄13'24		direct	1874 Feb 02 13:27	19°♄48'02	
opposition	1865 Nov 05 14:41	13°♄13'45	-15°-58'-24	conjunction	1874 May 12 04:03	21°♄13'37	-14°-16'-37
min. Earth dist.	1865 Nov 04 19:12	13°♄14'40	48.34795 AU	minimum elong	1874 May 12 04:14	21°♄13'38	14°16'37
direct	1866 Jan 25 23:07	12°♄15'11		max. Earth dist.	1874 May 12 14:39	21°♄14'13	50.13547 AU
conjunction	1866 May 04 10:01	13°♄40'48	-15°-17'-30	retrograde	1874 Aug 22 20:09	22°♄42'25	
minimum elong	1866 May 04 10:11	13°♄40'49	15°17'32	opposition	1874 Nov 14 05:34	21°♄43'00	-14°-47'-16
max. Earth dist.	1866 May 05 07:11	13°♄42'00	50.27444 AU	min. Earth dist.	1874 Nov 13 20:20	21°♄43'26	48.18114 AU
retrograde	1866 Aug 15 00:30	15°♄09'52		direct	1875 Feb 03 15:35	20°♄44'28	
opposition	1866 Nov 06 19:05	14°♄10'16	-15°-51'-24	conjunction	1875 May 13 09:00	22°♄10'05	-14°-7'-59
min. Earth dist.	1866 Nov 06 00:37	14°♄11'08	48.34780 AU	minimum elong	1875 May 13 09:12	22°♄10'06	14°08'01
direct	1867 Jan 27 06:34	13°♄11'45		max. Earth dist.	1875 May 13 17:45	22°♄10'35	50.09882 AU
conjunction	1867 May 05 15:03	14°♄37'21	-15°-10'-39	retrograde	1875 Aug 24 01:28	23°♄38'52	
minimum elong	1867 May 05 15:14	14°♄37'22	15°10'40	opposition	1875 Nov 15 09:54	22°♄39'27	-14°-38'-12
max. Earth dist.	1867 May 06 10:22	14°♄38'27	50.27367 AU	min. Earth dist.	1875 Nov 15 02:07	22°♄39'48	48.14175 AU
retrograde	1867 Aug 16 06:50	16°♄06'23		direct	1876 Feb 04 18:48	21°♄40'53	
opposition	1867 Nov 07 23:28	15°♄06'50	-15°-44'-10	conjunction	1876 May 13 14:16	23°♄06'32	-13°-59'-7
min. Earth dist.	1867 Nov 07 05:29	15°♄07'41	48.34393 AU	minimum elong	1876 May 13 14:27	23°♄06'33	13°59'08
direct	1868 Jan 28 10:42	14°♄08'21		max. Earth dist.	1876 May 13 23:03	23°♄07'02	50.05924 AU
conjunction	1868 May 05 20:21	15°♄33'57	-15°-3'-35	retrograde	1876 Aug 24 02:37	24°♄35'19	
minimum elong	1868 May 05 20:31	15°♄33'58	15°03'36	opposition	1876 Nov 15 14:02	23°♄35'54	-14°-28'-53
max. Earth dist.	1868 May 06 14:39	15°♄34'59	50.26866 AU	min. Earth dist.	1876 Nov 15 07:00	23°♄36'14	48.09936 AU
retrograde	1868 Aug 16 14:44	17°♄02'57		direct	1877 Feb 05 02:15	22°♄37'20	
opposition	1868 Nov 08 03:52	16°♄03'28	-15°-36'-42	conjunction	1877 May 14 19:27	24°♄03'01	-13°-50'-1
min. Earth dist.	1868 Nov 07 12:14	16°♄04'12	48.33551 AU	minimum elong	1877 May 14 19:38	24°♄03'02	13°50'02
direct	1869 Jan 28 13:13	15°♄05'01		max. Earth dist.	1877 May 15 02:31	24°♄03'25	50.01683 AU
conjunction	1869 May 07 01:45	16°♄30'37	-14°-56'-17	retrograde	1877 Aug 25 07:21	25°♄31'49	
minimum elong	1869 May 07 01:57	16°♄30'37	14°56'18	opposition	1877 Nov 16 18:15	24°♄32'25	-14°-19'-18
max. Earth dist.	1869 May 07 18:57	16°♄31'35	50.25894 AU	min. Earth dist.	1877 Nov 16 11:40	24°♄32'43	48.05409 AU
retrograde	1869 Aug 17 19:27	17°♄59'35		direct	1878 Feb 06 07:52	23°♄33'50	
opposition	1869 Nov 09 08:13	17°♄00'08	-15°-29'-1	conjunction	1878 May 16 00:42	24°♄59'34	-13°-40'-39
min. Earth dist.	1869 Nov 08 16:59	17°♄00'51	48.32192 AU	minimum elong	1878 May 16 00:53	24°♄59'35	13°40'40
direct	1870 Jan 29 17:01	16°♄01'41		max. Earth dist.	1878 May 16 06:55	24°♄59'56	49.97123 AU

retrograde	1878 Aug 26 15:03	26° ♁ 28'25		minimum elong	1886 May 23 21:00	2° ♁ 34'57	12°17'50
opposition	1878 Nov 17 22:31	25° ♁ 29'01	-14°-9'-29	max. Earth dist.	1886 May 23 16:23	2° ♁ 34'42	49.44372 AU
min. Earth dist.	1878 Nov 17 17:49	25° ♁ 29'14	48.00547 AU	retrograde	1886 Sep 03 07:00	4° ♁ 04'08	
direct	1879 Feb 07 10:53	24° ♁ 30'26		opposition	1886 Nov 25 09:20	3° ♁ 04'31	-12°-42'-43
				min. Earth dist.	1886 Nov 25 14:26	3° ♁ 04'16	47.44781 AU
conjunction	1879 May 17 06:01	25° ♁ 56'15	-13°-31'-3	direct	1887 Feb 14 23:14	2° ♁ 05'30	
minimum elong	1879 May 17 06:12	25° ♁ 56'15	13°31'05				
max. Earth dist.	1879 May 17 11:31	25° ♁ 56'33	49.92229 AU	conjunction	1887 May 25 02:19	3° ♁ 31'59	-12°-6'-28
retrograde	1879 Aug 27 21:09	27° ♁ 25'07		minimum elong	1887 May 25 02:30	3° ♁ 32'00	12°06'28
opposition	1879 Nov 19 02:41	26° ♁ 25'45	-13°-59'-25	max. Earth dist.	1887 May 24 20:08	3° ♁ 31'38	49.35779 AU
min. Earth dist.	1879 Nov 18 22:11	26° ♁ 25'57	47.95310 AU	retrograde	1887 Sep 04 11:18	5° ♁ 01'16	
direct	1880 Feb 08 13:12	25° ♁ 27'09		opposition	1887 Nov 26 13:43	4° ♁ 01'36	-12°-30'-49
				min. Earth dist.	1887 Nov 26 19:21	4° ♁ 01'20	47.35889 AU
conjunction	1880 May 17 11:17	26° ♁ 53'02	-13°-21'-14	direct	1888 Feb 16 04:57	3° ♁ 02'30	
minimum elong	1880 May 17 11:29	26° ♁ 53'03	13°21'14				
max. Earth dist.	1880 May 17 14:34	26° ♁ 53'13	49.86914 AU	conjunction	1888 May 25 07:54	4° ♁ 29'08	-11°-54'-52
retrograde	1880 Aug 28 02:54	28° ♁ 21'58		minimum elong	1888 May 25 08:06	4° ♁ 29'08	11°54'53
opposition	1880 Nov 19 07:05	27° ♁ 22'35	-13°-49'-7	max. Earth dist.	1888 May 25 00:53	4° ♁ 28'44	49.26874 AU
min. Earth dist.	1880 Nov 19 04:36	27° ♁ 22'42	47.89622 AU	retrograde	1888 Sep 04 18:10	5° ♁ 58'30	
direct	1881 Feb 08 16:51	26° ♁ 23'58		opposition	1888 Nov 26 18:19	4° ♁ 58'48	-12°-18'-40
				min. Earth dist.	1888 Nov 27 01:39	4° ♁ 58'27	47.26693 AU
conjunction	1881 May 18 16:58	27° ♁ 49'57	-13°-11'-12	direct	1889 Feb 16 08:59	3° ♁ 59'39	
minimum elong	1881 May 18 17:09	27° ♁ 49'57	13°11'13				
max. Earth dist.	1881 May 18 19:44	27° ♁ 50'06	49.81108 AU	conjunction	1889 May 26 13:41	5° ♁ 26'25	-11°-43'-1
retrograde	1881 Aug 29 04:47	29° ♁ 18'54		minimum elong	1889 May 26 13:53	5° ♁ 26'26	11°43'01
opposition	1881 Nov 20 11:21	28° ♁ 19'31	-13°-38'-36	max. Earth dist.	1889 May 26 06:04	5° ♁ 25'59	49.17693 AU
min. Earth dist.	1881 Nov 20 10:18	28° ♁ 19'34	47.83404 AU	retrograde	1889 Sep 06 01:20	6° ♁ 55'54	
direct	1882 Feb 10 00:13	27° ♁ 20'51		opposition	1889 Nov 27 22:40	5° ♁ 56'10	-12°-6'-16
				min. Earth dist.	1889 Nov 28 05:55	5° ♁ 55'50	47.17214 AU
conjunction	1882 May 19 22:31	28° ♁ 46'55	-13°00'-57	direct	1890 Feb 17 11:06	4° ♁ 56'58	
minimum elong	1882 May 19 22:43	28° ♁ 46'56	13°00'57				
max. Earth dist.	1882 May 19 22:50	28° ♁ 46'56	49.74767 AU	conjunction	1890 May 27 19:25	6° ♁ 23'54	-11°-30'-55
	1882 Jul 21 22:23	0° ♁		minimum elong	1890 May 27 19:36	6° ♁ 23'55	11°30'57
retrograde	1882 Aug 30 09:52	0° ♁ 15'55		max. Earth dist.	1890 May 27 09:52	6° ♁ 23'22	49.08215 AU
	1882 Oct 09 07:58	30° ♁		retrograde	1890 Sep 07 07:51	7° ♁ 53'32	
opposition	1882 Nov 21 15:46	29° ♁ 16'31	-13°-27'-52	opposition	1890 Nov 29 03:22	6° ♁ 53'46	-11°-53'-36
min. Earth dist.	1882 Nov 21 15:36	29° ♁ 16'31	47.76645 AU	min. Earth dist.	1890 Nov 29 12:20	6° ♁ 53'21	47.07437 AU
direct	1883 Feb 11 05:10	28° ♁ 17'48		direct	1891 Feb 18 14:42	5° ♁ 54'31	
conjunction	1883 May 21 03:58	29° ♁ 43'55	-12°-50'-30	conjunction	1891 May 29 01:11	7° ♁ 21'39	-11°-18'-34
minimum elong	1883 May 21 04:09	29° ♁ 43'56	12°50'31	minimum elong	1891 May 29 01:23	7° ♁ 21'40	11°18'35
max. Earth dist.	1883 May 21 02:56	29° ♁ 43'52	49.67874 AU	max. Earth dist.	1891 May 28 15:39	7° ♁ 21'06	48.98418 AU
	1883 Jun 02 01:30	0° ♁		retrograde	1891 Sep 08 10:26	8° ♁ 51'25	
retrograde	1883 Aug 31 15:40	1° ♁ 12'59		opposition	1891 Nov 30 08:01	7° ♁ 51'38	-11°-40'-41
opposition	1883 Nov 22 20:18	0° ♁ 13'31	-13°-16'-56	min. Earth dist.	1891 Nov 30 17:52	7° ♁ 51'10	46.97300 AU
min. Earth dist.	1883 Nov 22 22:21	0° ♁ 13'25	47.69347 AU	direct	1892 Feb 19 22:03	6° ♁ 52'20	
	1883 Dec 04 21:29	30° ♁					
direct	1884 Feb 12 10:09	29° ♁ 14'44		conjunction	1892 May 29 07:09	8° ♁ 19'40	-11°-6'00
	1884 Apr 20 00:47	0° ♁		minimum elong	1892 May 29 07:20	8° ♁ 19'41	11°06'01
				max. Earth dist.	1892 May 28 19:28	8° ♁ 19'00	48.88240 AU
conjunction	1884 May 21 09:36	0° ♁ 40'56	-12°-39'-50	retrograde	1892 Sep 08 15:53	9° ♁ 49'36	
minimum elong	1884 May 21 09:49	0° ♁ 40'57	12°39'51	opposition	1892 Nov 30 12:38	8° ♁ 49'47	-11°-27'-31
max. Earth dist.	1884 May 21 07:40	0° ♁ 40'49	49.60483 AU	min. Earth dist.	1892 Nov 30 23:27	8° ♁ 49'17	46.86755 AU
retrograde	1884 Aug 31 22:09	2° ♁ 10'01		direct	1893 Feb 20 03:26	7° ♁ 50'25	
opposition	1884 Nov 23 00:32	1° ♁ 10'31	-13°-5'-46				
min. Earth dist.	1884 Nov 23 02:59	1° ♁ 10'24	47.61569 AU	conjunction	1893 May 30 13:23	9° ♁ 17'57	-10°-53'-11
direct	1885 Feb 12 13:19	0° ♁ 11'39		minimum elong	1893 May 30 13:35	9° ♁ 17'58	10°53'12
				max. Earth dist.	1893 May 30 00:24	9° ♁ 17'13	48.77596 AU
conjunction	1885 May 22 15:10	1° ♁ 37'56	-12°-28'-56	retrograde	1893 Sep 09 22:10	10° ♁ 48'04	
minimum elong	1885 May 22 15:21	1° ♁ 37'57	12°28'57	opposition	1893 Dec 01 17:33	9° ♁ 48'12	-11°-14'-7
max. Earth dist.	1885 May 22 10:52	1° ♁ 37'41	49.52628 AU	min. Earth dist.	1893 Dec 02 06:33	9° ♁ 47'35	46.75713 AU
retrograde	1885 Sep 02 04:36	3° ♁ 07'04		direct	1894 Feb 21 08:48	8° ♁ 48'46	
opposition	1885 Nov 24 04:59	2° ♁ 07'30	-12°-54'-22				
min. Earth dist.	1885 Nov 24 09:17	2° ♁ 07'18	47.53366 AU	conjunction	1894 May 31 19:37	10° ♁ 16'29	-10°-40'-10
direct	1886 Feb 13 16:18	1° ♁ 08'33		minimum elong	1894 May 31 19:48	10° ♁ 16'30	10°40'10
				max. Earth dist.	1894 May 31 05:30	10° ♁ 15'41	48.66451 AU
conjunction	1886 May 23 20:48	2° ♁ 34'57	-12°-17'-49	retrograde	1894 Sep 11 05:54	11° ♁ 46'44	

opposition	1894 Dec 02 22:20	10°II46'50	-11°00'-30	max. Earth dist.	1903 Jun 10 05:45	19°II08'54	47.47975 AU
min. Earth dist.	1894 Dec 03 11:49	10°II46'11	46.64153 AU				
direct	1895 Feb 22 12:06	9°II47'17		conjunction	1903 Jun 11 06:54	19°II10'22	-8°-32'-10
max. Earth dist.	1895 Jun 01 09:12	11°II14'15	48.54787 AU	minimum elong	1903 Jun 11 07:04	19°II10'23	8°32'12
				retrograde	1903 Sep 21 12:38	20°II42'19	
conjunction	1895 Jun 02 01:51	11°II15'12	-10°-26'-54	opposition	1903 Dec 12 21:24	19°II41'33	-8°-46'-32
minimum elong	1895 Jun 02 02:03	11°II15'13	10°26'55	min. Earth dist.	1903 Dec 13 21:04	19°II40'23	45.42834 AU
retrograde	1895 Sep 12 14:45	12°II45'36		direct	1904 Mar 03 13:41	18°II40'52	
opposition	1895 Dec 04 03:20	11°II45'36	-10°-46'-38				
min. Earth dist.	1895 Dec 04 18:53	11°II44'52	46.52097 AU	conjunction	1904 Jun 11 14:06	20°II10'59	-8°-16'-41
direct	1896 Feb 23 14:11	10°II45'57		minimum elong	1904 Jun 11 14:17	20°II11'00	8°16'41
				max. Earth dist.	1904 Jun 10 12:05	20°II09'28	47.33277 AU
conjunction	1896 Jun 02 08:16	12°II14'04	-10°-13'-26	retrograde	1904 Sep 21 20:44	21°II43'13	
minimum elong	1896 Jun 02 08:27	12°II14'05	10°13'27	opposition	1904 Dec 13 03:06	20°II42'22	-8°-30'-18
max. Earth dist.	1896 Jun 01 15:13	12°II13'05	48.42641 AU	min. Earth dist.	1904 Dec 14 03:06	20°II41'12	45.27788 AU
retrograde	1896 Sep 12 18:55	13°II44'36		direct	1905 Mar 04 18:30	19°II41'34	
opposition	1896 Dec 04 08:19	12°II44'31	-10°-32'-32				
