conjunction	1600 Apr 21 03:49	1°♉10’51	0°-28’-42
minimum elong	1600 Apr 21 03:49	1°♉10’51	0°28’43
max. Earth dist.	1600 Apr 21 14:20	1°♉12’22	20.77348 AU
retrograde	1600 Aug 10 08:13	5°♉17’24	
opposition	1600 Oct 26 10:20	3°♉16’43	0°-30’-23
min. Earth dist.	1600 Oct 26 01:26	3°♉17’38	18.74828 AU
direct	1601 Jan 09 03:04	1°♉18’44	
conjunction	1601 Apr 25 15:02	5°♉16’50	0°-26’-15
minimum elong	1601 Apr 25 15:02	5°♉16’50	0°26’16
max. Earth dist.	1601 Apr 26 01:17	5°♉18’19	20.72244 AU
retrograde	1601 Aug 14 20:12	9°♉24’03	
opposition	1601 Oct 30 18:25	7°♉23’11	0°-27’-35
min. Earth dist.	1601 Oct 30 10:02	7°♉24’03	18.69597 AU
direct	1602 Jan 13 11:16	5°♉24’53	
conjunction	1602 Apr 30 02:48	9°♉23’59	0°-23’-38
minimum elong	1602 Apr 30 02:48	9°♉23’59	0°23’39
max. Earth dist.	1602 Apr 30 10:28	9°♉25’05	20.66908 AU
retrograde	1602 Aug 19 07:23	13°♉31’56	
opposition	1602 Nov 04 03:00	11°♉30’52	0°-24’-38
min. Earth dist.	1602 Nov 03 20:40	11°♉31’32	18.64163 AU
direct	1603 Jan 17 18:12	9°♉32’14	
conjunction	1603 May 04 15:31	13°♉32’26	0°-20’-54
minimum elong	1603 May 04 15:31	13°♉32’26	0°20’55
max. Earth dist.	1603 May 04 22:46	13°♉33’28	20.61383 AU
retrograde	1603 Aug 23 20:39	17°♉41’07	
opposition	1603 Nov 08 11:43	15°♉39’55	0°-21’-32
min. Earth dist.	1603 Nov 08 05:50	15°♉40’32	18.58549 AU
direct	1604 Jan 22 03:08	13°♉40’59	
conjunction	1604 May 08 04:49	17°♉42’20	0°-18’-3
minimum elong	1604 May 08 04:49	17°♉42’20	0°18’03
max. Earth dist.	1604 May 08 09:30	17°♉43’00	20.55702 AU
retrograde	1604 Aug 27 09:12	21°♉51’50	
opposition	1604 Nov 11 21:07	19°♉50’30	0°-18’-18
min. Earth dist.	1604 Nov 11 17:21	19°♉50’54	18.52804 AU
direct	1605 Jan 25 10:48	17°♉51’16	
conjunction	1605 May 12 19:04	21°♉53’51	0°-15’-4
minimum elong	1605 May 12 19:04	21°♉53’51	0°15’06
behind sun begin	1605 May 12 16:59	21°♉53’34	
behind sun end	1605 May 12 21:08	21°♉54’09	
max. Earth dist.	1605 May 12 23:15	21°♉54’27	20.49898 AU
retrograde	1605 Sep 01 00:11	26°♉04’12	
opposition	1605 Nov 16 06:52	24°♉02’46	0°-14’-57
min. Earth dist.	1605 Nov 16 03:38	24°♉03’06	18.46926 AU
direct	1606 Jan 29 21:04	22°♉03’15	
conjunction	1606 May 17 10:16	26°♉07’09	0°-12’00
minimum elong	1606 May 17 10:15	26°♉07’09	0°12’01
behind sun begin	1606 May 17 05:44	26°♉06’30	
behind sun end	1606 May 17 14:47	26°♉07’47	
max. Earth dist.	1606 May 17 11:44	26°♉07’21	20.43957 AU
	1606 Aug 09 16:21	0°♊	
retrograde	1606 Sep 05 13:57	0°♊18’21	
	1606 Oct 02 17:55	30°♉	
opposition	1606 Nov 20 17:11	28°♉16’50	0°-11’-30
min. Earth dist.	1606 Nov 20 16:28	28°♉16’55	18.40918 AU
direct	1607 Feb 03 05:42	26°♉17’01	
	1607 May 15 18:10	0°♊	
conjunction	1607 May 22 02:33	0°♊22’19	0°-8’-51
minimum elong	1607 May 22 02:32	0°♊22’19	0°08’52
behind sun begin	1607 May 21 20:46	0°♊21’30	
behind sun end	1607 May 22 08:18	0°♊23’09	
max. Earth dist.	1607 May 22 03:06	0°♊22’24	20.37878 AU
retrograde	1607 Sep 10 06:48	4°♊34’25	
opposition	1607 Nov 25 04:01	2°♊32’50	0°-7’-58
min. Earth dist.	1607 Nov 25 04:03	2°♊32’50	18.34752 AU
direct	1608 Feb 07 17:39	0°♊32’43	
conjunction	1608 May 25 19:28	4°♊39’26	0°-5’-38
minimum elong	1608 May 25 19:29	4°♊39’26	0°05’40
behind sun begin	1608 May 25 13:00	4°♊38’31	
behind sun end	1608 May 26 01:57	4°♊40’22	
max. Earth dist.	1608 May 25 17:14	4°♊39’09	20.31624 AU
retrograde	1608 Sep 13 21:33	8°♊52’26	
opposition	1608 Nov 28 15:42	6°♊50’46	0°-4’-20
min. Earth dist.	1608 Nov 28 18:26	6°♊50’29	18.28417 AU
direct	1609 Feb 11 03:46	4°♊50’18	
conjunction	1609 May 30 13:40	8°♊58’30	0°-2’-20
minimum elong	1609 May 30 13:40	8°♊58’30	0°02’21
behind sun begin	1609 May 30 06:55	8°♊57’32	
behind sun end	1609 May 30 20:26	8°♊59’28	
max. Earth dist.	1609 May 30 10:04	8°♊58’01	20.25203 AU
retrograde	1609 Sep 18 15:57	13°♊12’22	
opposition	1609 Dec 03 03:42	11°♊10’35	0°00’-40
min. Earth dist.	1609 Dec 03 07:16	11°♊10’13	18.21905 AU
asc. node	1610 Feb 09 07:11	9°♊10’52	
direct	1610 Feb 15 17:23	9°♊09’46	
conjunction	1610 Jun 04 08:42	13°♊19’27	0°01’05
minimum elong	1610 Jun 04 08:42	13°♊19’27	0°01’04
behind sun begin	1610 Jun 04 01:56	13°♊18’28	
behind sun end	1610 Jun 04 15:27	13°♊20’25	
max. Earth dist.	1610 Jun 04 02:14	13°♊18’31	20.18608 AU
retrograde	1610 Sep 23 07:45	17°♊34’10	
opposition	1610 Dec 07 16:33	15°♊32’16	0°03’02
min. Earth dist.	1610 Dec 07 22:54	15°♊31’36	18.15247 AU
direct	1611 Feb 20 05:26	13°♊31’02	
conjunction	1611 Jun 09 04:35	17°♊42’13	0°04’28
minimum elong	1611 Jun 09 04:34	17°♊42’13	0°04’28
behind sun begin	1611 Jun 08 21:56	17°♊41’15	
behind sun end	1611 Jun 09 11:12	17°♊43’11	
max. Earth dist.	1611 Jun 08 20:33	17°♊41’03	20.11902 AU
retrograde	1611 Sep 28 02:48	21°♊57’47	
opposition	1611 Dec 12 05:47	19°♊55’44	0°06’45
min. Earth dist.	1611 Dec 12 12:49	19°♊54’59	18.08502 AU
direct	1612 Feb 24 20:34	17°♊54’06	
conjunction	1612 Jun 13 01:12	22°♊06’46	0°07’47
minimum elong	1612 Jun 13 01:11	22°♊06’46	0°07’47
behind sun begin	1612 Jun 12 19:07	22°♊05’53	
behind sun end	1612 Jun 13 07:16	22°♊07’39	
max. Earth dist.	1612 Jun 12 14:52	22°♊05’15	20.05140 AU
retrograde	1612 Oct 01 19:34	26°♊23’09	
opposition	1612 Dec 15 19:47	24°♊20’58	0°10’27
min. Earth dist.	1612 Dec 16 05:22	24°♊19’56	18.01755 AU
direct	1613 Feb 28 10:24	22°♊18’53	
conjunction	1613 Jun 17 22:37	26°♊33’04	0°11’05
minimum elong	1613 Jun 17 22:37	26°♊33’04	0°11’05
behind sun begin	1613 Jun 17 17:39	26°♊32’21	
behind sun end	1613 Jun 18 03:36	26°♊33’48	
max. Earth dist.	1613 Jun 17 10:44	26°♊31’18	19.98423 AU
	1613 Aug 23 07:38	0°♋	
retrograde	1613 Oct 06 15:17	0°♋50’14	
	1613 Nov 20 13:02	30°♊	
opposition	1613 Dec 20 10:17	28°♊47’54	0°14’07
min. Earth dist.	1613 Dec 20 20:22	28°♊46’49	17.95077 AU

direct	1614 Mar 05 03:12	26°♊45’23	
	1614 Jun 05 18:57	0°♋	
conjunction	1614 Jun 22 20:54	1°♋01’06	0°14’21
minimum elong	1614 Jun 22 20:54	1°♋01’06	0°14’22
behind sun begin	1614 Jun 22 18:02	1°♋00’40	
behind sun end	1614 Jun 22 23:46	1°♋01’31	
max. Earth dist.	1614 Jun 22 07:18	0°♋59’03	19.91794 AU
retrograde	1614 Oct 11 08:51	5°♋19’01	
opposition	1614 Dec 25 01:29	3°♋16’33	0°17’43
min. Earth dist.	1614 Dec 25 13:51	3°♋15’13	17.88538 AU
direct	1615 Mar 09 19:06	1°♋13’36	
conjunction	1615 Jun 27 19:51	5°♋30’49	0°17’33
minimum elong	1615 Jun 27 19:51	5°♋30’49	0°17’33
max. Earth dist.	1615 Jun 27 04:36	5°♋28’31	19.85359 AU
retrograde	1615 Oct 16 05:08	9°♋49’29	
opposition	1615 Dec 29 17:19	7°♋46’54	0°21’14
min. Earth dist.	1615 Dec 30 05:57	7°♋45’32	17.82223 AU
direct	1616 Mar 13 13:26	5°♋43’33	
conjunction	1616 Jul 01 19:24	10°♋02’15	0°20’39
minimum elong	1616 Jul 01 19:24	10°♋02’15	0°20’40
max. Earth dist.	1616 Jul 01 03:13	9°♋59’48	19.79165 AU
retrograde	1616 Oct 20 00:09	14°♋21’38	
opposition	1617 Jan 02 10:01	12°♋18’57	0°24’38
min. Earth dist.	1617 Jan 03 00:28	12°♋17’23	17.76186 AU
direct	1617 Mar 18 07:33	10°♋15’14	
conjunction	1617 Jul 06 19:46	14°♋35’23	0°23’39
minimum elong	1617 Jul 06 19:46	14°♋35’23	0°23’39
max. Earth dist.	1617 Jul 06 01:47	14°♋32’39	19.73294 AU
retrograde	1617 Oct 24 21:12	18°♋55’28	
opposition	1618 Jan 07 03:08	16°♋52’44	0°27’55
min. Earth dist.	1618 Jan 07 17:51	16°♋51’08	17.70492 AU
direct	1618 Mar 23 03:24	14°♋48’39	
conjunction	1618 Jul 11 20:59	19°♋10’16	0°26’31
minimum elong	1618 Jul 11 20:59	19°♋10’16	0°26’30
max. Earth dist.	1618 Jul 11 02:32	19°♋07’27	19.67768 AU
retrograde	1618 Oct 29 17:57	23°♋30’59	
opposition	1619 Jan 11 21:16	21°♋28’15	0°31’02
min. Earth dist.	1619 Jan 12 13:31	21°♋26’29	17.65156 AU
direct	1619 Mar 27 22:58	19°♋23’53	
conjunction	1619 Jul 16 22:33	23°♋46’53	0°29’14
minimum elong	1619 Jul 16 22:32	23°♋46’53	0°29’14
max. Earth dist.	1619 Jul 16 02:11	23°♋43’46	19.62623 AU
retrograde	1619 Nov 03 16:38	28°♋08’14	
opposition	1620 Jan 16 15:59	26°♋05’31	0°33’58
min. Earth dist.	1620 Jan 17 08:37	26°♋03’42	17.60204 AU
direct	1620 Mar 31 20:22	24°♋00’53	
max. Earth dist.	1620 Jul 20 04:36	28°♋22’07	19.57842 AU
conjunction	1620 Jul 21 01:00	28°♋25’15	0°31’47
minimum elong	1620 Jul 21 01:00	28°♋25’15	0°31’46
	1620 Aug 16 06:30	0°♌	
retrograde	1620 Nov 07 14:57	2°♌47’08	
opposition	1621 Jan 20 11:28	0°♌44’29	0°36’43
min. Earth dist.	1621 Jan 21 05:28	0°♌42’31	17.55602 AU
	1621 Feb 06 19:50	30°♋	
direct	1621 Apr 05 17:09	28°♋39’36	
	1621 May 31 23:07	0°♌	
max. Earth dist.	1621 Jul 25 05:18	3°♌01’45	19.53411 AU
conjunction	1621 Jul 26 03:56	3°♌05’14	0°34’08
minimum elong	1621 Jul 26 03:56	3°♌05’14	0°34’08

retrograde	1621 Nov 12 14:52	7°♌27’38	
opposition	1622 Jan 25 07:44	5°♌25’00	0°39’14
min. Earth dist.	1622 Jan 26 02:29	5°♌22’57	17.51342 AU
direct	1622 Apr 10 15:53	3°♌19’52	
max. Earth dist.	1622 Jul 30 08:59	7°♌43’14	19.49296 AU
conjunction	1622 Jul 31 07:31	7°♌46’42	0°36’17
minimum elong	1622 Jul 31 07:31	7°♌46’42	0°36’17
retrograde	1622 Nov 17 14:15	12°♌09’31	
opposition	1623 Jan 30 04:43	10°♌06’56	0°41’30
min. Earth dist.	1623 Jan 31 00:26	10°♌04’46	17.47388 AU
direct	1623 Apr 15 14:40	8°♌01’34	
max. Earth dist.	1623 Aug 04 10:39	12°♌25’39	19.45507 AU
conjunction	1623 Aug 05 11:17	12°♌29’28	0°38’11
minimum elong	1623 Aug 05 11:17	12°♌29’28	0°38’11
retrograde	1623 Nov 22 14:17	16°♌52’38	
opposition	1624 Feb 04 02:24	14°♌50’03	0°43’30
min. Earth dist.	1624 Feb 04 22:55	14°♌47’48	17.43781 AU
direct	1624 Apr 19 14:32	12°♌44’27	
conjunction	1624 Aug 09 15:21	17°♌13’19	0°39’51
minimum elong	1624 Aug 09 15:21	17°♌13’19	0°39’51
max. Earth dist.	1624 Aug 08 15:06	17°♌09’33	19.42066 AU
retrograde	1624 Nov 26 14:17	21°♌36’45	
opposition	1625 Feb 08 00:36	19°♌34’10	0°45’13
min. Earth dist.	1625 Feb 08 21:29	19°♌31’53	17.40517 AU
direct	1625 Apr 24 15:25	17°♌28’22	
conjunction	1625 Aug 14 19:36	21°♌58’03	0°41’14
minimum elong	1625 Aug 14 19:36	21°♌58’03	0°41’13
max. Earth dist.	1625 Aug 13 17:43	21°♌54’01	19.38996 AU
retrograde	1625 Dec 01 13:45	26°♌21’41	
opposition	1626 Feb 12 23:18	24°♌19’06	0°46’37
min. Earth dist.	1626 Feb 13 21:06	24°♌16’43	17.37663 AU
direct	1626 Apr 29 16:07	22°♌13’05	
max. Earth dist.	1626 Aug 18 22:44	26°♌39’33	19.36359 AU
conjunction	1626 Aug 20 00:00	26°♌43’30	0°42’21
minimum elong	1626 Aug 20 00:00	26°♌43’30	0°42’21
	1626 Oct 17 14:51	0°♍	
retrograde	1626 Dec 06 14:17	1°♍07’14	
	1627 Jan 27 01:35	30°♌	
opposition	1627 Feb 17 22:32	29°♌04’39	0°47’42
min. Earth dist.	1627 Feb 18 19:57	29°♌02’18	17.35252 AU
direct	1627 May 04 18:59	26°♌58’28	
	1627 Jul 31 22:18	0°♍	
max. Earth dist.	1627 Aug 24 02:11	1°♍25’24	19.34192 AU
conjunction	1627 Aug 25 04:04	1°♍29’27	0°43’10
minimum elong	1627 Aug 25 04:04	1°♍29’27	0°43’10
retrograde	1627 Dec 11 13:08	5°♍53’13	
opposition	1628 Feb 22 22:14	3°♍50’39	0°48’27
min. Earth dist.	1628 Feb 23 20:23	3°♍48’13	17.33357 AU
direct	1628 May 08 20:30	1°♍44’18	
max. Earth dist.	1628 Aug 28 07:03	6°♍11’48	19.32571 AU
conjunction	1628 Aug 29 08:11	6°♍15’44	0°43’41
minimum elong	1628 Aug 29 08:11	6°♍15’44	0°43’40
retrograde	1628 Dec 15 13:37	10°♍39’27	
opposition	1629 Feb 26 22:04	8°♍36’54	0°48’52
min. Earth dist.	1629 Feb 27 19:12	8°♍34’35	17.32015 AU
direct	1629 May 14 00:49	6°♍30’27	
max. Earth dist.	1629 Sep 02 11:18	10°♍58’18	19.31525 AU
conjunction	1629 Sep 03 12:08	11°♍02’12	0°43’54
minimum elong	1629 Sep 03 12:07	11°♍02’12	0°43’54

retrograde	1629 Dec	20	12:08	15°♍25’48	
opposition	1630 Mar	03	22:32	13°♍23’17	0°48’57
min. Earth dist.	1630 Mar	04	20:06	13°♍20’55	17.31288 AU
direct	1630 May	19	03:03	11°♍16’46	
conjunction	1630 Sep	08	15:38	15°♍48’41	0°43’49
minimum elong	1630 Sep	08	15:38	15°♍48’41	0°43’48
max. Earth dist.	1630 Sep	07	15:33	15°♍44’54	19.31121 AU
retrograde	1630 Dec	25	12:51	20°♍12’07	
opposition	1631 Mar	08	23:10	18°♍09’40	0°48’41
min. Earth dist.	1631 Mar	09	19:00	18°♍07’30	17.31205 AU
direct	1631 May	24	08:12	16°♍03’11	
conjunction	1631 Sep	13	18:56	20°♍35’08	0°43’25
minimum elong	1631 Sep	13	18:56	20°♍35’08	0°43’25
max. Earth dist.	1631 Sep	12	20:10	20°♍31’34	19.31370 AU
retrograde	1631 Dec	30	11:32	24°♍58’19	
opposition	1632 Mar	13	00:07	22°♍56’01	0°48’05
min. Earth dist.	1632 Mar	13	20:08	22°♍53’50	17.31791 AU
direct	1632 May	28	10:18	20°♍49’35	
conjunction	1632 Sep	17	21:43	25°♍21’28	0°42’44
minimum elong	1632 Sep	17	21:43	25°♍21’28	0°42’44
max. Earth dist.	1632 Sep	16	23:30	25°♍17’58	19.32290 AU
retrograde	1633 Jan	03	12:31	29°♍44’21	
opposition	1633 Mar	18	01:09	27°♍42’12	0°47’10
min. Earth dist.	1633 Mar	18	19:18	27°♍40’13	17.33012 AU
direct	1633 Jun	02	14:38	25°♍35’54	
	1633 Sep	21	00:12	0°♎	
max. Earth dist.	1633 Sep	22	03:57	0°♎04’23	19.33810 AU
conjunction	1633 Sep	23	00:16	0°♎07’34	0°41’45
minimum elong	1633 Sep	23	00:16	0°♎07’34	0°41’45
retrograde	1634 Jan	08	11:53	4°♎30’05	
opposition	1634 Mar	23	02:32	2°♎28’07	0°45’55
min. Earth dist.	1634 Mar	23	20:46	2°♎26’08	17.34817 AU
direct	1634 Jun	07	16:55	0°♎21’59	
max. Earth dist.	1634 Sep	27	06:08	4°♎50’09	19.35897 AU
conjunction	1634 Sep	28	02:11	4°♎53’18	0°40’30
minimum elong	1634 Sep	28	02:11	4°♎53’18	0°40’31
retrograde	1635 Jan	13	12:26	9°♎15’23	
opposition	1635 Mar	28	03:57	7°♎13’36	0°44’21
min. Earth dist.	1635 Mar	28	20:19	7°♎11’50	17.37159 AU
direct	1635 Jun	12	20:23	5°♎07’40	
max. Earth dist.	1635 Oct	02	09:49	9°♎35’41	19.38480 AU
conjunction	1635 Oct	03	03:33	9°♎38’29	0°38’58
minimum elong	1635 Oct	03	03:33	9°♎38’29	0°38’57
retrograde	1636 Jan	18	11:38	14°♎00’02	
opposition	1636 Apr	01	05:33	11°♎58’25	0°42’29
min. Earth dist.	1636 Apr	01	21:42	11°♎56’41	17.39965 AU
direct	1636 Jun	16	23:15	9°♎52’42	
max. Earth dist.	1636 Oct	06	10:38	14°♎20’05	19.41510 AU
conjunction	1636 Oct	07	04:18	14°♎22’52	0°37’10
minimum elong	1636 Oct	07	04:18	14°♎22’52	0°37’10
retrograde	1637 Jan	22	10:42	18°♎43’50	
opposition	1637 Apr	06	06:50	16°♎42’22	0°40’20
min. Earth dist.	1637 Apr	06	21:19	16°♎40’49	17.43199 AU
direct	1637 Jun	22	02:27	14°♎36’52	
conjunction	1637 Oct	12	04:33	19°♎06’15	0°35’07
minimum elong	1637 Oct	12	04:33	19°♎06’15	0°35’07
max. Earth dist.	1637 Oct	11	13:17	19°♎03’51	19.44938 AU
retrograde	1638 Jan	27	09:03	23°♎26’34	
opposition	1638 Apr	11	08:19	21°♎25’14	0°37’54
min. Earth dist.	1638 Apr	11	22:07	21°♎23’45	17.46804 AU
direct	1638 Jun	27	06:22	19°♎19’59	
conjunction	1638 Oct	17	03:43	23°♎48’25	0°32’50
minimum elong	1638 Oct	17	03:43	23°♎48’25	0°32’50
max. Earth dist.	1638 Oct	16	12:45	23°♎46’04	19.48731 AU
retrograde	1639 Feb	01	06:14	28°♎08’02	
opposition	1639 Apr	16	09:28	26°♎06’49	0°35’14
min. Earth dist.	1639 Apr	16	21:40	26°♎05’31	17.50773 AU
direct	1639 Jul	02	09:24	24°♎01’46	
conjunction	1639 Oct	22	02:17	28°♎29’11	0°30’21
minimum elong	1639 Oct	22	02:17	28°♎29’11	0°30’22
max. Earth dist.	1639 Oct	21	13:51	28°♎27’15	19.52872 AU
	1639 Nov	15	16:44	0°♏	
retrograde	1640 Feb	06	03:16	2°♏48’01	
opposition	1640 Apr	20	10:13	0°♏46’55	0°32’21
min. Earth dist.	1640 Apr	20	21:14	0°♏45’44	17.55068 AU
	1640 May	09	07:09	30°♎	
direct	1640 Jul	06	13:02	28°♎42’06	
	1640 Aug	31	06:18	0°♏	
conjunction	1640 Oct	25	23:49	3°♏08’22	0°27’40
minimum elong	1640 Oct	25	23:49	3°♏08’22	0°27’40
max. Earth dist.	1640 Oct	25	11:59	3°♏06’31	19.57341 AU
retrograde	1641 Feb	09	23:06	7°♏26’24	
opposition	1641 Apr	25	10:42	5°♏25’21	0°29’16
min. Earth dist.	1641 Apr	25	20:17	5°♏24’21	17.59704 AU
direct	1641 Jul	11	14:46	3°♏20’47	
conjunction	1641 Oct	30	20:26	7°♏45’48	0°24’50
minimum elong	1641 Oct	30	20:26	7°♏45’48	0°24’50
max. Earth dist.	1641 Oct	30	11:15	7°♏44’23	19.62148 AU
retrograde	1642 Feb	14	18:59	12°♏02’58	
opposition	1642 Apr	30	10:46	10°♏02’02	0°26’00
min. Earth dist.	1642 Apr	30	18:26	10°♏01’13	17.64668 AU
direct	1642 Jul	16	17:17	7°♏57’42	
conjunction	1642 Nov	04	15:59	12°♏21’24	0°21’51
minimum elong	1642 Nov	04	15:59	12°♏21’24	0°21’51
max. Earth dist.	1642 Nov	04	08:04	12°♏20’11	19.67297 AU
retrograde	1643 Feb	19	13:36	16°♏37’43	
opposition	1643 May	05	10:24	14°♏36’50	0°22’36
min. Earth dist.	1643 May	05	16:34	14°♏36’11	17.70009 AU
direct	1643 Jul	21	17:03	12°♏32’48	
conjunction	1643 Nov	09	10:35	16°♏55’07	0°18’45
minimum elong	1643 Nov	09	10:35	16°♏55’07	0°18’44
max. Earth dist.	1643 Nov	09	05:17	16°♏54’18	19.72823 AU
retrograde	1644 Feb	24	08:43	21°♏10’32	
opposition	1644 May	09	09:25	19°♏09’48	0°19’05
min. Earth dist.	1644 May	09	13:03	19°♏09’25	17.75703 AU
direct	1644 Jul	25	17:48	17°♏06’05	
conjunction	1644 Nov	13	04:16	21°♏27’00	0°15’33
minimum elong	1644 Nov	13	04:16	21°♏27’00	0°15’33
behind sun begin	1644 Nov	13	02:22	21°♏26’43	
behind sun end	1644 Nov	13	06:10	21°♏27’17	
max. Earth dist.	1644 Nov	13	00:38	21°♏26’27	19.78697 AU
retrograde	1645 Feb	28	02:05	25°♏41’33	
opposition	1645 May	14	07:56	23°♏40’57	0°15’29
min. Earth dist.	1645 May	14	10:16	23°♏40’43	17.81755 AU
direct	1645 Jul	30	15:27	21°♏37’36	
conjunction	1645 Nov	17	21:06	25°♏57’06	0°12’17
minimum elong	1645 Nov	17	21:06	25°♏57’06	0°12’17
behind sun begin	1645 Nov	17	16:40	25°♏56’26	