min. Earth dist.	1896 Dec 05 00:49	12°II43'43	46.39568 AU	conjunction	1905 Jun 12 21:33	21°II12'02	-8°00'-57
direct	1897 Feb 23 21:12	11°II44'43		minimum elong	1905 Jun 12 21:43	21°II12'02	8°00'58
				max. Earth dist.	1905 Jun 11 17:02	21°II10'21	47.18142 AU
conjunction	1897 Jun 03 14:41	13°II13'02	-9°-59'-43	retrograde	1905 Sep 23 07:12	22°II44'32	
minimum elong	1897 Jun 03 14:53	13°II13'03	9°59'44	opposition	1905 Dec 14 09:01	21°II43'36	-8°-13'-50
max. Earth dist.	1897 Jun 02 19:34	13°II11'56	48.30059 AU	min. Earth dist.	1905 Dec 15 11:16	21°II42'19	45.12289 AU
retrograde	1897 Sep 13 22:28	14°II43'43		direct	1906 Mar 05 21:25	20°II42'41	
opposition	1897 Dec 05 13:14	13°II43'31	-10°-18'-12	max. Earth dist.	1906 Jun 13 00:17	22°II11'47	47.02532 AU
min. Earth dist.	1897 Dec 06 06:41	13°II42'41	46.26642 AU				
direct	1898 Feb 25 04:18	12°II43'36		conjunction	1906 Jun 14 05:15	22°II13'29	-7°-44'-58
				minimum elong	1906 Jun 14 05:25	22°II13'30	7°44'59
conjunction	1898 Jun 04 21:12	14°II12'07	-9°-45'-46	retrograde	1906 Sep 24 14:11	23°II46'17	
minimum elong	1898 Jun 04 21:23	14°II12'07	9°45'46	opposition	1906 Dec 15 15:08	22°II45'14	-7°-57'-6
max. Earth dist.	1898 Jun 04 01:03	14°II10'57	48.17089 AU	min. Earth dist.	1906 Dec 16 18:13	22°II43'55	44.96291 AU
retrograde	1898 Sep 15 03:35	15°II42'58		direct	1907 Mar 07 04:17	21°II44'10	
opposition	1898 Dec 06 18:26	14°II42'40	-10°-3'-35	max. Earth dist.	1907 Jun 14 05:25	23°II13'28	46.86431 AU
min. Earth dist.	1898 Dec 07 13:35	14°II41'44	46.13361 AU				
direct	1899 Feb 26 11:08	13°II42'36		conjunction	1907 Jun 15 12:46	23°II15'19	-7°-28'-45
max. Earth dist.	1899 Jun 05 06:55	15°II10'07	48.03807 AU	minimum elong	1907 Jun 15 12:56	23°II15'20	7°28'47
				retrograde	1907 Sep 25 20:53	24°II48'24	
conjunction	1899 Jun 06 03:36	15°II11'19	-9°-31'-34	opposition	1907 Dec 16 21:23	23°II47'15	-7°-40'-7
minimum elong	1899 Jun 06 03:48	15°II11'20	9°31'35	min. Earth dist.	1907 Dec 18 01:47	23°II45'51	44.79815 AU
retrograde	1899 Sep 16 11:23	16°II42'21		direct	1908 Mar 07 11:13	22°II46'01	
opposition	1899 Dec 07 23:35	15°II41'56	-9°-48'-43				
min. Earth dist.	1899 Dec 08 18:37	15°II41'01	45.99784 AU	conjunction	1908 Jun 15 20:44	24°II17'30	-7°-12'-18
direct	1900 Feb 27 14:49	14°II41'44		minimum elong	1908 Jun 15 20:54	24°II17'31	7°12'19
max. Earth dist.	1900 Jun 06 11:38	16°II09'23	47.90236 AU	max. Earth dist.	1908 Jun 14 12:10	24°II15'34	46.69843 AU
				retrograde	1908 Sep 26 02:04	25°II50'53	
conjunction	1900 Jun 07 10:13	16°II10'41	-9°-17'-6	opposition	1908 Dec 17 03:40	24°II49'35	-7°-22'-52
minimum elong	1900 Jun 07 10:24	16°II10'42	9°17'07	min. Earth dist.	1908 Dec 18 09:57	24°II48'06	44.62874 AU
retrograde	1900 Sep 17 19:23	17°II41'55		direct	1909 Mar 08 19:55	23°II48'11	
opposition	1900 Dec 09 04:51	16°II41'24	-9°-33'-35	max. Earth dist.	1909 Jun 15 19:08	25°II18'02	46.52831 AU
min. Earth dist.	1900 Dec 10 01:37	16°II40'24	45.85948 AU				
direct	1901 Feb 28 18:17	15°II41'04		conjunction	1909 Jun 17 04:47	25°II20'02	-6°-55'-35
				minimum elong	1909 Jun 17 04:55	25°II20'02	6°55'36
conjunction	1901 Jun 08 17:07	17°II10'17	-9°-2'-23	retrograde	1909 Sep 27 10:44	26°II53'43	
minimum elong	1901 Jun 08 17:17	17°II10'18	9°02'25	opposition	1909 Dec 18 10:02	25°II52'17	-7°-5'-21
max. Earth dist.	1901 Jun 07 18:33	17°II08'58	47.76413 AU	min. Earth dist.	1909 Dec 19 16:33	25°II50'46	44.45535 AU
retrograde	1901 Sep 19 00:36	18°II41'43		direct	1910 Mar 10 01:15	24°II50'41	
opposition	1901 Dec 10 10:16	17°II41'07	-9°-18'-10	max. Earth dist.	1910 Jun 17 01:07	26°II20'46	46.35427 AU
min. Earth dist.	1901 Dec 11 07:28	17°II40'05	45.71851 AU				
direct	1902 Mar 02 01:05	16°II40'39		conjunction	1910 Jun 18 12:46	26°II22'54	-6°-38'-37
				minimum elong	1910 Jun 18 12:56	26°II22'54	6°38'38
conjunction	1902 Jun 09 23:50	18°II10'09	-8°-47'-25	retrograde	1910 Sep 28 20:28	27°II56'54	
minimum elong	1902 Jun 10 00:01	18°II10'10	8°47'25	opposition	1910 Dec 19 16:39	26°II55'19	-6°-47'-34
max. Earth dist.	1902 Jun 08 23:27	18°II08'44	47.62339 AU	min. Earth dist.	1910 Dec 21 01:10	26°II53'42	44.27848 AU
retrograde	1902 Sep 20 06:48	19°II41'49		direct	1911 Mar 11 05:17	25°II53'32	
opposition	1902 Dec 11 15:44	18°II41'08	-9°-2'-29	max. Earth dist.	1911 Jun 18 09:22	27°II23'59	46.17707 AU
min. Earth dist.	1902 Dec 12 13:35	18°II40'04	45.57500 AU				
direct	1903 Mar 03 07:11	17°II40'34		conjunction	1911 Jun 19 21:05	27°II26'07	-6°-21'-23

minimum elong	1911 Jun 19 21:14	27°II26'07	6°21'24	conjunction	1919 Jun 28 22:41	6°☉09'13	-3°-53'-57
retrograde	1911 Sep 30 04:37	29°II00'27		minimum elong	1919 Jun 28 22:47	6°☉09'13	3°53'58
opposition	1911 Dec 20 23:16	27°II58'42	-6°-29'-30	retrograde	1919 Oct 09 04:02	7°☉46'49	
min. Earth dist.	1911 Dec 22 08:06	27°II57'04	44.09865 AU	opposition	1919 Dec 29 11:55	6°☉43'47	-3°-54'-41
direct	1912 Mar 11 12:45	26°II56'44		min. Earth dist.	1919 Dec 31 05:15	6°☉41'40	42.55594 AU
max. Earth dist.	1912 Jun 18 15:43	28°II27'27	45.99716 AU	direct	1920 Mar 20 02:47	5°☉40'12	
				max. Earth dist.	1920 Jun 27 08:52	7°☉14'02	44.44825 AU
conjunction	1912 Jun 20 05:26	28°II29'43	-6°-3'-54				
minimum elong	1912 Jun 20 05:34	28°II29'44	6°03'55	conjunction	1920 Jun 29 09:00	7°☉17'01	-3°-34'-20
	1912 Sep 10 16:37	0°☉		minimum elong	1920 Jun 29 09:05	7°☉17'02	3°34'21
retrograde	1912 Sep 30 13:09	0°☉04'24		retrograde	1920 Oct 09 14:24	8°☉55'05	
	1912 Oct 20 08:11	30°II		opposition	1920 Dec 29 20:33	7°☉51'50	-3°-34'-4
opposition	1912 Dec 21 06:09	29°II02'29	-6°-11'-9	min. Earth dist.	1920 Dec 31 16:10	7°☉49'36	42.34534 AU
min. Earth dist.	1912 Dec 22 15:53	29°II00'49	43.91635 AU	direct	1921 Mar 21 10:00	6°☉47'59	
direct	1913 Mar 12 20:19	28°II00'20		max. Earth dist.	1921 Jun 28 19:03	8°☉22'18	44.23651 AU
max. Earth dist.	1913 Jun 19 23:54	29°II31'26	45.81468 AU				
				conjunction	1921 Jun 30 19:35	8°☉25'20	-3°-14'-28
conjunction	1913 Jun 21 14:09	29°II33'45	-5°-46'-8	minimum elong	1921 Jun 30 19:40	8°☉25'20	3°14'28
minimum elong	1913 Jun 21 14:17	29°II33'46	5°46'08	retrograde	1921 Oct 11 01:06	10°☉03'52	
	1913 Jul 09 22:27	0°☉		opposition	1921 Dec 31 05:11	9°☉00'23	-3°-13'-10
retrograde	1913 Oct 01 19:26	1°☉08'48		min. Earth dist.	1922 Jan 02 01:06	8°☉58'07	42.13105 AU
opposition	1913 Dec 22 13:14	0°☉06'45	-5°-52'-30	direct	1922 Mar 22 18:40	7°☉56'15	
min. Earth dist.	1913 Dec 24 00:18	0°☉04'59	43.73161 AU	max. Earth dist.	1922 Jun 30 03:23	9°☉30'58	44.02135 AU
	1913 Dec 28 04:15	30°II					
direct	1914 Mar 14 05:02	29°II04'24		conjunction	1922 Jul 02 06:13	9°☉34'09	-2°-54'-19
	1914 May 26 20:45	0°☉		minimum elong	1922 Jul 02 06:17	9°☉34'09	2°54'20
max. Earth dist.	1914 Jun 21 07:52	0°☉35'53	45.62999 AU	retrograde	1922 Oct 12 14:08	11°☉13'10	
				opposition	1923 Jan 01 14:11	10°☉09'27	-2°-51'-58
conjunction	1914 Jun 22 22:57	0°☉38'15	-5°-28'-6	min. Earth dist.	1923 Jan 03 11:30	10°☉07'07	41.91385 AU
minimum elong	1914 Jun 22 23:05	0°☉38'16	5°28'08	direct	1923 Mar 24 02:07	9°☉05'02	
retrograde	1914 Oct 03 03:15	2°☉13'42		max. Earth dist.	1923 Jul 01 14:04	10°☉40'18	43.80336 AU
opposition	1914 Dec 23 20:27	1°☉11'30	-5°-33'-34				
min. Earth dist.	1914 Dec 25 07:32	1°☉09'44	43.54460 AU	conjunction	1923 Jul 03 17:05	10°☉43'31	-2°-33'-55
direct	1915 Mar 15 12:31	0°☉08'59		minimum elong	1923 Jul 03 17:09	10°☉43'31	2°33'56
max. Earth dist.	1915 Jun 22 14:55	1°☉40'48	45.44268 AU	retrograde	1923 Oct 14 00:01	12°☉23'02	
				opposition	1924 Jan 02 23:26	11°☉19'05	-2°-30'-29
conjunction	1915 Jun 24 07:49	1°☉43'17	-5°-9'-48	min. Earth dist.	1924 Jan 04 21:43	11°☉16'40	41.69409 AU
minimum elong	1915 Jun 24 07:56	1°☉43'18	5°09'48	direct	1924 Mar 24 12:43	10°☉14'23	
retrograde	1915 Oct 04 14:44	3°☉19'09		max. Earth dist.	1924 Jul 02 00:01	11°☉50'09	43.58321 AU
opposition	1915 Dec 25 04:00	2°☉16'49	-5°-14'-21				
min. Earth dist.	1915 Dec 26 17:02	2°☉14'57	43.35481 AU	conjunction	1924 Jul 04 04:14	11°☉53'27	-2°-13'-14
direct	1916 Mar 15 16:59	1°☉14'07		minimum elong	1924 Jul 04 04:18	11°☉53'28	2°13'15
max. Earth dist.	1916 Jun 23 00:12	2°☉46'24	45.25228 AU	retrograde	1924 Oct 14 09:40	13°☉33'30	
				opposition	1925 Jan 03 08:45	12°☉29'20	-2°-8'-43
conjunction	1916 Jun 24 17:15	2°☉48'55	-4°-51'-13	min. Earth dist.	1925 Jan 05 07:17	12°☉26'54	41.47252 AU
minimum elong	1916 Jun 24 17:22	2°☉48'55	4°51'15	direct	1925 Mar 25 23:07	11°☉24'22	
retrograde	1916 Oct 05 01:22	4°☉25'12		max. Earth dist.	1925 Jul 03 10:10	13°☉00'38	43.36117 AU
opposition	1916 Dec 25 11:32	3°☉22'43	-4°-54'-51				
min. Earth dist.	1916 Dec 27 01:06	3°☉20'49	43.16154 AU	conjunction	1925 Jul 05 15:45	13°☉04'04	-1°-52'-17
direct	1917 Mar 16 23:11	2°☉19'49		minimum elong	1925 Jul 05 15:48	13°☉04'04	1°52'19
max. Earth dist.	1917 Jun 24 07:18	3°☉52'27	45.05801 AU	retrograde	1925 Oct 15 20:16	14°☉44'41	
				opposition	1926 Jan 04 18:37	13°☉40'17	-1°-46'-39
conjunction	1917 Jun 26 02:49	3°☉55'07	-4°-32'-24	min. Earth dist.	1926 Jan 06 18:43	13°☉37'45	41.24934 AU
minimum elong	1917 Jun 26 02:56	3°☉55'08	4°32'24	direct	1926 Mar 27 08:09	12°☉35'03	
retrograde	1917 Oct 06 12:13	5°☉31'51		max. Earth dist.	1926 Jul 04 21:55	14°☉11'58	43.13771 AU
opposition	1917 Dec 26 19:28	4°☉29'12	-4°-35'-4				
min. Earth dist.	1917 Dec 28 10:41	4°☉27'13	42.96423 AU	conjunction	1926 Jul 07 03:23	14°☉15'24	-1°-31'-5
direct	1918 Mar 18 06:18	3°☉26'05		minimum elong	1926 Jul 07 03:26	14°☉15'24	1°31'06
max. Earth dist.	1918 Jun 25 16:09	4°☉59'09	44.85924 AU	retrograde	1926 Oct 17 08:51	15°☉56'38	
				opposition	1927 Jan 06 04:37	14°☉52'01	-1°-24'-18
conjunction	1918 Jun 27 12:39	5°☉01'54	-4°-13'-18	min. Earth dist.	1927 Jan 08 04:26	14°☉49'30	41.02471 AU
minimum elong	1918 Jun 27 12:45	5°☉01'54	4°13'19	direct	1927 Mar 28 16:01	13°☉46'32	
retrograde	1918 Oct 07 19:12	6°☉39'04		max. Earth dist.	1927 Jul 06 07:58	15°☉24'00	42.91263 AU
opposition	1918 Dec 28 03:41	5°☉36'14	-4°-15'-1				
min. Earth dist.	1918 Dec 29 20:29	5°☉34'09	42.76228 AU	conjunction	1927 Jul 08 15:24	15°☉27'34	-1°-9'-36
direct	1919 Mar 19 17:34	4°☉32'54		minimum elong	1927 Jul 08 15:26	15°☉27'35	1°09'38
max. Earth dist.	1919 Jun 27 00:39	6°☉06'21	44.65601 AU	retrograde	1927 Oct 18 23:12	17°☉09'26	

opposition	1928 Jan 07 14:53	16°☾04'37	-1°-1'-39	opposition	1936 Jan 17 13:55	26°☾17'47	2°09'26
min. Earth dist.	1928 Jan 09 16:22	16°☾02'00	40.79846 AU	min. Earth dist.	1936 Jan 19 23:53	26°☾14'36	38.88440 AU
direct	1928 Mar 28 23:46	14°☾58'52		direct	1936 Apr 07 23:25	25°☾09'26	
max. Earth dist.	1928 Jul 06 20:22	16°☾37'03	42.68548 AU	max. Earth dist.	1936 Jul 17 03:43	26°☾53'04	40.75969 AU
conjunction	1928 Jul 09 03:58	16°☾40'39	0°-47'-52	conjunction	1936 Jul 19 20:52	26°☾57'32	2°15'03
minimum elong	1928 Jul 09 04:00	16°☾40'39	0°47'52	minimum elong	1936 Jul 19 20:48	26°☾57'32	2°15'03
retrograde	1928 Oct 19 12:07	18°☾23'09		retrograde	1936 Oct 30 05:20	28°☾45'43	
opposition	1929 Jan 08 01:34	17°☾18'08	0°-38'-44	opposition	1937 Jan 18 03:23	27°☾38'24	2°34'31
min. Earth dist.	1929 Jan 10 03:52	17°☾15'27	40.56980 AU	min. Earth dist.	1937 Jan 20 13:07	27°☾35'12	38.63557 AU
direct	1929 Mar 30 11:51	16°☾12'08		direct	1937 Apr 09 13:47	26°☾29'40	
max. Earth dist.	1929 Jul 08 07:21	17°☾50'54	42.45563 AU	max. Earth dist.	1937 Jul 18 18:04	28°☾14'04	40.50985 AU
conjunction	1929 Jul 10 16:46	17°☾54'39	0°-25'-52	conjunction	1937 Jul 21 12:39	28°☾18'40	2°38'58
minimum elong	1929 Jul 10 16:47	17°☾54'39	0°25'53	minimum elong	1937 Jul 21 12:34	28°☾18'39	2°38'57
retrograde	1929 Oct 21 02:07	19°☾37'49		retrograde	1937 Oct 07 12:01	0°☾	
opposition	1930 Jan 09 12:29	18°☾32'35	0°-15'-31	retrograde	1937 Oct 31 20:07	0°☾07'40	
min. Earth dist.	1930 Jan 11 15:35	18°☾29'51	40.33826 AU	retrograde	1937 Nov 25 09:20	30°☾	
direct	1930 Mar 31 23:39	17°☾26'18		opposition	1938 Jan 19 17:24	29°☾00'02	2°59'49
max. Earth dist.	1930 Jul 09 19:16	19°☾05'44	42.22238 AU	min. Earth dist.	1938 Jan 22 04:41	28°☾56'43	38.38630 AU
conjunction	1930 Jul 12 06:04	19°☾09'35	0°-3'-40	direct	1938 Apr 11 01:54	27°☾50'55	
minimum elong	1930 Jul 12 06:04	19°☾09'35	0°03'41	max. Earth dist.	1938 Jul 20 10:45	29°☾36'14	40.25976 AU
behind sun begin	1930 Jul 11 23:35	19°☾09'12		conjunction	1938 Jul 23 04:55	29°☾40'50	3°03'04
behind sun end	1930 Jul 12 12:32	19°☾09'59		minimum elong	1938 Jul 23 04:50	29°☾40'50	3°03'04
asc. node	1930 Sep 09 10:34	20°☾31'13		retrograde	1938 Aug 03 17:53	0°☾	
retrograde	1930 Oct 22 13:32	20°☾53'27		retrograde	1938 Nov 02 12:19	1°☾30'41	
opposition	1931 Jan 10 23:58	19°☾47'57	0°07'57	opposition	1939 Jan 21 07:47	0°☾22'45	3°25'21
min. Earth dist.	1931 Jan 13 05:01	19°☾45'06	40.10328 AU	min. Earth dist.	1939 Jan 23 18:45	0°☾19'26	38.13687 AU
direct	1931 Apr 02 11:25	18°☾41'23		direct	1939 Feb 07 13:03	30°☾	
max. Earth dist.	1931 Jul 11 08:01	20°☾21'29	41.98572 AU	direct	1939 Apr 12 15:16	29°☾13'16	
conjunction	1931 Jul 13 19:34	20°☾25'25	0°18'55	max. Earth dist.	1939 Jun 14 04:42	0°☾	
minimum elong	1931 Jul 13 19:34	20°☾25'25	0°18'54	max. Earth dist.	1939 Jul 22 01:32	0°☾59'24	40.00942 AU
retrograde	1931 Oct 24 01:48	22°☾09'58		conjunction	1939 Jul 24 21:29	1°☾04'09	3°27'23
opposition	1932 Jan 12 11:39	21°☾04'13	0°31'43	minimum elong	1939 Jul 24 21:23	1°☾04'09	3°27'23
min. Earth dist.	1932 Jan 14 16:57	21°☾01'20	39.86485 AU	retrograde	1939 Nov 04 08:07	2°☾54'54	
direct	1932 Apr 02 22:59	19°☾57'19		opposition	1940 Jan 22 22:40	1°☾46'39	3°51'06
max. Earth dist.	1932 Jul 11 19:33	21°☾38'00	41.74550 AU	min. Earth dist.	1940 Jan 25 10:44	1°☾43'17	37.88719 AU
conjunction	1932 Jul 14 09:33	21°☾42'08	0°41'39	direct	1940 Apr 13 03:15	0°☾36'50	
minimum elong	1932 Jul 14 09:32	21°☾42'08	0°41'40	max. Earth dist.	1940 Jul 22 18:56	2°☾23'57	39.75834 AU
retrograde	1932 Oct 24 17:44	23°☾27'23		conjunction	1940 Jul 25 14:52	2°☾28'44	3°51'52
opposition	1933 Jan 12 23:40	22°☾21'20	0°55'45	minimum elong	1940 Jul 25 14:45	2°☾28'44	3°51'52
min. Earth dist.	1933 Jan 15 07:00	22°☾18'20	39.62322 AU	retrograde	1940 Nov 05 01:31	4°☾20'24	
direct	1933 Apr 04 07:29	21°☾14'05		opposition	1941 Jan 23 13:59	3°☾11'52	4°17'03
max. Earth dist.	1933 Jul 13 09:53	22°☾55'32	41.50221 AU	min. Earth dist.	1941 Jan 26 02:55	3°☾08'25	37.63658 AU
conjunction	1933 Jul 16 00:00	22°☾59'41	1°04'39	direct	1941 Apr 14 18:26	2°☾01'41	
minimum elong	1933 Jul 15 23:58	22°☾59'41	1°04'38	max. Earth dist.	1941 Jul 24 11:29	3°☾49'43	39.50611 AU
retrograde	1933 Oct 26 08:09	24°☾45'39		conjunction	1941 Jul 27 08:39	3°☾54'38	4°16'33
opposition	1934 Jan 14 12:06	23°☾39'17	1°20'03	minimum elong	1941 Jul 27 08:31	3°☾54'38	4°16'33
min. Earth dist.	1934 Jan 16 19:52	23°☾36'15	39.37880 AU	retrograde	1941 Nov 06 20:46	5°☾47'15	
direct	1934 Apr 05 19:22	22°☾31'41		opposition	1942 Jan 25 05:52	4°☾38'25	4°43'12
max. Earth dist.	1934 Jul 14 22:28	24°☾13'47	41.25641 AU	min. Earth dist.	1942 Jan 27 19:14	4°☾34'55	37.38467 AU
conjunction	1934 Jul 17 14:25	24°☾18'06	1°27'53	direct	1942 Apr 16 11:02	3°☾27'52	
minimum elong	1934 Jul 17 14:22	24°☾18'05	1°27'54	max. Earth dist.	1942 Jul 26 04:25	5°☾16'50	39.25198 AU
retrograde	1934 Oct 28 00:34	26°☾04'46		conjunction	1942 Jul 29 02:55	5°☾21'54	4°41'23
opposition	1935 Jan 16 00:49	24°☾58'06	1°44'37	minimum elong	1942 Jul 29 02:46	5°☾21'53	4°41'22
min. Earth dist.	1935 Jan 18 09:33	24°☾55'00	39.13238 AU	retrograde	1942 Nov 08 14:42	7°☾15'29	
direct	1935 Apr 07 07:54	23°☾50'07		opposition	1943 Jan 26 22:26	6°☾06'19	5°09'33
max. Earth dist.	1935 Jul 16 12:55	25°☾32'59	41.00864 AU	min. Earth dist.	1943 Jan 29 13:36	6°☾02'42	37.13083 AU
conjunction	1935 Jul 19 05:29	25°☾37'22	1°51'21	direct	1943 Apr 18 03:04	4°☾55'24	
minimum elong	1935 Jul 19 05:26	25°☾37'22	1°51'21	max. Earth dist.	1943 Jul 27 22:59	6°☾45'23	38.99588 AU
retrograde	1935 Oct 29 14:18	27°☾24'47		conjunction	1943 Jul 30 21:52	6°☾50'31	5°06'22

minimum elong	1943 Jul 30 21:42	6°♊50'30	5°06'22	min. Earth dist.	1952 Feb 12 23:16	20°♊16'19	34.81286 AU
retrograde	1943 Nov 10 09:00	8°♊45'05		direct	1952 Apr 30 23:21	19°♊05'31	
opposition	1944 Jan 28 15:15	7°♊35'35	5°36'04	max. Earth dist.	1952 Aug 10 21:38	21°♊05'39	36.66176 AU
min. Earth dist.	1944 Jan 31 06:23	7°♊31'57	36.87503 AU				
direct	1944 Apr 18 19:23	6°♊24'15		conjunction	1952 Aug 14 01:28	21°♊11'36	8°54'41
max. Earth dist.	1944 Jul 28 16:19	8°♊15'09	38.73767 AU	minimum elong	1952 Aug 14 01:10	21°♊11'35	8°54'40
				retrograde	1952 Nov 24 17:04	23°♊16'12	
conjunction	1944 Jul 31 17:23	8°♊20'29	5°31'30	opposition	1953 Feb 11 01:55	22°♊03'13	9°38'39
minimum elong	1944 Jul 31 17:12	8°♊20'28	5°31'29	min. Earth dist.	1953 Feb 13 21:46	21°♊59'04	34.56064 AU
retrograde	1944 Nov 11 05:11	10°♊16'05		direct	1953 May 02 20:21	20°♊47'51	
opposition	1945 Jan 29 08:50	9°♊06'13	6°02'44	max. Earth dist.	1953 Aug 12 21:21	22°♊49'14	36.40779 AU
min. Earth dist.	1945 Feb 01 01:47	9°♊02'27	36.61745 AU				
direct	1945 Apr 20 10:21	7°♊54'28		conjunction	1953 Aug 16 02:16	22°♊55'20	9°19'54
max. Earth dist.	1945 Jul 30 12:32	9°♊46'27	38.47773 AU	minimum elong	1953 Aug 16 01:58	22°♊55'18	9°19'55
				retrograde	1953 Nov 26 20:44	25°♊01'12	
conjunction	1945 Aug 02 13:26	9°♊51'49	5°56'44	opposition	1954 Feb 13 01:02	23°♊47'50	10°05'29
minimum elong	1945 Aug 02 13:15	9°♊51'48	5°56'45	min. Earth dist.	1954 Feb 15 21:10	23°♊43'39	34.30980 AU
retrograde	1945 Nov 13 01:54	11°♊48'26		direct	1954 May 04 17:45	22°♊32'01	
opposition	1946 Jan 31 02:53	10°♊38'12	6°29'33	max. Earth dist.	1954 Aug 14 23:03	24°♊34'45	36.15471 AU
min. Earth dist.	1946 Feb 02 20:08	10°♊34'23	36.35843 AU				
direct	1946 Apr 22 03:52	9°♊26'00		conjunction	1954 Aug 18 04:03	24°♊40'55	9°44'59
max. Earth dist.	1946 Aug 01 07:15	11°♊18'58	38.21669 AU	minimum elong	1954 Aug 18 03:44	24°♊40'53	9°44'58
				retrograde	1954 Nov 28 23:44	26°♊48'03	
conjunction	1946 Aug 04 09:53	11°♊24'30	6°22'05	opposition	1955 Feb 15 01:02	25°♊34'17	10°32'10
minimum elong	1946 Aug 04 09:40	11°♊24'29	6°22'05	min. Earth dist.	1955 Feb 17 22:07	25°♊30'01	34.05982 AU
retrograde	1946 Nov 15 00:42	13°♊22'10		direct	1955 May 06 18:29	24°♊18'01	
opposition	1947 Feb 01 21:23	12°♊11'32	6°56'28	max. Earth dist.	1955 Aug 17 01:07	26°♊22'06	35.90252 AU
min. Earth dist.	1947 Feb 04 15:22	12°♊07'40	36.09886 AU				
direct	1947 Apr 23 20:47	10°♊58'53		conjunction	1955 Aug 20 06:27	26°♊28'20	10°09'53
max. Earth dist.	1947 Aug 03 04:09	12°♊52'59	37.95507 AU	minimum elong	1955 Aug 20 06:07	26°♊28'19	10°09'54
				retrograde	1955 Dec 01 04:48	28°♊36'46	
conjunction	1947 Aug 06 06:59	12°♊58'35	6°47'31	opposition	1956 Feb 17 01:41	27°♊22'36	10°58'40
minimum elong	1947 Aug 06 06:46	12°♊58'34	6°47'32	min. Earth dist.	1956 Feb 19 22:19	27°♊18'19	33.81069 AU
retrograde	1947 Nov 16 21:42	14°♊57'19		direct	1956 May 07 20:00	26°♊05'51	
opposition	1948 Feb 03 16:38	13°♊46'17	7°23'29	max. Earth dist.	1956 Aug 18 03:25	28°♊11'13	35.65096 AU
min. Earth dist.	1948 Feb 06 11:32	13°♊42'20	35.83911 AU				
direct	1948 Apr 24 16:58	12°♊33'10		conjunction	1956 Aug 21 09:44	28°♊17'36	10°34'35
max. Earth dist.	1948 Aug 04 01:24	14°♊28'23	37.69371 AU	minimum elong	1956 Aug 21 09:23	28°♊17'34	10°34'34
					1956 Oct 20 06:09	0°♊	
conjunction	1948 Aug 07 04:37	14°♊34'04	7°12'59	retrograde	1956 Dec 02 07:16	0°♊27'20	
minimum elong	1948 Aug 07 04:23	14°♊34'03	7°12'59		1957 Jan 15 02:48	30°♊	
retrograde	1948 Nov 17 20:18	16°♊33'54		opposition	1957 Feb 18 03:13	29°♊12'44	11°24'56
opposition	1949 Feb 04 12:15	15°♊22'28	7°50'33	min. Earth dist.	1957 Feb 21 01:14	29°♊08'20	33.56252 AU
min. Earth dist.	1949 Feb 07 06:47	15°♊18'30	35.58012 AU	direct	1957 May 09 19:51	27°♊55'30	
direct	1949 Apr 26 14:00	14°♊08'53			1957 Aug 19 04:22	0°♊	
max. Earth dist.	1949 Aug 05 22:46	16°♊05'13	37.43316 AU	max. Earth dist.	1957 Aug 20 08:05	0°♊02'17	35.40064 AU
conjunction	1949 Aug 09 02:54	16°♊11'02	7°38'28	conjunction	1957 Aug 23 13:44	0°♊08'41	10°59'00
minimum elong	1949 Aug 09 02:39	16°♊11'01	7°38'28	minimum elong	1957 Aug 23 13:22	0°♊08'39	10°59'01
retrograde	1949 Nov 19 18:23	18°♊12'00		retrograde	1957 Dec 04 10:31	2°♊19'44	
opposition	1950 Feb 06 08:47	17°♊00'10	8°17'38	opposition	1958 Feb 20 05:28	1°♊04'42	11°50'56
min. Earth dist.	1950 Feb 09 04:32	16°♊56'06	35.32248 AU	min. Earth dist.	1958 Feb 23 02:46	1°♊00'18	33.31584 AU
direct	1950 Apr 28 08:40	15°♊46'08			1958 Apr 11 15:02	30°♊	
max. Earth dist.	1950 Aug 07 22:14	17°♊43'44	37.17423 AU	direct	1958 May 11 22:01	29°♊46'57	
					1958 Jun 10 18:46	0°♊	
conjunction	1950 Aug 11 01:37	17°♊49'32	8°03'56	max. Earth dist.	1958 Aug 22 11:23	1°♊55'02	35.15200 AU
minimum elong	1950 Aug 11 01:21	17°♊49'31	8°03'55				
retrograde	1950 Nov 21 15:56	19°♊51'40		conjunction	1958 Aug 25 18:12	2°♊01'35	11°23'08
opposition	1951 Feb 08 05:49	18°♊39'27	8°44'42	minimum elong	1958 Aug 25 17:50	2°♊01'34	11°23'07
min. Earth dist.	1951 Feb 11 00:41	18°♊35'25	35.06666 AU	retrograde	1958 Dec 06 15:43	4°♊13'58	
direct	1951 Apr 30 05:20	17°♊24'58		opposition	1959 Feb 22 08:30	2°♊58'28	12°16'35
max. Earth dist.	1951 Aug 09 20:24	19°♊23'44	36.91713 AU	min. Earth dist.	1959 Feb 25 06:34	2°♊54'01	33.07132 AU