behind sun end	1645 Nov 18	01:33	25°♏57’47	
max. Earth dist.	1645 Nov 17	19:49	25°♏56’55	19.84917 AU
	1646 Feb 12	20:44	0°♐	
retrograde	1646 Mar 04	20:47	0°♐10’47	
	1646 Mar 25	04:39	30°♏	
opposition	1646 May 19	05:57	28°♏10’23	0°11’48
min. Earth dist.	1646 May 19	05:27	28°♏10’27	17.88106 AU
direct	1646 Aug 04	14:36	26°♏07’27	
	1646 Nov 15	15:04	0°♐	
conjunction	1646 Nov 22	12:54	0°♐25’30	0°08’59
minimum elong	1646 Nov 22	12:54	0°♐25’30	0°08’59
behind sun begin	1646 Nov 22	07:15	0°♐24’39	
behind sun end	1646 Nov 22	18:33	0°♐26’21	
max. Earth dist.	1646 Nov 22	13:37	0°♐25’36	19.91398 AU
retrograde	1647 Mar 09	13:07	4°♐38’21	
opposition	1647 May 24	03:30	2°♐38’09	0°08’05
min. Earth dist.	1647 May 24	02:01	2°♐38’18	17.94703 AU
direct	1647 Aug 09	10:08	0°♐35’39	
conjunction	1647 Nov 27	04:01	4°♐52’14	0°05’38
minimum elong	1647 Nov 27	04:00	4°♐52’14	0°05’38
behind sun begin	1647 Nov 26	21:41	4°♐51’17	
behind sun end	1647 Nov 27	10:19	4°♐53’10	
max. Earth dist.	1647 Nov 27	06:34	4°♐52’35	19.98089 AU
retrograde	1648 Mar 13	07:26	9°♐04’13	
opposition	1648 May 28	00:09	7°♐04’14	0°04’21
min. Earth dist.	1648 May 27	20:01	7°♐04’39	18.01452 AU
direct	1648 Aug 13	07:45	5°♐02’10	
conjunction	1648 Nov 30	18:19	9°♐17’17	0°02’16
minimum elong	1648 Nov 30	18:19	9°♐17’17	0°02’16
behind sun begin	1648 Nov 30	11:46	9°♐16’19	
behind sun end	1648 Dec 01	00:53	9°♐18’16	
max. Earth dist.	1648 Nov 30	22:51	9°♐17’57	20.04885 AU
retrograde	1649 Mar 17	22:27	13°♐28’27	
opposition	1649 Jun 01	20:36	11°♐28’39	0°00’36
min. Earth dist.	1649 Jun 01	15:49	11°♐29’09	18.08286 AU
desc. node	1649 Jul 31	00:02	9°♐35’17	
direct	1649 Aug 18	01:51	9°♐27’03	
conjunction	1649 Dec 05	07:42	13°♐40’40	0°-1’-11
minimum elong	1649 Dec 05	07:41	13°♐40’40	0°01’11
behind sun begin	1649 Dec 05	01:09	13°♐39’42	
behind sun end	1649 Dec 05	14:14	13°♐41’39	
max. Earth dist.	1649 Dec 05	13:38	13°♐41’33	20.11732 AU
retrograde	1650 Mar 22	15:57	17°♐51’01	
opposition	1650 Jun 06	16:19	15°♐51’23	0°-3’-7
min. Earth dist.	1650 Jun 06	08:54	15°♐52’09	18.15123 AU
direct	1650 Aug 22	22:31	13°♐50’12	
conjunction	1650 Dec 09	20:26	18°♐02’21	0°-4’-33
minimum elong	1650 Dec 09	20:27	18°♐02’21	0°04’34
behind sun begin	1650 Dec 09	14:02	18°♐01’24	
behind sun end	1650 Dec 10	02:52	18°♐03’18	
max. Earth dist.	1650 Dec 10	04:22	18°♐03’32	20.18539 AU
retrograde	1651 Mar 27	05:46	22°♐11’52	
opposition	1651 Jun 11	11:26	20°♐12’25	0°-6’-48
min. Earth dist.	1651 Jun 11	03:39	20°♐13’12	18.21900 AU
direct	1651 Aug 27	15:17	18°♐11’38	
conjunction	1651 Dec 14	08:23	22°♐22’18	0°-7’-49
minimum elong	1651 Dec 14	08:22	22°♐22’18	0°07’50
behind sun begin	1651 Dec 14	02:28	22°♐21’25	
behind sun end	1651 Dec 14	14:17	22°♐23’10	
max. Earth dist.	1651 Dec 14	17:11	22°♐23’37	20.25261 AU
retrograde	1652 Mar 30	21:29	26°♐31’00	
opposition	1652 Jun 15	05:46	24°♐31’40	0°-10’-25
min. Earth dist.	1652 Jun 14	19:34	24°♐32’42	18.28547 AU
direct	1652 Aug 31	10:55	22°♐31’15	
conjunction	1652 Dec 17	19:34	26°♐40’27	0°-11’-2
minimum elong	1652 Dec 17	19:35	26°♐40’27	0°11’04
behind sun begin	1652 Dec 17	14:37	26°♐39’43	
behind sun end	1652 Dec 18	00:32	26°♐41’11	
max. Earth dist.	1652 Dec 18	06:19	26°♐42’03	20.31815 AU
	1653 Feb 19	18:37	0°♑	
retrograde	1653 Apr 04	09:57	0°♑48’21	
	1653 May 19	19:56	30°♐	
opposition	1653 Jun 19	23:35	28°♐49’06	0°-13’-57
min. Earth dist.	1653 Jun 19	13:06	28°♐50’10	18.35017 AU
direct	1653 Sep 05	02:49	26°♐49’03	
	1653 Dec 06	09:09	0°♑	
conjunction	1653 Dec 22	05:59	0°♑56’46	0°-14’-11
minimum elong	1653 Dec 22	05:59	0°♑56’46	0°14’11
behind sun begin	1653 Dec 22	02:40	0°♑56’17	
behind sun end	1653 Dec 22	09:18	0°♑57’15	
max. Earth dist.	1653 Dec 22	17:25	0°♑58’28	20.38198 AU
retrograde	1654 Apr 08	23:55	5°♑03’53	
opposition	1654 Jun 24	16:32	3°♑04’41	0°-17’-23
min. Earth dist.	1654 Jun 24	03:44	3°♑05’59	18.41306 AU
direct	1654 Sep 09	20:22	1°♑04’56	
conjunction	1654 Dec 26	15:36	5°♑11’12	0°-17’-13
minimum elong	1654 Dec 26	15:36	5°♑11’12	0°17’14
max. Earth dist.	1654 Dec 27	05:10	5°♑13’14	20.44387 AU
retrograde	1655 Apr 13	11:04	9°♑17’33	
opposition	1655 Jun 29	08:51	7°♑18’23	0°-20’-42
min. Earth dist.	1655 Jun 28	19:42	7°♑19’43	18.47411 AU
direct	1655 Sep 14	11:02	5°♑18’55	
conjunction	1655 Dec 31	00:28	9°♑23’46	0°-20’-9
minimum elong	1655 Dec 31	00:28	9°♑23’46	0°20’10
max. Earth dist.	1655 Dec 31	14:38	9°♑25’53	20.50411 AU
retrograde	1656 Apr 16	23:10	13°♑29’22	
min. Earth dist.	1656 Jul 02	08:44	11°♑31’47	18.53362 AU
opposition	1656 Jul 03	00:08	11°♑30’14	0°-23’-52
direct	1656 Sep 18	01:54	9°♑31’02	
conjunction	1657 Jan 03	08:44	13°♑34’33	0°-22’-56
minimum elong	1657 Jan 03	08:44	13°♑34’33	0°22’57
max. Earth dist.	1657 Jan 04	01:10	13°♑36’59	20.56281 AU
retrograde	1657 Apr 21	09:26	17°♑39’27	
opposition	1657 Jul 07	15:00	15°♑40’21	0°-26’-53
min. Earth dist.	1657 Jul 06	23:01	15°♑41’58	18.59172 AU
direct	1657 Sep 22	14:42	13°♑41’26	
conjunction	1658 Jan 07	16:11	17°♑43’39	0°-25’-36
minimum elong	1658 Jan 07	16:11	17°♑43’39	0°25’37
max. Earth dist.	1658 Jan 08	09:12	17°♑46’10	20.62027 AU
retrograde	1658 Apr 25	20:40	21°♑47’56	
min. Earth dist.	1658 Jul 11	10:55	19°♑50’42	18.64854 AU
opposition	1658 Jul 12	05:06	19°♑48’53	0°-29’-45
direct	1658 Sep 27	03:19	17°♑50’15	
conjunction	1659 Jan 11	23:21	21°♑51’16	0°-28’-6
minimum elong	1659 Jan 11	23:21	21°♑51’16	0°28’06
max. Earth dist.	1659 Jan 12	18:33	21°♑54’05	20.67620 AU
retrograde	1659 Apr 30	06:12	25°♑54’58	
opposition	1659 Jul 16	18:27	23°♑55’59	0°-32’-26
min. Earth dist.	1659 Jul 15	23:50	23°♑57’51	18.70365 AU
direct	1659 Oct 01	14:11	21°♑57’40	

conjunction	1660 Jan 16	05:55	25°♑57’33	0°-30’-28	
minimum elong	1660 Jan 16	05:55	25°♑57’33	0°30’29	
max. Earth dist.	1660 Jan 17	01:19	26°♑00’24	20.73037 AU	
	1660 Apr 28	08:21	0°♒		
retrograde	1660 May 03	17:13	0°♒00’44		
	1660 May 09	03:11	30°♑		
min. Earth dist.	1660 Jul 19	10:53	28°♑03’52	18.75677 AU	
opposition	1660 Jul 20	07:14	28°♑01’50	0°-34’-56	
direct	1660 Oct 05	01:00	26°♑03’49		
	1661 Jan 18	18:02	0°♒		

conjunction	1661 Jan 19	12:06	0°♒02’39	0°-32’-39	
minimum elong	1661 Jan 19	12:06	0°♒02’39	0°32’40	
max. Earth dist.	1661 Jan 20	09:31	0°♒05’47	20.78213 AU	
retrograde	1661 May 08	02:04	4°♒05’22		
opposition	1661 Jul 24	19:36	2°♒06’34	0°-37’-16	
min. Earth dist.	1661 Jul 23	22:57	2°♒08’38	18.80719 AU	
direct	1661 Oct 09	10:37	0°♒08’53		

conjunction	1662 Jan 23	17:56	4°♒06’42	0°-34’-40	
minimum elong	1662 Jan 23	17:56	4°♒06’42	0°34’41	
max. Earth dist.	1662 Jan 24	15:18	4°♒09’49	20.83113 AU	
retrograde	1662 May 12	12:55	8°♒09’03		
min. Earth dist.	1662 Jul 28	09:28	6°♒12’30	18.85462 AU	
opposition	1662 Jul 29	07:20	6°♒10’19	0°-39’-23	
direct	1662 Oct 13	20:01	4°♒12’55		

conjunction	1663 Jan 27	23:38	8°♒09’51	0°-36’-30	
minimum elong	1663 Jan 27	23:38	8°♒09’51	0°36’32	
max. Earth dist.	1663 Jan 28	22:39	8°♒13’12	20.87663 AU	
retrograde	1663 May 16	21:18	12°♒11’51		
opposition	1663 Aug 02	18:37	10°♒13’12	0°-41’-19	
min. Earth dist.	1663 Aug 01	20:48	10°♒15’22	18.89816 AU	
direct	1663 Oct 18	04:43	8°♒16’04		

conjunction	1664 Feb 01	05:02	12°♒12’11	0°-38’-10	
minimum elong	1664 Feb 01	05:02	12°♒12’11	0°38’11	
max. Earth dist.	1664 Feb 02	03:30	12°♒15’27	20.91805 AU	
retrograde	1664 May 20	07:25	16°♒13’53		
min. Earth dist.	1664 Aug 05	06:51	14°♒17’32	18.93739 AU	
opposition	1664 Aug 06	05:19	14°♒15’17	0°-43’-2	
direct	1664 Oct 21	12:41	12°♒18’24		

conjunction	1665 Feb 04	10:25	16°♒13’46	0°-39’-38	
minimum elong	1665 Feb 04	10:25	16°♒13’46	0°39’39	
max. Earth dist.	1665 Feb 05	10:09	16°♒17’12	20.95477 AU	
retrograde	1665 May 24	15:29	20°♒15’13		
opposition	1665 Aug 10	15:44	18°♒16’39	0°-44’-32	
min. Earth dist.	1665 Aug 09	17:29	18°♒18’52	18.97161 AU	
direct	1665 Oct 25	20:57	16°♒19’58		

conjunction	1666 Feb 08	15:28	20°♒14’38	0°-40’-54	
minimum elong	1666 Feb 08	15:28	20°♒14’38	0°40’54	
max. Earth dist.	1666 Feb 09	14:16	20°♒17’56	20.98642 AU	
retrograde	1666 May 29	01:05	24°♒15’54		
min. Earth dist.	1666 Aug 14	03:09	22°♒19’33	19.00063 AU	
opposition	1666 Aug 15	01:40	22°♒17’18	0°-45’-49	
direct	1666 Oct 30	03:35	20°♒20’45		

conjunction	1667 Feb 12	20:37	24°♒14’49	0°-41’-57	
minimum elong	1667 Feb 12	20:37	24°♒14’49	0°41’58	
max. Earth dist.	1667 Feb 13	20:23	24°♒18’14	21.01264 AU	
retrograde	1667 Jun 02	08:32	28°♒15’53		
opposition	1667 Aug 19	10:56	26°♒17’14	0°-46’-52	
min. Earth dist.	1667 Aug 18	12:47	26°♒19’27	19.02416 AU	
direct	1667 Nov 03	11:26	24°♒20’48		

conjunction	1668 Feb 17	01:26	28°♒14’18	0°-42’-48	
minimum elong	1668 Feb 17	01:26	28°♒14’18	0°42’49	
max. Earth dist.	1668 Feb 18	00:07	28°♒17’34	21.03368 AU	
	1668 Mar 19	16:56	0°♓		
retrograde	1668 Jun 05	17:44	2°♓15’15		
opposition	1668 Aug 22	19:53	0°♓16’31	0°-47’-41	
min. Earth dist.	1668 Aug 21	21:40	0°♓18’44	19.04276 AU	
	1668 Aug 29	17:58	30°♒		
direct	1668 Nov 06	17:17	28°♒20’07		
	1669 Jan 10	06:56	0°♓		

conjunction	1669 Feb 20	06:07	2°♓13’09	0°-43’-26	
minimum elong	1669 Feb 20	06:07	2°♓13’09	0°43’28	
max. Earth dist.	1669 Feb 21	05:54	2°♓16’34	21.04984 AU	
retrograde	1669 Jun 10	00:47	6°♓14’01		
min. Earth dist.	1669 Aug 26	06:22	4°♓17’23	19.05668 AU	
opposition	1669 Aug 27	04:26	4°♓15’11	0°-48’-16	
direct	1669 Nov 11	00:09	2°♓18’50		

conjunction	1670 Feb 24	10:47	6°♓11’29	0°-43’-52	
minimum elong	1670 Feb 24	10:47	6°♓11’29	0°43’53	
max. Earth dist.	1670 Feb 25	09:33	6°♓14’45	21.06171 AU	
retrograde	1670 Jun 14	09:56	10°♓12’20		
opposition	1670 Aug 31	12:30	8°♓13’23	0°-48’-36	
min. Earth dist.	1670 Aug 30	14:29	8°♓15’35	19.06660 AU	
direct	1670 Nov 15	05:42	6°♓17’03		

conjunction	1671 Feb 28	15:39	10°♓09’26	0°-44’-5	
minimum elong	1671 Feb 28	15:39	10°♓09’26	0°44’06	
max. Earth dist.	1671 Mar 01	15:23	10°♓12’50	21.06955 AU	
retrograde	1671 Jun 18	17:04	14°♓10’19		
opposition	1671 Sep 04	20:15	12°♓11’17	0°-48’-43	
min. Earth dist.	1671 Sep 03	22:23	12°♓13’28	19.07247 AU	
direct	1671 Nov 19	11:09	10°♓14’59		

conjunction	1672 Mar 03	20:21	14°♓07’10	0°-44’-5	
minimum elong	1672 Mar 03	20:21	14°♓07’10	0°44’07	
max. Earth dist.	1672 Mar 04	18:55	14°♓10’23	21.07358 AU	
retrograde	1672 Jun 22	02:00	18°♓08’11		
min. Earth dist.	1672 Sep 07	06:09	16°♓11’13	19.07465 AU	
opposition	1672 Sep 08	03:47	16°♓09’03	0°-48’-37	
direct	1672 Nov 22	16:32	14°♓12’46		

conjunction	1673 Mar 08	01:30	18°♓04’52	0°-43’-53	
minimum elong	1673 Mar 08	01:30	18°♓04’52	0°43’53	
max. Earth dist.	1673 Mar 09	00:55	18°♓08’13	21.07383 AU	
retrograde	1673 Jun 26	09:44	22°♓06’03		
opposition	1673 Sep 12	11:08	20°♓06’52	0°-48’-16	
min. Earth dist.	1673 Sep 11	13:44	20°♓09’01	19.07297 AU	
direct	1673 Nov 26	21:28	18°♓10’36		

conjunction	1674 Mar 12	06:41	22°♓02’42	0°-43’-28	
minimum elong	1674 Mar 12	06:41	22°♓02’42	0°43’29	
max. Earth dist.	1674 Mar 13	04:43	22°♓05’51	21.07032 AU	
retrograde	1674 Jun 30	18:38	26°♓04’09		
opposition	1674 Sep 16	18:24	24°♓04’53	0°-47’-42	
min. Earth dist.	1674 Sep 15	21:39	24°♓06’58	19.06746 AU	
direct	1674 Dec 01	02:29	22°♓08’37		

conjunction	1675 Mar 16	12:28	26°♓00’51	0°-42’-51	
minimum elong	1675 Mar 16	12:28	26°♓00’51	0°42’51	
max. Earth dist.	1675 Mar 17	11:01	26°♓04’04	21.06270 AU	
	1675 Jun 24	18:24	0°♈		
retrograde	1675 Jul 05	03:08	0°♈02’35		
	1675 Jul 15	10:48	30°♓		
min. Earth dist.	1675 Sep 20	05:12	28°♓05’17	19.05764 AU	
opposition	1675 Sep 21	01:24	28°♓03’15	0°-46’-54	

direct	1675 Dec 05 07:41	26°♓06’59	
conjunction	1676 Mar 19 18:26	29°♓59’25	0°-42’-1
minimum elong	1676 Mar 19 18:26	29°♓59’26	0°42’02
	1676 Mar 19 22:28	0°♈	
max. Earth dist.	1676 Mar 20 15:14	0°♈02’24	21.05081 AU
retrograde	1676 Jul 08 11:52	4°♈01’32	
opposition	1676 Sep 24 08:36	2°♈02’08	0°-45’-52
min. Earth dist.	1676 Sep 23 13:27	2°♈04’04	19.04349 AU
direct	1676 Dec 08 12:15	0°♈05’50	
conjunction	1677 Mar 24 00:56	3°♈58’34	0°-40’-59
minimum elong	1677 Mar 24 00:56	3°♈58’34	0°41’00
max. Earth dist.	1677 Mar 24 21:57	4°♈01’34	21.03422 AU
retrograde	1677 Jul 12 21:14	8°♈01’05	
opposition	1677 Sep 28 15:46	6°♈01’36	0°-44’-37
min. Earth dist.	1677 Sep 27 21:26	6°♈03’28	19.02433 AU
direct	1677 Dec 12 18:09	4°♈05’14	
conjunction	1678 Mar 28 07:59	7°♈58’21	0°-39’-45
minimum elong	1678 Mar 28 07:59	7°♈58’21	0°39’46
max. Earth dist.	1678 Mar 29 02:42	8°♈01’02	21.01256 AU
retrograde	1678 Jul 17 06:08	12°♈01’19	
opposition	1678 Oct 02 22:55	10°♈01’44	0°-43’-9
min. Earth dist.	1678 Oct 02 06:09	10°♈03’26	19.00002 AU
direct	1678 Dec 16 22:45	8°♈05’14	
conjunction	1679 Apr 01 15:44	11°♈58’50	0°-38’-19
minimum elong	1679 Apr 01 15:44	11°♈58’50	0°38’21
max. Earth dist.	1679 Apr 02 10:07	12°♈01’27	20.98547 AU
retrograde	1679 Jul 21 15:44	16°♈02’16	
opposition	1679 Oct 07 06:11	14°♈02’33	0°-41’-28
min. Earth dist.	1679 Oct 06 14:21	14°♈04’09	18.97010 AU
direct	1679 Dec 21 05:20	12°♈05’54	
conjunction	1680 Apr 04 23:38	16°♈00’00	0°-36’-42
minimum elong	1680 Apr 04 23:38	16°♈00’00	0°36’42
max. Earth dist.	1680 Apr 05 15:30	16°♈02’16	20.95300 AU
retrograde	1680 Jul 25 01:17	20°♈03’57	
opposition	1680 Oct 10 13:37	18°♈04’03	0°-39’-34
min. Earth dist.	1680 Oct 09 23:28	18°♈05’29	18.93503 AU
direct	1680 Dec 24 10:33	16°♈07’10	
conjunction	1681 Apr 09 08:20	20°♈01’53	0°-34’-53
minimum elong	1681 Apr 09 08:20	20°♈01’53	0°34’55
max. Earth dist.	1681 Apr 09 23:56	20°♈04’07	20.91552 AU
retrograde	1681 Jul 29 10:56	24°♈06’22	
opposition	1681 Oct 14 20:56	22°♈06’17	0°-37’-27
min. Earth dist.	1681 Oct 14 07:40	22°♈07’38	18.89520 AU
direct	1681 Dec 28 17:28	20°♈09’10	
conjunction	1682 Apr 13 17:24	24°♈04’32	0°-32’-53
minimum elong	1682 Apr 13 17:24	24°♈04’32	0°32’54
max. Earth dist.	1682 Apr 14 06:29	24°♈06’25	20.87371 AU
retrograde	1682 Aug 02 21:22	28°♈09’37	
opposition	1682 Oct 19 04:29	26°♈09’19	0°-35’-9
min. Earth dist.	1682 Oct 18 16:59	26°♈10’30	18.85142 AU
direct	1683 Jan 01 23:16	24°♈11’54	
conjunction	1683 Apr 18 03:11	28°♈08’04	0°-30’-43
minimum elong	1683 Apr 18 03:12	28°♈08’04	0°30’44
max. Earth dist.	1683 Apr 18 16:05	28°♈09’55	20.82811 AU
	1683 May 21 18:51	0°♉	
retrograde	1683 Aug 07 07:20	2°♉13’46	
opposition	1683 Oct 23 12:00	0°♉13’16	0°-32’-40
min. Earth dist.	1683 Oct 23 01:11	0°♉14’23	18.80414 AU
	1683 Oct 28 21:14	30°♈	
direct	1684 Jan 06 06:26	28°♈15’35	
	1684 Mar 11 23:42	0°♉	
conjunction	1684 Apr 21 13:24	2°♉12’35	0°-28’-23
minimum elong	1684 Apr 21 13:24	2°♉12’35	0°28’24
max. Earth dist.	1684 Apr 21 23:51	2°♉14’05	20.77948 AU
retrograde	1684 Aug 10 18:19	6°♉18’59	
opposition	1684 Oct 26 19:56	4°♉18’17	0°-30’-1
min. Earth dist.	1684 Oct 26 10:52	4°♉19’13	18.75421 AU
direct	1685 Jan 09 12:54	2°♉20’18	
conjunction	1685 Apr 26 00:24	6°♉18’16	0°-25’-54
minimum elong	1685 Apr 26 00:24	6°♉18’16	0°25’54
max. Earth dist.	1685 Apr 26 10:42	6°♉19’45	20.72831 AU
retrograde	1685 Aug 15 05:33	10°♉25’22	
opposition	1685 Oct 31 04:02	8°♉24’30	0°-27’-11
min. Earth dist.	1685 Oct 30 19:34	8°♉25’23	18.70183 AU
direct	1686 Jan 13 20:42	6°♉26’14	
conjunction	1686 Apr 30 12:06	10°♉25’14	0°-23’-16
minimum elong	1686 Apr 30 12:06	10°♉25’14	0°23’17
max. Earth dist.	1686 Apr 30 19:49	10°♉26’21	20.67497 AU
retrograde	1686 Aug 19 17:06	14°♉33’07	
opposition	1686 Nov 04 12:27	12°♉32’06	0°-24’-13
min. Earth dist.	1686 Nov 04 05:57	12°♉32’46	18.64755 AU
direct	1687 Jan 18 03:47	10°♉33’32	
conjunction	1687 May 05 00:43	14°♉33’40	0°-20’-31
minimum elong	1687 May 05 00:43	14°♉33’40	0°20’31
max. Earth dist.	1687 May 05 08:09	14°♉34’43	20.61979 AU
retrograde	1687 Aug 24 05:59	18°♉42’20	
opposition	1687 Nov 08 21:17	16°♉41’12	0°-21’-6
min. Earth dist.	1687 Nov 08 15:23	16°♉41’48	18.59143 AU
direct	1688 Jan 22 12:35	14°♉42’22	
conjunction	1688 May 08 13:51	18°♉43’40	0°-17’-38
minimum elong	1688 May 08 13:51	18°♉43’40	0°17’40
max. Earth dist.	1688 May 08 18:40	18°♉44’22	20.56293 AU
retrograde	1688 Aug 27 18:41	22°♉53’12	
opposition	1688 Nov 12 06:43	20°♉51’58	0°-17’-51
min. Earth dist.	1688 Nov 12 02:56	20°♉52’22	18.53378 AU
direct	1689 Jan 25 20:29	18°♉52’51	
conjunction	1689 May 13 04:15	22°♉55’26	0°-14’-39
minimum elong	1689 May 13 04:14	22°♉55’26	0°14’40
behind sun begin	1689 May 13 01:38	22°♉55’04	
behind sun end	1689 May 13 06:51	22°♉55’48	
max. Earth dist.	1689 May 13 08:31	22°♉56’03	20.50447 AU
retrograde	1689 Sep 01 09:22	27°♉05’50	
opposition	1689 Nov 16 16:23	25°♉04’30	0°-14’-29
min. Earth dist.	1689 Nov 16 13:24	25°♉04’49	18.47436 AU
direct	1690 Jan 30 06:23	23°♉05’07	
conjunction	1690 May 17 19:29	27°♉09’02	0°-11’-34
minimum elong	1690 May 17 19:30	27°♉09’03	0°11’35
behind sun begin	1690 May 17 14:45	27°♉08’22	
behind sun end	1690 May 18 00:14	27°♉09’43	
max. Earth dist.	1690 May 17 20:47	27°♉09’13	20.44415 AU
	1690 Jul 10 04:27	0°♊	
retrograde	1690 Sep 05 23:40	1°♊20’20	
	1690 Nov 04 12:10	30°♉	
opposition	1690 Nov 21 02:51	29°♉18’55	0°-11’00
min. Earth dist.	1690 Nov 21 02:24	29°♉18’58	18.41305 AU
direct	1691 Feb 03 15:40	27°♉19’12	
	1691 Apr 28 00:22	0°♊	
conjunction	1691 May 22 11:45	1°♊24’32	0°-8’-24

minimum elong	1691 May 22	11:45	1°♊24’32	0°08’25
behind sun begin	1691 May 22	05:52	1°♊23’41	
behind sun end	1691 May 22	17:39	1°♊25’22	
max. Earth dist.	1691 May 22	12:04	1°♊24’34	20.38175 AU
retrograde	1691 Sep 10	15:48	5°♊36’41	
opposition	1691 Nov 25	13:43	3°♊35’11	0°-7’-27
min. Earth dist.	1691 Nov 25	14:09	3°♊35’08	18.34952 AU
direct	1692 Feb 08	02:54	1°♊35’08	
conjunction	1692 May 26	04:52	5°♊41’52	0°-5’-10
minimum elong	1692 May 26	04:51	5°♊41’52	0°05’11
behind sun begin	1692 May 25	22:19	5°♊40’56	
behind sun end	1692 May 26	11:24	5°♊42’48	
max. Earth dist.	1692 May 26	02:01	5°♊41’29	20.31714 AU
retrograde	1692 Sep 14	07:34	9°♊54’55	
opposition	1692 Nov 29	01:22	7°♊53’16	0°-3’-49
min. Earth dist.	1692 Nov 29	04:28	7°♊52’56	18.28392 AU
direct	1693 Feb 11	13:51	5°♊52’50	
conjunction	1693 May 30	22:58	10°♊01’01	0°-1’-51
minimum elong	1693 May 30	23:00	10°♊01’01	0°01’53
behind sun begin	1693 May 30	16:14	10°♊00’03	
behind sun end	1693 May 31	05:45	10°♊01’59	
max. Earth dist.	1693 May 30	18:55	10°♊00’28	20.25060 AU
retrograde	1693 Sep 19	00:51	14°♊14’55	
opposition	1693 Dec 03	13:27	12°♊13’07	0°00’-8
min. Earth dist.	1693 Dec 03	17:22	12°♊12’42	18.21643 AU
asc. node	1693 Dec 18	05:30	11°♊36’17	
direct	1694 Feb 16	03:03	10°♊12’16	
conjunction	1694 Jun 04	17:55	14°♊21’55	0°01’34
minimum elong	1694 Jun 04	17:56	14°♊21’55	0°01’35
behind sun begin	1694 Jun 04	11:09	14°♊20’56	
behind sun end	1694 Jun 05	00:42	14°♊22’53	
max. Earth dist.	1694 Jun 04	10:52	14°♊20’54	20.18239 AU
retrograde	1694 Sep 23	17:09	18°♊36’39	
opposition	1694 Dec 08	02:10	16°♊34’41	0°03’34
min. Earth dist.	1694 Dec 08	08:46	16°♊33’58	18.14775 AU
direct	1695 Feb 20	15:21	14°♊33’23	
conjunction	1695 Jun 09	13:44	18°♊44’31	0°04’56
minimum elong	1695 Jun 09	13:44	18°♊44’31	0°04’56
behind sun begin	1695 Jun 09	07:09	18°♊43’34	
behind sun end	1695 Jun 09	20:20	18°♊45’28	
max. Earth dist.	1695 Jun 09	05:29	18°♊43’19	20.11344 AU
retrograde	1695 Sep 28	11:35	23°♊00’05	
opposition	1695 Dec 12	15:24	20°♊57’56	0°07’17
min. Earth dist.	1695 Dec 12	22:34	20°♊57’10	18.07866 AU
direct	1696 Feb 25	06:38	18°♊56’11	
conjunction	1696 Jun 13	10:08	23°♊08’48	0°08’16
minimum elong	1696 Jun 13	10:08	23°♊08’48	0°08’16
behind sun begin	1696 Jun 13	04:10	23°♊07’56	
behind sun end	1696 Jun 13	16:05	23°♊09’40	
max. Earth dist.	1696 Jun 12	23:33	23°♊07’14	20.04439 AU
retrograde	1696 Oct 02	04:20	27°♊25’12	
opposition	1696 Dec 16	05:25	25°♊22’52	0°10’58
min. Earth dist.	1696 Dec 16	15:02	25°♊21’50	18.00995 AU
direct	1697 Feb 28	20:19	23°♊20’40	
conjunction	1697 Jun 18	07:35	27°♊34’48	0°11’33
minimum elong	1697 Jun 18	07:34	27°♊34’48	0°11’34
behind sun begin	1697 Jun 18	02:49	27°♊34’07	
behind sun end	1697 Jun 18	12:20	27°♊35’30	
max. Earth dist.	1697 Jun 17	19:45	27°♊33’03	19.97617 AU
	1697 Jul 31	01:27	0°♋	
retrograde	1697 Oct 06	23:53	1°♋51’59	
	1697 Dec 16	18:16	30°♊	
opposition	1697 Dec 20	19:46	29°♊49’30	0°14’38
min. Earth dist.	1697 Dec 21	05:47	29°♊48’25	17.94236 AU
direct	1698 Mar 05	13:26	27°♊46’51	
	1698 May 18	21:54	0°♋	
conjunction	1698 Jun 23	05:47	2°♋02’31	0°14’48
minimum elong	1698 Jun 23	05:46	2°♋02’31	0°14’48
behind sun begin	1698 Jun 23	03:23	2°♋02’10	
behind sun end	1698 Jun 23	08:10	2°♋02’52	
max. Earth dist.	1698 Jun 22	16:07	2°♋00’29	19.90930 AU
retrograde	1698 Oct 11	17:41	6°♋20’29	
opposition	1698 Dec 25	11:05	4°♋17’52	0°18’13
min. Earth dist.	1698 Dec 25	23:17	4°♋16’33	17.87660 AU
direct	1699 Mar 10	04:34	2°♋14’48	
conjunction	1699 Jun 28	04:33	6°♋32’00	0°17’59
minimum elong	1699 Jun 28	04:33	6°♋32’00	0°17’59
max. Earth dist.	1699 Jun 27	13:37	6°♋29’45	19.84471 AU
retrograde	1699 Oct 16	14:27	10°♋50’44	
opposition	1699 Dec 30	02:55	8°♋48’01	0°21’43
min. Earth dist.	1699 Dec 30	15:15	8°♋46’41	17.81336 AU
direct	1700 Mar 14	23:29	6°♋44’34	
conjunction	1700 Jul 03	04:15	11°♋03’17	0°21’04
minimum elong	1700 Jul 03	04:15	11°♋03’17	0°21’04
max. Earth dist.	1700 Jul 02	12:09	11°♋00’51	19.78284 AU
retrograde	1700 Oct 21	09:22	15°♋22’46	
opposition	1701 Jan 03	19:34	13°♋20’00	0°25’06
min. Earth dist.	1701 Jan 04	09:50	13°♋18’26	17.75316 AU
direct	1701 Mar 19	16:02	11°♋16’12	
max. Earth dist.	1701 Jul 07	11:01	15°♋33’44	19.72434 AU
conjunction	1701 Jul 08	04:42	15°♋36’25	0°24’03
minimum elong	1701 Jul 08	04:41	15°♋36’25	0°24’03
retrograde	1701 Oct 26	07:35	19°♋56’39	
opposition	1702 Jan 08	12:52	17°♋53’51	0°28’21
min. Earth dist.	1702 Jan 09	03:20	17°♋52’17	17.69635 AU
direct	1702 Mar 24	12:44	15°♋49’46	
max. Earth dist.	1702 Jul 12	11:38	20°♋08’42	19.66911 AU
conjunction	1702 Jul 13	05:56	20°♋11’29	0°26’54
minimum elong	1702 Jul 13	05:56	20°♋11’29	0°26’54
retrograde	1702 Oct 31	03:50	24°♋32’24	
opposition	1703 Jan 13	07:04	22°♋29’39	0°31’27
min. Earth dist.	1703 Jan 13	23:19	22°♋27’52	17.64288 AU
direct	1703 Mar 29	07:25	20°♋25’17	
max. Earth dist.	1703 Jul 17	11:36	24°♋45’22	19.61736 AU
conjunction	1703 Jul 18	07:46	24°♋48’27	0°29’36
minimum elong	1703 Jul 18	07:45	24°♋48’27	0°29’35
retrograde	1703 Nov 05	02:54	29°♋10’03	
opposition	1704 Jan 18	01:54	27°♋07’19	0°34’22
min. Earth dist.	1704 Jan 18	18:32	27°♋05’30	17.59283 AU
direct	1704 Apr 02	05:32	25°♋02’42	
conjunction	1704 Jul 22	10:20	29°♋27’16	0°32’07
minimum elong	1704 Jul 22	10:20	29°♋27’16	0°32’08
max. Earth dist.	1704 Jul 21	13:53	29°♋24’07	19.56874 AU
	1704 Jul 31	07:35	0°♌	
retrograde	1704 Nov 09	01:05	3°♌49’26	
opposition	1705 Jan 21	21:41	1°♌46’45	0°37’05
min. Earth dist.	1705 Jan 22	15:55	1°♌44’46	17.54576 AU
	1705 Mar 11	20:56	30°♋	
direct	1705 Apr 07	02:39	29°♋41’53	
	1705 May 03	03:04	0°♌	