				direct	1959 May 13 21:52	1°♊40'12	
conjunction	1951 Aug 13 01:05	19°♊29'42	8°29'21	max. Earth dist.	1959 Aug 24 18:03	3°♊49'48	34.90574 AU
minimum elong	1951 Aug 13 00:49	19°♊29'40	8°29'21				
retrograde	1951 Nov 23 16:28	21°♊33'03		conjunction	1959 Aug 27 23:42	3°♊56'19	11°46'52
opposition	1952 Feb 10 03:26	20°♊20'27	9°11'43	minimum elong	1959 Aug 27 23:20	3°♊56'17	11°46'53

retrograde	1959 Dec 08 20:27	6° <u>♏</u> 10'02		direct	1968 May 31 04:01	20° <u>♏</u> 10'19	
opposition	1960 Feb 24 12:12	4° <u>♏</u> 54'05	12°41'50	max. Earth dist.	1968 Sep 12 12:39	22° <u>♏</u> 33'46	32.89919 AU
min. Earth dist.	1960 Feb 27 09:51	4° <u>♏</u> 49'37	32.82953 AU				
direct	1960 May 15 00:49	3° <u>♏</u> 35'19		conjunction	1968 Sep 15 11:27	22° <u>♏</u> 40'16	14°52'30
max. Earth dist.	1960 Aug 25 23:36	5° <u>♏</u> 46'17	34.66270 AU	minimum elong	1968 Sep 15 11:06	22° <u>♏</u> 40'14	14°52'29
				retrograde	1968 Dec 27 17:05	25° <u>♏</u> 06'37	
conjunction	1960 Aug 29 05:47	5° <u>♏</u> 52'55	12°10'11	opposition	1969 Mar 14 13:17	23° <u>♏</u> 47'09	15°58'17
minimum elong	1960 Aug 29 05:25	5° <u>♏</u> 52'53	12°10'10	min. Earth dist.	1969 Mar 17 05:35	23° <u>♏</u> 42'48	30.87295 AU
retrograde	1960 Dec 10 04:38	8° <u>♏</u> 08'00		direct	1969 Jun 02 14:00	22° <u>♏</u> 24'30	
opposition	1961 Feb 25 16:47	6° <u>♏</u> 51'35	13°06'35	max. Earth dist.	1969 Sep 15 02:06	24° <u>♏</u> 49'20	32.70251 AU
min. Earth dist.	1961 Feb 28 14:05	6° <u>♏</u> 47'07	32.59153 AU				
direct	1961 May 17 04:24	5° <u>♏</u> 32'18		conjunction	1969 Sep 18 00:40	24° <u>♏</u> 55'53	15°08'47
max. Earth dist.	1961 Aug 28 07:38	7° <u>♏</u> 44'49	34.42362 AU	minimum elong	1969 Sep 18 00:19	24° <u>♏</u> 55'51	15°08'48
				retrograde	1969 Dec 30 08:08	27° <u>♏</u> 23'35	
conjunction	1961 Aug 31 12:38	7° <u>♏</u> 51'25	12°32'59	opposition	1970 Mar 17 01:52	26° <u>♏</u> 03'44	16°15'22
minimum elong	1961 Aug 31 12:15	7° <u>♏</u> 51'23	12°32'59	min. Earth dist.	1970 Mar 19 16:57	25° <u>♏</u> 59'27	30.68173 AU
retrograde	1961 Dec 12 11:54	10° <u>♏</u> 07'52		direct	1970 Jun 05 02:24	24° <u>♏</u> 40'40	
opposition	1962 Feb 27 22:21	8° <u>♏</u> 51'01	13°30'48	max. Earth dist.	1970 Sep 17 18:07	27° <u>♏</u> 07'03	32.51154 AU
min. Earth dist.	1962 Mar 02 19:36	8° <u>♏</u> 46'31	32.35794 AU				
direct	1962 May 19 09:39	7° <u>♏</u> 31'15		conjunction	1970 Sep 20 14:53	27° <u>♏</u> 13'29	15°23'57
max. Earth dist.	1962 Aug 30 15:44	9° <u>♏</u> 45'16	34.18957 AU	minimum elong	1970 Sep 20 14:34	27° <u>♏</u> 13'27	15°23'56
				retrograde	1971 Jan 01 21:59	29° <u>♏</u> 42'28	
conjunction	1962 Sep 02 20:10	9° <u>♏</u> 51'53	12°55'12	opposition	1971 Mar 19 15:17	28° <u>♏</u> 22'15	16°31'13
minimum elong	1962 Sep 02 19:48	9° <u>♏</u> 51'51	12°55'11	min. Earth dist.	1971 Mar 22 06:04	28° <u>♏</u> 17'57	30.49635 AU
retrograde	1962 Dec 14 21:45	12° <u>♏</u> 09'45		direct	1971 Jun 07 15:17	26° <u>♏</u> 58'47	
opposition	1963 Mar 02 04:30	10° <u>♏</u> 52'28	13°54'21	max. Earth dist.	1971 Sep 20 09:59	29° <u>♏</u> 26'34	32.32708 AU
min. Earth dist.	1963 Mar 05 00:15	10° <u>♏</u> 48'03	32.12969 AU				
direct	1963 May 21 15:41	9° <u>♏</u> 32'14		conjunction	1971 Sep 23 05:42	29° <u>♏</u> 32'56	15°37'53
max. Earth dist.	1963 Sep 02 00:45	11° <u>♏</u> 47'48	33.96091 AU	minimum elong	1971 Sep 23 05:23	29° <u>♏</u> 32'55	15°37'54
					1971 Oct 05 06:13	0° <u>♏</u>	
conjunction	1963 Sep 05 04:40	11° <u>♏</u> 54'26	13°16'46	retrograde	1972 Jan 04 14:44	2° <u>♏</u> 03'11	
minimum elong	1963 Sep 05 04:16	11° <u>♏</u> 54'24	13°16'46	opposition	1972 Mar 21 05:30	0° <u>♏</u> 42'35	16°45'45
retrograde	1963 Dec 17 07:07	14° <u>♏</u> 13'43		min. Earth dist.	1972 Mar 23 18:11	0° <u>♏</u> 38'25	30.31758 AU
opposition	1964 Mar 03 11:46	12° <u>♏</u> 56'03	14°17'12		1972 Apr 17 07:51	30° <u>♏</u>	
min. Earth dist.	1964 Mar 06 07:47	12° <u>♏</u> 51'35	31.90696 AU	direct	1972 Jun 09 05:44	29° <u>♏</u> 18'43	
direct	1964 May 22 21:29	11° <u>♏</u> 35'24		max. Earth dist.	1972 Jul 30 11:37	0° <u>♏</u>	
max. Earth dist.	1964 Sep 03 11:36	13° <u>♏</u> 52'35	33.73798 AU		1972 Sep 22 03:02	1° <u>♏</u> 47'55	32.14959 AU
conjunction	1964 Sep 06 13:56	13° <u>♏</u> 59'09	13°37'36	conjunction	1972 Sep 24 21:12	1° <u>♏</u> 54'11	15°50'32
minimum elong	1964 Sep 06 13:33	13° <u>♏</u> 59'07	13°37'36	minimum elong	1972 Sep 24 20:55	1° <u>♏</u> 54'10	15°50'32
retrograde	1964 Dec 18 18:39	16° <u>♏</u> 19'52		retrograde	1973 Jan 06 06:56	4° <u>♏</u> 25'37	
opposition	1965 Mar 05 19:45	15° <u>♏</u> 01'50	14°39'15	opposition	1973 Mar 23 20:40	3° <u>♏</u> 04'39	16°58'50
min. Earth dist.	1965 Mar 08 14:04	14° <u>♏</u> 57'27	31.68981 AU	min. Earth dist.	1973 Mar 26 08:50	3° <u>♏</u> 00'30	30.14612 AU
direct	1965 May 25 05:21	13° <u>♏</u> 40'46		direct	1973 Jun 11 20:11	1° <u>♏</u> 40'25	
max. Earth dist.	1965 Sep 05 21:42	15° <u>♏</u> 59'28	33.52051 AU	max. Earth dist.	1973 Sep 24 21:29	4° <u>♏</u> 11'02	31.98024 AU
conjunction	1965 Sep 09 00:02	16° <u>♏</u> 06'06	13°57'39	conjunction	1973 Sep 27 13:15	4° <u>♏</u> 17'08	16°01'47
minimum elong	1965 Sep 08 23:39	16° <u>♏</u> 06'04	13°57'40	minimum elong	1973 Sep 27 13:00	4° <u>♏</u> 17'06	16°01'48
retrograde	1965 Dec 21 05:06	18° <u>♏</u> 28'15		retrograde	1974 Jan 09 00:53	6° <u>♏</u> 49'43	
opposition	1966 Mar 08 04:47	17° <u>♏</u> 09'52	15°00'28	opposition	1974 Mar 26 12:31	5° <u>♏</u> 28'23	17°10'23
min. Earth dist.	1966 Mar 10 23:26	17° <u>♏</u> 05'26	31.47810 AU	min. Earth dist.	1974 Mar 28 21:57	5° <u>♏</u> 24'25	29.98296 AU
direct	1966 May 27 11:12	15° <u>♏</u> 48'24		direct	1974 Jun 14 13:17	4° <u>♏</u> 03'48	
max. Earth dist.	1966 Sep 08 10:33	18° <u>♏</u> 08'46	33.30837 AU	max. Earth dist.	1974 Sep 27 15:38	6° <u>♏</u> 35'43	31.81973 AU
conjunction	1966 Sep 11 10:54	18° <u>♏</u> 15'18	14°16'52	conjunction	1974 Sep 30 05:51	6° <u>♏</u> 41'42	16°11'34
minimum elong	1966 Sep 11 10:32	18° <u>♏</u> 15'16	14°16'52	minimum elong	1974 Sep 30 05:36	6° <u>♏</u> 41'41	16°11'33
retrograde	1966 Dec 23 15:37	20° <u>♏</u> 38'52		retrograde	1975 Jan 11 17:39	9° <u>♏</u> 15'24	
opposition	1967 Mar 10 14:42	19° <u>♏</u> 20'08	15°20'45	opposition	1975 Mar 29 05:13	7° <u>♏</u> 53'45	17°20'19
min. Earth dist.	1967 Mar 13 08:02	19° <u>♏</u> 15'46	31.27138 AU	min. Earth dist.	1975 Mar 31 13:37	7° <u>♏</u> 49'50	29.82888 AU
direct	1967 May 29 20:30	17° <u>♏</u> 58'17		direct	1975 Jun 17 04:04	6° <u>♏</u> 28'52	
max. Earth dist.	1967 Sep 10 21:56	20° <u>♏</u> 20'05	33.10125 AU	max. Earth dist.	1975 Sep 30 12:13	9° <u>♏</u> 02'11	31.66892 AU
conjunction	1967 Sep 13 22:41	20° <u>♏</u> 26'42	14°35'10	conjunction	1975 Oct 02 23:13	9° <u>♏</u> 07'54	16°19'46
minimum elong	1967 Sep 13 22:19	20° <u>♏</u> 26'40	14°35'11	minimum elong	1975 Oct 02 23:01	9° <u>♏</u> 07'53	16°19'46
retrograde	1967 Dec 26 04:47	22° <u>♏</u> 51'41		retrograde	1976 Jan 14 11:41	11° <u>♏</u> 42'38	
opposition	1968 Mar 12 01:25	21° <u>♏</u> 32'35	15°40'03	opposition	1976 Mar 30 22:31	10° <u>♏</u> 20'44	17°28'31
min. Earth dist.	1968 Mar 14 18:29	21° <u>♏</u> 28'13	31.06969 AU	min. Earth dist.	1976 Apr 02 04:11	10° <u>♏</u> 16'59	29.68433 AU

direct	1976 Jun 18 21:43	8°♁55'35				1984 Aug 28 04:43	0°♁		
max. Earth dist.	1976 Oct 02 07:28	11°♁30'04	31.52813 AU		max. Earth dist.	1984 Oct 23 19:13	2°♁00'30	30.75190 AU	
conjunction	1976 Oct 04 17:06	11°♁35'42	16°26'20		conjunction	1984 Oct 25 07:35	2°♁04'10	16°15'07	
minimum elong	1976 Oct 04 16:55	11°♁35'41	16°26'20		minimum elong	1984 Oct 25 07:42	2°♁04'11	16°15'07	
retrograde	1977 Jan 16 07:05	14°♁11'26			retrograde	1985 Feb 05 23:58	4°♁44'55		
opposition	1977 Apr 02 16:41	12°♁49'18	17°34'56		opposition	1985 Apr 23 14:06	3°♁21'39	17°17'03	
min. Earth dist.	1977 Apr 04 20:35	12°♁45'40	29.54971 AU		min. Earth dist.	1985 Apr 24 23:11	3°♁19'18	28.80933 AU	
direct	1977 Jun 21 13:21	11°♁23'56			direct	1985 Jul 12 08:41	1°♁55'28		
max. Earth dist.	1977 Oct 05 05:29	13°♁59'45	31.39746 AU		max. Earth dist.	1985 Oct 26 18:32	4°♁37'28	30.69965 AU	
conjunction	1977 Oct 07 11:29	14°♁05'04	16°31'13		conjunction	1985 Oct 28 04:04	4°♁40'52	16°05'22	
minimum elong	1977 Oct 07 11:21	14°♁05'03	16°31'13		minimum elong	1985 Oct 28 04:15	4°♁40'53	16°05'22	
retrograde	1978 Jan 19 00:46	16°♁41'45			retrograde	1986 Feb 08 20:16	7°♁21'46		
opposition	1978 Apr 05 11:33	15°♁19'25	17°39'31		opposition	1986 Apr 26 12:21	5°♁58'24	17°05'45	
min. Earth dist.	1978 Apr 07 13:12	15°♁15'56	29.42468 AU		min. Earth dist.	1986 Apr 27 19:23	5°♁56'13	28.76098 AU	
direct	1978 Jun 24 07:42	13°♁53'54			direct	1986 Jul 15 06:32	4°♁32'12		
max. Earth dist.	1978 Oct 08 01:45	16°♁30'44	31.27665 AU		max. Earth dist.	1986 Oct 29 19:00	7°♁14'35	30.65902 AU	
conjunction	1978 Oct 10 06:22	16°♁35'56	16°34'22		conjunction	1986 Oct 31 00:38	7°♁17'35	15°53'42	
minimum elong	1978 Oct 10 06:15	16°♁35'55	16°34'21		minimum elong	1986 Oct 31 00:49	7°♁17'36	15°53'41	
retrograde	1979 Jan 21 20:46	19°♁13'30			retrograde	1987 Feb 11 16:56	9°♁58'31		
opposition	1979 Apr 08 06:50	17°♁51'00	17°42'12		opposition	1987 Apr 29 10:26	8°♁35'07	16°52'24	
min. Earth dist.	1979 Apr 10 06:16	17°♁47'40	29.30918 AU		min. Earth dist.	1987 Apr 30 13:43	8°♁33'11	28.72411 AU	
direct	1979 Jun 27 01:26	16°♁25'19			direct	1987 Jul 18 06:11	7°♁08'56		
max. Earth dist.	1979 Oct 11 00:46	19°♁03'19	31.16538 AU						
conjunction	1979 Oct 13 01:56	19°♁08'12	16°35'44		conjunction	1987 Nov 02 21:02	9°♁54'12	15°40'08	
minimum elong	1979 Oct 13 01:53	19°♁08'12	16°35'45		minimum elong	1987 Nov 02 21:17	9°♁54'14	15°40'08	
retrograde	1980 Jan 24 15:49	21°♁46'33			max. Earth dist.	1987 Nov 01 18:00	9°♁51'28	30.63047 AU	
opposition	1980 Apr 10 03:02	20°♁23'54	17°42'59		retrograde	1988 Feb 14 14:51	12°♁35'06		
min. Earth dist.	1980 Apr 12 00:56	20°♁20'40	29.20269 AU		opposition	1988 May 01 08:48	11°♁11'40	16°37'00	
direct	1980 Jun 28 20:09	18°♁58'05			min. Earth dist.	1988 May 02 09:08	11°♁09'57	28.69944 AU	
max. Earth dist.	1980 Oct 12 22:08	21°♁36'57	31.06354 AU		direct	1988 Jul 20 04:21	9°♁45'34		
conjunction	1980 Oct 14 21:40	21°♁41'42	16°35'19		conjunction	1988 Nov 04 17:16	12°♁30'37	15°24'42	
minimum elong	1980 Oct 14 21:38	21°♁41'41	16°35'18		minimum elong	1988 Nov 04 17:31	12°♁30'38	15°24'42	
retrograde	1981 Jan 26 12:51	24°♁20'45			max. Earth dist.	1988 Nov 03 18:43	12°♁28'20	30.61457 AU	
opposition	1981 Apr 12 23:39	22°♁57'57	17°41'48		retrograde	1989 Feb 16 09:47	15°♁11'22		
min. Earth dist.	1981 Apr 14 18:35	22°♁54'55	29.10533 AU		opposition	1989 May 04 07:11	13°♁47'59	16°19'35	
direct	1981 Jul 01 16:12	21°♁32'02			min. Earth dist.	1989 May 05 04:03	13°♁46'30	28.68702 AU	
max. Earth dist.	1981 Oct 15 21:34	24°♁11'48	30.97101 AU		direct	1989 Jul 23 03:55	12°♁22'00		
conjunction	1981 Oct 17 17:57	24°♁16'15	16°33'03		conjunction	1989 Nov 07 13:14	15°♁06'43	15°07'26	
minimum elong	1981 Oct 17 17:58	24°♁16'15	16°33'04		minimum elong	1989 Nov 07 13:32	15°♁06'45	15°07'27	
retrograde	1982 Jan 29 08:18	26°♁55'53			max. Earth dist.	1989 Nov 06 17:13	15°♁04'41	30.61126 AU	
opposition	1982 Apr 15 20:52	25°♁32'57	17°38'39		retrograde	1990 Feb 19 06:31	17°♁47'15		
min. Earth dist.	1982 Apr 17 14:26	25°♁30'01	29.01703 AU		opposition	1990 May 07 05:17	16°♁23'56	16°00'13	
direct	1982 Jul 04 13:11	24°♁06'57			min. Earth dist.	1990 May 07 22:41	16°♁22'43	28.68697 AU	
max. Earth dist.	1982 Oct 18 20:01	26°♁47'24	30.88812 AU		direct	1990 Jul 26 01:26	14°♁58'07		
conjunction	1982 Oct 20 14:16	26°♁51'39	16°28'57		conjunction	1990 Nov 10 09:05	17°♁42'25	14°48'24	
minimum elong	1982 Oct 20 14:18	26°♁51'39	16°28'57		minimum elong	1990 Nov 10 09:23	17°♁42'27	14°48'25	
retrograde	1983 Feb 01 05:53	29°♁31'47			max. Earth dist.	1990 Nov 09 17:35	17°♁40'51	30.62022 AU	
opposition	1983 Apr 18 18:16	28°♁08'43	17°33'29		retrograde	1991 Feb 22 01:28	20°♁22'38		
min. Earth dist.	1983 Apr 20 08:25	28°♁06'02	28.93801 AU		opposition	1991 May 10 03:25	18°♁59'26	15°38'58	
direct	1983 Jul 07 11:25	26°♁42'38			min. Earth dist.	1991 May 10 18:10	18°♁58'24	28.69854 AU	
max. Earth dist.	1983 Oct 21 19:31	29°♁23'44	30.81484 AU		direct	1991 Jul 28 23:48	17°♁33'48		
conjunction	1983 Oct 23 10:56	29°♁27'42	16°22'59		conjunction	1991 Nov 13 04:30	20°♁17'34	14°27'40	
minimum elong	1983 Oct 23 11:02	29°♁27'43	16°22'59		minimum elong	1991 Nov 13 04:51	20°♁17'37	14°27'40	
	1983 Nov 05 21:07	0°♁			max. Earth dist.	1991 Nov 12 15:19	20°♁16'15	30.64086 AU	
retrograde	1984 Feb 04 02:06	2°♁08'12			retrograde	1992 Feb 24 21:33	22°♁57'24		
opposition	1984 Apr 20 16:05	0°♁45'01	17°26'17		opposition	1992 May 12 01:14	21°♁34'19	15°15'56	
min. Earth dist.	1984 Apr 22 04:52	0°♁42'26	28.86859 AU		min. Earth dist.	1992 May 12 12:06	21°♁33'34	28.72144 AU	
	1984 May 18 14:36	30°♁			direct	1992 Jul 30 21:35	20°♁08'54		
direct	1984 Jul 09 08:23	29°♁18'53			conjunction	1992 Nov 14 23:47	22°♁52'03	14°05'20	

minimum elong	1992 Nov 15 00:07	22° \mathbb{M} 52'05	14°05'20	minimum elong	2000 Dec 04 14:27	12° \mathbb{Z} 44'11	10°19'10
max. Earth dist.	1992 Nov 14 14:45	22° \mathbb{M} 51'08	30.67264 AU	max. Earth dist.	2000 Dec 05 05:05	12° \mathbb{Z} 45'36	31.29665 AU
retrograde	1993 Feb 26 14:30	25° \mathbb{M} 31'22		retrograde	2001 Mar 18 02:38	15° \mathbb{Z} 16'46	
opposition	1993 May 14 23:04	24° \mathbb{M} 08'26	14°51'12	opposition	2001 Jun 04 11:51	13° \mathbb{Z} 55'18	10°43'48
min. Earth dist.	1993 May 15 07:46	24° \mathbb{M} 07'50	28.75508 AU	min. Earth dist.	2001 Jun 03 19:02	13° \mathbb{Z} 56'26	29.39019 AU
direct	1993 Aug 02 19:29	22° \mathbb{M} 43'15		direct	2001 Aug 23 16:07	12° \mathbb{Z} 32'22	
conjunction	1993 Nov 17 18:25	25° \mathbb{M} 25'39	13°41'28	conjunction	2001 Dec 07 03:55	15° \mathbb{Z} 06'10	9°46'17
minimum elong	1993 Nov 17 18:48	25° \mathbb{M} 25'42	13°41'27	minimum elong	2001 Dec 07 04:17	15° \mathbb{Z} 06'12	9°46'16
max. Earth dist.	1993 Nov 17 11:44	25° \mathbb{M} 24'59	30.71519 AU	max. Earth dist.	2001 Dec 07 23:13	15° \mathbb{Z} 08'01	31.42208 AU
retrograde	1994 Mar 01 10:01	28° \mathbb{M} 04'23		retrograde	2002 Mar 20 14:55	17° \mathbb{Z} 37'44	
opposition	1994 May 17 20:22	26° \mathbb{M} 41'37	14°24'51	min. Earth dist.	2002 Jun 06 09:24	16° \mathbb{Z} 17'52	29.51726 AU
min. Earth dist.	1994 May 18 01:04	26° \mathbb{M} 41'17	28.79909 AU	opposition	2002 Jun 07 04:44	16° \mathbb{Z} 16'34	10°08'10
direct	1994 Aug 05 17:08	25° \mathbb{M} 16'40		direct	2002 Aug 26 11:01	14° \mathbb{Z} 54'02	
conjunction	1994 Nov 20 12:52	27° \mathbb{M} 58'14	13°16'10	conjunction	2002 Dec 09 16:57	17° \mathbb{Z} 26'34	9°12'43
minimum elong	1994 Nov 20 13:14	27° \mathbb{M} 58'16	13°16'10	minimum elong	2002 Dec 09 17:18	17° \mathbb{Z} 26'36	9°12'43
max. Earth dist.	1994 Nov 20 09:45	27° \mathbb{M} 57'56	30.76790 AU	max. Earth dist.	2002 Dec 10 14:13	17° \mathbb{Z} 28'36	31.55794 AU
retrograde	1995 Jan 17 09:15	0° \mathbb{Z}		retrograde	2003 Mar 23 05:13	19° \mathbb{Z} 57'04	
opposition	1995 Mar 04 02:34	0° \mathbb{Z} 36'18		opposition	2003 Jun 09 20:44	18° \mathbb{Z} 36'14	9°31'50
min. Earth dist.	1995 Apr 21 02:57	30° \mathbb{M}		min. Earth dist.	2003 Jun 08 21:27	18° \mathbb{Z} 37'47	29.65464 AU
opposition	1995 May 20 17:19	29° \mathbb{M} 13'41	13°57'01	direct	2003 Aug 29 03:34	17° \mathbb{Z} 14'07	
min. Earth dist.	1995 May 20 20:12	29° \mathbb{M} 13'29	28.85309 AU	conjunction	2003 Dec 12 05:28	19° \mathbb{Z} 45'22	8°38'33
direct	1995 Aug 08 13:34	27° \mathbb{M} 48'59		minimum elong	2003 Dec 12 05:49	19° \mathbb{Z} 45'24	8°38'32
conjunction	1995 Nov 10 19:11	0° \mathbb{Z}		max. Earth dist.	2003 Dec 13 06:37	19° \mathbb{Z} 47'46	31.70353 AU
conjunction	1995 Nov 23 06:45	0° \mathbb{Z} 29'38	12°49'31	retrograde	2004 Mar 24 15:09	22° \mathbb{Z} 14'48	
minimum elong	1995 Nov 23 07:09	0° \mathbb{Z} 29'40	12°49'30	min. Earth dist.	2004 Jun 10 11:19	20° \mathbb{Z} 55'58	29.80154 AU
max. Earth dist.	1995 Nov 23 06:19	0° \mathbb{Z} 29'35	30.83069 AU	opposition	2004 Jun 11 12:26	20° \mathbb{Z} 54'18	8°54'57
retrograde	1996 Mar 05 20:18	3° \mathbb{Z} 06'56		direct	2004 Aug 30 19:38	19° \mathbb{Z} 32'37	
opposition	1996 May 22 13:50	1° \mathbb{Z} 44'29	13°27'46	conjunction	2004 Dec 13 17:05	22° \mathbb{Z} 02'33	8°03'54
min. Earth dist.	1996 May 22 12:47	1° \mathbb{Z} 44'33	28.91689 AU	minimum elong	2004 Dec 13 17:23	22° \mathbb{Z} 02'35	8°03'54
direct	1996 Aug 10 12:35	0° \mathbb{Z} 20'02		max. Earth dist.	2004 Dec 14 20:12	22° \mathbb{Z} 05'07	31.85815 AU
conjunction	1996 Nov 24 23:56	2° \mathbb{Z} 59'41	12°21'36	retrograde	2005 Mar 27 02:29	24° \mathbb{Z} 30'53	
minimum elong	1996 Nov 25 00:20	2° \mathbb{Z} 59'43	12°21'37	min. Earth dist.	2005 Jun 12 22:27	23° \mathbb{Z} 12'38	29.95718 AU
max. Earth dist.	1996 Nov 25 02:36	2° \mathbb{Z} 59'57	30.90323 AU	opposition	2005 Jun 14 03:15	23° \mathbb{Z} 10'44	8°17'36
retrograde	1997 Mar 08 12:54	5° \mathbb{Z} 36'10		direct	2005 Sep 02 10:52	21° \mathbb{Z} 49'28	
opposition	1997 May 25 09:59	4° \mathbb{Z} 13'51	12°57'12	conjunction	2005 Dec 16 04:12	24° \mathbb{Z} 18'06	7°28'51
min. Earth dist.	1997 May 25 06:41	4° \mathbb{Z} 14'05	28.99061 AU	minimum elong	2005 Dec 16 04:30	24° \mathbb{Z} 18'08	7°28'51
direct	1997 Aug 13 08:32	2° \mathbb{Z} 49'40		max. Earth dist.	2005 Dec 17 10:26	24° \mathbb{Z} 20'56	32.02081 AU
conjunction	1997 Nov 27 16:35	5° \mathbb{Z} 28'14	11°52'32	retrograde	2006 Mar 29 12:40	26° \mathbb{Z} 45'19	
minimum elong	1997 Nov 27 16:59	5° \mathbb{Z} 28'17	11°52'32	min. Earth dist.	2006 Jun 15 11:00	25° \mathbb{Z} 27'29	30.12081 AU
max. Earth dist.	1997 Nov 27 22:35	5° \mathbb{Z} 28'50	30.98587 AU	opposition	2006 Jun 16 17:24	25° \mathbb{Z} 25'29	7°39'53
retrograde	1998 Mar 11 04:55	8° \mathbb{Z} 03'48		direct	2006 Sep 04 23:21	24° \mathbb{Z} 04'39	
opposition	1998 May 28 05:15	6° \mathbb{Z} 41'41	12°25'26	conjunction	2006 Dec 18 14:40	26° \mathbb{Z} 31'57	6°53'31
min. Earth dist.	1998 May 27 22:20	6° \mathbb{Z} 42'10	29.07436 AU	minimum elong	2006 Dec 18 14:56	26° \mathbb{Z} 31'58	6°53'31
direct	1998 Aug 16 06:09	5° \mathbb{Z} 17'46		max. Earth dist.	2006 Dec 19 23:02	26° \mathbb{Z} 34'57	32.19091 AU
conjunction	1998 Nov 30 08:26	7° \mathbb{Z} 55'12	11°22'22	retrograde	2007 Mar 31 22:45	28° \mathbb{Z} 58'01	
minimum elong	1998 Nov 30 08:50	7° \mathbb{Z} 55'14	11°22'23	min. Earth dist.	2007 Jun 17 21:23	27° \mathbb{Z} 40'42	30.29151 AU
max. Earth dist.	1998 Nov 30 17:01	7° \mathbb{Z} 56'02	31.07867 AU	opposition	2007 Jun 19 06:49	27° \mathbb{Z} 38'32	7°01'56
retrograde	1999 Mar 13 21:34	10° \mathbb{Z} 29'49		direct	2007 Sep 07 14:55	26° \mathbb{Z} 18'07	
opposition	1999 May 31 00:06	9° \mathbb{Z} 07'53	11°52'32	conjunction	2007 Dec 21 00:17	28° \mathbb{Z} 44'02	6°17'58
min. Earth dist.	1999 May 30 14:16	9° \mathbb{Z} 08'33	29.16871 AU	minimum elong	2007 Dec 21 00:32	28° \mathbb{Z} 44'04	6°17'58
direct	1999 Aug 19 01:46	7° \mathbb{Z} 44'16		max. Earth dist.	2007 Dec 22 10:39	28° \mathbb{Z} 47'13	32.36749 AU
conjunction	1999 Dec 02 23:39	10° \mathbb{Z} 20'30	10°51'13	retrograde	2008 Jan 26 02:37	0° \mathbb{Z}	
minimum elong	1999 Dec 03 00:02	10° \mathbb{Z} 20'33	10°51'12	retrograde	2008 Apr 02 09:24	1° \mathbb{Z} 08'57	
max. Earth dist.	1999 Dec 03 12:17	10° \mathbb{Z} 21'44	31.18219 AU	min. Earth dist.	2008 Jun 14 05:13	30° \mathbb{Z}	
retrograde	2000 Mar 15 11:51	12° \mathbb{Z} 54'08		opposition	2008 Jun 19 08:16	29° \mathbb{Z} 52'04	30.46886 AU
opposition	2000 Jun 01 18:19	11° \mathbb{Z} 32'25	11°18'38	opposition	2008 Jun 20 19:42	29° \mathbb{Z} 49'46	6°23'50
min. Earth dist.	2000 Jun 01 05:17	11° \mathbb{Z} 33'18	29.27383 AU	direct	2008 Sep 09 03:14	28° \mathbb{Z} 29'46	
direct	2000 Aug 20 22:43	10° \mathbb{Z} 09'08		conjunction	2008 Nov 27 01:03	0° \mathbb{Z}	
conjunction	2000 Dec 04 14:05	12° \mathbb{Z} 44'09	10°19'09	conjunction	2008 Dec 22 09:24	0° \mathbb{Z} 54'19	5°42'18

minimum elong	2008 Dec 22 09:37	0°☾54'20	5°42'19	min. Earth dist.	2017 Jul 07 21:41	18°☾11'01	32.34630 AU
max. Earth dist.	2008 Dec 23 22:22	0°☾57'42	32.55033 AU	opposition	2017 Jul 10 04:35	18°☾07'38	0°45'56
retrograde	2009 Apr 04 17:35	3°☾18'02		direct	2017 Sep 28 19:36	16°☾51'15	
min. Earth dist.	2009 Jun 21 18:12	2°☾01'35	30.65231 AU				
opposition	2009 Jun 23 07:42	1°☾59'10	5°45'39	conjunction	2018 Jan 09 09:33	19°☾03'53	0°26'23
direct	2009 Sep 11 16:57	0°☾39'32		minimum elong	2018 Jan 09 09:34	19°☾03'53	0°26'22
				max. Earth dist.	2018 Jan 11 16:54	19°☾08'35	34.46507 AU
conjunction	2009 Dec 24 17:32	3°☾02'43	5°06'35	retrograde	2018 Apr 22 15:26	21°☾17'14	
minimum elong	2009 Dec 24 17:44	3°☾02'44	5°06'34	min. Earth dist.	2018 Jul 10 02:13	20°☾04'45	32.58225 AU
max. Earth dist.	2009 Dec 26 07:47	3°☾06'11	32.73895 AU	opposition	2018 Jul 12 10:04	20°☾01'20	0°10'04
retrograde	2010 Apr 07 02:34	5°☾25'14		direct	2018 Oct 01 02:03	18°☾45'22	
min. Earth dist.	2010 Jun 24 02:48	4°☾09'13	30.84188 AU	desc. node	2018 Oct 24 09:53	18°☾53'29	
opposition	2010 Jun 25 18:55	4°☾06'39	5°07'29				
direct	2010 Sep 14 04:36	2°☾47'23		conjunction	2019 Jan 11 11:38	20°☾56'48	0°-7'-14