conjunction	1705 Jul 27 13:30	4°♌07’45	0°34’27
minimum elong	1705 Jul 27 13:30	4°♌07’45	0°34’27
max. Earth dist.	1705 Jul 26 14:48	4°♌04’15	19.52318 AU
retrograde	1705 Nov 14 00:46	8°♌30’27	
opposition	1706 Jan 26 18:01	6°♌27’47	0°39’34
min. Earth dist.	1706 Jan 27 12:51	6°♌25’44	17.50180 AU
direct	1706 Apr 12 02:02	4°♌22’39	
conjunction	1706 Aug 01 17:16	8°♌49’44	0°36’34
minimum elong	1706 Aug 01 17:16	8°♌49’43	0°36’34
max. Earth dist.	1706 Jul 31 18:37	8°♌46’13	19.48065 AU
retrograde	1706 Nov 19 00:40	13°♌12’51	
opposition	1707 Jan 31 15:14	11°♌10’13	0°41’49
min. Earth dist.	1707 Feb 01 11:08	11°♌08’02	17.46092 AU
direct	1707 Apr 17 00:51	9°♌04’50	
conjunction	1707 Aug 06 21:02	13°♌32’58	0°38’27
minimum elong	1707 Aug 06 21:02	13°♌32’58	0°38’27
max. Earth dist.	1707 Aug 05 20:22	13°♌29’09	19.44152 AU
retrograde	1707 Nov 24 00:34	17°♌56’27	
opposition	1708 Feb 05 12:58	15°♌53’49	0°43’47
min. Earth dist.	1708 Feb 06 09:29	15°♌51’34	17.42371 AU
direct	1708 Apr 21 01:04	13°♌48’10	
max. Earth dist.	1708 Aug 10 01:12	18°♌13’31	19.40617 AU
conjunction	1708 Aug 11 01:22	18°♌17’17	0°40’04
minimum elong	1708 Aug 11 01:22	18°♌17’17	0°40’03
retrograde	1708 Nov 28 01:16	22°♌41’00	
opposition	1709 Feb 09 11:10	20°♌38’22	0°45’27
min. Earth dist.	1709 Feb 10 08:10	20°♌36’04	17.39040 AU
direct	1709 Apr 26 01:18	18°♌32’30	
max. Earth dist.	1709 Aug 15 04:00	22°♌58’26	19.37507 AU
conjunction	1709 Aug 16 05:45	23°♌02’27	0°41’26
minimum elong	1709 Aug 16 05:45	23°♌02’27	0°41’26
retrograde	1709 Dec 03 00:42	27°♌26’21	
opposition	1710 Feb 14 10:00	25°♌23’41	0°46’49
min. Earth dist.	1710 Feb 15 07:38	25°♌21’19	17.36172 AU
direct	1710 May 01 02:43	23°♌17’36	
max. Earth dist.	1710 Aug 20 09:16	27°♌44’21	19.34879 AU
conjunction	1710 Aug 21 10:08	27°♌48’15	0°42’30
minimum elong	1710 Aug 21 10:08	27°♌48’15	0°42’30
	1710 Sep 27 00:23	0°♍	
retrograde	1710 Dec 08 01:08	2°♍12’14	
opposition	1711 Feb 19 09:17	0°♍09’34	0°47’51
min. Earth dist.	1711 Feb 20 06:33	0°♍07’14	17.33799 AU
	1711 Feb 23 00:34	30°♌	
direct	1711 May 06 04:48	28°♌03’18	
	1711 Jul 13 23:03	0°♍	
conjunction	1711 Aug 26 14:24	2°♍34’30	0°43’16
minimum elong	1711 Aug 26 14:24	2°♍34’30	0°43’16
max. Earth dist.	1711 Aug 25 12:49	2°♍30’29	19.32781 AU
retrograde	1711 Dec 12 23:56	6°♍58’30	
opposition	1712 Feb 24 08:57	4°♍55’49	0°48’34
min. Earth dist.	1712 Feb 25 06:42	4°♍53’26	17.32002 AU
direct	1712 May 10 07:13	2°♍49’23	
conjunction	1712 Aug 30 18:36	7°♍21’01	0°43’45
minimum elong	1712 Aug 30 18:36	7°♍21’01	0°43’46
max. Earth dist.	1712 Aug 29 18:01	7°♍17’10	19.31280 AU
retrograde	1712 Dec 17 00:28	11°♍44’58	
opposition	1713 Feb 28 09:01	9°♍42’19	0°48’56
min. Earth dist.	1713 Mar 01 05:42	9°♍40’03	17.30801 AU
direct	1713 May 15 11:10	7°♍35’48	
conjunction	1713 Sep 04 22:36	12°♍07’43	0°43’56
minimum elong	1713 Sep 04 22:36	12°♍07’43	0°43’55
max. Earth dist.	1713 Sep 03 22:12	12°♍03’53	19.30393 AU
retrograde	1713 Dec 21 23:07	16°♍31’31	
opposition	1714 Mar 05 09:32	14°♍28’56	0°48’58
min. Earth dist.	1714 Mar 06 06:30	14°♍26’38	17.30248 AU
direct	1714 May 20 13:57	12°♍22’23	
max. Earth dist.	1714 Sep 09 02:53	16°♍50’47	19.30175 AU
conjunction	1714 Sep 10 02:21	16°♍54’28	0°43’48
minimum elong	1714 Sep 10 02:21	16°♍54’28	0°43’48
retrograde	1714 Dec 27 00:10	21°♍18’05	
opposition	1715 Mar 10 10:18	19°♍15’37	0°48’39
min. Earth dist.	1715 Mar 11 05:38	19°♍13’30	17.30347 AU
direct	1715 May 25 18:26	17°♍09’06	
max. Earth dist.	1715 Sep 14 07:19	21°♍37’43	19.30595 AU
conjunction	1715 Sep 15 05:42	21°♍41’14	0°43’22
minimum elong	1715 Sep 15 05:42	21°♍41’14	0°43’22
retrograde	1715 Dec 31 23:10	26°♍04’37	
opposition	1716 Mar 14 11:26	24°♍02’17	0°48’01
min. Earth dist.	1716 Mar 15 07:03	24°♍00’09	17.31080 AU
direct	1716 May 29 20:53	21°♍55’52	
max. Earth dist.	1716 Sep 18 10:56	26°♍24’29	19.31634 AU
conjunction	1716 Sep 19 08:47	26°♍27’55	0°42’39
minimum elong	1716 Sep 19 08:47	26°♍27’55	0°42’39
	1716 Nov 22 23:57	0°♎	
retrograde	1717 Jan 05 00:32	0°♎50’59	
	1717 Feb 18 08:43	30°♍	
opposition	1717 Mar 19 12:32	28°♍48’50	0°47’03
min. Earth dist.	1717 Mar 20 06:27	28°♍46’53	17.32392 AU
direct	1717 Jun 04 01:37	26°♍42’33	
	1717 Sep 04 13:43	0°♎	
conjunction	1717 Sep 24 11:35	1°♎14’24	0°41’38
minimum elong	1717 Sep 24 11:35	1°♎14’24	0°41’38
max. Earth dist.	1717 Sep 23 15:20	1°♎11’12	19.33215 AU
retrograde	1718 Jan 09 23:23	5°♎37’05	
opposition	1718 Mar 24 14:11	3°♎35’07	0°45’45
min. Earth dist.	1718 Mar 25 08:20	3°♎33’09	17.34233 AU
direct	1718 Jun 09 03:51	1°♎29’00	
conjunction	1718 Sep 29 13:36	6°♎00’28	0°40’20
minimum elong	1718 Sep 29 13:36	6°♎00’28	0°40’19
max. Earth dist.	1718 Sep 28 17:37	5°♎57’19	19.35308 AU
retrograde	1719 Jan 15 00:35	10°♎22’43	
opposition	1719 Mar 29 15:45	8°♎20’54	0°44’09
min. Earth dist.	1719 Mar 30 08:03	8°♎19’09	17.36556 AU
direct	1719 Jun 14 08:35	6°♎14’59	
conjunction	1719 Oct 04 15:19	10°♎45’56	0°38’45
minimum elong	1719 Oct 04 15:19	10°♎45’56	0°38’46
max. Earth dist.	1719 Oct 03 21:23	10°♎43’07	19.37853 AU
retrograde	1720 Jan 19 22:57	15°♎07’39	
opposition	1720 Apr 02 17:24	13°♎06’01	0°42’14
min. Earth dist.	1720 Apr 03 09:41	13°♎04’16	17.39313 AU
direct	1720 Jun 18 10:42	11°♎00’17	
conjunction	1720 Oct 08 16:17	15°♎30’35	0°36’55
minimum elong	1720 Oct 08 16:17	15°♎30’35	0°36’55
max. Earth dist.	1720 Oct 07 22:24	15°♎27’46	19.40823 AU
retrograde	1721 Jan 23 23:16	19°♎51’43	
opposition	1721 Apr 07 18:57	17°♎50’13	0°40’02
min. Earth dist.	1721 Apr 08 09:27	17°♎48’40	17.42476 AU
direct	1721 Jun 23 15:08	15°♎44’41	

conjunction	1721 Oct	13	16:36	20°♎14’13	0°34’50
minimum elong	1721 Oct	13	16:36	20°♎14’13	0°34’50
max. Earth dist.	1721 Oct	13	01:07	20°♎11’47	19.44177 AU
retrograde	1722 Jan	28	20:50	24°♎34’41	
opposition	1722 Apr	12	20:32	22°♎33’20	0°37’34
min. Earth dist.	1722 Apr	13	10:30	22°♎31’50	17.46010 AU
direct	1722 Jun	28	17:29	20°♎28’01	
conjunction	1722 Oct	18	15:59	24°♎56’37	0°32’31
minimum elong	1722 Oct	18	15:59	24°♎56’37	0°32’32
max. Earth dist.	1722 Oct	18	00:48	24°♎54’14	19.47911 AU
retrograde	1723 Feb	02	19:36	29°♎16’23	
opposition	1723 Apr	17	21:42	27°♎15’07	0°34’52
min. Earth dist.	1723 Apr	18	09:54	27°♎13’49	17.49932 AU
direct	1723 Jul	03	21:24	25°♎10’02	
conjunction	1723 Oct	23	14:35	29°♎37’36	0°29’59
minimum elong	1723 Oct	23	14:35	29°♎37’36	0°29’59
max. Earth dist.	1723 Oct	23	02:04	29°♎35’39	19.52019 AU
	1723 Oct	29	13:25	0°♏	
retrograde	1724 Feb	07	15:54	3°♏56’35	
opposition	1724 Apr	21	22:37	1°♏55’26	0°31’56
min. Earth dist.	1724 Apr	22	09:43	1°♏54’15	17.54211 AU
	1724 Jun	18	19:40	30°♎	
direct	1724 Jul	08	00:13	29°♎50’35	
	1724 Jul	27	00:39	0°♏	
conjunction	1724 Oct	27	12:08	4°♏16’59	0°27’17
minimum elong	1724 Oct	27	12:08	4°♏16’59	0°27’17
max. Earth dist.	1724 Oct	27	00:18	4°♏15’09	19.56496 AU
retrograde	1725 Feb	11	12:22	8°♏35’10	
opposition	1725 Apr	26	23:04	6°♏34’05	0°28’49
min. Earth dist.	1725 Apr	27	08:26	6°♏33’05	17.58884 AU
direct	1725 Jul	13	02:56	4°♏29’28	
conjunction	1725 Nov	01	08:51	8°♏54’39	0°24’25
minimum elong	1725 Nov	01	08:51	8°♏54’39	0°24’24
max. Earth dist.	1725 Oct	31	23:56	8°♏53’16	19.61371 AU
retrograde	1726 Feb	16	07:51	13°♏11’58	
opposition	1726 May	01	23:14	11°♏10’59	0°25’32
min. Earth dist.	1726 May	02	06:42	11°♏10’12	17.63951 AU
direct	1726 Jul	18	05:08	9°♏06’40	
conjunction	1726 Nov	06	04:21	13°♏30’31	0°21’24
minimum elong	1726 Nov	06	04:20	13°♏30’31	0°21’24
max. Earth dist.	1726 Nov	05	20:43	13°♏29’20	19.66649 AU
retrograde	1727 Feb	21	02:33	17°♏46’59	
opposition	1727 May	06	22:54	15°♏46’07	0°22’06
min. Earth dist.	1727 May	07	04:39	15°♏45’31	17.69440 AU
direct	1727 Jul	23	05:21	13°♏42’06	
conjunction	1727 Nov	10	23:10	18°♏04’36	0°18’17
minimum elong	1727 Nov	10	23:10	18°♏04’36	0°18’17
max. Earth dist.	1727 Nov	10	18:18	18°♏03’51	19.72340 AU
retrograde	1728 Feb	25	21:27	22°♏20’10	
opposition	1728 May	10	21:51	20°♏19’29	0°18’34
min. Earth dist.	1728 May	11	01:17	20°♏19’07	17.75307 AU
direct	1728 Jul	27	05:55	18°♏15’49	
conjunction	1728 Nov	14	17:00	22°♏36’55	0°15’04
minimum elong	1728 Nov	14	17:01	22°♏36’55	0°15’04
behind sun begin	1728 Nov	14	14:30	22°♏36’33	
behind sun end	1728 Nov	14	19:31	22°♏37’18	
max. Earth dist.	1728 Nov	14	13:39	22°♏36’25	19.78392 AU
retrograde	1729 Mar	01	15:14	26°♏51’38	
opposition	1729 May	15	20:33	24°♏51’07	0°14’56
min. Earth dist.	1729 May	15	22:35	24°♏50’54	17.81526 AU
direct	1729 Aug	01	03:41	22°♏47’50	
conjunction	1729 Nov	19	09:54	27°♏07’31	0°11’47
minimum elong	1729 Nov	19	09:54	27°♏07’31	0°11’48
behind sun begin	1729 Nov	19	05:14	27°♏06’49	
behind sun end	1729 Nov	19	14:33	27°♏08’13	
max. Earth dist.	1729 Nov	19	09:02	27°♏07’23	19.84761 AU
	1730 Jan	09	08:44	0°♐	
retrograde	1730 Mar	06	09:47	1°♐21’20	
	1730 May	04	21:04	30°♏	
opposition	1730 May	20	18:40	29°♏21’02	0°11’14
min. Earth dist.	1730 May	20	18:07	29°♏21’05	17.88008 AU
direct	1730 Aug	06	02:30	27°♏18’11	
	1730 Oct	28	08:54	0°♐	
conjunction	1730 Nov	24	01:58	1°♐36’23	0°08’27
minimum elong	1730 Nov	24	01:57	1°♐36’23	0°08’27
behind sun begin	1730 Nov	23	20:10	1°♐35’31	
behind sun end	1730 Nov	24	07:44	1°♐37’15	
max. Earth dist.	1730 Nov	24	02:46	1°♐36’30	19.91352 AU
retrograde	1731 Mar	11	02:49	5°♐49’20	
opposition	1731 May	25	16:12	3°♐49’13	0°07’30
min. Earth dist.	1731 May	25	14:42	3°♐49’22	17.94695 AU
direct	1731 Aug	10	22:44	1°♐46’47	
conjunction	1731 Nov	28	17:11	6°♐03’29	0°05’06
minimum elong	1731 Nov	28	17:11	6°♐03’29	0°05’06
behind sun begin	1731 Nov	28	10:48	6°♐02’32	
behind sun end	1731 Nov	28	23:34	6°♐04’27	
max. Earth dist.	1731 Nov	28	19:54	6°♐03’52	19.98107 AU
retrograde	1732 Mar	14	20:24	10°♐15’34	
opposition	1732 May	29	13:07	8°♐15’38	0°03’44
min. Earth dist.	1732 May	29	09:04	8°♐16’03	18.01484 AU
direct	1732 Aug	14	20:11	6°♐13’38	
conjunction	1732 Dec	02	07:34	10°♐28’50	0°01’42
minimum elong	1732 Dec	02	07:33	10°♐28’50	0°01’42
behind sun begin	1732 Dec	02	00:59	10°♐27’51	
behind sun end	1732 Dec	02	14:07	10°♐29’48	
max. Earth dist.	1732 Dec	02	11:58	10°♐29’28	20.04917 AU
retrograde	1733 Mar	19	12:15	14°♐40’01	
desc. node	1733 May	31	11:58	12°♐47’25	
opposition	1733 Jun	03	09:37	12°♐40’16	0°00’-1
min. Earth dist.	1733 Jun	03	04:55	12°♐40’45	18.08313 AU
direct	1733 Aug	19	15:20	10°♐38’40	
conjunction	1733 Dec	06	21:07	14°♐52’20	0°-1’-46
minimum elong	1733 Dec	06	21:08	14°♐52’21	0°01’47
behind sun begin	1733 Dec	06	14:35	14°♐51’22	
behind sun end	1733 Dec	07	03:41	14°♐53’19	
max. Earth dist.	1733 Dec	07	03:00	14°♐53’12	20.11742 AU
retrograde	1734 Mar	24	04:43	19°♐02’40	
opposition	1734 Jun	08	05:20	17°♐03’03	0°-3’-45
min. Earth dist.	1734 Jun	07	22:07	17°♐03’48	18.15111 AU
direct	1734 Aug	24	11:30	15°♐01’51	
conjunction	1734 Dec	11	09:53	19°♐14’00	0°-5’-7
minimum elong	1734 Dec	11	09:53	19°♐14’00	0°05’08
behind sun begin	1734 Dec	11	03:31	19°♐13’04	
behind sun end	1734 Dec	11	16:15	19°♐14’57	
max. Earth dist.	1734 Dec	11	17:28	19°♐15’08	20.18493 AU
retrograde	1735 Mar	28	18:45	23°♐23’29	
opposition	1735 Jun	13	00:32	21°♐23’59	0°-7’-26
min. Earth dist.	1735 Jun	12	16:56	21°♐24’45	18.21817 AU
direct	1735 Aug	29	05:31	19°♐23’09	
conjunction	1735 Dec	15	21:51	23°♐33’46	0°-8’-24

minimum elong	1735 Dec 15 21:51	23°♐33'46	0°08'26
behind sun begin	1735 Dec 15 16:05	23°♐32'55	
behind sun end	1735 Dec 16 03:38	23°♐34'37	
max. Earth dist.	1735 Dec 16 06:26	23°♐35'03	20.25136 AU
retrograde	1736 Apr 01 10:03	27°♐42'23	
opposition	1736 Jun 16 18:42	25°♐42'59	0°-11'-3
min. Earth dist.	1736 Jun 16 08:43	25°♐44'00	18.28382 AU
direct	1736 Sep 01 23:59	23°♐42'29	
conjunction	1736 Dec 19 09:04	27°♐51'37	0°-11'-37
minimum elong	1736 Dec 19 09:04	27°♐51'37	0°11'37
behind sun begin	1736 Dec 19 04:19	27°♐50'55	
behind sun end	1736 Dec 19 13:48	27°♐52'19	
max. Earth dist.	1736 Dec 19 19:27	27°♐53'10	20.31622 AU
	1737 Jan 25 14:48	0°♑	
retrograde	1737 Apr 05 22:16	1°♑59'24	
opposition	1737 Jun 21 12:32	0°♑00'04	0°-14'-35
min. Earth dist.	1737 Jun 21 02:12	0°♑01'07	18.34799 AU
	1737 Jun 21 13:08	30°♐	
direct	1737 Sep 06 16:34	27°♐59'53	
	1737 Nov 16 16:19	0°♑	
conjunction	1737 Dec 23 19:14	2°♑07'30	0°-14'-44
minimum elong	1737 Dec 23 19:15	2°♑07'30	0°14'46
behind sun begin	1737 Dec 23 16:24	2°♑07'05	
behind sun end	1737 Dec 23 22:05	2°♑07'55	
max. Earth dist.	1737 Dec 24 06:37	2°♑09'12	20.37972 AU
retrograde	1738 Apr 10 12:34	6°♑14'29	
opposition	1738 Jun 26 05:23	4°♑15'11	0°-18'00
min. Earth dist.	1738 Jun 25 16:35	4°♑16'29	18.41080 AU
direct	1738 Sep 11 09:22	2°♑15'18	
conjunction	1738 Dec 28 04:49	6°♑21'29	0°-17'-46
minimum elong	1738 Dec 28 04:49	6°♑21'29	0°17'47
max. Earth dist.	1738 Dec 28 18:17	6°♑23'29	20.44180 AU
retrograde	1739 Apr 14 23:12	10°♑27'41	
opposition	1739 Jun 30 21:27	8°♑28'25	0°-21'-17
min. Earth dist.	1739 Jun 30 08:16	8°♑29'46	18.47241 AU
direct	1739 Sep 15 23:50	6°♑28'50	
conjunction	1740 Jan 01 13:35	10°♑33'37	0°-20'-40
minimum elong	1740 Jan 01 13:35	10°♑33'37	0°20'41
max. Earth dist.	1740 Jan 02 03:54	10°♑35'45	20.50290 AU
retrograde	1740 Apr 18 12:24	14°♑39'06	
opposition	1740 Jul 04 12:46	12°♑39'53	0°-24'-26
min. Earth dist.	1740 Jul 03 21:07	12°♑41'28	18.53303 AU
direct	1740 Sep 19 14:42	10°♑40'36	
conjunction	1741 Jan 04 21:39	14°♑44'04	0°-23'-27
minimum elong	1741 Jan 04 21:39	14°♑44'04	0°23'28
max. Earth dist.	1741 Jan 05 14:13	14°♑46'32	20.56288 AU
retrograde	1741 Apr 22 21:53	18°♑48'53	
min. Earth dist.	1741 Jul 08 11:24	16°♑51'23	18.59254 AU
opposition	1741 Jul 09 03:35	16°♑49'46	0°-27'-26
direct	1741 Sep 24 03:18	14°♑50'49	
conjunction	1742 Jan 09 05:10	18°♑53'00	0°-26'-5
minimum elong	1742 Jan 09 05:10	18°♑53'00	0°26'05
max. Earth dist.	1742 Jan 09 22:26	18°♑55'33	20.62183 AU
retrograde	1742 Apr 27 10:12	22°♑57'13	
opposition	1742 Jul 13 17:30	20°♑58'11	0°-30'-16
min. Earth dist.	1742 Jul 12 23:07	21°♑00'02	18.65082 AU
direct	1742 Sep 28 15:58	18°♑59'34	
conjunction	1743 Jan 13 12:13	23°♑00'35	0°-28'-34
minimum elong	1743 Jan 13 12:13	23°♑00'35	0°28'35
max. Earth dist.	1743 Jan 14 07:33	23°♑03'26	20.67915 AU
retrograde	1743 May 01 19:04	27°♑04'15	
opposition	1743 Jul 18 06:56	25°♑05'19	0°-32'-55
min. Earth dist.	1743 Jul 17 12:17	25°♑07'11	18.70719 AU
direct	1743 Oct 03 02:55	23°♑07'03	
conjunction	1744 Jan 17 18:43	27°♑06'56	0°-30'-54
minimum elong	1744 Jan 17 18:43	27°♑06'56	0°30'54
max. Earth dist.	1744 Jan 18 14:21	27°♑09'50	20.73442 AU
	1744 Mar 12 07:29	0°♒	
retrograde	1744 May 05 06:16	1°♒10'06	
	1744 Jun 30 22:12	30°♑	
opposition	1744 Jul 21 19:39	29°♑11'17	0°-35'-24
min. Earth dist.	1744 Jul 20 23:13	29°♑13'20	18.76122 AU
direct	1744 Oct 06 13:37	27°♑13'21	
	1744 Dec 31 05:18	0°♒	
conjunction	1745 Jan 21 00:59	1°♒12'12	0°-33'-3
minimum elong	1745 Jan 21 00:59	1°♒12'12	0°33'05
max. Earth dist.	1745 Jan 21 22:27	1°♒15'21	20.78695 AU
retrograde	1745 May 09 15:06	5°♒14'55	
min. Earth dist.	1745 Jul 25 11:31	3°♒18'15	18.81226 AU
opposition	1745 Jul 26 08:02	3°♒16'12	0°-37'-42
direct	1745 Oct 10 23:22	1°♒18'35	
conjunction	1746 Jan 25 06:46	5°♒16'27	0°-35'-3
minimum elong	1746 Jan 25 06:45	5°♒16'27	0°35'04
max. Earth dist.	1746 Jan 26 04:09	5°♒19'34	20.83631 AU
retrograde	1746 May 14 01:27	9°♒18'47	
opposition	1746 Jul 30 19:46	7°♒20'08	0°-39'-47
min. Earth dist.	1746 Jul 29 21:59	7°♒22'19	18.85980 AU
direct	1746 Oct 15 08:34	5°♒22'48	
conjunction	1747 Jan 29 12:32	9°♒19'46	0°-36'-52
minimum elong	1747 Jan 29 12:32	9°♒19'46	0°36'52
max. Earth dist.	1747 Jan 30 11:17	9°♒23'05	20.88167 AU
retrograde	1747 May 18 09:54	13°♒21'44	
min. Earth dist.	1747 Aug 03 09:25	11°♒25'18	18.90300 AU
opposition	1747 Aug 04 06:54	11°♒23'10	0°-41'-41
direct	1747 Oct 19 17:09	9°♒26'05	
conjunction	1748 Feb 02 17:58	13°♒22'12	0°-38'-29
minimum elong	1748 Feb 02 17:58	13°♒22'12	0°38'30
max. Earth dist.	1748 Feb 03 16:07	13°♒25'25	20.92258 AU
retrograde	1748 May 21 19:48	17°♒23'51	
opposition	1748 Aug 07 17:39	15°♒25'18	0°-43'-22
min. Earth dist.	1748 Aug 06 19:21	15°♒27'31	18.94153 AU
direct	1748 Oct 23 01:35	13°♒28'25	
conjunction	1749 Feb 05 23:11	17°♒23'45	0°-39'-55
minimum elong	1749 Feb 05 23:11	17°♒23'45	0°39'55
max. Earth dist.	1749 Feb 06 22:27	17°♒27'08	20.95845 AU
retrograde	1749 May 26 03:38	21°♒25'07	
min. Earth dist.	1749 Aug 11 06:05	19°♒28'45	18.97482 AU
opposition	1749 Aug 12 04:01	19°♒26'34	0°-44'-50
direct	1749 Oct 27 09:06	17°♒29'51	
conjunction	1750 Feb 10 04:14	21°♒24'27	0°-41'-9
minimum elong	1750 Feb 10 04:13	21°♒24'27	0°41'10
max. Earth dist.	1750 Feb 11 02:40	21°♒27'42	20.98923 AU
retrograde	1750 May 30 13:02	25°♒25'34	
opposition	1750 Aug 16 13:39	23°♒26'57	0°-46'-4
min. Earth dist.	1750 Aug 15 15:17	23°♒29'10	19.00310 AU
direct	1750 Oct 31 16:58	21°♒30'20	
conjunction	1751 Feb 14 09:08	25°♒24'17	0°-42'-10
minimum elong	1751 Feb 14 09:08	25°♒24'17	0°42'10
max. Earth dist.	1751 Feb 15 08:37	25°♒27'40	21.01493 AU

retrograde	1751 Jun 03 20:21	29°♒25’11	
opposition	1751 Aug 20 22:54	27°♒26’29	0°-47’-4
min. Earth dist.	1751 Aug 20 00:55	27°♒28’41	19.02639 AU
direct	1751 Nov 04 23:34	25°♒29’57	
conjunction	1752 Feb 18 13:41	29°♒23’19	0°-42’-59
minimum elong	1752 Feb 18 13:41	29°♒23’19	0°43’00
max. Earth dist.	1752 Feb 19 12:26	29°♒26’35	21.03603 AU
	1752 Feb 29 05:18	0°♓	
retrograde	1752 Jun 07 05:00	3°♓24’04	
min. Earth dist.	1752 Aug 23 09:18	1°♓27’30	19.04542 AU
opposition	1752 Aug 24 07:41	1°♓25’16	0°-47’-51
	1752 Oct 03 04:49	30°♒	
direct	1752 Nov 08 06:29	29°♒28’47	
	1752 Dec 13 10:00	0°♓	
conjunction	1753 Feb 21 18:21	3°♓21’40	0°-43’-35
minimum elong	1753 Feb 21 18:20	3°♓21’40	0°43’36
max. Earth dist.	1753 Feb 22 18:15	3°♓25’06	21.05295 AU
retrograde	1753 Jun 11 12:17	7°♓22’20	
opposition	1753 Aug 28 16:04	5°♓23’26	0°-48’-23
min. Earth dist.	1753 Aug 27 17:56	5°♓25’38	19.06042 AU
direct	1753 Nov 12 12:38	3°♓27’00	
conjunction	1754 Feb 25 22:51	7°♓19’30	0°-43’-58
minimum elong	1754 Feb 25 22:51	7°♓19’30	0°43’59
max. Earth dist.	1754 Feb 26 21:55	7°♓22’48	21.06615 AU
retrograde	1754 Jun 15 20:46	11°♓20’09	
min. Earth dist.	1754 Sep 01 01:45	9°♓23’23	19.07181 AU
opposition	1754 Sep 02 00:07	9°♓21’09	0°-48’-42
direct	1754 Nov 16 17:58	7°♓24’46	
conjunction	1755 Mar 02 03:35	11°♓17’00	0°-44’-9
minimum elong	1755 Mar 02 03:35	11°♓17’00	0°44’10
max. Earth dist.	1755 Mar 03 03:36	11°♓20’26	21.07557 AU
retrograde	1755 Jun 20 03:56	15°♓17’41	
min. Earth dist.	1755 Sep 05 09:41	13°♓20’51	19.07937 AU
opposition	1755 Sep 06 07:43	13°♓18’38	0°-48’-47
direct	1755 Nov 20 23:49	11°♓22’19	
conjunction	1756 Mar 05 08:17	15°♓14’22	0°-44’-7
minimum elong	1756 Mar 05 08:17	15°♓14’22	0°44’07
max. Earth dist.	1756 Mar 06 07:12	15°♓17’38	21.08138 AU
retrograde	1756 Jun 23 12:46	19°♓15’12	
opposition	1756 Sep 09 15:16	17°♓16’05	0°-48’-38
min. Earth dist.	1756 Sep 08 17:16	17°♓18’17	19.08332 AU
direct	1756 Nov 24 04:03	15°♓19’48	
conjunction	1757 Mar 09 13:13	19°♓11’47	0°-43’-53
minimum elong	1757 Mar 09 13:13	19°♓11’47	0°43’54
max. Earth dist.	1757 Mar 10 12:55	19°♓15’10	21.08334 AU
retrograde	1757 Jun 27 20:15	23°♓12’48	
opposition	1757 Sep 13 22:38	21°♓13’39	0°-48’-15
min. Earth dist.	1757 Sep 13 01:07	21°♓15’49	19.08322 AU
direct	1757 Nov 28 09:37	19°♓17’27	
conjunction	1758 Mar 13 18:28	23°♓09’26	0°-43’-26
minimum elong	1758 Mar 13 18:28	23°♓09’26	0°43’26
max. Earth dist.	1758 Mar 14 16:44	23°♓12’37	21.08127 AU
retrograde	1758 Jul 02 05:48	27°♓10’43	
min. Earth dist.	1758 Sep 17 08:48	25°♓13’38	19.07900 AU
opposition	1758 Sep 18 05:45	25°♓11’32	0°-47’-38
direct	1758 Dec 02 13:48	23°♓15’20	
conjunction	1759 Mar 18 00:11	27°♓07’28	0°-42’-47
minimum elong	1759 Mar 18 00:11	27°♓07’28	0°42’49
max. Earth dist.	1759 Mar 18 22:48	27°♓10’42	21.07472 AU
	1759 May 13 00:33	0°♈	
retrograde	1759 Jul 06 13:42	1°♈09’04	
	1759 Sep 01 01:40	30°♓	
opposition	1759 Sep 22 12:52	29°♓09’51	0°-46’-48
min. Earth dist.	1759 Sep 21 16:44	29°♓11’53	19.07001 AU
direct	1759 Dec 06 18:48	27°♓13’41	
	1760 Mar 01 18:00	0°♈	
conjunction	1760 Mar 21 06:03	1°♈06’01	0°-41’-56
minimum elong	1760 Mar 21 06:03	1°♈06’01	0°41’57
max. Earth dist.	1760 Mar 22 02:51	1°♈08’59	21.06335 AU
retrograde	1760 Jul 09 23:52	5°♈08’00	
opposition	1760 Sep 25 20:05	3°♈08’43	0°-45’-45
min. Earth dist.	1760 Sep 25 00:54	3°♈10’39	19.05606 AU
direct	1760 Dec 09 23:44	1°♈12’31	
conjunction	1761 Mar 25 12:41	5°♈05’10	0°-40’-52
minimum elong	1761 Mar 25 12:41	5°♈05’10	0°40’53
max. Earth dist.	1761 Mar 26 09:26	5°♈08’08	21.04663 AU
retrograde	1761 Jul 14 08:11	9°♈07’33	
min. Earth dist.	1761 Sep 29 09:05	7°♈10’01	19.03651 AU
opposition	1761 Sep 30 03:11	7°♈08’12	0°-44’-28
direct	1761 Dec 14 04:40	5°♈11’55	
conjunction	1762 Mar 29 19:41	9°♈04’56	0°-39’-36
minimum elong	1762 Mar 29 19:41	9°♈04’56	0°39’37
max. Earth dist.	1762 Mar 30 14:06	9°♈07’34	21.02435 AU
retrograde	1762 Jul 18 18:24	13°♈07’47	
opposition	1762 Oct 04 10:24	11°♈08’17	0°-42’-57
min. Earth dist.	1762 Oct 03 17:42	11°♈09’59	19.01133 AU
direct	1762 Dec 18 10:23	9°♈11’52	
conjunction	1763 Apr 03 03:13	13°♈05’21	0°-38’-8
minimum elong	1763 Apr 03 03:13	13°♈05’21	0°38’09
max. Earth dist.	1763 Apr 03 21:20	13°♈07’56	20.99631 AU
retrograde	1763 Jul 23 03:03	17°♈08’38	
opposition	1763 Oct 08 17:31	15°♈09’00	0°-41’-14
min. Earth dist.	1763 Oct 08 01:54	15°♈10’35	18.98048 AU
direct	1763 Dec 22 16:05	13°♈12’24	
conjunction	1764 Apr 06 11:03	17°♈06’22	0°-36’-29
minimum elong	1764 Apr 06 11:03	17°♈06’22	0°36’31
max. Earth dist.	1764 Apr 07 02:49	17°♈08’37	20.96308 AU
retrograde	1764 Jul 26 12:43	21°♈10’11	
min. Earth dist.	1764 Oct 11 10:38	19°♈11’47	18.94486 AU
opposition	1764 Oct 12 00:47	19°♈10’20	0°-39’-18
direct	1764 Dec 25 21:58	17°♈13’31	
conjunction	1765 Apr 10 19:28	21°♈08’05	0°-34’-38
minimum elong	1765 Apr 10 19:28	21°♈08’05	0°34’39
max. Earth dist.	1765 Apr 11 11:04	21°♈10’19	20.92521 AU
retrograde	1765 Jul 30 22:25	25°♈12’26	
opposition	1765 Oct 16 08:01	23°♈12’23	0°-37’-10
min. Earth dist.	1765 Oct 15 18:50	23°♈13’44	18.90483 AU
direct	1765 Dec 30 04:29	21°♈15’19	
conjunction	1766 Apr 15 04:23	25°♈10’33	0°-32’-37
minimum elong	1766 Apr 15 04:23	25°♈10’33	0°32’38
max. Earth dist.	1766 Apr 15 17:35	25°♈12’26	20.88340 AU
retrograde	1766 Aug 04 07:42	29°♈15’29	
opposition	1766 Oct 20 15:18	27°♈15’13	0°-34’-51
min. Earth dist.	1766 Oct 20 03:41	27°♈16’25	18.86128 AU
direct	1767 Jan 03 10:19	25°♈17’52	
conjunction	1767 Apr 19 14:01	29°♈13’53	0°-30’-25
minimum elong	1767 Apr 19 14:01	29°♈13’53	0°30’26
max. Earth dist.	1767 Apr 20 03:04	29°♈15’45	20.83819 AU

	1767 May 03 00:40	0°♉		
retrograde	1767 Aug 08 18:22	3°♉19’26		
opposition	1767 Oct 24 22:49	1°♉18’59	0°-32’-20	
min. Earth dist.	1767 Oct 24 11:59	1°♉20’06	18.81453 AU	
	1767 Nov 29 00:33	30°♈		
direct	1768 Jan 07 17:33	29°♈21’22		
	1768 Feb 15 13:10	0°♉		
conjunction	1768 Apr 22 23:58	3°♉18’13	0°-28’-4	
minimum elong	1768 Apr 22 23:58	3°♉18’13	0°28’05	
max. Earth dist.	1768 Apr 23 10:39	3°♉19’45	20.79019 AU	
retrograde	1768 Aug 12 04:26	7°♉24’28		
opposition	1768 Oct 28 06:42	5°♉23’49	0°-29’-39	
min. Earth dist.	1768 Oct 27 21:25	5°♉24’47	18.76527 AU	
direct	1769 Jan 10 23:44	3°♉25’55		
conjunction	1769 Apr 27 11:00	7°♉23’43	0°-25’-34	
minimum elong	1769 Apr 27 11:00	7°♉23’43	0°25’35	
max. Earth dist.	1769 Apr 27 21:27	7°♉25’13	20.73972 AU	
retrograde	1769 Aug 16 16:02	11°♉30’40		
opposition	1769 Nov 01 14:41	9°♉29’53	0°-26’-49	
min. Earth dist.	1769 Nov 01 06:10	9°♉30’46	18.71361 AU	
direct	1770 Jan 15 07:37	7°♉31’42		
conjunction	1770 May 01 22:38	11°♉30’32	0°-22’-56	
minimum elong	1770 May 01 22:38	11°♉30’32	0°22’56	
max. Earth dist.	1770 May 02 06:29	11°♉31’39	20.68710 AU	
retrograde	1770 Aug 21 03:39	15°♉38’16		
opposition	1770 Nov 05 23:12	13°♉37’19	0°-23’-49	
min. Earth dist.	1770 Nov 05 16:28	13°♉38’01	18.65995 AU	
direct	1771 Jan 19 14:28	11°♉38’51		
conjunction	1771 May 06 11:07	15°♉38’49	0°-20’-9	
minimum elong	1771 May 06 11:07	15°♉38’49	0°20’11	
max. Earth dist.	1771 May 06 18:40	15°♉39’54	20.63239 AU	
retrograde	1771 Aug 25 16:32	19°♉47’21		
opposition	1771 Nov 10 08:01	17°♉46’18	0°-20’-41	
min. Earth dist.	1771 Nov 10 02:03	17°♉46’55	18.60414 AU	
direct	1772 Jan 23 23:11	15°♉47’34		
conjunction	1772 May 10 00:24	19°♉48’43	0°-17’-15	
minimum elong	1772 May 10 00:24	19°♉48’43	0°17’16	
max. Earth dist.	1772 May 10 05:11	19°♉49’24	20.57568 AU	
retrograde	1772 Aug 29 05:35	23°♉58’07		
opposition	1772 Nov 13 17:23	21°♉56’57	0°-17’-24	
min. Earth dist.	1772 Nov 13 13:34	21°♉57’21	18.54638 AU	
direct	1773 Jan 27 07:04	19°♉57’56		
conjunction	1773 May 14 14:48	24°♉00’22	0°-14’-15	
minimum elong	1773 May 14 14:48	24°♉00’22	0°14’16	
behind sun begin	1773 May 14 11:48	23°♉59’57		
behind sun end	1773 May 14 17:49	24°♉00’48		
max. Earth dist.	1773 May 14 18:56	24°♉00’58	20.51676 AU	
retrograde	1773 Sep 02 20:10	28°♉10’38		
opposition	1773 Nov 18 03:12	26°♉09’23	0°-14’-1	
min. Earth dist.	1773 Nov 18 00:24	26°♉09’41	18.48616 AU	
direct	1774 Jan 31 17:08	24°♉10’04		
conjunction	1774 May 19 06:03	28°♉13’50	0°-11’-9	
minimum elong	1774 May 19 06:03	28°♉13’50	0°11’09	
behind sun begin	1774 May 19 01:06	28°♉13’08		
behind sun end	1774 May 19 10:59	28°♉14’32		
max. Earth dist.	1774 May 19 07:00	28°♉13’58	20.45529 AU	
	1774 Jun 19 10:49	0°♊		
retrograde	1774 Sep 07 10:14	2°♊24’59		
opposition	1774 Nov 22 13:36	0°♊23’37	0°-10’-32	
min. Earth dist.	1774 Nov 22 13:20	0°♊23’38	18.42343 AU	
	1774 Dec 01 23:27	30°♉		
direct	1775 Feb 05 02:26	28°♉23’57		
	1775 Apr 08 13:31	0°♊		
conjunction	1775 May 23 22:20	2°♊29’07	0°-7’-58	
minimum elong	1775 May 23 22:21	2°♊29’07	0°07’58	
behind sun begin	1775 May 23 16:20	2°♊28’15		
behind sun end	1775 May 24 04:21	2°♊29’58		
max. Earth dist.	1775 May 23 22:18	2°♊29’06	20.39125 AU	
retrograde	1775 Sep 12 02:20	6°♊41’07		
opposition	1775 Nov 27 00:32	4°♊39’38	0°-6’-57	
min. Earth dist.	1775 Nov 27 01:15	4°♊39’33	18.35808 AU	
direct	1776 Feb 09 14:17	2°♊39’36		
conjunction	1776 May 27 15:14	6°♊46’10	0°-4’-43	
minimum elong	1776 May 27 15:14	6°♊46’10	0°04’44	
behind sun begin	1776 May 27 08:39	6°♊45’13		
behind sun end	1776 May 27 21:50	6°♊47’06		
max. Earth dist.	1776 May 27 12:02	6°♊45’44	20.32479 AU	
retrograde	1776 Sep 15 17:13	10°♊59’04		
opposition	1776 Nov 30 12:10	8°♊57’24	0°-3’-18	
min. Earth dist.	1776 Nov 30 15:29	8°♊57’03	18.29060 AU	
direct	1777 Feb 13 01:04	6°♊56’58		
conjunction	1777 Jun 01 09:20	11°♊04’58	0°-1’-23	
minimum elong	1777 Jun 01 09:20	11°♊04’58	0°01’23	
behind sun begin	1777 Jun 01 02:34	11°♊04’00		
behind sun end	1777 Jun 01 16:06	11°♊05’57		
max. Earth dist.	1777 Jun 01 05:05	11°♊04’23	20.25645 AU	
retrograde	1777 Sep 20 10:43	15°♊18’44		
asc. node	1777 Oct 29 00:12	14°♊41’56		
opposition	1777 Dec 05 00:03	13°♊16’54	0°00’22	
min. Earth dist.	1777 Dec 05 04:15	13°♊16’27	18.22149 AU	
direct	1778 Feb 17 14:28	11°♊16’02		
conjunction	1778 Jun 06 04:07	15°♊25’31	0°02’03	
minimum elong	1778 Jun 06 04:06	15°♊25’31	0°02’02	
behind sun begin	1778 Jun 05 21:20	15°♊24’33		
behind sun end	1778 Jun 06 10:52	15°♊26’30		
max. Earth dist.	1778 Jun 05 20:54	15°♊24’29	20.18684 AU	
retrograde	1778 Sep 25 02:36	19°♊40’08		
opposition	1778 Dec 09 12:45	17°♊38’08	0°04’05	
min. Earth dist.	1778 Dec 09 19:29	17°♊37’25	18.15165 AU	
direct	1779 Feb 22 02:44	15°♊36’49		
conjunction	1779 Jun 10 23:36	19°♊47’48	0°05’24	
minimum elong	1779 Jun 10 23:36	19°♊47’48	0°05’24	
behind sun begin	1779 Jun 10 17:05	19°♊46’51		
behind sun end	1779 Jun 11 06:08	19°♊48’44		
max. Earth dist.	1779 Jun 10 15:32	19°♊46’37	20.11690 AU	
retrograde	1779 Sep 29 21:10	24°♊03’16		
opposition	1779 Dec 14 01:52	22°♊01’06	0°07’48	
min. Earth dist.	1779 Dec 14 09:06	22°♊00’19	18.08177 AU	
direct	1780 Feb 26 17:14	19°♊59’20		
conjunction	1780 Jun 14 19:56	24°♊11’50	0°08’43	
minimum elong	1780 Jun 14 19:57	24°♊11’50	0°08’43	
behind sun begin	1780 Jun 14 14:07	24°♊10’59		
behind sun end	1780 Jun 15 01:47	24°♊12’41		
max. Earth dist.	1780 Jun 14 09:24	24°♊10’17	20.04727 AU	
retrograde	1780 Oct 03 14:23	28°♊28’10		
opposition	1780 Dec 17 15:40	26°♊25’49	0°11’29	
min. Earth dist.	1780 Dec 18 01:16	26°♊24’47	18.01272 AU	
direct	1781 Mar 02 07:05	24°♊23’36		
conjunction	1781 Jun 19 17:14	28°♊37’39	0°12’00	
minimum elong	1781 Jun 19 17:14	28°♊37’39	0°12’00	

behind sun begin	1781 Jun	19	12:42	28°♊36’59	
behind sun end	1781 Jun	19	21:47	28°♊38’19	
max. Earth dist.	1781 Jun	19	05:41	28°♊35’56	19.97885 AU
	1781 Jul	12	23:58	0°♋	
retrograde	1781 Oct	08	09:51	2°♋54’48	
opposition	1781 Dec	22	06:03	0°♋52’19	0°15’07
min. Earth dist.	1781 Dec	22	15:56	0°♋51’15	17.94507 AU
	1782 Jan	12	03:31	30°♊	
direct	1782 Mar	06	23:03	28°♊49’41	
	1782 Apr	28	12:13	0°♋	
conjunction	1782 Jun	24	15:12	3°♋05’17	0°15’15
minimum elong	1782 Jun	24	15:12	3°♋05’17	0°15’15
behind sun begin	1782 Jun	24	13:28	3°♋05’01	
behind sun end	1782 Jun	24	16:55	3°♋05’32	
max. Earth dist.	1782 Jun	24	01:41	3°♋03’15	19.91205 AU
retrograde	1782 Oct	13	04:03	7°♋23’15	
opposition	1782 Dec	26	21:14	5°♋20’39	0°18’42
min. Earth dist.	1782 Dec	27	09:14	5°♋19’21	17.87950 AU
direct	1783 Mar	11	14:36	3°♋17’37	
conjunction	1783 Jun	29	14:00	7°♋34’46	0°18’25
minimum elong	1783 Jun	29	14:00	7°♋34’46	0°18’24
max. Earth dist.	1783 Jun	28	23:24	7°♋32’34	19.84777 AU
retrograde	1783 Oct	18	00:28	11°♋53’32	
opposition	1783 Dec	31	13:00	9°♋50’51	0°22’11
min. Earth dist.	1784 Jan	01	01:05	9°♋49’32	17.81659 AU
direct	1784 Mar	15	08:25	7°♋47’28	
conjunction	1784 Jul	03	13:35	12°♋06’10	0°21’29
minimum elong	1784 Jul	03	13:35	12°♋06’10	0°21’30
max. Earth dist.	1784 Jul	02	21:35	12°♋03’45	19.78621 AU
retrograde	1784 Oct	21	19:55	16°♋25’42	
opposition	1785 Jan	04	05:43	14°♋22’59	0°25’33
min. Earth dist.	1785 Jan	04	19:51	14°♋21’27	17.75656 AU
direct	1785 Mar	20	02:02	12°♋19’17	
conjunction	1785 Jul	08	14:05	16°♋39’30	0°24’27
minimum elong	1785 Jul	08	14:05	16°♋39’30	0°24’27
max. Earth dist.	1785 Jul	07	20:38	16°♋36’52	19.72770 AU
retrograde	1785 Oct	26	17:15	20°♋59’48	
opposition	1786 Jan	08	22:56	18°♋57’04	0°28’47
min. Earth dist.	1786 Jan	09	13:18	18°♋55’31	17.69951 AU
direct	1786 Mar	24	21:54	16°♋53’04	
conjunction	1786 Jul	13	15:25	21°♋14’48	0°27’17
minimum elong	1786 Jul	13	15:25	21°♋14’48	0°27’17
max. Earth dist.	1786 Jul	12	20:58	21°♋11’59	19.67196 AU
retrograde	1786 Oct	31	14:10	25°♋35’47	
opposition	1787 Jan	13	17:14	23°♋33’05	0°31’52
min. Earth dist.	1787 Jan	14	09:35	23°♋31’18	17.64525 AU
direct	1787 Mar	29	17:25	21°♋28’47	
conjunction	1787 Jul	18	17:12	25°♋51’56	0°29’58
minimum elong	1787 Jul	18	17:12	25°♋51’56	0°29’58
max. Earth dist.	1787 Jul	17	20:56	25°♋48’50	19.61908 AU
	1787 Oct	14	06:13	0°♌	
retrograde	1787 Nov	05	12:57	0°♌13’36	
	1787 Nov	27	23:55	30°♋	
opposition	1788 Jan	18	12:09	28°♋10’52	0°34’46
min. Earth dist.	1788 Jan	19	04:51	28°♋09’03	17.59375 AU
direct	1788 Apr	02	15:28	26°♋06’17	
	1788 Jul	14	11:06	0°♌	
conjunction	1788 Jul	22	19:57	0°♌30’49	0°32’28
minimum elong	1788 Jul	22	19:57	0°♌30’49	0°32’27
max. Earth dist.	1788 Jul	21	23:03	0°♌27’37	19.56873 AU
retrograde	1788 Nov	09	10:59	4°♌53’01	
opposition	1789 Jan	22	07:51	2°♌50’19	0°37’28
min. Earth dist.	1789 Jan	23	02:22	2°♌48’18	17.54481 AU
direct	1789 Apr	07	12:34	0°♌45’25	
conjunction	1789 Jul	27	23:08	5°♌11’14	0°34’46
minimum elong	1789 Jul	27	23:08	5°♌11’14	0°34’46
max. Earth dist.	1789 Jul	27	00:04	5°♌07’41	19.52121 AU
retrograde	1789 Nov	14	10:54	9°♌33’57	
opposition	1790 Jan	27	04:15	7°♌31’12	0°39’55
min. Earth dist.	1790 Jan	27	23:12	7°♌29’08	17.49881 AU
direct	1790 Apr	12	12:08	5°♌26’01	
max. Earth dist.	1790 Aug	01	03:43	9°♌49’27	19.47666 AU
conjunction	1790 Aug	02	02:46	9°♌53’01	0°36’52
minimum elong	1790 Aug	02	02:45	9°♌53’01	0°36’51
retrograde	1790 Nov	19	09:59	14°♌16’08	
opposition	1791 Feb	01	01:23	12°♌13’23	0°42’07
min. Earth dist.	1791 Feb	01	21:33	12°♌11’11	17.45600 AU
direct	1791 Apr	17	11:01	10°♌07’55	
max. Earth dist.	1791 Aug	06	05:39	14°♌32’06	19.43576 AU
conjunction	1791 Aug	07	06:36	14°♌35’58	0°38’42
minimum elong	1791 Aug	07	06:36	14°♌35’58	0°38’42
retrograde	1791 Nov	24	10:04	18°♌59’27	
opposition	1792 Feb	05	22:56	16°♌56’39	0°44’03
min. Earth dist.	1792 Feb	06	19:32	16°♌54’24	17.41720 AU
direct	1792 Apr	21	11:23	14°♌50’54	
max. Earth dist.	1792 Aug	10	10:30	19°♌16’09	19.39900 AU
conjunction	1792 Aug	11	10:53	19°♌19’56	0°40’17
minimum elong	1792 Aug	11	10:53	19°♌19’56	0°40’18
retrograde	1792 Nov	28	10:03	23°♌43’40	
opposition	1793 Feb	09	21:12	21°♌40’52	0°45’41
min. Earth dist.	1793 Feb	10	18:21	21°♌38’33	17.38266 AU
direct	1793 Apr	26	12:02	19°♌34’51	
conjunction	1793 Aug	16	15:08	24°♌04’44	0°41’36
minimum elong	1793 Aug	16	15:08	24°♌04’44	0°41’36
max. Earth dist.	1793 Aug	15	13:17	24°♌00’43	19.36689 AU
retrograde	1793 Dec	03	09:52	28°♌28’40	
opposition	1794 Feb	14	19:55	26°♌25’51	0°47’00
min. Earth dist.	1794 Feb	15	17:24	26°♌23’29	17.35324 AU
direct	1794 May	01	12:54	24°♌19’37	
conjunction	1794 Aug	21	19:33	28°♌50’14	0°42’38
minimum elong	1794 Aug	21	19:33	28°♌50’14	0°42’39
max. Earth dist.	1794 Aug	20	18:48	28°♌46’22	19.34015 AU
	1794 Sep	09	14:06	0°♍	
retrograde	1794 Dec	08	10:38	3°♍14’16	
opposition	1795 Feb	19	19:11	1°♍11’27	0°48’00
min. Earth dist.	1795 Feb	20	16:23	1°♍09’07	17.32935 AU
	1795 Mar	20	16:06	30°♌	
direct	1795 May	06	15:13	29°♌05’03	
	1795 Jun	21	15:57	0°♍	
conjunction	1795 Aug	26	23:40	3°♍36’15	0°43’23
minimum elong	1795 Aug	26	23:40	3°♍36’15	0°43’23
max. Earth dist.	1795 Aug	25	22:15	3°♍32’17	19.31928 AU
retrograde	1795 Dec	13	09:52	8°♍00’22	
opposition	1796 Feb	24	18:55	5°♍57’34	0°48’40
min. Earth dist.	1796 Feb	25	16:19	5°♍55’13	17.31172 AU
direct	1796 May	10	16:27	3°♍51’03	
max. Earth dist.	1796 Aug	30	03:47	8°♍18’56	19.30484 AU
conjunction	1796 Aug	31	03:58	8°♍22’44	0°43’49
minimum elong	1796 Aug	31	03:58	8°♍22’44	0°43’48