				minimum elong	2019 Jan 11 11:38	20°☾56'48	0°07'15
conjunction	2010 Dec 27 01:04	5°☾09'10	4°30'53	behind sun begin	2019 Jan 11 05:46	20°☾56'20	
minimum elong	2010 Dec 27 01:15	5°☾09'11	4°30'53	behind sun end	2019 Jan 11 17:30	20°☾57'16	
max. Earth dist.	2010 Dec 28 18:29	5°☾12'54	32.93344 AU	max. Earth dist.	2019 Jan 13 19:23	21°☾01'31	34.70270 AU
retrograde	2011 Apr 09 08:51	7°☾30'28		retrograde	2019 Apr 24 18:48	23°☾09'07	
min. Earth dist.	2011 Jun 26 11:45	6°☾14'49	31.03756 AU	min. Earth dist.	2019 Jul 12 04:46	21°☾57'05	32.82131 AU
opposition	2011 Jun 28 05:19	6°☾12'10	4°29'23	opposition	2019 Jul 14 14:51	21°☾53'34	0°-25'-17
direct	2011 Sep 16 18:24	4°☾53'17		direct	2019 Oct 03 06:39	20°☾38'01	
conjunction	2011 Dec 29 07:43	7°☾13'40	3°55'15	conjunction	2020 Jan 13 13:20	22°☾48'16	0°-40'-16
minimum elong	2011 Dec 29 07:52	7°☾13'41	3°55'14	minimum elong	2020 Jan 13 13:19	22°☾48'16	0°40'17
max. Earth dist.	2011 Dec 31 02:18	7°☾17'29	33.13408 AU	max. Earth dist.	2020 Jan 15 23:22	22°☾53'08	34.94281 AU
retrograde	2012 Apr 10 16:24	9°☾33'46		retrograde	2020 Apr 25 18:54	24°☾59'32	
min. Earth dist.	2012 Jun 27 18:05	8°☾18'37	31.23992 AU	min. Earth dist.	2020 Jul 13 08:54	23°☾47'51	33.06268 AU
opposition	2012 Jun 29 15:02	8°☾15'46	3°51'26	opposition	2020 Jul 15 19:12	23°☾44'20	-1°00'-6
direct	2012 Sep 18 05:07	6°☾57'15		direct	2020 Oct 04 13:32	22°☾29'12	
conjunction	2012 Dec 30 13:39	9°☾16'17	3°19'46	conjunction	2021 Jan 14 14:19	24°☾38'16	-1°-12'-51
minimum elong	2012 Dec 30 13:46	9°☾16'17	3°19'47	minimum elong	2021 Jan 14 14:16	24°☾38'16	1°12'51
max. Earth dist.	2013 Jan 01 11:27	9°☾20'20	33.34119 AU	max. Earth dist.	2021 Jan 17 00:28	24°☾43'07	35.18482 AU
retrograde	2013 Apr 12 19:34	11°☾35'12		retrograde	2021 Apr 27 20:02	26°☾48'29	
min. Earth dist.	2013 Jun 30 01:54	10°☾20'25	31.44903 AU	min. Earth dist.	2021 Jul 15 10:21	25°☾37'15	33.30583 AU
opposition	2013 Jul 02 00:06	10°☾17'30	3°13'41	opposition	2021 Jul 17 22:46	25°☾33'36	-1°-34'-21
direct	2013 Sep 20 15:29	8°☾59'23		direct	2021 Oct 06 18:29	24°☾18'51	
conjunction	2014 Jan 01 18:57	11°☾17'04	2°44'29	conjunction	2022 Jan 16 14:51	26°☾26'45	-1°-44'-55
minimum elong	2014 Jan 01 19:03	11°☾17'05	2°44'29	minimum elong	2022 Jan 16 14:47	26°☾26'45	1°44'56
max. Earth dist.	2014 Jan 03 18:10	11°☾21'14	33.55488 AU	max. Earth dist.	2022 Jan 19 02:32	26°☾31'41	35.42817 AU
retrograde	2014 Apr 14 23:47	13°☾34'49		retrograde	2022 Apr 29 18:36	28°☾35'56	
min. Earth dist.	2014 Jul 02 06:43	12°☾20'33	31.66476 AU	min. Earth dist.	2022 Jul 17 13:06	27°☾24'59	33.55055 AU
opposition	2014 Jul 04 08:03	12°☾17'28	2°36'13	opposition	2022 Jul 20 01:38	27°☾21'22	-2°-8'-1
direct	2014 Sep 23 00:36	10°☾59'46		direct	2022 Oct 08 21:56	26°☾06'58	
conjunction	2015 Jan 03 23:34	13°☾16'09	2°09'27	conjunction	2023 Jan 18 14:44	28°☾13'42	-2°-16'-26
minimum elong	2015 Jan 03 23:39	13°☾16'09	2°09'28	minimum elong	2023 Jan 18 14:40	28°☾13'42	2°16'27
max. Earth dist.	2015 Jan 06 01:16	13°☾20'29	33.77469 AU	max. Earth dist.	2023 Jan 21 03:21	28°☾18'41	35.67306 AU
retrograde	2015 Apr 17 03:54	15°☾32'46			2023 Mar 23 12:14	0°≈	
min. Earth dist.	2015 Jul 04 12:52	14°☾18'55	31.88671 AU	retrograde	2023 May 01 17:08	0°≈21'51	
opposition	2015 Jul 06 15:38	14°☾15'46	1°59'03		2023 Jun 11 09:45	30°☾	
direct	2015 Sep 25 06:58	12°☾58'29		min. Earth dist.	2023 Jul 19 13:41	29°☾11'16	33.79692 AU
				opposition	2023 Jul 22 03:52	29°☾07'34	-2°-41'-4
conjunction	2016 Jan 06 03:28	15°☾13'35	1°34'43	direct	2023 Oct 11 01:10	27°☾53'31	
minimum elong	2016 Jan 06 03:32	15°☾13'35	1°34'43				
max. Earth dist.	2016 Jan 08 07:11	15°☾18'04	34.00023 AU	conjunction	2024 Jan 20 13:46	29°☾59'06	-2°-47'-24
retrograde	2016 Apr 18 07:26	17°☾29'06		minimum elong	2024 Jan 20 13:40	29°☾59'05	2°47'25
min. Earth dist.	2016 Jul 05 17:20	16°☾15'45	32.11407 AU		2024 Jan 21 00:51	0°≈	
opposition	2016 Jul 07 22:27	16°☾12'28	1°22'17	max. Earth dist.	2024 Jan 23 03:20	0°≈04'06	35.91958 AU
direct	2016 Sep 26 15:02	14°☾55'38		retrograde	2024 May 02 17:46	2°≈06'15	
				min. Earth dist.	2024 Jul 20 14:10	0°≈55'59	34.04558 AU
conjunction	2017 Jan 07 06:45	17°☾09'29	1°00'21	opposition	2024 Jul 23 05:38	0°≈52'14	-3°-13'-29
minimum elong	2017 Jan 07 06:47	17°☾09'29	1°00'22		2024 Sep 02 00:08	30°☾	
max. Earth dist.	2017 Jan 09 11:46	17°☾14'02	34.23057 AU	direct	2024 Oct 12 00:33	29°☾38'31	
retrograde	2017 Apr 20 12:49	19°☾23'55			2024 Nov 19 20:30	0°≈	

conjunction	2025 Jan 21 12:29	1°42'59"	-3°-17'-47"	retrograde	2033 May 17 12:59	16°46'26"	
minimum elong	2025 Jan 21 12:22	1°42'58"	3°17'47"	min. Earth dist.	2033 Aug 04 19:29	15°39'09"	36.36602 AU
max. Earth dist.	2025 Jan 24 03:59	1°48'06"	36.16844 AU	opposition	2033 Aug 07 18:55	15°35'07"	-7°-34'-43"
retrograde	2025 May 04 15:26	3°49'08"		direct	2033 Oct 27 16:40	14°24'32"	
min. Earth dist.	2025 Jul 22 14:17	2°39'11"	34.29670 AU				
opposition	2025 Jul 25 06:33	2°35'24"	-3°-45'-15"	conjunction	2034 Feb 05 02:19	16°20'12"	-7°-23'-14"
direct	2025 Oct 14 02:53	1°22'02"		minimum elong	2034 Feb 05 02:07	16°20'11"	7°23'14"
				max. Earth dist.	2034 Feb 08 00:47	16°25'32"	38.47831 AU
conjunction	2026 Jan 23 10:28	3°25'24"	-3°-47'-33"	retrograde	2034 May 19 06:59	18°18'27"	
minimum elong	2026 Jan 23 10:20	3°25'24"	3°47'35"	min. Earth dist.	2034 Aug 06 16:43	17°11'22"	36.62363 AU
max. Earth dist.	2026 Jan 26 02:12	3°30'30"	36.41978 AU	opposition	2034 Aug 09 15:18	17°07'23"	-8°00'-19"
retrograde	2026 May 06 15:34	5°30'35"		direct	2034 Oct 29 13:42	15°57'07"	
min. Earth dist.	2026 Jul 24 12:35	4°21'02"	34.55056 AU				
opposition	2026 Jul 27 06:55	4°17'09"	-4°-16'-21"	conjunction	2035 Feb 06 20:18	17°51'52"	-7°-47'-21"
direct	2026 Oct 16 02:39	3°04'07"		minimum elong	2035 Feb 06 20:06	17°51'52"	7°47'23"
				max. Earth dist.	2035 Feb 09 18:25	17°57'09"	38.73330 AU
conjunction	2027 Jan 25 08:01	5°06'27"	-4°-16'-44"	retrograde	2035 May 20 23:00	19°49'18"	
minimum elong	2027 Jan 25 07:53	5°06'27"	4°16'45"	min. Earth dist.	2035 Aug 08 11:10	18°42'32"	36.87995 AU
max. Earth dist.	2027 Jan 28 02:02	5°11'42"	36.67358 AU	opposition	2035 Aug 11 11:03	18°38'30"	-8°-25'-14"
retrograde	2027 May 08 12:56	7°10'42"		direct	2035 Oct 31 11:34	17°28'30"	
min. Earth dist.	2027 Jul 26 12:15	6°01'26"	34.80685 AU				
opposition	2027 Jul 29 06:48	5°57'34"	-4°-46'-46"	conjunction	2036 Feb 08 13:53	19°22'23"	-8°-10'-51"
direct	2027 Oct 18 03:50	4°44'54"		minimum elong	2036 Feb 08 13:40	19°22'22"	8°10'51"
				max. Earth dist.	2036 Feb 11 12:38	19°27'40"	38.98715 AU
conjunction	2028 Jan 27 05:03	6°46'13"	-4°-45'-16"	retrograde	2036 May 21 15:37	21°19'01"	
minimum elong	2028 Jan 27 04:53	6°46'12"	4°45'17"	min. Earth dist.	2036 Aug 09 06:48	20°12'27"	37.13565 AU
max. Earth dist.	2028 Jan 29 23:18	6°51'26"	36.92966 AU	opposition	2036 Aug 12 06:30	20°08'27"	-8°-49'-28"
retrograde	2028 May 09 09:33	8°49'32"		direct	2036 Nov 01 07:54	18°58'44"	
min. Earth dist.	2028 Jul 27 09:21	7°40'42"	35.06527 AU				
opposition	2028 Jul 30 06:03	7°36'43"	-5°-16'-29"	conjunction	2037 Feb 09 07:03	20°51'46"	-8°-33'-42"
direct	2028 Oct 19 03:42	6°24'25"		minimum elong	2037 Feb 09 06:51	20°51'45"	8°33'44"
				max. Earth dist.	2037 Feb 12 06:37	20°57'05"	39.24060 AU
conjunction	2029 Jan 28 01:33	8°24'44"	-5°-13'-11"	retrograde	2037 May 23 07:49	22°47'38"	
minimum elong	2029 Jan 28 01:23	8°24'43"	5°13'12"	min. Earth dist.	2037 Aug 11 01:04	21°41'19"	37.39099 AU
max. Earth dist.	2029 Jan 30 21:20	8°30'03"	37.18738 AU	opposition	2037 Aug 14 01:19	21°37'18"	-9°-13'00"
retrograde	2029 May 11 04:17	10°27'11"		direct	2037 Nov 03 03:36	20°27'52"	
min. Earth dist.	2029 Jul 29 08:11	9°18'38"	35.32523 AU				
opposition	2029 Aug 01 04:56	9°14'40"	-5°-45'-31"	conjunction	2038 Feb 10 23:45	22°20'04"	-8°-55'-55"
direct	2029 Oct 21 03:54	8°02'45"		minimum elong	2038 Feb 10 23:32	22°20'03"	8°55'56"
				max. Earth dist.	2038 Feb 13 23:06	22°25'20"	39.49386 AU
conjunction	2030 Jan 29 21:46	10°02'05"	-5°-40'-27"	retrograde	2038 May 25 02:20	24°15'12"	
minimum elong	2030 Jan 29 21:36	10°02'04"	5°40'28"	min. Earth dist.	2038 Aug 12 18:26	23°09'10"	37.64651 AU
max. Earth dist.	2030 Feb 01 18:15	10°07'25"	37.44623 AU	opposition	2038 Aug 15 19:38	23°05'08"	-9°-35'-52"
retrograde	2030 May 12 23:12	12°03'39"		direct	2038 Nov 04 20:20	21°55'59"	
min. Earth dist.	2030 Jul 31 05:12	10°55'29"	35.58589 AU				
opposition	2030 Aug 03 02:59	10°51'28"	-6°-13'-51"	conjunction	2039 Feb 12 16:13	23°47'24"	-9°-17'-30"
direct	2030 Oct 23 03:06	9°39'54"		minimum elong	2039 Feb 12 16:00	23°47'23"	9°17'31"
				max. Earth dist.	2039 Feb 15 17:11	23°52'44"	39.74731 AU
conjunction	2031 Jan 31 17:27	11°38'18"	-6°-7'-6"	retrograde	2039 May 26 19:19	25°41'48"	
minimum elong	2031 Jan 31 17:17	11°38'17"	6°07'07"	min. Earth dist.	2039 Aug 14 12:45	24°36'01"	37.90210 AU
max. Earth dist.	2031 Feb 03 14:11	11°43'36"	37.70531 AU	opposition	2039 Aug 17 13:41	24°32'00"	-9°-58'-3"
retrograde	2031 May 14 20:27	13°39'02"		direct	2039 Nov 06 13:54	23°23'10"	
min. Earth dist.	2031 Aug 02 02:24	12°31'10"	35.84676 AU				
opposition	2031 Aug 05 00:51	12°27'09"	-6°-41'-29"	conjunction	2040 Feb 14 08:04	25°13'49"	-9°-38'-27"
direct	2031 Oct 24 23:14	11°15'55"		minimum elong	2040 Feb 14 07:51	25°13'49"	9°38'27"
				max. Earth dist.	2040 Feb 17 08:30	25°19'06"	40.00084 AU
conjunction	2032 Feb 02 12:46	13°13'23"	-6°-33'-6"	retrograde	2040 May 27 13:24	27°07'32"	
minimum elong	2032 Feb 02 12:35	13°13'22"	6°33'07"	min. Earth dist.	2040 Aug 15 04:52	26°02'05"	38.15766 AU
max. Earth dist.	2032 Feb 05 10:50	13°18'46"	37.96411 AU	opposition	2040 Aug 18 07:18	25°58'00"	-10°-19'-33"
retrograde	2032 May 15 15:53	15°13'17"		direct	2040 Nov 07 06:02	24°49'28"	
min. Earth dist.	2032 Aug 02 23:54	14°05'41"	36.10692 AU				
opposition	2032 Aug 05 22:12	14°01'42"	-7°-8'-27"	conjunction	2041 Feb 14 23:46	26°39'24"	-9°-58'-46"
direct	2032 Oct 25 21:09	12°50'49"		minimum elong	2041 Feb 14 23:33	26°39'23"	9°58'48"
				max. Earth dist.	2041 Feb 18 01:22	26°44'43"	40.25402 AU
conjunction	2033 Feb 03 07:42	14°47'22"	-6°-58'-29"	retrograde	2041 May 29 03:32	28°32'27"	
minimum elong	2033 Feb 03 07:31	14°47'21"	6°58'30"	min. Earth dist.	2041 Aug 16 22:52	27°27'13"	38.41272 AU
max. Earth dist.	2033 Feb 06 05:00	14°52'38"	38.22191 AU	opposition	2041 Aug 20 00:28	27°23'12"	-10°-40'-23"

direct	2041 Nov 09 00:10	26° 14 '58		direct	2049 Nov 20 09:39	7° 10 '12	
conjunction	2042 Feb 16 15:11	28° 04 '12	-10°-18'-29	conjunction	2050 Feb 27 07:39	8° 15 '54'03	-12°-35'-33