retrograde	1796 Dec 17	10:53	12°♍46’48		
opposition	1797 Feb 28	18:56	10°♍44’05	0°48’59	
min. Earth dist.	1797 Mar 01	15:22	10°♍41’51	17.30049	AU
direct	1797 May 15	20:22	8°♍37’32		
max. Earth dist.	1797 Sep 04	07:55	13°♍05’47	19.29696	AU
conjunction	1797 Sep 05	08:03	13°♍09’34	0°43’58	
minimum elong	1797 Sep 05	08:03	13°♍09’34	0°43’58	
retrograde	1797 Dec 22	09:44	17°♍33’34		
opposition	1798 Mar 05	19:32	15°♍30’57	0°48’59	
min. Earth dist.	1798 Mar 06	16:09	15°♍28’42	17.29601	AU
direct	1798 May 20	22:23	13°♍24’26		
conjunction	1798 Sep 10	11:47	17°♍56’41	0°43’48	
minimum elong	1798 Sep 10	11:47	17°♍56’41	0°43’48	
max. Earth dist.	1798 Sep 09	12:50	17°♍53’04	19.29579	AU
retrograde	1798 Dec 27	10:56	22°♍20’32		
opposition	1799 Mar 10	20:23	20°♍18’05	0°48’39	
min. Earth dist.	1799 Mar 11	15:32	20°♍15’59	17.29791	AU
direct	1799 May 26	03:38	18°♍11’38		
conjunction	1799 Sep 15	15:24	22°♍43’58	0°43’21	
minimum elong	1799 Sep 15	15:24	22°♍43’58	0°43’21	
max. Earth dist.	1799 Sep 14	17:12	22°♍40’29	19.30076	AU
retrograde	1800 Jan 01	09:42	27°♍07’36		
opposition	1800 Mar 15	21:29	25°♍05’19	0°47’58	
min. Earth dist.	1800 Mar 16	17:02	25°♍03’12	17.30586	AU
direct	1800 May 31	05:59	22°♍58’59		
conjunction	1800 Sep 20	18:43	27°♍31’16	0°42’35	
minimum elong	1800 Sep 20	18:43	27°♍31’16	0°42’35	
max. Earth dist.	1800 Sep 19	21:09	27°♍27’52	19.31154	AU
	1800 Nov 01	08:10	0°♎		
retrograde	1801 Jan 06	11:07	1°♎54’35		
	1801 Mar 18	01:38	30°♍		
opposition	1801 Mar 20	22:53	29°♍52’29	0°46’57	
min. Earth dist.	1801 Mar 21	16:48	29°♍50’32	17.31917	AU
direct	1801 Jun 05	11:20	27°♍46’17		
	1801 Aug 18	13:55	0°♎		
conjunction	1801 Sep 25	21:38	2°♎18’20	0°41’32	
minimum elong	1801 Sep 25	21:38	2°♎18’20	0°41’32	
max. Earth dist.	1801 Sep 25	01:23	2°♎15’09	19.32733	AU
retrograde	1802 Jan 11	10:20	6°♎41’16		
opposition	1802 Mar 26	00:40	4°♎39’20	0°45’37	
min. Earth dist.	1802 Mar 26	18:52	4°♎37’22	17.33741	AU
direct	1802 Jun 10	14:05	2°♎33’17		
conjunction	1802 Sep 30	23:57	7°♎04’57	0°40’11	
minimum elong	1802 Sep 30	23:58	7°♎04’57	0°40’12	
max. Earth dist.	1802 Sep 30	04:03	7°♎01’48	19.34797	AU
retrograde	1803 Jan 16	11:12	11°♎27’24		
opposition	1803 Mar 31	02:18	9°♎25’38	0°43’58	
min. Earth dist.	1803 Mar 31	18:40	9°♎23’51	17.36023	AU
direct	1803 Jun 15	18:31	7°♎19’44		
max. Earth dist.	1803 Oct 05	07:44	11°♎48’01	19.37290	AU
conjunction	1803 Oct 06	01:47	11°♎50’52	0°38’35	
minimum elong	1803 Oct 06	01:47	11°♎50’52	0°38’34	
retrograde	1804 Jan 21	10:14	16°♎12’45		
opposition	1804 Apr 04	04:07	14°♎11’07	0°42’01	
min. Earth dist.	1804 Apr 04	20:34	14°♎09’20	17.38718	AU
direct	1804 Jun 19	21:17	12°♎05’23		
max. Earth dist.	1804 Oct 09	08:55	16°♎33’00	19.40194	AU
conjunction	1804 Oct 10	02:50	16°♎35’50	0°36’42	
minimum elong	1804 Oct 10	02:50	16°♎35’50	0°36’42	

retrograde	1805 Jan 25	09:56	20°♎57’06		
opposition	1805 Apr 09	05:38	18°♎55’34	0°39’46	
min. Earth dist.	1805 Apr 09	20:11	18°♎54’00	17.41814	AU
direct	1805 Jun 25	01:14	16°♎50’00		
max. Earth dist.	1805 Oct 14	11:43	21°♎17’12	19.43490	AU
conjunction	1805 Oct 15	03:17	21°♎19’39	0°34’35	
minimum elong	1805 Oct 15	03:17	21°♎19’39	0°34’35	
retrograde	1806 Jan 30	07:54	25°♎40’12		
opposition	1806 Apr 14	07:14	23°♎38’47	0°37’16	
min. Earth dist.	1806 Apr 14	21:20	23°♎37’17	17.45301	AU
direct	1806 Jun 30	04:32	21°♎33’25		
max. Earth dist.	1806 Oct 19	11:24	25°♎59’42	19.47186	AU
conjunction	1806 Oct 20	02:34	26°♎02’05	0°32’14	
minimum elong	1806 Oct 20	02:34	26°♎02’05	0°32’13	
	1807 Jan 07	02:50	0°♏		
retrograde	1807 Feb 04	05:47	0°♏21’55		
	1807 Mar 04	21:29	30°♎		
opposition	1807 Apr 19	08:22	28°♎20’34	0°34’32	
min. Earth dist.	1807 Apr 19	20:29	28°♎19’16	17.49193	AU
direct	1807 Jul 05	08:00	26°♎15’23		
	1807 Oct 13	14:02	0°♏		
conjunction	1807 Oct 25	01:14	0°♏43’00	0°29’41	
minimum elong	1807 Oct 25	01:14	0°♏43’00	0°29’41	
max. Earth dist.	1807 Oct 24	12:50	0°♏41’03	19.51282	AU
retrograde	1808 Feb 09	02:24	5°♏02’01		
opposition	1808 Apr 23	09:10	3°♏00’45	0°31’34	
min. Earth dist.	1808 Apr 23	20:18	2°♏59’34	17.53486	AU
direct	1808 Jul 09	11:12	0°♏55’48		
conjunction	1808 Oct 28	22:50	5°♏22’15	0°26’57	
minimum elong	1808 Oct 28	22:50	5°♏22’15	0°26’56	
max. Earth dist.	1808 Oct 28	11:10	5°♏20’26	19.55798	AU
retrograde	1809 Feb 12	22:52	9°♏40’27		
opposition	1809 Apr 28	09:42	7°♏39’16	0°28’26	
min. Earth dist.	1809 Apr 28	18:47	7°♏38’18	17.58224	AU
direct	1809 Jul 14	13:28	5°♏34’33		
conjunction	1809 Nov 02	19:30	9°♏59’47	0°24’03	
minimum elong	1809 Nov 02	19:30	9°♏59’47	0°24’03	
max. Earth dist.	1809 Nov 02	10:55	9°♏58’27	19.60757	AU
retrograde	1810 Feb 17	18:28	14°♏17’08		
opposition	1810 May 03	09:55	12°♏16’05	0°25’07	
min. Earth dist.	1810 May 03	17:11	12°♏15’19	17.63393	AU
direct	1810 Jul 19	15:39	10°♏11’41		
conjunction	1810 Nov 07	15:14	14°♏35’36	0°21’02	
minimum elong	1810 Nov 07	15:14	14°♏35’36	0°21’02	
max. Earth dist.	1810 Nov 07	07:44	14°♏34’27	19.66153	AU
retrograde	1811 Feb 22	13:53	18°♏52’07		
opposition	1811 May 08	09:29	16°♏51’14	0°21’41	
min. Earth dist.	1811 May 08	14:54	16°♏50’39	17.69005	AU
direct	1811 Jul 24	15:39	14°♏47’10		
conjunction	1811 Nov 12	10:12	19°♏09’47	0°17’53	
minimum elong	1811 Nov 12	10:12	19°♏09’47	0°17’53	
max. Earth dist.	1811 Nov 12	05:32	19°♏09’04	19.71965	AU
retrograde	1812 Feb 27	08:50	23°♏25’25		
opposition	1812 May 12	08:40	21°♏24’44	0°18’07	
min. Earth dist.	1812 May 12	11:59	21°♏24’23	17.74979	AU
direct	1812 Jul 28	16:20	19°♏21’05		
conjunction	1812 Nov 16	04:05	23°♏42’18	0°14’39	
minimum elong	1812 Nov 16	04:05	23°♏42’18	0°14’40	
behind sun begin	1812 Nov 16	01:11	23°♏41’52		

behind sun end	1812 Nov 16 06:58	23°♏42’45	
max. Earth dist.	1812 Nov 16 00:42	23°♏41’48	19.78106 AU
retrograde	1813 Mar 03 03:04	27°♏57’07	
opposition	1813 May 17 07:28	25°♏56’38	0°14’28
min. Earth dist.	1813 May 17 09:18	25°♏56’26	17.81271 AU
direct	1813 Aug 02 14:26	23°♏53’24	
conjunction	1813 Nov 20 21:15	28°♏13’13	0°11’22
minimum elong	1813 Nov 20 21:15	28°♏13’13	0°11’21
behind sun begin	1813 Nov 20 16:24	28°♏12’29	
behind sun end	1813 Nov 21 02:06	28°♏13’56	
max. Earth dist.	1813 Nov 20 20:24	28°♏13’05	19.84528 AU
	1813 Dec 20 12:49	0°♐	
retrograde	1814 Mar 07 21:31	2°♐27’09	
opposition	1814 May 22 05:42	0°♐26’53	0°10’45
min. Earth dist.	1814 May 22 05:14	0°♐26’56	17.87787 AU
	1814 Jun 02 02:24	30°♏	
direct	1814 Aug 07 13:45	28°♏24’05	
	1814 Oct 09 01:05	0°♐	
conjunction	1814 Nov 25 13:23	2°♐42’27	0°08’01
minimum elong	1814 Nov 25 13:23	2°♐42’27	0°08’01
behind sun begin	1814 Nov 25 07:29	2°♐41’34	
behind sun end	1814 Nov 25 19:16	2°♐43’20	
max. Earth dist.	1814 Nov 25 13:56	2°♐42’31	19.91129 AU
retrograde	1815 Mar 12 14:25	6°♐55’32	
opposition	1815 May 27 03:27	4°♐55’29	0°06’59
min. Earth dist.	1815 May 27 02:01	4°♐55’38	17.94460 AU
direct	1815 Aug 12 09:38	2°♐53’06	
conjunction	1815 Nov 30 04:51	7°♐09’59	0°04’38
minimum elong	1815 Nov 30 04:50	7°♐09’59	0°04’38
behind sun begin	1815 Nov 29 22:24	7°♐09’02	
behind sun end	1815 Nov 30 11:16	7°♐10’57	
max. Earth dist.	1815 Nov 30 07:23	7°♐10’20	19.97848 AU
retrograde	1816 Mar 16 08:19	11°♐22’11	
opposition	1816 May 31 00:28	9°♐22’20	0°03’13
min. Earth dist.	1816 May 30 20:43	9°♐22’43	18.01197 AU
direct	1816 Aug 16 07:50	7°♐20’23	
conjunction	1816 Dec 03 19:26	11°♐35’46	0°01’13
minimum elong	1816 Dec 03 19:27	11°♐35’46	0°01’13
behind sun begin	1816 Dec 03 12:53	11°♐34’47	
behind sun end	1816 Dec 04 02:00	11°♐36’44	
max. Earth dist.	1816 Dec 03 23:26	11°♐36’20	20.04595 AU
retrograde	1817 Mar 20 23:49	15°♐47’06	
desc. node	1817 Apr 10 11:09	15°♐36’24	
opposition	1817 Jun 04 21:10	13°♐47’25	0°00’-33
min. Earth dist.	1817 Jun 04 16:44	13°♐47’52	18.07951 AU
direct	1817 Aug 21 02:05	11°♐45’51	
conjunction	1817 Dec 08 09:07	15°♐59’43	0°-2’-15
minimum elong	1817 Dec 08 09:07	15°♐59’43	0°02’16
behind sun begin	1817 Dec 08 02:34	15°♐58’45	
behind sun end	1817 Dec 08 15:40	16°♐00’41	
max. Earth dist.	1817 Dec 08 14:44	16°♐00’32	20.11332 AU
retrograde	1818 Mar 25 16:56	20°♐10’11	
opposition	1818 Jun 09 17:03	18°♐10’38	0°-4’-17
min. Earth dist.	1818 Jun 09 10:11	18°♐11’20	18.14649 AU
direct	1818 Aug 25 23:05	16°♐09’27	
conjunction	1818 Dec 12 22:04	20°♐21’47	0°-5’-37
minimum elong	1818 Dec 12 22:04	20°♐21’47	0°05’38
behind sun begin	1818 Dec 12 15:46	20°♐20’51	
behind sun end	1818 Dec 13 04:23	20°♐22’43	
max. Earth dist.	1818 Dec 13 05:12	20°♐22’50	20.17983 AU
retrograde	1819 Mar 30 06:58	24°♐31’23	
opposition	1819 Jun 14 12:10	22°♐31’55	0°-7’-59
min. Earth dist.	1819 Jun 14 04:56	22°♐32’39	18.21260 AU
direct	1819 Aug 30 16:00	20°♐31’04	
conjunction	1819 Dec 17 10:09	24°♐41’53	0°-8’-53
minimum elong	1819 Dec 17 10:09	24°♐41’53	0°08’54
behind sun begin	1819 Dec 17 04:30	24°♐41’03	
behind sun end	1819 Dec 17 15:48	24°♐42’43	
max. Earth dist.	1819 Dec 17 18:32	24°♐43’08	20.24544 AU
retrograde	1820 Apr 02 22:12	28°♐50’36	
opposition	1820 Jun 18 06:32	26°♐51’13	0°-11’-36
min. Earth dist.	1820 Jun 17 20:50	26°♐52’12	18.27759 AU
direct	1820 Sep 03 11:52	24°♐50’42	
conjunction	1820 Dec 20 21:13	28°♐59’58	0°-12’-6
minimum elong	1820 Dec 20 21:13	28°♐59’58	0°12’07
behind sun begin	1820 Dec 20 16:42	28°♐59’18	
behind sun end	1820 Dec 21 01:44	29°♐00’38	
max. Earth dist.	1820 Dec 21 07:28	29°♐01’30	20.30986 AU
	1821 Jan 06 14:47	0°♑	
retrograde	1821 Apr 07 11:00	3°♑07’51	
opposition	1821 Jun 23 00:21	1°♑08’29	0°-15’-7
min. Earth dist.	1821 Jun 22 14:10	1°♑09’31	18.34164 AU
	1821 Jul 22 21:09	30°♐	
direct	1821 Sep 08 03:37	29°♐08’16	
	1821 Oct 23 15:34	0°♑	
conjunction	1821 Dec 25 07:31	3°♑16’01	0°-15’-13
minimum elong	1821 Dec 25 07:30	3°♑16’01	0°15’13
behind sun begin	1821 Dec 25 05:07	3°♑15’40	
behind sun end	1821 Dec 25 09:53	3°♑16’22	
max. Earth dist.	1821 Dec 25 19:03	3°♑17’45	20.37354 AU
retrograde	1822 Apr 12 00:27	7°♑23’04	
opposition	1822 Jun 27 17:06	5°♑23’46	0°-18’-31
min. Earth dist.	1822 Jun 27 04:18	5°♑25’03	18.40499 AU
direct	1822 Sep 12 21:18	3°♑23’50	
conjunction	1822 Dec 29 17:01	7°♑30’08	0°-18’-14
minimum elong	1822 Dec 29 17:01	7°♑30’08	0°18’15
max. Earth dist.	1822 Dec 30 06:36	7°♑32’09	20.43646 AU
retrograde	1823 Apr 16 11:51	11°♑36’24	
opposition	1823 Jul 02 09:18	9°♑37’08	0°-21’-48
min. Earth dist.	1823 Jul 01 19:58	9°♑38’29	18.46769 AU
direct	1823 Sep 17 11:36	7°♑37’31	
conjunction	1824 Jan 03 01:46	11°♑42’24	0°-21’-7
minimum elong	1824 Jan 03 01:46	11°♑42’24	0°21’09
max. Earth dist.	1824 Jan 03 16:26	11°♑44’35	20.49883 AU
retrograde	1824 Apr 20 00:03	15°♑47’56	
min. Earth dist.	1824 Jul 05 08:39	13°♑50’21	18.52969 AU
opposition	1824 Jul 06 00:36	13°♑48’44	0°-24’-56
direct	1824 Sep 21 02:38	11°♑49’27	
conjunction	1825 Jan 06 09:59	15°♑53’00	0°-23’-52
minimum elong	1825 Jan 06 09:59	15°♑53’00	0°23’53
max. Earth dist.	1825 Jan 07 02:41	15°♑55’29	20.56030 AU
retrograde	1825 Apr 24 10:25	19°♑57’52	
opposition	1825 Jul 10 15:27	17°♑58’45	0°-27’-54
min. Earth dist.	1825 Jul 09 23:04	18°♑00’24	18.59069 AU
direct	1825 Sep 25 15:08	15°♑59’48	
conjunction	1826 Jan 10 17:28	20°♑02’04	0°-26’-29
minimum elong	1826 Jan 10 17:28	20°♑02’04	0°26’31
max. Earth dist.	1826 Jan 11 10:58	20°♑04’39	20.62066 AU
retrograde	1826 Apr 28 22:00	24°♑06’19	
min. Earth dist.	1826 Jul 14 10:50	22°♑09’10	18.65022 AU
opposition	1826 Jul 15 05:28	22°♑07’18	0°-30’-43

direct	1826 Sep 30	03:58	20°♉08'41		
conjunction	1827 Jan 15	00:39	24°♉09'45	0°-28'-58	
minimum elong	1827 Jan 15	00:38	24°♉09'45	0°28'58	
max. Earth dist.	1827 Jan 15	19:57	24°♉12'36	20.67909 AU	
retrograde	1827 May 03	07:25	28°♉13'24		
opposition	1827 Jul 19	18:50	26°♉14'30	0°-33'-21	
min. Earth dist.	1827 Jul 19	00:08	26°♉16'23	18.70757 AU	
direct	1827 Oct 04	14:43	24°♉16'15		
conjunction	1828 Jan 19	07:17	28°♉16'10	0°-31'-16	
minimum elong	1828 Jan 19	07:17	28°♉16'10	0°31'17	
max. Earth dist.	1828 Jan 20	02:56	28°♉19'03	20.73520 AU	
	1828 Feb 18	16:14	0°♒		
retrograde	1828 May 06	18:46	2°♒19'18		
min. Earth dist.	1828 Jul 22	11:11	0°♒22'33	18.76227 AU	
opposition	1828 Jul 23	07:41	0°♒20'30	0°-35'-48	
	1828 Jul 31	21:38	30°♉		
direct	1828 Oct 08	01:55	28°♉22'34		
	1828 Dec 10	14:58	0°♒		
conjunction	1829 Jan 22	13:31	2°♒21'25	0°-33'-24	
minimum elong	1829 Jan 22	13:31	2°♒21'25	0°33'25	
max. Earth dist.	1829 Jan 23	10:48	2°♒24'32	20.78817 AU	
retrograde	1829 May 11	03:22	6°♒24'06		
opposition	1829 Jul 27	20:07	4°♒25'23	0°-38'-4	
min. Earth dist.	1829 Jul 26	23:46	4°♒27'25	18.81355 AU	
direct	1829 Oct 12	11:31	2°♒27'45		
conjunction	1830 Jan 26	19:28	6°♒25'36	0°-35'-22	
minimum elong	1830 Jan 26	19:28	6°♒25'36	0°35'23	
max. Earth dist.	1830 Jan 27	16:42	6°♒28'42	20.83756 AU	
retrograde	1830 May 15	14:21	10°♒27'52		
min. Earth dist.	1830 Jul 31	10:08	8°♒31'22	18.86094 AU	
opposition	1830 Aug 01	07:43	8°♒29'13	0°-40'-8	
direct	1830 Oct 16	21:16	6°♒31'51		
conjunction	1831 Jan 31	01:16	10°♒28'48	0°-37'-9	
minimum elong	1831 Jan 31	01:16	10°♒28'48	0°37'10	
max. Earth dist.	1831 Jan 31	23:39	10°♒32'03	20.88257 AU	
retrograde	1831 May 19	22:07	14°♒30'40		
opposition	1831 Aug 05	19:00	12°♒32'04	0°-41'-59	
min. Earth dist.	1831 Aug 04	21:53	12°♒34'10	18.90363 AU	
direct	1831 Oct 21	05:58	10°♒34'56		
conjunction	1832 Feb 04	06:35	14°♒31'00	0°-38'-45	
minimum elong	1832 Feb 04	06:35	14°♒31'00	0°38'45	
max. Earth dist.	1832 Feb 05	04:31	14°♒34'11	20.92285 AU	
retrograde	1832 May 23	08:14	18°♒32'33		
min. Earth dist.	1832 Aug 08	07:38	16°♒36'08	18.94145 AU	
opposition	1832 Aug 09	05:43	16°♒33'57	0°-43'-38	
direct	1832 Oct 24	14:30	14°♒37'00		
conjunction	1833 Feb 07	11:49	18°♒32'16	0°-40'-8	
minimum elong	1833 Feb 07	11:49	18°♒32'16	0°40'09	
max. Earth dist.	1833 Feb 08	10:49	18°♒35'36	20.95811 AU	
retrograde	1833 May 27	15:26	22°♒33'31		
opposition	1833 Aug 13	15:57	20°♒34'52	0°-45'-3	
min. Earth dist.	1833 Aug 12	18:22	20°♒37'01	18.97429 AU	
direct	1833 Oct 28	22:28	18°♒38'05		
conjunction	1834 Feb 11	16:39	22°♒32'36	0°-41'-19	
minimum elong	1834 Feb 11	16:39	22°♒32'36	0°41'20	
max. Earth dist.	1834 Feb 12	15:06	22°♒35'50	20.98865 AU	
retrograde	1834 Jun 01	00:38	26°♒33'36		
min. Earth dist.	1834 Aug 17	03:13	24°♒37'07	19.00257 AU	
opposition	1834 Aug 18	01:33	24°♒34'54	0°-46'-14	
direct	1834 Nov 02	05:31	22°♒38'11		
conjunction	1835 Feb 15	21:23	26°♒32'04	0°-42'-18	
minimum elong	1835 Feb 15	21:23	26°♒32'04	0°42'20	
max. Earth dist.	1835 Feb 16	20:54	26°♒35'28	21.01463 AU	
	1835 Apr 29	09:50	0°♓		
retrograde	1835 Jun 05	07:22	0°♓32'51		
	1835 Jul 13	06:05	30°♒		
opposition	1835 Aug 22	10:36	28°♒34'05	0°-47'-12	
min. Earth dist.	1835 Aug 21	12:38	28°♒36'16	19.02651 AU	
direct	1835 Nov 06	12:34	26°♒37'29		
	1836 Feb 11	03:33	0°♓		
conjunction	1836 Feb 20	01:51	0°♓30'48	0°-43'-4	
minimum elong	1836 Feb 20	01:51	0°♓30'48	0°43'05	
max. Earth dist.	1836 Feb 21	00:49	0°♓34'06	21.03671 AU	
retrograde	1836 Jun 08	16:16	4°♓31'27		
opposition	1836 Aug 25	19:17	2°♓32'36	0°-47'-56	
min. Earth dist.	1836 Aug 24	20:35	2°♓34'52	19.04679 AU	
direct	1836 Nov 09	18:34	0°♓36'05		
conjunction	1837 Feb 23	06:16	4°♓28'56	0°-43'-38	
minimum elong	1837 Feb 23	06:16	4°♓28'56	0°43'39	
max. Earth dist.	1837 Feb 24	06:20	4°♓32'23	21.05506 AU	
retrograde	1837 Jun 12	22:59	8°♓29'30		
min. Earth dist.	1837 Aug 29	05:15	6°♓32'51	19.06335 AU	
opposition	1837 Aug 30	03:37	6°♓30'37	0°-48'-26	
direct	1837 Nov 14	00:15	4°♓34'11		
conjunction	1838 Feb 27	10:44	8°♓26'39	0°-43'-59	
minimum elong	1838 Feb 27	10:44	8°♓26'39	0°44'00	
max. Earth dist.	1838 Feb 28	10:02	8°♓29'59	21.06991 AU	
retrograde	1838 Jun 17	08:02	12°♓27'14		
opposition	1838 Sep 03	11:24	10°♓28'17	0°-48'-42	
min. Earth dist.	1838 Sep 02	12:38	10°♓30'33	19.07642 AU	
direct	1838 Nov 18	05:52	8°♓31'55		
conjunction	1839 Mar 03	15:20	12°♓24'08	0°-44'-8	
minimum elong	1839 Mar 03	15:20	12°♓24'08	0°44'09	
max. Earth dist.	1839 Mar 04	15:29	12°♓27'35	21.08103 AU	
retrograde	1839 Jun 21	15:03	16°♓24'46		
opposition	1839 Sep 07	19:05	14°♓25'47	0°-48'-44	
min. Earth dist.	1839 Sep 06	20:49	14°♓28'01	19.08564 AU	
direct	1839 Nov 22	10:15	12°♓29'32		
conjunction	1840 Mar 06	19:50	16°♓21'33	0°-44'-4	
minimum elong	1840 Mar 06	19:50	16°♓21'33	0°44'06	
max. Earth dist.	1840 Mar 07	19:03	16°♓24'52	21.08842 AU	
retrograde	1840 Jun 25	00:07	20°♓22'19		
min. Earth dist.	1840 Sep 10	04:15	18°♓25'32	19.09103 AU	
opposition	1840 Sep 11	02:36	18°♓23'18	0°-48'-33	
direct	1840 Nov 25	15:53	16°♓27'06		
conjunction	1841 Mar 11	00:50	20°♓19'03	0°-43'-48	
minimum elong	1841 Mar 11	00:50	20°♓19'03	0°43'49	
max. Earth dist.	1841 Mar 12	00:41	20°♓22'27	21.09168 AU	
retrograde	1841 Jun 29	07:57	24°♓20'00		
opposition	1841 Sep 15	09:52	22°♓20'57	0°-48'-8	
min. Earth dist.	1841 Sep 14	12:19	22°♓23'07	19.09210 AU	
direct	1841 Nov 29	20:11	20°♓24'49		
conjunction	1842 Mar 15	06:02	24°♓16'46	0°-43'-20	
minimum elong	1842 Mar 15	06:02	24°♓16'46	0°43'21	
max. Earth dist.	1842 Mar 16	04:30	24°♓19'58	21.09057 AU	
retrograde	1842 Jul 03	17:02	28°♓17'58		
opposition	1842 Sep 19	17:03	26°♓18'52	0°-47'-30	
min. Earth dist.	1842 Sep 18	20:00	26°♓20'59	19.08859 AU	

direct	1842 Dec 04 01:17	24°♓22’46	
conjunction	1843 Mar 19 11:40	28°♓14’49	0°-42’-39
minimum elong	1843 Mar 19 11:40	28°♓14’49	0°42’39
max. Earth dist.	1843 Mar 20 10:18	28°♓18’03	21.08444 AU
	1843 Apr 20 05:23	0°♈	
retrograde	1843 Jul 08 01:20	2°♈16’18	
min. Earth dist.	1843 Sep 23 04:11	0°♈19’10	19.07979 AU
opposition	1843 Sep 24 00:09	0°♈17’10	0°-46’-38
	1843 Oct 01 03:30	30°♓	
direct	1843 Dec 08 06:26	28°♓21’03	
	1844 Feb 10 10:56	0°♈	
conjunction	1844 Mar 22 17:39	2°♈13’16	0°-41’-45
minimum elong	1844 Mar 22 17:39	2°♈13’16	0°41’47
max. Earth dist.	1844 Mar 23 14:24	2°♈16’14	21.07305 AU
retrograde	1844 Jul 11 10:28	6°♈15’06	
opposition	1844 Sep 27 07:17	4°♈15’52	0°-45’-32
min. Earth dist.	1844 Sep 26 12:11	4°♈17’47	19.06562 AU
direct	1844 Dec 11 11:04	2°♈19’41	
conjunction	1845 Mar 27 00:07	6°♈12’10	0°-40’-40
minimum elong	1845 Mar 27 00:07	6°♈12’10	0°40’40
max. Earth dist.	1845 Mar 27 20:39	6°♈15’06	21.05595 AU
retrograde	1845 Jul 15 18:58	10°♈14’22	
opposition	1845 Oct 01 14:22	8°♈15’00	0°-44’-13
min. Earth dist.	1845 Sep 30 20:32	8°♈16’49	19.04556 AU
direct	1845 Dec 15 17:01	6°♈18’43	
conjunction	1846 Mar 31 07:00	10°♈11’32	0°-39’-22
minimum elong	1846 Mar 31 07:00	10°♈11’32	0°39’22
max. Earth dist.	1846 Apr 01 01:16	10°♈14’08	21.03320 AU
retrograde	1846 Jul 20 04:08	14°♈14’07	
opposition	1846 Oct 05 21:17	12°♈14’35	0°-42’-41
min. Earth dist.	1846 Oct 05 04:37	12°♈16’17	19.02003 AU
direct	1846 Dec 19 21:53	10°♈18’07	
conjunction	1847 Apr 04 14:18	14°♈11’21	0°-37’-52
minimum elong	1847 Apr 04 14:18	14°♈11’21	0°37’54
max. Earth dist.	1847 Apr 05 08:19	14°♈13’55	21.00505 AU
retrograde	1847 Jul 24 12:36	18°♈14’22	
opposition	1847 Oct 10 04:17	16°♈14’40	0°-40’-56
min. Earth dist.	1847 Oct 09 12:45	16°♈16’15	18.98937 AU
direct	1847 Dec 24 03:54	14°♈18’01	
conjunction	1848 Apr 07 21:48	18°♈11’42	0°-36’-11
minimum elong	1848 Apr 07 21:48	18°♈11’42	0°36’12
max. Earth dist.	1848 Apr 08 13:43	18°♈13’59	20.97226 AU
retrograde	1848 Jul 27 22:32	22°♈15’14	
opposition	1848 Oct 13 11:23	20°♈15’19	0°-38’-58
min. Earth dist.	1848 Oct 12 21:00	20°♈16’47	18.95444 AU
direct	1848 Dec 27 09:19	18°♈18’26	
conjunction	1849 Apr 12 06:06	22°♈12’43	0°-34’-19
minimum elong	1849 Apr 12 06:06	22°♈12’43	0°34’21
max. Earth dist.	1849 Apr 12 21:52	22°♈14’59	20.93530 AU
retrograde	1849 Aug 01 07:18	26°♈16’46	
opposition	1849 Oct 17 18:22	24°♈16’41	0°-36’-49
min. Earth dist.	1849 Oct 17 05:02	24°♈18’03	18.91558 AU
direct	1849 Dec 31 15:07	22°♈19’34	
conjunction	1850 Apr 16 14:50	26°♈14’32	0°-32’-17
minimum elong	1850 Apr 16 14:50	26°♈14’32	0°32’18
max. Earth dist.	1850 Apr 17 04:21	26°♈16’28	20.89483 AU
	1850 Jul 08 15:38	0°♉	
retrograde	1850 Aug 05 18:11	0°♉19’11	
	1850 Sep 03 00:51	30°♈	
opposition	1850 Oct 22 01:38	28°♈18’55	0°-34’-28
min. Earth dist.	1850 Oct 21 13:33	28°♈20’09	18.87347 AU
direct	1851 Jan 04 21:05	26°♈21’33	
	1851 Apr 15 23:30	0°♉	
conjunction	1851 Apr 21 00:08	0°♉17’19	0°-30’-5
minimum elong	1851 Apr 21 00:09	0°♉17’19	0°30’06
max. Earth dist.	1851 Apr 21 13:32	0°♉19’14	20.85112 AU
retrograde	1851 Aug 10 03:38	4°♉22’36	
opposition	1851 Oct 26 09:03	2°♉22’11	0°-31’-57
min. Earth dist.	1851 Oct 25 21:53	2°♉23’20	18.82825 AU
direct	1852 Jan 09 03:14	0°♉24’36	
conjunction	1852 Apr 24 10:05	4°♉21’13	0°-27’-43
minimum elong	1852 Apr 24 10:05	4°♉21’13	0°27’44
max. Earth dist.	1852 Apr 24 21:10	4°♉22’48	20.80468 AU
retrograde	1852 Aug 13 15:10	8°♉27’14	
opposition	1852 Oct 29 16:46	6°♉26’39	0°-29’-15
min. Earth dist.	1852 Oct 29 07:01	6°♉27’39	18.78050 AU
direct	1853 Jan 12 09:50	4°♉28’50	
conjunction	1853 Apr 28 20:55	8°♉26’26	0°-25’-12
minimum elong	1853 Apr 28 20:55	8°♉26’26	0°25’13
max. Earth dist.	1853 Apr 29 07:43	8°♉27’59	20.75561 AU
retrograde	1853 Aug 18 02:13	12°♉33’11	
opposition	1853 Nov 03 00:47	10°♉32’30	0°-26’-24
min. Earth dist.	1853 Nov 02 16:02	10°♉33’25	18.73008 AU
direct	1854 Jan 16 16:57	8°♉34’27	
conjunction	1854 May 03 08:25	12°♉33’06	0°-22’-33
minimum elong	1854 May 03 08:25	12°♉33’06	0°22’34
max. Earth dist.	1854 May 03 16:36	12°♉34’17	20.70404 AU
retrograde	1854 Aug 22 14:06	16°♉40’40	
opposition	1854 Nov 07 09:09	14°♉39’53	0°-23’-23
min. Earth dist.	1854 Nov 07 02:09	14°♉40’37	18.67723 AU
direct	1855 Jan 21 00:14	12°♉41’35	
conjunction	1855 May 07 20:54	16°♉41’24	0°-19’-46
minimum elong	1855 May 07 20:54	16°♉41’24	0°19’46
max. Earth dist.	1855 May 08 04:37	16°♉42’30	20.64991 AU
retrograde	1855 Aug 27 02:55	20°♉49’48	
opposition	1855 Nov 11 17:58	18°♉48’56	0°-20’-14
min. Earth dist.	1855 Nov 11 12:06	18°♉49’32	18.62170 AU
direct	1856 Jan 25 08:41	16°♉50’23	
conjunction	1856 May 11 10:03	20°♉51’24	0°-16’-51
minimum elong	1856 May 11 10:03	20°♉51’24	0°16’52
max. Earth dist.	1856 May 11 14:52	20°♉52’05	20.59309 AU
retrograde	1856 Aug 30 15:43	25°♉00’41	
opposition	1856 Nov 15 03:22	22°♉59’43	0°-16’-57
min. Earth dist.	1856 Nov 14 23:40	23°♉00’06	18.56342 AU
direct	1857 Jan 28 16:59	21°♉00’52	
conjunction	1857 May 16 00:31	25°♉03’11	0°-13’-50
minimum elong	1857 May 16 00:31	25°♉03’11	0°13’50
behind sun begin	1857 May 15 21:08	25°♉02’42	
behind sun end	1857 May 16 03:53	25°♉03’39	
max. Earth dist.	1857 May 16 04:25	25°♉03’44	20.53324 AU
retrograde	1857 Sep 04 05:56	29°♉13’19	
opposition	1857 Nov 19 13:05	27°♉12’14	0°-13’-33
min. Earth dist.	1857 Nov 19 10:41	27°♉12’29	18.50195 AU
direct	1858 Feb 02 03:03	25°♉13’04	
conjunction	1858 May 20 15:41	29°♉16’42	0°-10’-43
minimum elong	1858 May 20 15:42	29°♉16’42	0°10’44
behind sun begin	1858 May 20 10:35	29°♉15’58	
behind sun end	1858 May 20 20:49	29°♉17’26	

max. Earth dist.	1858 May 20	16:16	29°♉16’47	20.47029 AU
	1858 Jun 02	01:28	0°♊	
retrograde	1858 Sep 08	19:55	3°♊27’43	
opposition	1858 Nov 23	23:33	1°♊26’28	0°-10’-3
min. Earth dist.	1858 Nov 23	23:32	1°♊26’29	18.43754 AU
	1859 Jan 01	07:40	30°♉	
direct	1859 Feb 06	12:44	29°♉26’56	
	1859 Mar 14	03:44	0°♊	
conjunction	1859 May 25	07:43	3°♊31’55	0°-7’-32
minimum elong	1859 May 25	07:42	3°♊31’55	0°07’33
behind sun begin	1859 May 25	01:36	3°♊31’03	
behind sun end	1859 May 25	13:49	3°♊32’47	
max. Earth dist.	1859 May 25	07:22	3°♊31’52	20.40446 AU
retrograde	1859 Sep 13	11:22	7°♊43’47	
opposition	1859 Nov 28	10:25	5°♊42’23	0°-6’-28
min. Earth dist.	1859 Nov 28	11:27	5°♊42’16	18.37037 AU
direct	1860 Feb 11	00:13	3°♊42’26	
conjunction	1860 May 29	00:33	7°♊48’47	0°-4’-17
minimum elong	1860 May 29	00:33	7°♊48’47	0°04’18
behind sun begin	1860 May 28	17:55	7°♊47’51	
behind sun end	1860 May 29	07:11	7°♊49’44	
max. Earth dist.	1860 May 28	21:00	7°♊48’19	20.33629 AU
retrograde	1860 Sep 17	02:31	12°♊01’32	
opposition	1860 Dec 01	21:48	9°♊59’55	0°-2’-49
min. Earth dist.	1860 Dec 02	01:16	9°♊59’33	18.30135 AU
direct	1861 Feb 14	11:14	7°♊59’31	
conjunction	1861 Jun 02	18:25	12°♊07’19	0°00’-56
minimum elong	1861 Jun 02	18:26	12°♊07’19	0°00’58
behind sun begin	1861 Jun 02	11:41	12°♊06’21	
behind sun end	1861 Jun 03	01:11	12°♊08’17	
max. Earth dist.	1861 Jun 02	14:01	12°♊06’42	20.26656 AU
asc. node	1861 Sep 12	18:46	16°♊18’47	
retrograde	1861 Sep 21	19:20	16°♊20’54	
opposition	1861 Dec 06	09:38	14°♊19’05	0°00’51
min. Earth dist.	1861 Dec 06	13:56	14°♊18’38	18.23103 AU
direct	1862 Feb 19	00:13	12°♊18’14	
conjunction	1862 Jun 07	12:52	16°♊27’29	0°02’29
minimum elong	1862 Jun 07	12:52	16°♊27’29	0°02’30
behind sun begin	1862 Jun 07	06:07	16°♊26’30	
behind sun end	1862 Jun 07	19:38	16°♊28’27	
max. Earth dist.	1862 Jun 07	05:33	16°♊26’25	20.19592 AU
retrograde	1862 Sep 26	11:18	20°♊41’55	
opposition	1862 Dec 10	22:07	18°♊39’54	0°04’33
min. Earth dist.	1862 Dec 11	04:44	18°♊39’12	18.16036 AU
direct	1863 Feb 23	12:15	16°♊38’35	
conjunction	1863 Jun 12	08:20	20°♊49’20	0°05’49
minimum elong	1863 Jun 12	08:20	20°♊49’20	0°05’49
behind sun begin	1863 Jun 12	01:52	20°♊48’24	
behind sun end	1863 Jun 12	14:48	20°♊50’16	
max. Earth dist.	1863 Jun 12	00:19	20°♊48’10	20.12533 AU
retrograde	1863 Oct 01	05:41	25°♊04’37	
opposition	1863 Dec 15	11:04	23°♊02’25	0°08’15
min. Earth dist.	1863 Dec 15	18:12	23°♊01’39	18.09004 AU
direct	1864 Feb 28	03:03	21°♊00’39	
conjunction	1864 Jun 16	04:28	25°♊12’55	0°09’07
minimum elong	1864 Jun 16	04:27	25°♊12’55	0°09’08
behind sun begin	1864 Jun 15	22:45	25°♊12’05	
behind sun end	1864 Jun 16	10:10	25°♊13’44	
max. Earth dist.	1864 Jun 15	17:55	25°♊11’21	20.05541 AU
retrograde	1864 Oct 04	22:23	29°♊29’04	
opposition	1864 Dec 19	00:51	27°♊26’41	0°11’55
min. Earth dist.	1864 Dec 19	10:14	27°♊25’41	18.02079 AU
direct	1865 Mar 03	16:13	25°♊24’29	
conjunction	1865 Jun 21	01:40	29°♊38’18	0°12’24
minimum elong	1865 Jun 21	01:40	29°♊38’18	0°12’24
behind sun begin	1865 Jun 20	21:21	29°♊37’40	
behind sun end	1865 Jun 21	05:59	29°♊38’55	
max. Earth dist.	1865 Jun 20	14:22	29°♊36’37	19.98688 AU
	1865 Jun 27	02:40	0°♋	
retrograde	1865 Oct 09	18:20	3°♋55’17	
opposition	1865 Dec 23	15:05	1°♋52’47	0°15’33
min. Earth dist.	1865 Dec 24	00:46	1°♋51’44	17.95313 AU
	1866 Feb 17	02:35	30°♊	
direct	1866 Mar 08	08:54	29°♊50’10	
	1866 Mar 27	12:15	0°♋	
conjunction	1866 Jun 25	23:35	4°♋05’33	0°15’38
minimum elong	1866 Jun 25	23:35	4°♋05’33	0°15’37
behind sun begin	1866 Jun 25	22:42	4°♋05’25	
behind sun end	1866 Jun 26	00:27	4°♋05’40	
max. Earth dist.	1866 Jun 25	10:10	4°♋03’32	19.92018 AU
retrograde	1866 Oct 14	12:05	8°♋23’22	
opposition	1866 Dec 28	06:19	6°♋20’47	0°19’07
min. Earth dist.	1866 Dec 28	18:05	6°♋19’31	17.88767 AU
direct	1867 Mar 12	23:33	4°♋17’48	
conjunction	1867 Jun 30	22:15	8°♋34’45	0°18’47
minimum elong	1867 Jun 30	22:15	8°♋34’45	0°18’47
max. Earth dist.	1867 Jun 30	08:01	8°♋32’37	19.85596 AU
retrograde	1867 Oct 19	09:29	12°♋53’25	
opposition	1868 Jan 01	22:07	10°♋50’47	0°22’35
min. Earth dist.	1868 Jan 02	10:04	10°♋49’29	17.82465 AU
direct	1868 Mar 16	17:55	8°♋47’28	
conjunction	1868 Jul 04	21:56	13°♋06’00	0°21’51
minimum elong	1868 Jul 04	21:56	13°♋06’00	0°21’50
max. Earth dist.	1868 Jul 04	05:57	13°♋03’35	19.79411 AU
retrograde	1868 Oct 23	04:32	17°♋25’29	
opposition	1869 Jan 05	14:43	15°♋22’49	0°25’56
min. Earth dist.	1869 Jan 06	04:56	15°♋21’16	17.76411 AU
direct	1869 Mar 21	10:22	13°♋19’11	
conjunction	1869 Jul 09	22:31	17°♋39’18	0°24’48
minimum elong	1869 Jul 09	22:31	17°♋39’18	0°24’48
max. Earth dist.	1869 Jul 09	05:10	17°♋36’40	19.73478 AU
retrograde	1869 Oct 28	03:13	21°♋59’34	
opposition	1870 Jan 10	08:04	19°♋56’54	0°29’10
min. Earth dist.	1870 Jan 10	22:36	19°♋55’19	17.70593 AU
direct	1870 Mar 26	06:45	17°♋52’58	
conjunction	1870 Jul 14	23:44	22°♋14’36	0°27’37
minimum elong	1870 Jul 14	23:44	22°♋14’36	0°27’37
max. Earth dist.	1870 Jul 14	05:02	22°♋11’45	19.67754 AU
retrograde	1870 Nov 01	23:15	26°♋35’36	
opposition	1871 Jan 15	02:23	24°♋32’55	0°32’13
min. Earth dist.	1871 Jan 15	19:06	24°♋31’06	17.64991 AU
direct	1871 Mar 31	01:30	22°♋28’41	
max. Earth dist.	1871 Jul 19	05:15	26°♋48’39	19.62265 AU
conjunction	1871 Jul 20	01:43	26°♋51’47	0°30’16
minimum elong	1871 Jul 20	01:43	26°♋51’47	0°30’16
	1871 Sep 14	19:03	0°♌	
retrograde	1871 Nov 06	22:31	1°♌13’27	
	1871 Dec 31	12:29	30°♋	
opposition	1872 Jan 19	21:13	29°♋10’45	0°35’06
min. Earth dist.	1872 Jan 20	14:17	29°♋08’53	17.59620 AU
direct	1872 Apr 03	23:55	27°♋06’12	

	1872 Jun	29	03:00	0°♌	
max. Earth dist.	1872 Jul	23	07:05	1°♌27’25	19.57000 AU
conjunction	1872 Jul	24	04:27	1°♌30’41	0°32’45
minimum elong	1872 Jul	24	04:27	1°♌30’41	0°32’46
retrograde	1872 Nov	10	19:52	5°♌52’56	
opposition	1873 Jan	23	17:02	3°♌50’13	0°37’46
min. Earth dist.	1873 Jan	24	11:59	3°♌48’08	17.54488 AU
direct	1873 Apr	08	21:15	1°♌45’20	
max. Earth dist.	1873 Jul	28	08:15	6°♌07’32	19.52010 AU
conjunction	1873 Jul	29	07:34	6°♌11’07	0°35’02
minimum elong	1873 Jul	29	07:33	6°♌11’07	0°35’01
retrograde	1873 Nov	15	19:30	10°♌33’53	
opposition	1874 Jan	28	13:19	8°♌31’08	0°40’11
min. Earth dist.	1874 Jan	29	08:30	8°♌29’02	17.49658 AU
direct	1874 Apr	13	21:11	6°♌25’55	
max. Earth dist.	1874 Aug	02	11:50	10°♌49’19	19.47341 AU
conjunction	1874 Aug	03	11:12	10°♌52’55	0°37’05
minimum elong	1874 Aug	03	11:12	10°♌52’55	0°37’05
retrograde	1874 Nov	20	18:14	15°♌16’07	
opposition	1875 Feb	02	10:23	13°♌13’19	0°42’21
min. Earth dist.	1875 Feb	03	06:53	13°♌11’04	17.45181 AU
direct	1875 Apr	18	19:58	11°♌07’49	
conjunction	1875 Aug	08	14:53	15°♌35’53	0°38’54
minimum elong	1875 Aug	08	14:53	15°♌35’53	0°38’54
max. Earth dist.	1875 Aug	07	13:47	15°♌32’00	19.43072 AU
retrograde	1875 Nov	25	18:36	19°♌59’28	
opposition	1876 Feb	07	07:56	17°♌56’37	0°44’14
min. Earth dist.	1876 Feb	08	04:35	17°♌54’21	17.41134 AU
direct	1876 Apr	22	20:47	15°♌50’48	
conjunction	1876 Aug	12	19:07	20°♌19’53	0°40’27
minimum elong	1876 Aug	12	19:07	20°♌19’53	0°40’26
max. Earth dist.	1876 Aug	11	18:39	20°♌16’04	19.39246 AU
retrograde	1876 Nov	29	18:22	24°♌43’43	
opposition	1877 Feb	11	06:02	22°♌40’50	0°45’49
min. Earth dist.	1877 Feb	12	03:22	22°♌38’30	17.37557 AU
direct	1877 Apr	27	20:29	20°♌34’46	
conjunction	1877 Aug	17	23:18	25°♌04’43	0°41’43
minimum elong	1877 Aug	17	23:18	25°♌04’43	0°41’44
max. Earth dist.	1877 Aug	16	21:28	25°♌00’41	19.35938 AU
retrograde	1877 Dec	04	18:50	29°♌28’46	
opposition	1878 Feb	16	04:47	27°♌25’51	0°47’06
min. Earth dist.	1878 Feb	17	02:05	27°♌23’31	17.34541 AU
direct	1878 May	02	22:02	25°♌19’33	
max. Earth dist.	1878 Aug	22	03:00	29°♌46’24	19.33208 AU
conjunction	1878 Aug	23	03:31	29°♌50’14	0°42’43
minimum elong	1878 Aug	23	03:31	29°♌50’14	0°42’42
	1878 Aug	25	17:51	0°♍	
retrograde	1878 Dec	09	18:58	4°♍14’26	
opposition	1879 Feb	21	04:02	2°♍11’32	0°48’03
min. Earth dist.	1879 Feb	22	01:09	2°♍09’12	17.32118 AU
direct	1879 May	07	22:55	0°♍05’05	
max. Earth dist.	1879 Aug	27	06:26	4°♍32’24	19.31107 AU
conjunction	1879 Aug	28	07:46	4°♍36’22	0°43’25
minimum elong	1879 Aug	28	07:46	4°♍36’22	0°43’24
retrograde	1879 Dec	14	19:00	9°♍00’38	
opposition	1880 Feb	26	03:38	6°♍57’46	0°48’41
min. Earth dist.	1880 Feb	27	00:45	6°♍55’27	17.30355 AU
direct	1880 May	12	01:25	4°♍51’12	
conjunction	1880 Sep	01	12:11	9°♍23’01	0°43’49
minimum elong	1880 Sep	01	12:11	9°♍23’01	0°43’49
max. Earth dist.	1880 Aug	31	12:14	9°♍19’15	19.29673 AU
retrograde	1880 Dec	18	19:22	13°♍47’16	
opposition	1881 Mar	02	03:49	11°♍44’30	0°48’59
min. Earth dist.	1881 Mar	03	00:07	11°♍42’17	17.29240 AU
direct	1881 May	17	04:15	9°♍37’56	
conjunction	1881 Sep	06	16:18	14°♍10’06	0°43’56
minimum elong	1881 Sep	06	16:18	14°♍10’06	0°43’55
max. Earth dist.	1881 Sep	05	16:10	14°♍06’18	19.28886 AU
retrograde	1881 Dec	23	19:01	18°♍34’18	
opposition	1882 Mar	07	04:28	16°♍31’39	0°48’56
min. Earth dist.	1882 Mar	08	00:53	16°♍29’25	17.28779 AU
direct	1882 May	22	07:21	14°♍25’06	
conjunction	1882 Sep	11	20:22	18°♍57’31	0°43’44
minimum elong	1882 Sep	11	20:22	18°♍57’31	0°43’45
max. Earth dist.	1882 Sep	10	21:29	18°♍53’55	19.28738 AU
retrograde	1882 Dec	28	20:00	23°♍21’34	
opposition	1883 Mar	12	05:22	21°♍19’05	0°48’33
min. Earth dist.	1883 Mar	13	00:36	21°♍16’59	17.28917 AU
direct	1883 May	27	11:36	19°♍12’36	
max. Earth dist.	1883 Sep	16	01:39	23°♍41’33	19.29158 AU
conjunction	1883 Sep	17	00:10	23°♍45’06	0°43’14
minimum elong	1883 Sep	17	00:10	23°♍45’06	0°43’14
retrograde	1884 Jan	02	19:32	28°♍08’56	
opposition	1884 Mar	16	06:45	26°♍06’36	0°47’50
min. Earth dist.	1884 Mar	17	02:22	26°♍04’28	17.29613 AU
direct	1884 May	31	14:54	24°♍00’13	
max. Earth dist.	1884 Sep	20	05:57	28°♍29’14	19.30114 AU
conjunction	1884 Sep	21	03:42	28°♍32’39	0°42’27
minimum elong	1884 Sep	21	03:42	28°♍32’39	0°42’27
	1884 Oct	14	14:38	0°♎	
retrograde	1885 Jan	06	20:47	2°♎56’10	
opposition	1885 Mar	21	08:15	0°♎53’59	0°46’47
min. Earth dist.	1885 Mar	22	02:22	0°♎52’01	17.30810 AU
	1885 Apr	11	18:09	30°♍	
direct	1885 Jun	05	20:05	28°♍47’43	
	1885 Jul	29	01:26	0°♎	
max. Earth dist.	1885 Sep	25	10:08	3°♎16’40	19.31553 AU
conjunction	1885 Sep	26	06:51	3°♎19’56	0°41’21
minimum elong	1885 Sep	26	06:51	3°♎19’56	0°41’22
retrograde	1886 Jan	11	19:50	7°♎43’03	
opposition	1886 Mar	26	10:10	5°♎41’02	0°45’24
min. Earth dist.	1886 Mar	27	04:33	5°♎39’03	17.32491 AU
direct	1886 Jun	10	23:06	3°♎34’53	
conjunction	1886 Oct	01	09:15	8°♎06’43	0°39’59
minimum elong	1886 Oct	01	09:15	8°♎06’43	0°39’58
max. Earth dist.	1886 Sep	30	13:03	8°♎03’32	19.33473 AU
retrograde	1887 Jan	16	20:57	12°♎29’22	
opposition	1887 Mar	31	11:56	10°♎27’28	0°43’43
min. Earth dist.	1887 Apr	01	04:28	10°♎25’41	17.34625 AU
direct	1887 Jun	16	04:25	8°♎21’28	
conjunction	1887 Oct	06	11:18	12°♎52’47	0°38’20
minimum elong	1887 Oct	06	11:18	12°♎52’47	0°38’20
max. Earth dist.	1887 Oct	05	16:48	12°♎49’52	19.35828 AU
retrograde	1888 Jan	21	19:12	17°♎14’52	
opposition	1888 Apr	04	13:43	15°♎13’07	0°41’43
min. Earth dist.	1888 Apr	05	06:22	15°♎11’19	17.37200 AU
direct	1888 Jun	20	07:01	13°♎07’15	

conjunction	1888 Oct 10 12:32	17°♎37’54	0°36’25
minimum elong	1888 Oct 10 12:32	17°♎37’54	0°36’25
max. Earth dist.	1888 Oct 09 18:24	17°♎35’03	19.38635 AU
retrograde	1889 Jan 25 19:33	21°♎59’22	
opposition	1889 Apr 09 15:23	19°♎57’43	0°39’27
min. Earth dist.	1889 Apr 10 05:59	19°♎56’09	17.40220 AU
direct	1889 Jun 25 11:39	17°♎52’01	
conjunction	1889 Oct 15 12:57	22°♎21’52	0°34’16
minimum elong	1889 Oct 15 12:57	22°♎21’52	0°34’16
max. Earth dist.	1889 Oct 14 21:18	22°♎19’24	19.41880 AU
retrograde	1890 Jan 30 17:13	26°♎42’39	
opposition	1890 Apr 14 17:02	24°♎41’06	0°36’55
min. Earth dist.	1890 Apr 15 07:12	24°♎39’35	17.43688 AU
direct	1890 Jun 30 13:54	22°♎35’36	
conjunction	1890 Oct 20 12:26	27°♎04’29	0°31’53
minimum elong	1890 Oct 20 12:26	27°♎04’29	0°31’54
max. Earth dist.	1890 Oct 19 21:23	27°♎02’07	19.45591 AU
	1890 Dec 10 07:00	0°♏	
retrograde	1891 Feb 04 16:06	1°♏24’32	
	1891 Apr 05 02:51	30°♎	
opposition	1891 Apr 19 18:05	29°♎23’04	0°34’08
min. Earth dist.	1891 Apr 20 06:03	29°♎21’47	17.47634 AU
direct	1891 Jul 05 17:40	27°♎17’46	
	1891 Sep 26 15:36	0°♏	
conjunction	1891 Oct 25 11:11	1°♏45’38	0°29’19
minimum elong	1891 Oct 25 11:11	1°♏45’38	0°29’18
max. Earth dist.	1891 Oct 24 23:02	1°♏43’44	19.49776 AU
retrograde	1892 Feb 09 12:42	6°♏04’52	
opposition	1892 Apr 23 19:07	4°♏03’32	0°31’09
min. Earth dist.	1892 Apr 24 06:03	4°♏02’22	17.52053 AU
direct	1892 Jul 09 19:58	1°♏58’29	
conjunction	1892 Oct 29 08:48	6°♏25’12	0°26’33
minimum elong	1892 Oct 29 08:48	6°♏25’12	0°26’34
max. Earth dist.	1892 Oct 28 21:31	6°♏23’26	19.54448 AU
retrograde	1893 Feb 13 09:48	10°♏43’38	
opposition	1893 Apr 28 19:43	8°♏42’25	0°27’59
min. Earth dist.	1893 Apr 29 04:17	8°♏41’31	17.56972 AU
direct	1893 Jul 14 22:41	6°♏37’41	
conjunction	1893 Nov 03 05:43	11°♏03’11	0°23’39
minimum elong	1893 Nov 03 05:43	11°♏03’11	0°23’38
max. Earth dist.	1893 Nov 02 21:34	11°♏01’55	19.59610 AU
retrograde	1894 Feb 18 05:38	15°♏20’47	
opposition	1894 May 03 19:58	13°♏19’44	0°24’39
min. Earth dist.	1894 May 04 02:57	13°♏19’00	17.62353 AU
direct	1894 Jul 20 00:34	11°♏15’21	
conjunction	1894 Nov 08 01:30	15°♏39’34	0°20’36
minimum elong	1894 Nov 08 01:30	15°♏39’34	0°20’36
max. Earth dist.	1894 Nov 07 18:21	15°♏38’27	19.65217 AU
retrograde	1895 Feb 23 00:54	19°♏56’20	
opposition	1895 May 08 19:44	17°♏55’29	0°21’11
min. Earth dist.	1895 May 09 00:43	17°♏54’57	17.68157 AU
direct	1895 Jul 25 01:22	15°♏51’28	
conjunction	1895 Nov 12 20:37	20°♏14’21	0°17’26
minimum elong	1895 Nov 12 20:38	20°♏14’21	0°17’26
max. Earth dist.	1895 Nov 12 16:23	20°♏13’42	19.71200 AU
retrograde	1896 Feb 27 20:03	24°♏30’15	
opposition	1896 May 12 19:01	22°♏29’37	0°17’36
min. Earth dist.	1896 May 12 22:15	22°♏29’17	17.74283 AU
direct	1896 Jul 29 02:05	20°♏26’02	
conjunction	1896 Nov 16 14:45	24°♏47’31	0°14’12
minimum elong	1896 Nov 16 14:46	24°♏47’31	0°14’11
behind sun begin	1896 Nov 16 11:28	24°♏47’01	
behind sun end	1896 Nov 16 18:03	24°♏48’01	
max. Earth dist.	1896 Nov 16 11:34	24°♏47’02	19.77472 AU
retrograde	1897 Mar 03 14:13	29°♏02’33	
opposition	1897 May 17 18:01	27°♏02’08	0°13’56
min. Earth dist.	1897 May 17 19:42	27°♏01’57	17.80681 AU
direct	1897 Aug 03 00:40	24°♏58’57	
conjunction	1897 Nov 21 08:02	29°♏19’00	0°10’53
minimum elong	1897 Nov 21 08:02	29°♏19’00	0°10’53
behind sun begin	1897 Nov 21 02:59	29°♏18’14	
behind sun end	1897 Nov 21 13:04	29°♏19’45	
max. Earth dist.	1897 Nov 21 07:26	29°♏18’54	19.83968 AU
	1897 Dec 02 09:58	0°♐	
retrograde	1898 Mar 08 08:41	3°♐33’08	
opposition	1898 May 22 16:26	1°♐32’55	0°10’12
min. Earth dist.	1898 May 22 16:07	1°♐32’57	17.87243 AU
	1898 Jul 03 23:02	30°♏	
direct	1898 Aug 07 23:44	29°♏30’10	
	1898 Sep 11 02:20	0°♐	
conjunction	1898 Nov 26 00:29	3°♐48’43	0°07’31
minimum elong	1898 Nov 26 00:28	3°♐48’43	0°07’31
behind sun begin	1898 Nov 25 18:28	3°♐47’49	
behind sun end	1898 Nov 26 06:29	3°♐49’37	
max. Earth dist.	1898 Nov 26 00:55	3°♐48’47	19.90591 AU
retrograde	1899 Mar 13 01:52	8°♐01’57	
opposition	1899 May 27 14:11	6°♐01’56	0°06’26
min. Earth dist.	1899 May 27 12:52	6°♐02’04	17.93918 AU
direct	1899 Aug 12 20:40	3°♐59’33	
conjunction	1899 Nov 30 16:10	8°♐16’37	0°04’08
minimum elong	1899 Nov 30 16:10	8°♐16’37	0°04’09
behind sun begin	1899 Nov 30 09:42	8°♐15’39	
behind sun end	1899 Nov 30 22:39	8°♐17’35	
max. Earth dist.	1899 Nov 30 18:39	8°♐16’57	19.97290 AU
retrograde	1900 Mar 17 19:27	12°♐28’56	
opposition	1900 Jun 01 11:27	10°♐29’05	0°02’39
min. Earth dist.	1900 Jun 01 07:58	10°♐29’27	18.00617 AU
direct	1900 Aug 17 18:17	8°♐27’06	
conjunction	1900 Dec 05 06:49	12°♐42’37	0°00’41
minimum elong	1900 Dec 05 06:49	12°♐42’37	0°00’41
behind sun begin	1900 Dec 05 00:16	12°♐41’39	
behind sun end	1900 Dec 05 13:22	12°♐43’36	
max. Earth dist.	1900 Dec 05 10:28	12°♐43’08	20.03982 AU
desc. node	1901 Feb 15 06:19	16°♐21’26	
retrograde	1901 Mar 22 11:25	16°♐54’03	
opposition	1901 Jun 06 08:14	14°♐54’19	0°-1’-7
min. Earth dist.	1901 Jun 06 03:57	14°♐54’45	18.07305 AU
direct	1901 Aug 22 13:55	12°♐52’42	
conjunction	1901 Dec 09 20:42	17°♐06’40	0°-2’-47
minimum elong	1901 Dec 09 20:43	17°♐06’40	0°02’47
behind sun begin	1901 Dec 09 14:11	17°♐05’42	
behind sun end	1901 Dec 10 03:15	17°♐07’38	
max. Earth dist.	1901 Dec 10 02:07	17°♐07’28	20.10649 AU
retrograde	1902 Mar 27 03:49	21°♐17’11	
opposition	1902 Jun 11 04:02	19°♐17’33	0°-4’-52
min. Earth dist.	1902 Jun 10 21:27	19°♐18’14	18.13934 AU
direct	1902 Aug 27 10:18	17°♐16’17	
conjunction	1902 Dec 14 09:39	21°♐28’41	0°-6’-7
minimum elong	1902 Dec 14 09:39	21°♐28’41	0°06’08
behind sun begin	1902 Dec 14 03:25	21°♐27’45	