minimum elong	2042 Feb 16 14:58	28° 04 '11	10°18'29	minimum elong	2050 Feb 27 07:28	8° 15 '54'02	12°35'34
max. Earth dist.	2042 Feb 19 16:46	28° 09 '29	40.50650 AU	max. Earth dist.	2050 Mar 02 07:34	8° 15 '59'00	42.43726 AU
retrograde	2042 May 30 16:36	29° 56 '35		retrograde	2050 Jun 10 09:59	10° 11 '41'27	
min. Earth dist.	2042 Aug 18 14:48	28° 55 '40	38.66660 AU	min. Earth dist.	2050 Aug 29 18:43	9° 11 '38'04	40.60400 AU
opposition	2042 Aug 21 17:14	28° 47 '37	-11°00'-34	opposition	2050 Sep 01 19:29	9° 11 '34'14	-13°-20'-21
direct	2042 Nov 10 19:21	27° 39 '42		direct	2050 Nov 21 22:12	8° 11 '28'16	
conjunction	2043 Feb 18 06:05	29° 28 '14	-10°-37'-35	conjunction	2051 Feb 28 20:18	10° 11 '11'30	-12°-50'-13
minimum elong	2043 Feb 18 05:52	29° 28 '13	10°37'37	minimum elong	2051 Feb 28 20:07	10° 11 '11'29	12°50'14
max. Earth dist.	2043 Feb 21 07:33	29° 33 '29	40.75740 AU	max. Earth dist.	2051 Mar 03 21:16	10° 11 '16'29	42.66774 AU
	2043 Mar 09 00:46	0° 11 '		retrograde	2051 Jun 11 22:42	11° 11 '58'20	
retrograde	2043 Jun 01 08:39	1° 11 '20'00		min. Earth dist.	2051 Aug 31 09:20	10° 11 '55'06	40.83569 AU
min. Earth dist.	2043 Aug 20 07:37	0° 11 '15'19	38.91881 AU	opposition	2051 Sep 03 09:15	10° 11 '51'19	-13°-35'-13
opposition	2043 Aug 23 09:51	0° 11 '11'18	-11°-20'-7	direct	2051 Nov 23 12:12	9° 11 '45'34	
	2043 Sep 01 03:32	30° 00 '		conjunction	2052 Mar 01 08:42	11° 11 '28'13	-13°-4'-19
direct	2043 Nov 12 11:26	29° 03 '41		minimum elong	2052 Mar 01 08:32	11° 11 '28'13	13°04'21
	2044 Jan 19 09:31	0° 11 '		max. Earth dist.	2052 Mar 04 08:46	11° 11 '33'07	42.89680 AU
conjunction	2044 Feb 19 21:01	0° 11 '51'32	-10°-56'-7	retrograde	2052 Jun 12 12:11	13° 11 '14'30	
minimum elong	2044 Feb 19 20:49	0° 11 '51'31	10°56'07	min. Earth dist.	2052 Aug 31 21:45	12° 11 '11'31	41.06588 AU
max. Earth dist.	2044 Feb 22 23:07	0° 11 '56'48	41.00632 AU	opposition	2052 Sep 03 22:35	12° 11 '07'42	-13°-49'-30
retrograde	2044 Jun 01 23:11	2° 11 '42'40		direct	2052 Nov 23 23:59	11° 11 '02'11	
min. Earth dist.	2044 Aug 21 00:23	1° 11 '38'12	39.16852 AU	conjunction	2053 Mar 02 20:52	12° 11 '44'17	-13°-17'-54
opposition	2044 Aug 24 02:00	1° 11 '34'14	-11°-39'-3	minimum elong	2053 Mar 02 20:41	12° 11 '44'17	13°17'55
direct	2044 Nov 13 04:07	0° 11 '26'54		max. Earth dist.	2053 Mar 05 21:26	12° 11 '49'11	43.12417 AU
conjunction	2045 Feb 20 11:31	2° 11 '14'04	-11°-14'-4	retrograde	2053 Jun 14 00:08	14° 11 '30'03	
minimum elong	2045 Feb 20 11:18	2° 11 '14'03	11°14'05	min. Earth dist.	2053 Sep 02 12:04	13° 11 '27'13	41.29423 AU
max. Earth dist.	2045 Feb 23 12:21	2° 11 '19'12	41.25244 AU	opposition	2053 Sep 05 11:49	13° 11 '23'28	-14°-3'-13
retrograde	2045 Jun 03 16:36	4° 11 '04'35		direct	2053 Nov 25 13:08	12° 11 '18'12	
min. Earth dist.	2045 Aug 22 15:48	3° 11 '00'21	39.41524 AU	conjunction	2054 Mar 04 08:53	13° 11 '59'46	-13°-30'-58
opposition	2045 Aug 25 17:51	2° 11 '56'23	-11°-57'-23	minimum elong	2054 Mar 04 08:43	13° 11 '59'45	13°30'59
direct	2045 Nov 14 17:33	1° 11 '49'19		max. Earth dist.	2054 Mar 07 09:15	14° 11 '04'38	43.34958 AU
conjunction	2046 Feb 22 01:54	3° 11 '35'49	-11°-31'-27	retrograde	2054 Jun 15 10:07	15° 11 '45'01	
minimum elong	2046 Feb 22 01:42	3° 11 '35'48	11°31'28	min. Earth dist.	2054 Sep 04 00:33	14° 11 '42'25	41.52017 AU
max. Earth dist.	2046 Feb 25 03:23	3° 11 '40'58	41.49525 AU	opposition	2054 Sep 07 00:31	14° 11 '38'41	-14°-16'-25
retrograde	2046 Jun 05 07:25	5° 11 '25'41		direct	2054 Nov 27 03:41	13° 11 '33'39	
min. Earth dist.	2046 Aug 24 08:39	4° 11 '21'35	39.65847 AU	conjunction	2055 Mar 05 20:33	15° 11 '14'42	-13°-43'-31
opposition	2046 Aug 27 09:17	4° 11 '17'42	-12°-15'-8	minimum elong	2055 Mar 05 20:23	15° 11 '14'41	13°43'31
direct	2046 Nov 16 08:46	3° 11 '10'53		max. Earth dist.	2055 Mar 08 20:00	15° 11 '19'29	43.57239 AU
conjunction	2047 Feb 23 15:53	4° 11 '56'42	-11°-48'-18	retrograde	2055 Jun 16 22:47	16° 11 '59'29	
minimum elong	2047 Feb 23 15:40	4° 11 '56'41	11°48'19	min. Earth dist.	2055 Sep 05 13:47	15° 11 '57'04	41.74342 AU
max. Earth dist.	2047 Feb 26 16:17	5° 11 '01'45	41.73479 AU	opposition	2055 Sep 08 13:15	15° 11 '53'22	-14°-29'-5
retrograde	2047 Jun 06 20:53	6° 11 '45'56		direct	2055 Nov 28 16:12	14° 11 '48'35	
min. Earth dist.	2047 Aug 25 23:04	5° 11 '42'04	39.89846 AU	conjunction	2056 Mar 06 08:08	16° 11 '29'08	-13°-55'-35
opposition	2047 Aug 29 00:23	5° 11 '38'10	-12°-32'-19	minimum elong	2056 Mar 06 07:58	16° 11 '29'07	13°55'36
direct	2047 Nov 17 23:55	4° 11 '31'33		max. Earth dist.	2056 Mar 09 08:10	16° 11 '33'56	43.79215 AU
conjunction	2048 Feb 25 05:21	6° 11 '16'42	-12°-4'-36	retrograde	2056 Jun 17 11:19	18° 11 '13'27	
minimum elong	2048 Feb 25 05:09	6° 11 '16'41	12°04'37	min. Earth dist.	2056 Sep 06 03:23	17° 11 '11'11	41.96306 AU
max. Earth dist.	2048 Feb 28 05:47	6° 11 '21'44	41.97120 AU	opposition	2056 Sep 09 01:39	17° 11 '07'33	-14°-41'-15
retrograde	2048 Jun 07 08:19	8° 11 '05'19		direct	2056 Nov 29 04:15	16° 11 '03'01	
min. Earth dist.	2048 Aug 26 14:54	7° 11 '01'34	40.13572 AU	conjunction	2057 Mar 07 19:33	17° 11 '43'04	-14°-7'-11
opposition	2048 Aug 29 15:15	6° 11 '57'43	-12°-48'-55	minimum elong	2057 Mar 07 19:24	17° 11 '43'03	14°07'11
direct	2048 Nov 18 16:54	5° 11 '51'19		max. Earth dist.	2057 Mar 10 17:52	17° 11 '47'43	44.00811 AU
conjunction	2049 Feb 25 18:44	7° 11 '35'48	-12°-20'-21	retrograde	2057 Jun 19 01:26	19° 11 '26'54	
minimum elong	2049 Feb 25 18:32	7° 11 '35'47	12°20'22	min. Earth dist.	2057 Sep 07 15:12	18° 11 '24'51	42.17866 AU
max. Earth dist.	2049 Feb 28 19:31	7° 11 '40'50	42.20523 AU	opposition	2057 Sep 10 13:38	18° 11 '21'13	-14°-52'-56
retrograde	2049 Jun 08 19:14	9° 11 '23'48		direct	2057 Nov 30 13:44	17° 11 '16'54	
min. Earth dist.	2049 Aug 28 05:04	8° 11 '20'14	40.37069 AU	conjunction	2058 Mar 09 06:50	18° 11 '56'28	-14°-18'-20
opposition	2049 Aug 31 05:26	8° 11 '16'23	-13°-4'-55				

minimum elong	2058 Mar 09 06:41	18° 56 '27	14°18'21	retrograde	2066 Jun 29 15:15	0° 01 '42	
max. Earth dist.	2058 Mar 12 05:06	19° 01 '05	44.21973 AU		2066 Jul 12 00:48	30° 00 '	
retrograde	2058 Jun 20 11:42	20° 39 '49		min. Earth dist.	2066 Sep 18 21:54	29° 00 '47	43.96023 AU
min. Earth dist.	2058 Sep 09 05:04	19° 37 '51	42.38976 AU	opposition	2066 Sep 21 14:53	28° 57 '31	-16°-17'-15
opposition	2058 Sep 12 01:36	19° 34 '20	-15°-4'-9	direct	2066 Dec 11 20:18	27° 54 '46	
direct	2058 Dec 02 02:01	18° 30 '13					
				conjunction	2067 Mar 20 00:54	29° 30 '14	-15°-38'-42
conjunction	2059 Mar 10 17:44	20° 09 '17	-14°-29'-2	minimum elong	2067 Mar 20 00:50	29° 30 '13	15°38'43
minimum elong	2059 Mar 10 17:36	20° 09 '16	14°29'02	max. Earth dist.	2067 Mar 22 18:25	29° 34 '23	45.97514 AU
max. Earth dist.	2059 Mar 13 15:00	20° 13 '50	44.42701 AU		2067 Apr 08 21:30	0° 00 '	
retrograde	2059 Jun 21 20:08	21° 52 '09		retrograde	2067 Jul 01 02:17	1° 09 '39	
min. Earth dist.	2059 Sep 10 16:32	20° 50 '21	42.59643 AU	min. Earth dist.	2067 Sep 20 07:49	0° 08 '53	44.14461 AU
opposition	2059 Sep 13 13:11	20° 46 '50	-15°-14'-55	opposition	2067 Sep 23 00:37	0° 05 '38	-16°-24'-21
direct	2059 Dec 03 15:22	19° 42 '53			2067 Sep 27 17:26	30° 00 '	
				direct	2067 Dec 13 05:01	29° 03 '05	
conjunction	2060 Mar 11 04:24	21° 21 '28	-14°-39'-18		2068 Feb 23 13:06	0° 00 '	
minimum elong	2060 Mar 11 04:15	21° 21 '27	14°39'20	conjunction	2068 Mar 20 10:10	0° 38 '10	-15°-45'-28
max. Earth dist.	2060 Mar 14 00:47	21° 25 '56	44.63008 AU	minimum elong	2068 Mar 20 10:05	0° 38 '09	15°45'29
retrograde	2060 Jun 22 06:09	23° 03 '52		max. Earth dist.	2068 Mar 23 03:56	0° 42 '19	46.15656 AU
min. Earth dist.	2060 Sep 11 04:58	22° 02 '09	42.79933 AU	retrograde	2068 Jul 01 12:26	2° 17 '13	
opposition	2060 Sep 14 00:32	21° 58 '42	-15°-25'-13	min. Earth dist.	2068 Sep 20 19:03	1° 16 '32	44.32521 AU
direct	2060 Dec 04 03:50	20° 54 '55		opposition	2068 Sep 23 10:06	1° 13 '23	-16°-31'-3
				direct	2068 Dec 13 14:16	0° 11 '00	
conjunction	2061 Mar 12 14:56	22° 33 '00	-14°-49'-7				
minimum elong	2061 Mar 12 14:49	22° 32 '59	14°49'08	conjunction	2069 Mar 21 19:17	1° 45 '42	-15°-51'-52
max. Earth dist.	2061 Mar 15 11:37	22° 37 '28	44.82971 AU	minimum elong	2069 Mar 21 19:13	1° 45 '42	15°51'54
retrograde	2061 Jun 23 15:03	24° 14 '56		max. Earth dist.	2069 Mar 24 11:28	1° 49 '44	46.33402 AU
min. Earth dist.	2061 Sep 12 16:36	23° 13 '20	42.99884 AU	retrograde	2069 Jul 02 22:47	3° 24 '22	
opposition	2061 Sep 15 11:31	23° 09 '55	-15°-35'-3	min. Earth dist.	2069 Sep 22 04:22	2° 23 '51	44.50144 AU
direct	2061 Dec 05 16:55	22° 06 '18		opposition	2069 Sep 24 19:22	2° 20 '43	-16°-37'-21
				direct	2069 Dec 14 21:36	1° 18 '30	
conjunction	2062 Mar 14 01:03	23° 43 '54	-14°-58'-29				
minimum elong	2062 Mar 14 00:55	23° 43 '53	14°58'31	conjunction	2070 Mar 23 04:10	2° 52 '50	-15°-57'-54
max. Earth dist.	2062 Mar 16 20:17	23° 48 '15	45.02636 AU	minimum elong	2070 Mar 23 04:06	2° 52 '49	15°57'55
retrograde	2062 Jun 25 03:49	25° 25 '22		max. Earth dist.	2070 Mar 25 19:29	2° 56 '48	46.50677 AU
min. Earth dist.	2062 Sep 14 03:04	24° 23 '55	43.19576 AU	retrograde	2070 Jul 04 07:25	4° 31 '07	
opposition	2062 Sep 16 22:13	24° 20 '31	-15°-44'-25	min. Earth dist.	2070 Sep 23 15:25	3° 30 '39	44.67286 AU
direct	2062 Dec 07 01:43	23° 17 '03		opposition	2070 Sep 26 04:35	3° 27 '37	-16°-43'-18
				direct	2070 Dec 16 06:17	2° 25 '33	
conjunction	2063 Mar 15 11:04	24° 54 '11	-15°-7'-25				
minimum elong	2063 Mar 15 10:58	24° 54 '11	15°07'26	conjunction	2071 Mar 24 13:03	3° 59 '30	-16°-3'-35
max. Earth dist.	2063 Mar 18 07:01	24° 58 '34	45.22062 AU	minimum elong	2071 Mar 24 13:00	3° 59 '30	16°03'36
retrograde	2063 Jun 26 15:43	26° 35 '13		max. Earth dist.	2071 Mar 27 03:49	4° 03 '25	46.67486 AU
min. Earth dist.	2063 Sep 15 14:56	25° 33 '51	43.39034 AU	retrograde	2071 Jul 05 13:15	5° 37 '25	
opposition	2063 Sep 18 08:49	25° 30 '31	-15°-53'-19	min. Earth dist.	2071 Sep 25 00:55	4° 37 '03	44.83943 AU
direct	2063 Dec 08 10:32	24° 27 '14		opposition	2071 Sep 27 13:31	4° 34 '03	-16°-48'-52
				direct	2071 Dec 17 18:02	3° 32 '07	
conjunction	2064 Mar 15 20:46	26° 03 '56	-15°-15'-53				
minimum elong	2064 Mar 15 20:39	26° 03 '55	15°15'54	conjunction	2072 Mar 24 21:29	5° 05 '41	-16°-8'-54
max. Earth dist.	2064 Mar 18 15:54	26° 08 '14	45.41283 AU	minimum elong	2072 Mar 24 21:26	5° 05 '41	16°08'55
retrograde	2064 Jun 27 00:45	27° 44 '31		max. Earth dist.	2072 Mar 27 10:25	5° 09 '29	46.83830 AU
min. Earth dist.	2064 Sep 16 00:30	26° 43 '21	43.58273 AU	retrograde	2072 Jul 05 22:08	6° 43 '15	