behind sun end	1902 Dec 14	15:53	21°♐29’36		
max. Earth dist.	1902 Dec 14	16:24	21°♐29’41	20.17241 AU	
retrograde	1903 Mar 31	17:50	25°♐38’18		
opposition	1903 Jun 15	23:18	23°♐38’44	0°-8’-33	
min. Earth dist.	1903 Jun 15	16:10	23°♐39’28	18.20498 AU	
direct	1903 Sep 01	04:19	21°♐37’47		
conjunction	1903 Dec 18	21:38	25°♐48’38	0°-9’-23	
minimum elong	1903 Dec 18	21:39	25°♐48’38	0°09’25	
behind sun begin	1903 Dec 18	16:08	25°♐47’49		
behind sun end	1903 Dec 19	03:09	25°♐49’26		
max. Earth dist.	1903 Dec 19	06:02	25°♐49’53	20.23773 AU	
retrograde	1904 Apr 04	09:09	29°♐57’21		
opposition	1904 Jun 19	17:38	27°♐57’51	0°-12’-9	
min. Earth dist.	1904 Jun 19	07:57	27°♐58’51	18.26996 AU	
direct	1904 Sep 04	23:11	25°♐57’12		
	1904 Dec 20	13:35	0°♑		
conjunction	1904 Dec 22	08:48	0°♑06’31	0°-12’-35	
minimum elong	1904 Dec 22	08:47	0°♑06’31	0°12’36	
behind sun begin	1904 Dec 22	04:30	0°♑05’53		
behind sun end	1904 Dec 22	13:04	0°♑07’09		
max. Earth dist.	1904 Dec 22	18:57	0°♑08’02	20.30246 AU	
retrograde	1905 Apr 08	21:19	4°♑14’24		
opposition	1905 Jun 24	11:27	2°♑14’57	0°-15’-40	
min. Earth dist.	1905 Jun 24	01:08	2°♑16’00	18.33467 AU	
direct	1905 Sep 09	15:17	0°♑14’37		
conjunction	1905 Dec 26	19:03	4°♑22’26	0°-15’-42	
minimum elong	1905 Dec 26	19:03	4°♑22’26	0°15’43	
behind sun begin	1905 Dec 26	17:18	4°♑22’11		
behind sun end	1905 Dec 26	20:47	4°♑22’41		
max. Earth dist.	1905 Dec 27	06:46	4°♑24’11	20.36704 AU	
retrograde	1906 Apr 13	11:54	8°♑29’30		
opposition	1906 Jun 29	04:17	6°♑30’08	0°-19’-3	
min. Earth dist.	1906 Jun 28	15:15	6°♑31’27	18.39908 AU	
direct	1906 Sep 14	08:12	4°♑30’08		
conjunction	1906 Dec 31	04:40	8°♑36’31	0°-18’-41	
minimum elong	1906 Dec 31	04:40	8°♑36’31	0°18’42	
max. Earth dist.	1906 Dec 31	18:15	8°♑38’32	20.43120 AU	
retrograde	1907 Apr 17	22:43	12°♑42’49		
opposition	1907 Jul 03	20:25	10°♑43’33	0°-22’-18	
min. Earth dist.	1907 Jul 03	06:54	10°♑44’55	18.46311 AU	
direct	1907 Sep 18	22:04	8°♑43’54		
conjunction	1908 Jan 04	13:36	12°♑48’55	0°-21’-34	
minimum elong	1908 Jan 04	13:36	12°♑48’55	0°21’35	
max. Earth dist.	1908 Jan 05	04:25	12°♑51’07	20.49495 AU	
retrograde	1908 Apr 21	12:18	16°♑54’31		
opposition	1908 Jul 07	11:51	14°♑55’21	0°-25’-25	
min. Earth dist.	1908 Jul 06	19:46	14°♑56’59	18.52641 AU	
direct	1908 Sep 22	13:25	12°♑56’05		
conjunction	1909 Jan 07	21:47	16°♑59’47	0°-24’-19	
minimum elong	1909 Jan 07	21:46	16°♑59’47	0°24’20	
max. Earth dist.	1909 Jan 08	14:30	17°♑02’16	20.55760 AU	
retrograde	1909 Apr 25	22:26	21°♑04’44		
min. Earth dist.	1909 Jul 11	10:27	19°♑07’21	18.58845 AU	
opposition	1909 Jul 12	02:49	19°♑05’42	0°-28’-22	
direct	1909 Sep 27	01:29	17°♑06’48		
conjunction	1910 Jan 12	05:31	21°♑09’14	0°-26’-55	
minimum elong	1910 Jan 12	05:31	21°♑09’14	0°26’55	
max. Earth dist.	1910 Jan 12	23:07	21°♑11’51	20.61881 AU	
retrograde	1910 Apr 30	10:51	25°♑13’35		
opposition	1910 Jul 16	16:48	23°♑14’40	0°-31’-10	
min. Earth dist.	1910 Jul 15	22:18	23°♑16’32	18.64863 AU	
direct	1910 Oct 01	15:05	21°♑16’08		
conjunction	1911 Jan 16	12:47	25°♑17’24	0°-29’-22	
minimum elong	1911 Jan 16	12:47	25°♑17’24	0°29’23	
max. Earth dist.	1911 Jan 17	07:59	25°♑20’14	20.67768 AU	
retrograde	1911 May 04	20:17	29°♑21’11		
opposition	1911 Jul 21	06:28	27°♑22’23	0°-33’-47	
min. Earth dist.	1911 Jul 20	12:02	27°♑24’14	18.70622 AU	
direct	1911 Oct 06	01:53	25°♑24’13		
conjunction	1912 Jan 20	19:28	29°♑24’19	0°-31’-39	
minimum elong	1912 Jan 20	19:28	29°♑24’19	0°31’40	
max. Earth dist.	1912 Jan 21	15:07	29°♑27’13	20.73376 AU	
	1912 Jan 30	22:40	0°♒		
retrograde	1912 May 08	07:34	3°♒27’36		
opposition	1912 Jul 24	19:28	1°♒28’54	0°-36’-13	
min. Earth dist.	1912 Jul 23	23:14	1°♒30’56	18.76065 AU	
	1912 Sep 04	16:51	30°♑		
direct	1912 Oct 09	13:43	29°♑31’02		
	1912 Nov 12	08:41	0°♒		
conjunction	1913 Jan 24	01:57	3°♒30’05	0°-33’-46	
minimum elong	1913 Jan 24	01:57	3°♒30’05	0°33’48	
max. Earth dist.	1913 Jan 24	22:55	3°♒33’10	20.78624 AU	
retrograde	1913 May 12	16:33	7°♒32’54		
opposition	1913 Jul 29	07:59	5°♒34’16	0°-38’-28	
min. Earth dist.	1913 Jul 28	12:05	5°♒36’15	18.81126 AU	
direct	1913 Oct 13	23:23	3°♒36’42		
conjunction	1914 Jan 28	08:01	7°♒34’43	0°-35’-43	
minimum elong	1914 Jan 28	08:01	7°♒34’43	0°35’44	
max. Earth dist.	1914 Jan 29	04:54	7°♒37’46	20.83473 AU	
retrograde	1914 May 17	02:40	11°♒37’05		
opposition	1914 Aug 02	19:48	9°♒38’30	0°-40’-30	
min. Earth dist.	1914 Aug 01	22:32	9°♒40’37	18.85750 AU	
direct	1914 Oct 18	09:40	7°♒41’09		
conjunction	1915 Feb 01	13:50	11°♒38’14	0°-37’-28	
minimum elong	1915 Feb 01	13:50	11°♒38’14	0°37’29	
max. Earth dist.	1915 Feb 02	11:41	11°♒41’25	20.87848 AU	
retrograde	1915 May 21	10:48	15°♒40’11		
min. Earth dist.	1915 Aug 06	10:21	13°♒43’40	18.89891 AU	
opposition	1915 Aug 07	07:05	13°♒41’36	0°-42’-19	
direct	1915 Oct 22	18:11	11°♒44’27		
conjunction	1916 Feb 05	19:15	15°♒40’37	0°-39’-1	
minimum elong	1916 Feb 05	19:15	15°♒40’37	0°39’03	
max. Earth dist.	1916 Feb 06	16:49	15°♒43’45	20.91760 AU	
retrograde	1916 May 24	20:13	19°♒42’12		
opposition	1916 Aug 10	17:49	17°♒43’34	0°-43’-55	
min. Earth dist.	1916 Aug 09	19:54	17°♒45’45	18.93571 AU	
direct	1916 Oct 26	03:18	15°♒46’33		
conjunction	1917 Feb 09	00:18	19°♒41’53	0°-40’-22	
minimum elong	1917 Feb 09	00:18	19°♒41’53	0°40’23	
max. Earth dist.	1917 Feb 09	22:57	19°♒45’10	20.95205 AU	
retrograde	1917 May 29	03:27	23°♒43’08		
min. Earth dist.	1917 Aug 14	06:37	21°♒46’34	18.96802 AU	
opposition	1917 Aug 15	04:01	21°♒44’26	0°-45’-18	
direct	1917 Oct 30	10:31	19°♒47’32		
conjunction	1918 Feb 13	05:08	23°♒42’06	0°-41’-31	
minimum elong	1918 Feb 13	05:08	23°♒42’06	0°41’33	
max. Earth dist.	1918 Feb 14	03:30	23°♒45’19	20.98237 AU	
retrograde	1918 Jun 02	12:30	27°♒43’03		
opposition	1918 Aug 19	13:24	25°♒44’16	0°-46’-26	

min. Earth dist.	1918 Aug 18 15:00	25°♒46’30	18.99643 AU	
direct	1918 Nov 03 18:27	23°♒47’28		
conjunction	1919 Feb 17 09:47	27°♒41’22	0°-42’-28	
minimum elong	1919 Feb 17 09:47	27°♒41’22	0°42’28	
max. Earth dist.	1919 Feb 18 09:16	27°♒44’45	21.00878 AU	
	1919 Apr 01 01:46	0°♓		
retrograde	1919 Jun 06 19:12	1°♓42’07		
	1919 Aug 16 22:08	30°♒		
opposition	1919 Aug 23 22:32	29°♒43’16	0°-47’-21	
min. Earth dist.	1919 Aug 23 00:32	29°♒45’27	19.02110 AU	
direct	1919 Nov 08 00:35	27°♒46’34		
	1920 Jan 22 18:31	0°♓		
conjunction	1920 Feb 21 14:07	1°♓39’52	0°-43’-12	
minimum elong	1920 Feb 21 14:07	1°♓39’52	0°43’13	
max. Earth dist.	1920 Feb 22 13:19	1°♓43’12	21.03178 AU	
retrograde	1920 Jun 10 04:07	5°♓40’29		
min. Earth dist.	1920 Aug 26 08:17	3°♓43’51	19.04241 AU	
opposition	1920 Aug 27 07:12	3°♓41’34	0°-48’-2	
direct	1920 Nov 11 07:15	1°♓44’58		
conjunction	1921 Feb 24 18:35	5°♓37’48	0°-43’-43	
minimum elong	1921 Feb 24 18:35	5°♓37’48	0°43’43	
max. Earth dist.	1921 Feb 25 18:47	5°♓41’16	21.05126 AU	
retrograde	1921 Jun 14 10:56	9°♓38’20		
opposition	1921 Aug 31 15:26	7°♓39’23	0°-48’-30	
min. Earth dist.	1921 Aug 30 17:03	7°♓41’37	19.06017 AU	
direct	1921 Nov 15 12:50	5°♓42’53		
conjunction	1922 Feb 28 23:01	9°♓35’21	0°-44’-2	
minimum elong	1922 Feb 28 23:01	9°♓35’21	0°44’03	
max. Earth dist.	1922 Mar 01 22:35	9°♓38’44	21.06730 AU	
retrograde	1922 Jun 18 19:50	13°♓35’53		
opposition	1922 Sep 04 23:22	11°♓36’54	0°-48’-44	
min. Earth dist.	1922 Sep 04 00:25	11°♓39’11	19.07435 AU	
direct	1922 Nov 19 18:06	9°♓40’30		
conjunction	1923 Mar 05 03:31	13°♓32’43	0°-44’-8	
minimum elong	1923 Mar 05 03:31	13°♓32’43	0°44’10	
max. Earth dist.	1923 Mar 06 03:50	13°♓36’11	21.07944 AU	
retrograde	1923 Jun 23 02:41	17°♓33’19		
min. Earth dist.	1923 Sep 08 08:49	15°♓36’32	19.08448 AU	
opposition	1923 Sep 09 07:05	15°♓34’19	0°-48’-44	
direct	1923 Nov 23 23:29	13°♓38’02		
conjunction	1924 Mar 08 08:11	17°♓30’03	0°-44’-2	
minimum elong	1924 Mar 08 08:11	17°♓30’03	0°44’03	
max. Earth dist.	1924 Mar 09 07:34	17°♓33’24	21.08764 AU	
retrograde	1924 Jun 26 12:02	21°♓30’48		
opposition	1924 Sep 12 14:35	19°♓31’47	0°-48’-30	
min. Earth dist.	1924 Sep 11 16:11	19°♓34’01	19.09052 AU	
direct	1924 Nov 27 04:03	17°♓35’35		
conjunction	1925 Mar 12 13:12	21°♓27’32	0°-43’-44	
minimum elong	1925 Mar 12 13:12	21°♓27’32	0°43’46	
max. Earth dist.	1925 Mar 13 12:56	21°♓30’55	21.09132 AU	
retrograde	1925 Jun 30 19:12	25°♓28’29		
opposition	1925 Sep 16 21:58	23°♓29’27	0°-48’-3	
min. Earth dist.	1925 Sep 16 00:36	23°♓31’35	19.09176 AU	
direct	1925 Dec 01 09:02	21°♓33’19		
conjunction	1926 Mar 16 18:30	25°♓25’17	0°-43’-13	
minimum elong	1926 Mar 16 18:30	25°♓25’17	0°43’13	
max. Earth dist.	1926 Mar 17 16:46	25°♓28’28	21.09012 AU	
retrograde	1926 Jul 05 05:02	29°♓26’29		
min. Earth dist.	1926 Sep 20 08:07	27°♓29’31	19.08792 AU	
opposition	1926 Sep 21 05:03	27°♓27’25	0°-47’-22	
direct	1926 Dec 05 13:51	25°♓31’17		
conjunction	1927 Mar 21 00:14	29°♓23’23	0°-42’-30	
minimum elong	1927 Mar 21 00:14	29°♓23’23	0°42’31	
max. Earth dist.	1927 Mar 21 22:24	29°♓26’33	21.08344 AU	
	1927 Mar 31 17:24	0°♈		
retrograde	1927 Jul 09 12:31	3°♈24’52		
opposition	1927 Sep 25 12:16	1°♈25’44	0°-46’-27	
min. Earth dist.	1927 Sep 24 16:36	1°♈27’43	19.07839 AU	
	1927 Nov 04 10:33	30°♓		
direct	1927 Dec 09 18:15	29°♓29’37		
	1928 Jan 13 08:44	0°♈		
conjunction	1928 Mar 24 06:07	3°♈21’52	0°-41’-34	
minimum elong	1928 Mar 24 06:07	3°♈21’52	0°41’35	
max. Earth dist.	1928 Mar 25 02:31	3°♈24’46	21.07117 AU	
retrograde	1928 Jul 12 22:34	7°♈23’42		
opposition	1928 Sep 28 19:26	5°♈24’27	0°-45’-19	
min. Earth dist.	1928 Sep 28 00:28	5°♈26’21	19.06320 AU	
direct	1928 Dec 12 23:57	3°♈28’14		
conjunction	1929 Mar 28 12:36	7°♈20’44	0°-40’-26	
minimum elong	1929 Mar 28 12:36	7°♈20’44	0°40’27	
max. Earth dist.	1929 Mar 29 08:43	7°♈23’36	21.05310 AU	
retrograde	1929 Jul 17 06:25	11°♈22’55		
min. Earth dist.	1929 Oct 02 08:48	9°♈25’18	19.04231 AU	
opposition	1929 Oct 03 02:22	9°♈23’32	0°-43’-57	
direct	1929 Dec 17 04:19	7°♈27’11		
conjunction	1930 Apr 01 19:20	11°♈20’01	0°-39’-6	
minimum elong	1930 Apr 01 19:20	11°♈20’01	0°39’08	
max. Earth dist.	1930 Apr 02 13:32	11°♈22’36	21.02976 AU	
retrograde	1930 Jul 21 16:09	15°♈22’35		
opposition	1930 Oct 07 09:20	13°♈23’02	0°-42’-22	
min. Earth dist.	1930 Oct 06 16:37	13°♈24’43	19.01647 AU	
direct	1930 Dec 21 10:18	11°♈26’31		
conjunction	1931 Apr 06 02:22	15°♈19’45	0°-37’-35	
minimum elong	1931 Apr 06 02:22	15°♈19’45	0°37’36	
max. Earth dist.	1931 Apr 06 20:28	15°♈22’20	21.00155 AU	
retrograde	1931 Jul 26 00:36	19°♈22’46		
opposition	1931 Oct 11 16:18	17°♈23’01	0°-40’-35	
min. Earth dist.	1931 Oct 11 00:45	17°♈24’36	18.98608 AU	
direct	1931 Dec 25 15:28	15°♈26’19		
conjunction	1932 Apr 09 09:53	19°♈20’02	0°-35’-52	
minimum elong	1932 Apr 09 09:53	19°♈20’02	0°35’54	
max. Earth dist.	1932 Apr 10 02:07	19°♈22’21	20.96934 AU	
retrograde	1932 Jul 29 10:14	23°♈23’32		
opposition	1932 Oct 14 23:14	21°♈23’36	0°-38’-36	
min. Earth dist.	1932 Oct 14 08:35	21°♈25’06	18.95203 AU	
direct	1932 Dec 28 21:01	19°♈26’42		
conjunction	1933 Apr 13 18:02	23°♈21’00	0°-33’-59	
minimum elong	1933 Apr 13 18:02	23°♈21’00	0°33’59	
max. Earth dist.	1933 Apr 14 10:05	23°♈23’17	20.93346 AU	
retrograde	1933 Aug 02 19:44	27°♈25’03		
opposition	1933 Oct 19 06:17	25°♈24’56	0°-36’-25	
min. Earth dist.	1933 Oct 18 16:45	25°♈26’20	18.91444 AU	
direct	1934 Jan 02 03:05	23°♈27’50		
conjunction	1934 Apr 18 02:37	27°♈22’48	0°-31’-55	
minimum elong	1934 Apr 18 02:37	27°♈22’48	0°31’56	
max. Earth dist.	1934 Apr 18 16:36	27°♈24’48	20.89442 AU	
	1934 Jun 06 15:39	0°♉		
retrograde	1934 Aug 07 05:24	1°♉27’27		

	1934 Oct 10 00:39	30°♈	
opposition	1934 Oct 23 13:25	29°♈27’11	0°-34’-3
min. Earth dist.	1934 Oct 23 00:54	29°♈28’27	18.87391 AU
direct	1935 Jan 06 08:34	27°♈29’50	
	1935 Mar 28 02:56	0°♉	
conjunction	1935 Apr 22 11:56	1°♉25’35	0°-29’-41
minimum elong	1935 Apr 22 11:56	1°♉25’35	0°29’42
max. Earth dist.	1935 Apr 23 01:41	1°♉27’33	20.85243 AU
retrograde	1935 Aug 11 15:49	5°♉30’52	
opposition	1935 Oct 27 20:52	3°♉30’28	0°-31’-30
min. Earth dist.	1935 Oct 27 09:23	3°♉31’39	18.83049 AU
direct	1936 Jan 10 15:20	1°♉32’56	
conjunction	1936 Apr 25 21:45	5°♉29’31	0°-27’-18
minimum elong	1936 Apr 25 21:45	5°♉29’31	0°27’19
max. Earth dist.	1936 Apr 26 09:17	5°♉31’10	20.80782 AU
retrograde	1936 Aug 15 02:35	9°♉35’31	
opposition	1936 Oct 31 04:38	7°♉34’59	0°-28’-47
min. Earth dist.	1936 Oct 30 18:25	7°♉36’02	18.78450 AU
direct	1937 Jan 13 21:32	5°♉37’12	
conjunction	1937 Apr 30 08:38	9°♉34’46	0°-24’-46
minimum elong	1937 Apr 30 08:38	9°♉34’46	0°24’47
max. Earth dist.	1937 Apr 30 19:44	9°♉36’21	20.76044 AU
retrograde	1937 Aug 19 13:48	13°♉41’29	
opposition	1937 Nov 04 12:33	11°♉40’52	0°-25’-54
min. Earth dist.	1937 Nov 04 03:36	11°♉41’47	18.73565 AU
direct	1938 Jan 18 04:53	9°♉42’52	
conjunction	1938 May 04 20:09	13°♉41’28	0°-22’-6
minimum elong	1938 May 04 20:09	13°♉41’28	0°22’07
max. Earth dist.	1938 May 05 04:39	13°♉42’41	20.71030 AU
retrograde	1938 Aug 24 02:09	17°♉48’59	
opposition	1938 Nov 08 21:02	15°♉48’15	0°-22’-53
min. Earth dist.	1938 Nov 08 13:44	15°♉49’00	18.68402 AU
direct	1939 Jan 22 12:05	13°♉50’01	
conjunction	1939 May 09 08:33	17°♉49’44	0°-19’-18
minimum elong	1939 May 09 08:33	17°♉49’44	0°19’19
max. Earth dist.	1939 May 09 16:27	17°♉50’52	20.65705 AU
retrograde	1939 Aug 28 14:27	21°♉58’04	
opposition	1939 Nov 13 05:57	19°♉57’15	0°-19’-42
min. Earth dist.	1939 Nov 13 00:03	19°♉57’52	18.62906 AU
direct	1940 Jan 26 20:26	17°♉58’45	
conjunction	1940 May 12 21:53	21°♉59’39	0°-16’-22
minimum elong	1940 May 12 21:53	21°♉59’39	0°16’23
max. Earth dist.	1940 May 13 02:43	22°♉00’20	20.60050 AU
retrograde	1940 Sep 01 04:00	26°♉08’49	
opposition	1940 Nov 16 15:17	24°♉07’52	0°-16’-24
min. Earth dist.	1940 Nov 16 11:28	24°♉08’16	18.57078 AU
direct	1941 Jan 30 05:02	22°♉09’03	
conjunction	1941 May 17 12:18	26°♉11’13	0°-13’-20
minimum elong	1941 May 17 12:18	26°♉11’13	0°13’22
behind sun begin	1941 May 17 08:34	26°♉10’41	
behind sun end	1941 May 17 16:02	26°♉11’45	
max. Earth dist.	1941 May 17 16:07	26°♉11’45	20.54039 AU
	1941 Aug 07 15:29	0°♊	
retrograde	1941 Sep 05 17:36	0°♊21’13	
	1941 Oct 05 02:11	30°♉	
opposition	1941 Nov 21 01:06	28°♉20’07	0°-13’00
min. Earth dist.	1941 Nov 20 22:44	28°♉20’22	18.50886 AU
direct	1942 Feb 03 14:50	26°♉20’58	
	1942 May 15 04:03	0°♊	
conjunction	1942 May 22 03:18	0°♊24’24	0°-10’-13
minimum elong	1942 May 22 03:18	0°♊24’24	0°10’13
behind sun begin	1942 May 21 21:59	0°♊23’39	
behind sun end	1942 May 22 08:36	0°♊25’09	
max. Earth dist.	1942 May 22 03:51	0°♊24’29	20.47693 AU
retrograde	1942 Sep 10 07:42	4°♊35’15	
opposition	1942 Nov 25 11:26	2°♊33’59	0°-9’-29
min. Earth dist.	1942 Nov 25 11:18	2°♊34’00	18.44392 AU
direct	1943 Feb 08 00:53	0°♊34’26	
conjunction	1943 May 26 19:18	4°♊39’13	0°-7’-1
minimum elong	1943 May 26 19:18	4°♊39’13	0°07’02
behind sun begin	1943 May 26 13:05	4°♊38’20	
behind sun end	1943 May 27 01:31	4°♊40’06	
max. Earth dist.	1943 May 26 19:00	4°♊39’11	20.41068 AU
retrograde	1943 Sep 14 22:36	8°♊50’55	
opposition	1943 Nov 29 22:09	6°♊49’28	0°-5’-54
min. Earth dist.	1943 Nov 29 23:13	6°♊49’21	18.37649 AU
direct	1944 Feb 12 12:14	4°♊49’30	
conjunction	1944 May 30 11:58	8°♊55’40	0°-3’-46
minimum elong	1944 May 30 11:58	8°♊55’40	0°03’47
behind sun begin	1944 May 30 05:17	8°♊54’43	
behind sun end	1944 May 30 18:39	8°♊56’37	
max. Earth dist.	1944 May 30 08:33	8°♊55’12	20.34240 AU
retrograde	1944 Sep 18 13:31	13°♊08’15	
opposition	1944 Dec 03 09:29	11°♊06’36	0°-2’-15
min. Earth dist.	1944 Dec 03 12:48	11°♊06’14	18.30749 AU
direct	1945 Feb 15 23:25	9°♊06’11	
conjunction	1945 Jun 04 05:43	13°♊13’48	0°00’-24
minimum elong	1945 Jun 04 05:43	13°♊13’48	0°00’25
behind sun begin	1945 Jun 03 22:59	13°♊12’50	
behind sun end	1945 Jun 04 12:26	13°♊14’46	
max. Earth dist.	1945 Jun 04 01:34	13°♊13’14	20.27281 AU
asc. node	1945 Jul 19 08:16	15°♊43’32	
retrograde	1945 Sep 23 05:56	17°♊27’13	
opposition	1945 Dec 07 21:08	15°♊25’24	0°01’25
min. Earth dist.	1945 Dec 08 01:22	15°♊24’57	18.23751 AU
direct	1946 Feb 20 12:13	13°♊24’34	
conjunction	1946 Jun 09 00:04	17°♊33’39	0°03’00
minimum elong	1946 Jun 09 00:04	17°♊33’39	0°02’59
behind sun begin	1946 Jun 08 17:19	17°♊32’41	
behind sun end	1946 Jun 09 06:48	17°♊34’37	
max. Earth dist.	1946 Jun 08 17:01	17°♊32’38	20.20270 AU
retrograde	1946 Sep 27 22:01	21°♊47’58	
opposition	1946 Dec 12 09:35	19°♊45’57	0°05’07
min. Earth dist.	1946 Dec 12 15:57	19°♊45’16	18.16753 AU
direct	1947 Feb 25 00:30	17°♊44’40	
conjunction	1947 Jun 13 19:16	21°♊55’16	0°06’19
minimum elong	1947 Jun 13 19:17	21°♊55’16	0°06’19
behind sun begin	1947 Jun 13 12:54	21°♊54’21	
behind sun end	1947 Jun 14 01:39	21°♊56’12	
max. Earth dist.	1947 Jun 13 11:44	21°♊54’10	20.13290 AU
retrograde	1947 Oct 02 16:05	26°♊10’28	
opposition	1947 Dec 16 22:34	24°♊08’18	0°08’48
min. Earth dist.	1947 Dec 17 05:28	24°♊07’34	18.09806 AU
direct	1948 Feb 29 14:23	22°♊06’37	
conjunction	1948 Jun 17 15:24	26°♊18’45	0°09’36
minimum elong	1948 Jun 17 15:24	26°♊18’45	0°09’36
behind sun begin	1948 Jun 17 09:51	26°♊17’57	
behind sun end	1948 Jun 17 20:57	26°♊19’33	
max. Earth dist.	1948 Jun 17 05:11	26°♊17’15	20.06393 AU
	1948 Aug 30 15:38	0°♋	