opposition	2064 Sep 18 19:03	26° 40 '00	-16°-1'-45	min. Earth dist.	2072 Sep 25 10:29	5° 42 '57	45.00169 AU
direct	2064 Dec 08 20:01	25° 36 '53		opposition	2072 Sep 27 22:20	5° 39 '59	-16°-54'-5
				direct	2072 Dec 18 03:26	4° 38 '11	
conjunction	2065 Mar 17 06:21	27° 13 '09	-15°-23'-55				
minimum elong	2065 Mar 17 06:16	27° 13 '08	15°23'56	conjunction	2073 Mar 26 05:58	6° 11 '23	-16°-13'-52
max. Earth dist.	2065 Mar 20 01:02	27° 17 '25	45.60275 AU	minimum elong	2073 Mar 26 05:56	6° 11 '23	16°13'54
retrograde	2065 Jun 28 08:19	28° 53 '20		max. Earth dist.	2073 Mar 28 19:14	6° 15 '11	46.99767 AU
min. Earth dist.	2065 Sep 17 11:42	27° 52 '16	43.77284 AU	retrograde	2073 Jul 07 07:11	7° 48 '35	
opposition	2065 Sep 20 05:04	27° 48 '58	-16°-9'-43	min. Earth dist.	2073 Sep 26 20:27	6° 48 '19	45.16004 AU
direct	2065 Dec 10 07:47	26° 46 '03		opposition	2073 Sep 29 06:44	6° 45 '27	-16°-58'-55
				direct	2073 Dec 19 12:03	5° 43 '46	
conjunction	2066 Mar 18 15:52	28° 21 '54	-15°-31'-31				
minimum elong	2066 Mar 18 15:46	28° 21 '54	15°31'31	conjunction	2074 Mar 27 14:08	7° 16 '37	-16°-18'-28
max. Earth dist.	2066 Mar 21 10:47	28° 26 '10	45.79037 AU	minimum elong	2074 Mar 27 14:07	7° 16 '37	16°18'29
	2066 Jun 17 12:34	0° 00 '					

max. Earth dist.	2074 Mar 30 01:58	7°♃20'18	47.15365 AU	opposition	2082 Oct 09 04:08	16°♃19'22	-17°-25'-51
retrograde	2074 Jul 08 16:56	8°♃53'27		direct	2082 Dec 29 08:39	15°♃18'59	
min. Earth dist.	2074 Sep 28 04:18	7°♃53'20	45.31525 AU				
opposition	2074 Sep 30 15:01	7°♃50'27	-17°-3'-22	conjunction	2083 Apr 06 10:12	16°♃49'15	-16°-44'00
direct	2074 Dec 20 18:10	6°♃48'54		minimum elong	2083 Apr 06 10:13	16°♃49'15	16°44'01
				max. Earth dist.	2083 Apr 08 15:29	16°♃52'28	48.41725 AU
conjunction	2075 Mar 28 21:59	8°♃21'25	-16°-22'-42	retrograde	2083 Jul 18 08:52	18°♃23'30	
minimum elong	2075 Mar 28 21:57	8°♃21'25	16°22'43	min. Earth dist.	2083 Oct 08 09:24	17°♃24'11	46.56611 AU
max. Earth dist.	2075 Mar 31 09:33	8°♃25'04	47.30661 AU	opposition	2083 Oct 10 11:15	17°♃21'46	-17°-27'-13
retrograde	2075 Jul 09 23:47	9°♃57'55		direct	2083 Dec 30 18:22	16°♃21'28	
min. Earth dist.	2075 Sep 29 14:07	8°♃57'51	45.46765 AU				
opposition	2075 Oct 01 23:18	8°♃55'02	-17°-7'-26	conjunction	2084 Apr 06 17:17	17°♃51'28	-16°-45'-17
direct	2075 Dec 22 02:34	7°♃53'38		minimum elong	2084 Apr 06 17:19	17°♃51'28	16°45'18
				max. Earth dist.	2084 Apr 08 20:28	17°♃54'31	48.53602 AU
conjunction	2076 Mar 29 05:58	9°♃25'50	-16°-26'-34	retrograde	2084 Jul 18 18:00	19°♃25'25	
minimum elong	2076 Mar 29 05:58	9°♃25'50	16°26'34	min. Earth dist.	2084 Oct 08 16:30	18°♃26'09	46.68269 AU
max. Earth dist.	2076 Mar 31 17:24	9°♃29'29	47.45707 AU	opposition	2084 Oct 10 18:00	18°♃23'46	-17°-28'-17
retrograde	2076 Jul 10 04:27	11°♃02'01		direct	2084 Dec 31 00:01	17°♃23'33	
min. Earth dist.	2076 Sep 29 21:58	10°♃02'05	45.61738 AU				
opposition	2076 Oct 02 07:09	9°♃59'17	-17°-11'-7	conjunction	2085 Apr 08 00:15	18°♃53'16	-16°-46'-16
direct	2076 Dec 22 12:31	8°♃58'01		minimum elong	2085 Apr 08 00:18	18°♃53'16	16°46'17
				max. Earth dist.	2085 Apr 10 02:49	18°♃56'16	48.65009 AU
conjunction	2077 Mar 30 13:39	10°♃29'55	-16°-30'-4	retrograde	2085 Jul 20 01:22	20°♃26'56	
minimum elong	2077 Mar 30 13:38	10°♃29'55	16°30'05	min. Earth dist.	2085 Oct 10 01:18	19°♃27'39	46.79485 AU
max. Earth dist.	2077 Apr 01 23:38	10°♃33'28	47.60487 AU	opposition	2085 Oct 12 00:48	19°♃25'21	-17°-29'-4
retrograde	2077 Jul 11 12:46	12°♃05'49		direct	2086 Jan 01 05:45	18°♃25'12	
min. Earth dist.	2077 Oct 01 06:29	11°♃06'00	45.76448 AU				
opposition	2077 Oct 03 15:02	11°♃03'14	-17°-14'-26	conjunction	2086 Apr 09 07:01	19°♃54'39	-16°-46'-57
direct	2077 Dec 23 20:40	10°♃02'07		minimum elong	2086 Apr 09 07:03	19°♃54'39	16°46'59
				max. Earth dist.	2086 Apr 11 08:57	19°♃57'37	48.76023 AU
conjunction	2078 Mar 31 21:17	11°♃33'44	-16°-33'-12	retrograde	2086 Jul 21 06:16	21°♃28'02	
minimum elong	2078 Mar 31 21:18	11°♃33'44	16°33'13	min. Earth dist.	2086 Oct 11 07:50	20°♃28'49	46.90323 AU
max. Earth dist.	2078 Apr 03 07:41	11°♃37'17	47.74994 AU	opposition	2086 Oct 13 07:17	20°♃26'32	-17°-29'-31
retrograde	2078 Jul 12 20:23	13°♃09'21		direct	2087 Jan 02 12:22	19°♃26'27	
min. Earth dist.	2078 Oct 02 15:22	12°♃09'38	45.90851 AU				
opposition	2078 Oct 04 22:42	12°♃06'55	-17°-17'-23	conjunction	2087 Apr 10 13:36	20°♃55'39	-16°-47'-20
direct	2078 Dec 25 05:32	11°♃05'59		minimum elong	2087 Apr 10 13:39	20°♃55'39	16°47'21
				max. Earth dist.	2087 Apr 12 14:00	20°♃58'32	48.86687 AU
conjunction	2079 Apr 02 04:46	12°♃37'18	-16°-35'-59	retrograde	2087 Jul 22 11:55	22°♃28'46	
minimum elong	2079 Apr 02 04:45	12°♃37'18	16°36'00	min. Earth dist.	2087 Oct 12 15:25	21°♃29'35	47.00846 AU
max. Earth dist.	2079 Apr 04 13:33	12°♃40'45	47.89198 AU	opposition	2087 Oct 14 13:47	21°♃27'21	-17°-29'-39
retrograde	2079 Jul 14 06:58	14°♃12'39		direct	2088 Jan 03 19:24	20°♃27'21	
min. Earth dist.	2079 Oct 03 22:52	13°♃13'05	46.04926 AU				
opposition	2079 Oct 06 06:14	13°♃10'23	-17°-19'-59	conjunction	2088 Apr 10 20:12	21°♃56'18	-16°-47'-25
direct	2079 Dec 26 09:59	12°♃09'36		minimum elong	2088 Apr 10 20:15	21°♃56'18	16°47'26
				max. Earth dist.	2088 Apr 12 20:52	21°♃59'11	48.97051 AU
conjunction	2080 Apr 02 12:10	13°♃40'40	-16°-38'-27	retrograde	2088 Jul 22 16:15	23°♃29'10	
minimum elong	2080 Apr 02 12:12	13°♃40'40	16°38'28	min. Earth dist.	2088 Oct 12 22:41	22°♃30'02	47.11054 AU
max. Earth dist.	2080 Apr 04 20:34	13°♃44'05	48.03030 AU	opposition	2088 Oct 14 20:06	22°♃27'51	-17°-29'-28
retrograde	2080 Jul 14 16:37	15°♃15'44		direct	2089 Jan 04 04:20	21°♃27'57	
min. Earth dist.	2080 Oct 04 08:26	14°♃16'13	46.18595 AU				
opposition	2080 Oct 06 13:45	14°♃13'38	-17°-22'-15	conjunction	2089 Apr 12 02:39	22°♃56'40	-16°-47'-10
direct	2080 Dec 26 14:46	13°♃13'00		minimum elong	2089 Apr 12 02:44	22°♃56'40	16°47'11
				max. Earth dist.	2089 Apr 14 01:37	22°♃59'26	49.07123 AU
conjunction	2081 Apr 03 19:42	14°♃43'48	-16°-40'-36	retrograde	2089 Jul 24 00:26	24°♃29'18	
minimum elong	2081 Apr 03 19:43	14°♃43'49	16°40'36	min. Earth dist.	2089 Oct 14 04:49	23°♃30'15	47.20973 AU
max. Earth dist.	2081 Apr 06 03:08	14°♃47'09	48.16436 AU	opposition	2089 Oct 16 02:10	23°♃28'05	-17°-28'-59
retrograde	2081 Jul 15 21:15	16°♃18'36		direct	2090 Jan 05 09:36	22°♃28'17	
min. Earth dist.	2081 Oct 05 15:58	15°♃19'12	46.31787 AU				
opposition	2081 Oct 07 20:51	15°♃16'39	-17°-24'-12	conjunction	2090 Apr 13 09:00	23°♃56'48	-16°-46'-38
direct	2081 Dec 27 23:32	14°♃16'08		minimum elong	2090 Apr 13 09:03	23°♃56'48	16°46'39
				max. Earth dist.	2090 Apr 15 07:44	23°♃59'32	49.16893 AU
conjunction	2082 Apr 05 02:59	15°♃46'41	-16°-42'-27	retrograde	2090 Jul 25 09:03	25°♃29'13	
minimum elong	2082 Apr 05 03:01	15°♃46'41	16°42'28	min. Earth dist.	2090 Oct 15 12:47	24°♃30'12	47.30576 AU
max. Earth dist.	2082 Apr 07 08:24	15°♃49'54	48.29340 AU	opposition	2090 Oct 17 08:22	24°♃28'07	-17°-28'-10
retrograde	2082 Jul 17 02:47	17°♃21'13		direct	2091 Jan 06 13:44	23°♃28'25	
min. Earth dist.	2082 Oct 07 00:45	16°♃21'52	46.44469 AU				

conjunction	2091 Apr 14 15:12	24°♃56'45	-16°-45'-48	direct	2099 Jan 14 14:40	1°♃23'28	
minimum elong	2091 Apr 14 15:18	24°♃56'45	16°45'49				
max. Earth dist.	2091 Apr 16 13:13	24°♃59'27	49.26353 AU	conjunction	2099 Apr 22 15:25	2°♃50'26	-16°-29'-41
retrograde	2091 Jul 26 14:30	26°♃28'58		minimum elong	2099 Apr 22 15:31	2°♃50'27	16°29'42
min. Earth dist.	2091 Oct 16 18:45	25°♃30'04	47.39831 AU	max. Earth dist.	2099 Apr 24 03:37	2°♃52'32	49.85693 AU
opposition	2091 Oct 18 14:21	25°♃27'59	-17°-27'-4	retrograde	2099 Aug 03 10:12	4°♃21'11	
direct	2092 Jan 07 18:58	24°♃28'24		min. Earth dist.	2099 Oct 25 00:27	3°♃22'29	47.97100 AU
				opposition	2099 Oct 26 10:55	3°♃20'51	-17°-8'-43
conjunction	2092 Apr 14 21:26	25°♃56'33	-16°-44'-40				
minimum elong	2092 Apr 14 21:30	25°♃56'33	16°44'41				
max. Earth dist.	2092 Apr 16 17:44	25°♃59'09	49.35432 AU				
retrograde	2092 Jul 26 19:37	27°♃28'36					
min. Earth dist.	2092 Oct 17 02:22	26°♃29'43	47.48687 AU				
opposition	2092 Oct 18 20:14	26°♃27'44	-17°-25'-40				
direct	2093 Jan 08 01:53	25°♃28'15					
conjunction	2093 Apr 16 03:49	26°♃56'15	-16°-43'-17				
minimum elong	2093 Apr 16 03:55	26°♃56'15	16°43'18				
max. Earth dist.	2093 Apr 18 00:00	26°♃58'50	49.44080 AU				
retrograde	2093 Jul 27 23:49	28°♃28'07					
min. Earth dist.	2093 Oct 18 09:34	27°♃29'18	47.57060 AU				
opposition	2093 Oct 20 02:04	27°♃27'22	-17°-24'-1				
direct	2094 Jan 09 10:37	26°♃27'59					
conjunction	2094 Apr 17 09:54	27°♃55'49	-16°-41'-38				
minimum elong	2094 Apr 17 09:58	27°♃55'49	16°41'39				
max. Earth dist.	2094 Apr 19 03:43	27°♃58'16	49.52230 AU				
retrograde	2094 Jul 29 08:02	29°♃27'30					
min. Earth dist.	2094 Oct 19 15:55	28°♃28'45	47.64918 AU				
opposition	2094 Oct 21 07:51	28°♃26'51	-17°-22'-6				
direct	2095 Jan 10 15:25	27°♃27'34					
conjunction	2095 Apr 18 16:05	28°♃55'13	-16°-39'-45				
minimum elong	2095 Apr 18 16:11	28°♃55'14	16°39'47				
max. Earth dist.	2095 Apr 20 09:05	28°♃57'36	49.59848 AU				
	2095 Jun 09 03:37	0°♃					
retrograde	2095 Jul 30 15:19	0°♃26'44					
	2095 Sep 20 23:29	30°♃					
min. Earth dist.	2095 Oct 20 23:57	29°♃27'57	47.72241 AU				
opposition	2095 Oct 22 13:36	29°♃26'10	-17°-19'-57				
direct	2096 Jan 11 20:08	28°♃26'56					
conjunction	2096 Apr 18 22:09	29°♃54'25	-16°-37'-37				
minimum elong	2096 Apr 18 22:15	29°♃54'25	16°37'37				
max. Earth dist.	2096 Apr 20 13:59	29°♃56'44	49.66961 AU				
	2096 Apr 22 22:22	0°♃					
retrograde	2096 Jul 30 20:44	1°♃25'43					
min. Earth dist.	2096 Oct 21 05:43	0°♃26'59	47.79059 AU				
opposition	2096 Oct 22 19:04	0°♃25'13	-17°-17'-32				
	2096 Nov 14 15:48	30°♃					
direct	2097 Jan 12 00:45	29°♃26'02					
	2097 Mar 09 23:36	0°♃					
conjunction	2097 Apr 20 04:01	0°♃53'21	-16°-35'-14				
minimum elong	2097 Apr 20 04:08	0°♃53'22	16°35'15				
max. Earth dist.	2097 Apr 21 17:58	0°♃55'33	49.73588 AU				
retrograde	2097 Aug 01 01:09	2°♃24'27					
min. Earth dist.	2097 Oct 22 12:48	1°♃25'42	47.85437 AU				
opposition	2097 Oct 24 00:26	1°♃24'01	-17°-14'-52				
direct	2098 Jan 13 06:21	0°♃24'53					
conjunction	2098 Apr 21 09:54	1°♃52'02	-16°-32'-36				
minimum elong	2098 Apr 21 10:01	1°♃52'02	16°32'36				
max. Earth dist.	2098 Apr 22 23:51	1°♃54'14	49.79813 AU				
retrograde	2098 Aug 02 03:50	3°♃22'57					
min. Earth dist.	2098 Oct 23 18:53	2°♃24'12	47.91427 AU				
opposition	2098 Oct 25 05:42	2°♃22'33	-17°-11'-56				