retrograde	1948 Oct	06	09:51	0°♋34’50	
	1948 Nov	12	13:29	30°♊	
opposition	1948 Dec	20	12:12	28°♊32’32	0°12’28
min. Earth dist.	1948 Dec	20	21:15	28°♊31’34	18.02984 AU
direct	1949 Mar	05	04:09	26°♊30’26	
	1949 Jun	10	04:06	0°♋	
conjunction	1949 Jun	22	12:33	0°♋44’09	0°12’52
minimum elong	1949 Jun	22	12:33	0°♋44’09	0°12’52
behind sun begin	1949 Jun	22	08:31	0°♋43’34	
behind sun end	1949 Jun	22	16:36	0°♋44’45	
max. Earth dist.	1949 Jun	22	01:42	0°♋42’33	19.99646 AU
retrograde	1949 Oct	11	05:14	5°♋01’06	
opposition	1949 Dec	25	02:32	2°♋58’43	0°16’04
min. Earth dist.	1949 Dec	25	11:54	2°♋57’43	17.96321 AU
direct	1950 Mar	09	19:24	0°♋56’15	
conjunction	1950 Jun	27	10:17	5°♋11’33	0°16’05
minimum elong	1950 Jun	27	10:17	5°♋11’33	0°16’05
max. Earth dist.	1950 Jun	26	21:08	5°♋09’35	19.93073 AU
retrograde	1950 Oct	16	00:18	9°♋29’23	
opposition	1950 Dec	29	17:44	7°♋26’56	0°19’37
min. Earth dist.	1950 Dec	30	05:13	7°♋25’42	17.89857 AU
direct	1951 Mar	14	10:41	5°♋24’07	
conjunction	1951 Jul	02	09:07	9°♋41’01	0°19’14
minimum elong	1951 Jul	02	09:06	9°♋41’01	0°19’13
max. Earth dist.	1951 Jul	01	19:10	9°♋38’55	19.86711 AU
retrograde	1951 Oct	20	20:56	13°♋59’41	
opposition	1952 Jan	03	09:25	11°♋57’12	0°23’05
min. Earth dist.	1952 Jan	03	21:17	11°♋55’55	17.83591 AU
direct	1952 Mar	18	04:12	9°♋54’03	
conjunction	1952 Jul	06	08:50	14°♋12’33	0°22’17
minimum elong	1952 Jul	06	08:50	14°♋12’33	0°22’18
max. Earth dist.	1952 Jul	05	16:45	14°♋10’07	19.80530 AU
retrograde	1952 Oct	24	16:47	18°♋32’02	
opposition	1953 Jan	07	02:10	16°♋29’31	0°26’25
min. Earth dist.	1953 Jan	07	16:24	16°♋27’58	17.77508 AU
direct	1953 Mar	22	21:22	14°♋26’02	
conjunction	1953 Jul	11	09:23	18°♋46’05	0°25’13
minimum elong	1953 Jul	11	09:23	18°♋46’05	0°25’14
max. Earth dist.	1953 Jul	10	16:02	18°♋43’27	19.74530 AU
retrograde	1953 Oct	29	14:19	23°♋06’19	
opposition	1954 Jan	11	19:30	21°♋03’46	0°29’37
min. Earth dist.	1954 Jan	12	10:06	21°♋02’11	17.71593 AU
direct	1954 Mar	27	17:31	18°♋59’58	
conjunction	1954 Jul	16	10:42	23°♋21’30	0°28’01
minimum elong	1954 Jul	16	10:42	23°♋21’30	0°28’01
max. Earth dist.	1954 Jul	15	15:37	23°♋18’36	19.68690 AU
retrograde	1954 Nov	03	10:58	27°♋42’26	
opposition	1955 Jan	16	13:50	25°♋39’50	0°32’40
min. Earth dist.	1955 Jan	17	06:40	25°♋38’00	17.65859 AU
direct	1955 Apr	01	12:50	23°♋35’40	
conjunction	1955 Jul	21	12:34	27°♋58’38	0°30’39
minimum elong	1955 Jul	21	12:34	27°♋58’38	0°30’40
max. Earth dist.	1955 Jul	20	15:54	27°♋55’28	19.63057 AU
	1955 Aug	24	18:03	0°♌	
retrograde	1955 Nov	08	09:29	2°♌20’12	
opposition	1956 Jan	21	08:41	0°♌17’31	0°35’31
min. Earth dist.	1956 Jan	22	01:47	0°♌15’39	17.60333 AU
	1956 Jan	28	01:58	30°♋	
direct	1956 Apr	05	11:22	28°♋13’00	
	1956 Jun	10	01:47	0°♌	
conjunction	1956 Jul	25	15:14	2°♌37’19	0°33’07
minimum elong	1956 Jul	25	15:14	2°♌37’19	0°33’06
max. Earth dist.	1956 Jul	24	17:30	2°♌33’59	19.57640 AU
retrograde	1956 Nov	12	06:51	6°♌59’26	
opposition	1957 Jan	25	04:19	4°♌56’42	0°38’08
min. Earth dist.	1957 Jan	25	23:24	4°♌54’37	17.55059 AU
direct	1957 Apr	10	08:20	2°♌51’49	
conjunction	1957 Jul	30	18:16	7°♌17’24	0°35’21
minimum elong	1957 Jul	30	18:16	7°♌17’24	0°35’21
max. Earth dist.	1957 Jul	29	18:52	7°♌13’48	19.52526 AU
retrograde	1957 Nov	17	06:27	11°♌40’02	
opposition	1958 Jan	30	00:32	9°♌37’12	0°40’31
min. Earth dist.	1958 Jan	30	19:41	9°♌35’07	17.50119 AU
direct	1958 Apr	15	08:27	7°♌31’59	
conjunction	1958 Aug	04	21:36	11°♌58’45	0°37’22
minimum elong	1958 Aug	04	21:36	11°♌58’45	0°37’22
max. Earth dist.	1958 Aug	03	22:09	11°♌55’07	19.47760 AU
retrograde	1958 Nov	22	04:49	16°♌21’48	
opposition	1959 Feb	03	21:30	14°♌18’55	0°42’39
min. Earth dist.	1959 Feb	04	18:03	14°♌16’40	17.45562 AU
direct	1959 Apr	20	06:57	12°♌13’21	
max. Earth dist.	1959 Aug	09	00:18	16°♌37’20	19.43428 AU
conjunction	1959 Aug	10	01:17	16°♌41’12	0°39’08
minimum elong	1959 Aug	10	01:17	16°♌41’12	0°39’08
retrograde	1959 Nov	27	04:47	21°♌04’37	
opposition	1960 Feb	08	18:47	19°♌01’40	0°44’29
min. Earth dist.	1960 Feb	09	15:19	18°♌59’25	17.41473 AU
direct	1960 Apr	24	07:47	16°♌55’48	
max. Earth dist.	1960 Aug	13	05:04	21°♌20’52	19.39578 AU
conjunction	1960 Aug	14	05:24	21°♌24’39	0°40’39
minimum elong	1960 Aug	14	05:24	21°♌24’39	0°40’39
retrograde	1960 Dec	01	04:20	25°♌48’21	
opposition	1961 Feb	12	16:55	23°♌45’23	0°46’02
min. Earth dist.	1961 Feb	13	14:11	23°♌43’03	17.37894 AU
direct	1961 Apr	29	07:50	21°♌39’15	
max. Earth dist.	1961 Aug	18	07:49	26°♌05’00	19.36284 AU
conjunction	1961 Aug	19	09:21	26°♌08’59	0°41’53
minimum elong	1961 Aug	19	09:21	26°♌08’59	0°41’52
	1961 Nov	01	15:59	0°♍	
retrograde	1961 Dec	06	04:27	0°♍32’55	
	1962 Jan	10	05:55	30°♌	
opposition	1962 Feb	17	15:31	28°♌29’57	0°47’15
min. Earth dist.	1962 Feb	18	12:30	28°♌27’38	17.34907 AU
direct	1962 May	04	08:57	26°♌23’37	
	1962 Aug	10	01:18	0°♍	
conjunction	1962 Aug	24	13:40	0°♍54’08	0°42’50
minimum elong	1962 Aug	24	13:40	0°♍54’08	0°42’50
max. Earth dist.	1962 Aug	23	13:25	0°♍50’21	19.33599 AU
retrograde	1962 Dec	11	05:12	5°♍18’14	
opposition	1963 Feb	22	14:38	3°♍15’18	0°48’10
min. Earth dist.	1963 Feb	23	11:37	3°♍13’00	17.32540 AU
direct	1963 May	09	10:16	1°♍08’52	
conjunction	1963 Aug	29	17:53	5°♍40’02	0°43’30
minimum elong	1963 Aug	29	17:53	5°♍40’02	0°43’29
max. Earth dist.	1963 Aug	28	16:44	5°♍36’06	19.31557 AU
retrograde	1963 Dec	16	05:12	10°♍04’15	
opposition	1964 Feb	27	14:17	8°♍01’25	0°48’45
min. Earth dist.	1964 Feb	28	11:08	7°♍59’08	17.30822 AU
direct	1964 May	13	11:26	5°♍54’54	

conjunction	1964 Sep	02	22:17	10°♍26’39	0°43’52
minimum elong	1964 Sep	02	22:17	10°♍26’39	0°43’51
max. Earth dist.	1964 Sep	01	22:35	10°♍22’55	19.30152 AU
retrograde	1964 Dec	20	06:45	14°♍50’53	
opposition	1965 Mar	03	14:23	12°♍48’11	0°49’00
min. Earth dist.	1965 Mar	04	10:46	12°♍45’57	17.29716 AU
direct	1965 May	18	14:32	10°♍41’41	
max. Earth dist.	1965 Sep	07	02:21	15°♍10’02	19.29350 AU
conjunction	1965 Sep	08	02:30	15°♍13’50	0°43’56
minimum elong	1965 Sep	08	02:30	15°♍13’50	0°43’56
retrograde	1965 Dec	25	06:06	19°♍38’03	
opposition	1966 Mar	08	15:02	17°♍35’29	0°48’54
min. Earth dist.	1966 Mar	09	11:31	17°♍33’14	17.29213 AU
direct	1966 May	23	16:37	15°♍29’01	
max. Earth dist.	1966 Sep	12	07:40	19°♍57’50	19.29124 AU
conjunction	1966 Sep	13	06:31	20°♍01’26	0°43’41
minimum elong	1966 Sep	13	06:31	20°♍01’26	0°43’41
retrograde	1966 Dec	30	07:30	24°♍25’32	
opposition	1967 Mar	13	16:00	22°♍23’06	0°48’29
min. Earth dist.	1967 Mar	14	11:34	22°♍20’58	17.29243 AU
direct	1967 May	28	21:37	20°♍16’43	
max. Earth dist.	1967 Sep	17	11:33	24°♍45’37	19.29409 AU
conjunction	1967 Sep	18	10:26	24°♍49’13	0°43’09
minimum elong	1967 Sep	18	10:26	24°♍49’13	0°43’09
retrograde	1968 Jan	04	06:14	29°♍13’06	
opposition	1968 Mar	17	17:16	27°♍10’49	0°47’43
min. Earth dist.	1968 Mar	18	13:11	27°♍08’39	17.29786 AU
direct	1968 Jun	02	00:36	25°♍04’29	
conjunction	1968 Sep	22	14:01	29°♍36’57	0°42’19
minimum elong	1968 Sep	22	14:01	29°♍36’57	0°42’18
max. Earth dist.	1968 Sep	21	16:03	29°♍33’29	19.30198 AU
	1968 Sep	28	16:09	0°♎	
retrograde	1969 Jan	08	07:28	4°♎00’31	
opposition	1969 Mar	22	18:49	1°♎58’22	0°46’37
min. Earth dist.	1969 Mar	23	13:19	1°♎56’21	17.30801 AU
	1969 May	20	20:53	30°♍	
direct	1969 Jun	07	06:34	29°♍52’07	
	1969 Jun	24	10:33	0°♎	
conjunction	1969 Sep	27	17:02	4°♎24’21	0°41’11
minimum elong	1969 Sep	27	17:02	4°♎24’21	0°41’10
max. Earth dist.	1969 Sep	26	19:53	4°♎21’01	19.31448 AU
retrograde	1970 Jan	13	06:09	8°♎47’33	
opposition	1970 Mar	27	20:38	6°♎45’30	0°45’11
min. Earth dist.	1970 Mar	28	15:21	6°♎43’28	17.32291 AU
direct	1970 Jun	12	09:40	4°♎39’21	
conjunction	1970 Oct	02	19:32	9°♎11’12	0°39’46
minimum elong	1970 Oct	02	19:32	9°♎11’12	0°39’46
max. Earth dist.	1970 Oct	01	23:05	9°♎07’59	19.33177 AU
retrograde	1971 Jan	18	06:54	13°♎33’54	
opposition	1971 Apr	01	22:10	11°♎31’58	0°43’27
min. Earth dist.	1971 Apr	02	15:06	11°♎30’08	17.34241 AU
direct	1971 Jun	17	14:51	9°♎25’54	
conjunction	1971 Oct	07	21:33	13°♎57’15	0°38’04
minimum elong	1971 Oct	07	21:33	13°♎57’15	0°38’04
max. Earth dist.	1971 Oct	07	02:40	13°♎54’16	19.35362 AU
retrograde	1972 Jan	23	05:26	18°♎19’23	
opposition	1972 Apr	06	00:00	16°♎17’32	0°41’25
min. Earth dist.	1972 Apr	06	16:57	16°♎15’42	17.36660 AU
direct	1972 Jun	21	17:27	14°♎11’36	

conjunction	1972 Oct	11	22:36	18°♎42’15	0°36’07
minimum elong	1972 Oct	11	22:36	18°♎42’15	0°36’08
max. Earth dist.	1972 Oct	11	04:23	18°♎39’23	19.38030 AU
retrograde	1973 Jan	27	05:30	23°♎03’45	
opposition	1973 Apr	11	01:31	21°♎01’59	0°39’06
min. Earth dist.	1973 Apr	11	16:15	21°♎00’24	17.39563 AU
direct	1973 Jun	26	22:00	18°♎56’11	
conjunction	1973 Oct	16	23:00	23°♎26’02	0°33’56
minimum elong	1973 Oct	16	23:00	23°♎26’02	0°33’56
max. Earth dist.	1973 Oct	16	07:14	23°♎23’33	19.41186 AU
retrograde	1974 Feb	01	02:56	27°♎46’50	
opposition	1974 Apr	16	03:02	25°♎45’09	0°36’32
min. Earth dist.	1974 Apr	16	17:17	25°♎43’37	17.42975 AU
direct	1974 Jul	02	00:16	23°♎39’31	
conjunction	1974 Oct	21	22:20	28°♎08’25	0°31’32
minimum elong	1974 Oct	21	22:20	28°♎08’25	0°31’32
max. Earth dist.	1974 Oct	21	07:22	28°♎06’04	19.44868 AU
	1974 Nov	21	09:31	0°♏	
retrograde	1975 Feb	06	01:48	2°♏28’29	
opposition	1975 Apr	21	04:09	0°♏26’54	0°33’44
min. Earth dist.	1975 Apr	21	15:53	0°♏25’38	17.46917 AU
	1975 May	01	17:47	30°♎	
direct	1975 Jul	07	03:58	28°♎21’28	
	1975 Sep	08	05:16	0°♏	
conjunction	1975 Oct	26	21:04	2°♏49’21	0°28’56
minimum elong	1975 Oct	26	21:04	2°♏49’21	0°28’56
max. Earth dist.	1975 Oct	26	09:02	2°♏47’28	19.49075 AU
retrograde	1976 Feb	10	22:11	7°♏08’37	
opposition	1976 Apr	25	05:05	5°♏07’11	0°30’43
min. Earth dist.	1976 Apr	25	15:51	5°♏06’02	17.51382 AU
direct	1976 Jul	11	06:05	3°♏02’03	
conjunction	1976 Oct	30	18:48	7°♏28’48	0°26’09
minimum elong	1976 Oct	30	18:48	7°♏28’48	0°26’09
max. Earth dist.	1976 Oct	30	07:38	7°♏27’03	19.53815 AU
retrograde	1977 Feb	14	19:50	11°♏47’17	
opposition	1977 Apr	30	05:42	9°♏46’00	0°27’32
min. Earth dist.	1977 Apr	30	13:55	9°♏45’08	17.56374 AU
direct	1977 Jul	16	08:41	7°♏41’12	
conjunction	1977 Nov	04	15:41	12°♏06’46	0°23’14
minimum elong	1977 Nov	04	15:42	12°♏06’46	0°23’14
max. Earth dist.	1977 Nov	04	07:41	12°♏05’31	19.59050 AU
retrograde	1978 Feb	19	15:25	16°♏24’26	
opposition	1978 May	05	06:01	14°♏23’22	0°24’11
min. Earth dist.	1978 May	05	12:57	14°♏22’38	17.61818 AU
direct	1978 Jul	21	10:03	12°♏18’56	
conjunction	1978 Nov	09	11:42	16°♏43’15	0°20’10
minimum elong	1978 Nov	09	11:42	16°♏43’15	0°20’10
max. Earth dist.	1978 Nov	09	04:32	16°♏42’08	19.64707 AU
retrograde	1979 Feb	24	11:58	21°♏00’05	
opposition	1979 May	10	05:43	18°♏59’13	0°20’42
min. Earth dist.	1979 May	10	10:37	18°♏58’42	17.67659 AU
direct	1979 Jul	26	10:59	16°♏55’12	
conjunction	1979 Nov	14	07:03	21°♏18’12	0°16’59
minimum elong	1979 Nov	14	07:02	21°♏18’12	0°16’59
max. Earth dist.	1979 Nov	14	02:46	21°♏17’33	19.70711 AU
retrograde	1980 Feb	29	06:40	25°♏34’11	
opposition	1980 May	14	05:16	23°♏33’34	0°17’06
min. Earth dist.	1980 May	14	08:40	23°♏33’12	17.73793 AU
direct	1980 Jul	30	11:39	21°♏29’58	

conjunction	1980 Nov 18	01:14	25°♏51’35	0°13’43
minimum elong	1980 Nov 18	01:14	25°♏51’35	0°13’44
behind sun begin	1980 Nov 17	21:38	25°♏51’02	
behind sun end	1980 Nov 18	04:51	25°♏52’07	
max. Earth dist.	1980 Nov 17	21:51	25°♏51’04	19.76974 AU
	1981 Feb 17	09:00	0°♐	
retrograde	1981 Mar 05	01:47	0°♐06’43	
	1981 Mar 20	23:17	30°♏	
opposition	1981 May 19	04:22	28°♏06’18	0°13’24
min. Earth dist.	1981 May 19	06:05	28°♏06’07	17.80168 AU
direct	1981 Aug 04	10:50	26°♏03’06	
	1981 Nov 16	12:05	0°♐	
conjunction	1981 Nov 22	18:49	0°♐23’18	0°10’24
minimum elong	1981 Nov 22	18:49	0°♐23’18	0°10’23
behind sun begin	1981 Nov 22	13:36	0°♐22’31	
behind sun end	1981 Nov 23	00:02	0°♐24’05	
max. Earth dist.	1981 Nov 22	18:02	0°♐23’11	19.83435 AU
retrograde	1982 Mar 09	19:41	4°♐37’32	
opposition	1982 May 24	02:48	2°♐37’20	0°09’39
min. Earth dist.	1982 May 24	02:48	2°♐37’20	17.86689 AU
direct	1982 Aug 09	10:21	0°♐34’33	
conjunction	1982 Nov 27	11:23	4°♐53’16	0°07’01
minimum elong	1982 Nov 27	11:23	4°♐53’16	0°07’02
behind sun begin	1982 Nov 27	05:17	4°♐52’21	
behind sun end	1982 Nov 27	17:29	4°♐54’11	
max. Earth dist.	1982 Nov 27	11:25	4°♐53’16	19.90007 AU
retrograde	1983 Mar 14	13:03	9°♐06’37	
opposition	1983 May 29	00:47	7°♐06’35	0°05’52
min. Earth dist.	1983 May 28	23:35	7°♐06’43	17.93303 AU
direct	1983 Aug 14	07:11	5°♐04’12	
conjunction	1983 Dec 02	03:10	9°♐21’25	0°03’37
minimum elong	1983 Dec 02	03:09	9°♐21’25	0°03’37
behind sun begin	1983 Dec 01	20:38	9°♐20’26	
behind sun end	1983 Dec 02	09:39	9°♐22’23	
max. Earth dist.	1983 Dec 02	05:25	9°♐21’43	19.96638 AU
retrograde	1984 Mar 18	06:13	13°♐33’50	
opposition	1984 Jun 01	22:06	11°♐33’58	0°02’04
min. Earth dist.	1984 Jun 01	18:54	11°♐34’18	17.99932 AU
direct	1984 Aug 18	05:40	9°♐31’58	
conjunction	1984 Dec 05	17:57	13°♐47’38	0°00’09
minimum elong	1984 Dec 05	17:57	13°♐47’38	0°00’09
behind sun begin	1984 Dec 05	11:29	13°♐46’40	
behind sun end	1984 Dec 06	00:25	13°♐48’36	
max. Earth dist.	1984 Dec 05	21:15	13°♐48’05	20.03271 AU
desc. node	1984 Dec 21	02:31	14°♐43’40	
retrograde	1985 Mar 22	22:02	17°♐59’09	
opposition	1985 Jun 06	18:50	15°♐59’24	0°-1’-42
min. Earth dist.	1985 Jun 06	14:44	15°♐59’50	18.06570 AU
direct	1985 Aug 23	00:19	13°♐57’44	
conjunction	1985 Dec 10	07:48	18°♐11’51	0°-3’-18
minimum elong	1985 Dec 10	07:47	18°♐11’51	0°03’19
behind sun begin	1985 Dec 10	01:16	18°♐10’52	
behind sun end	1985 Dec 10	14:18	18°♐12’49	
max. Earth dist.	1985 Dec 10	13:08	18°♐12’38	20.09899 AU
retrograde	1986 Mar 27	14:17	22°♐22’26	
opposition	1986 Jun 11	14:41	20°♐22’47	0°-5’-26
min. Earth dist.	1986 Jun 11	08:21	20°♐23’26	18.13174 AU
direct	1986 Aug 27	21:15	18°♐21’27	
conjunction	1986 Dec 14	20:42	22°♐33’59	0°-6’-38
minimum elong	1986 Dec 14	20:43	22°♐33’59	0°06’40
behind sun begin	1986 Dec 14	14:34	22°♐33’05	
behind sun end	1986 Dec 15	02:52	22°♐34’54	
max. Earth dist.	1986 Dec 15	03:21	22°♐34’58	20.16489 AU
retrograde	1987 Apr 01	04:35	26°♐43’40	
opposition	1987 Jun 16	09:48	24°♐44’05	0°-9’-7
min. Earth dist.	1987 Jun 16	02:43	24°♐44’49	18.19766 AU
direct	1987 Sep 01	14:23	22°♐43’04	
conjunction	1987 Dec 19	08:45	26°♐54’03	0°-9’-54
minimum elong	1987 Dec 19	08:45	26°♐54’03	0°09’55
behind sun begin	1987 Dec 19	03:23	26°♐53’15	
behind sun end	1987 Dec 19	14:07	26°♐54’50	
max. Earth dist.	1987 Dec 19	17:21	26°♐55’20	20.23079 AU
	1988 Feb 15	00:10	0°♑	
retrograde	1988 Apr 04	19:25	1°♑02’50	
	1988 May 27	01:18	30°♐	
opposition	1988 Jun 20	04:11	29°♐03’20	0°-12’-42
min. Earth dist.	1988 Jun 19	18:29	29°♐04’19	18.26353 AU
direct	1988 Sep 05	09:41	27°♐02’38	
	1988 Dec 02	15:35	0°♑	
conjunction	1988 Dec 22	19:47	1°♑12’05	0°-13’-5
minimum elong	1988 Dec 22	19:47	1°♑12’05	0°13’07
behind sun begin	1988 Dec 22	15:46	1°♑11’30	
behind sun end	1988 Dec 22	23:47	1°♑12’40	
max. Earth dist.	1988 Dec 23	06:05	1°♑13’37	20.29664 AU
retrograde	1989 Apr 09	08:54	5°♑20’02	
opposition	1989 Jun 24	22:01	3°♑20’36	0°-16’-12
min. Earth dist.	1989 Jun 24	11:30	3°♑21’40	18.32955 AU
direct	1989 Sep 10	01:14	1°♑20’15	
conjunction	1989 Dec 27	06:12	5°♑28’13	0°-16’-10
minimum elong	1989 Dec 27	06:12	5°♑28’13	0°16’11
behind sun begin	1989 Dec 27	05:29	5°♑28’06	
behind sun end	1989 Dec 27	06:54	5°♑28’19	
max. Earth dist.	1989 Dec 27	18:14	5°♑30’00	20.36265 AU
retrograde	1990 Apr 13	22:21	9°♑35’21	
opposition	1990 Jun 29	14:43	7°♑36’01	0°-19’-34
min. Earth dist.	1990 Jun 29	01:34	7°♑37’21	18.39545 AU
direct	1990 Sep 14	18:29	5°♑36’02	
conjunction	1990 Dec 31	15:51	9°♑42’34	0°-19’-9
minimum elong	1990 Dec 31	15:51	9°♑42’34	0°19’10
max. Earth dist.	1991 Jan 01	05:31	9°♑44’36	20.42830 AU
retrograde	1991 Apr 18	10:33	13°♑48’57	
opposition	1991 Jul 04	07:04	11°♑49’44	0°-22’-48
min. Earth dist.	1991 Jul 03	17:23	11°♑51’07	18.46088 AU
direct	1991 Sep 19	08:37	9°♑50’08	
conjunction	1992 Jan 05	00:45	13°♑55’17	0°-22’-1
minimum elong	1992 Jan 05	00:45	13°♑55’17	0°22’02
max. Earth dist.	1992 Jan 05	15:50	13°♑57’32	20.49330 AU
retrograde	1992 Apr 21	23:19	18°♑00’58	
opposition	1992 Jul 07	22:38	16°♑01’52	0°-25’-54
min. Earth dist.	1992 Jul 07	06:26	16°♑03’30	18.52526 AU
direct	1992 Sep 22	23:45	14°♑02’39	
conjunction	1993 Jan 08	09:09	18°♑06’28	0°-24’-45
minimum elong	1993 Jan 08	09:09	18°♑06’28	0°24’45
max. Earth dist.	1993 Jan 09	01:49	18°♑08’57	20.55687 AU
retrograde	1993 Apr 26	10:03	22°♑11’30	
opposition	1993 Jul 12	13:39	20°♑12’32	0°-28’-51
min. Earth dist.	1993 Jul 11	21:18	20°♑14’11	18.58804 AU
direct	1993 Sep 27	12:29	18°♑13’41	
conjunction	1994 Jan 12	16:59	22°♑16’14	0°-27’-20
minimum elong	1994 Jan 12	16:59	22°♑16’14	0°27’21
max. Earth dist.	1994 Jan 13	10:35	22°♑18’50	20.61859 AU

retrograde	1994 Apr	30	22:18	26°♉20’38			retrograde	2002 Jun	03	00:11	28°♒50’08		
min. Earth dist.	1994 Jul	16	09:26	24°♉23’38	18.64849 AU		min. Earth dist.	2002 Aug	19	02:23	26°♒53’34	18.99336 AU	
opposition	1994 Jul	17	03:54	24°♉21’47	0°-31’-37		opposition	2002 Aug	20	00:54	26°♒51’19	0°-46’-38	
direct	1994 Oct	02	01:47	22°♉23’17			direct	2002 Nov	04	06:27	24°♒54’30		
conjunction	1995 Jan	17	00:22	26°♉24’38	0°-29’-46		conjunction	2003 Feb	17	21:38	28°♒48’27	0°-42’-37	
minimum elong	1995 Jan	17	00:22	26°♉24’38	0°29’47		minimum elong	2003 Feb	17	21:38	28°♒48’27	0°42’39	
max. Earth dist.	1995 Jan	17	19:16	26°♉27’25	20.67748 AU		max. Earth dist.	2003 Feb	18	21:11	28°♒51’51	21.00619 AU	
	1995 Apr	01	12:10	0°♒				2003 Mar	10	20:53	0°♓		
retrograde	1995 May	05	07:48	0°♒28’28			retrograde	2003 Jun	07	06:59	2°♓49’14		
	1995 Jun	09	01:43	30°♉			min. Earth dist.	2003 Aug	23	11:56	0°♓52’35	19.01909 AU	
opposition	1995 Jul	21	17:40	28°♉29’43	0°-34’-13		opposition	2003 Aug	24	10:02	0°♓50’23	0°-47’-30	
min. Earth dist.	1995 Jul	20	23:25	28°♉31’33	18.70590 AU			2003 Sep	15	03:47	30°♒		
direct	1995 Oct	06	12:58	26°♉31’34			direct	2003 Nov	08	12:44	28°♒53’42		
	1996 Jan	12	07:13	0°♒				2003 Dec	30	09:14	0°♓		
conjunction	1996 Jan	21	07:21	0°♒31’45	0°-32’-2		conjunction	2004 Feb	22	02:07	2°♓47’06	0°-43’-18	
minimum elong	1996 Jan	21	07:21	0°♒31’45	0°32’04		minimum elong	2004 Feb	22	02:07	2°♓47’06	0°43’19	
max. Earth dist.	1996 Jan	22	02:44	0°♒34’36	20.73320 AU		max. Earth dist.	2004 Feb	23	01:28	2°♓50’28	21.03035 AU	
retrograde	1996 May	08	19:35	4°♒35’03			retrograde	2004 Jun	10	15:47	6°♓47’46		
min. Earth dist.	1996 Jul	24	10:47	2°♒38’23	18.75977 AU		opposition	2004 Aug	27	18:41	4°♓48’53	0°-48’-9	
opposition	1996 Jul	25	06:49	2°♒36’22	0°-36’-38		min. Earth dist.	2004 Aug	26	19:30	4°♓51’12	19.04158 AU	
direct	1996 Oct	10	00:55	0°♒38’31			direct	2004 Nov	11	19:11	2°♓52’20		
conjunction	1997 Jan	24	13:53	4°♒37’37	0°-34’-8		conjunction	2005 Feb	25	06:33	6°♓45’16	0°-43’-48	
minimum elong	1997 Jan	24	13:53	4°♒37’37	0°34’08		minimum elong	2005 Feb	25	06:33	6°♓45’16	0°43’49	
max. Earth dist.	1997 Jan	25	10:21	4°♒40’37	20.78492 AU		max. Earth dist.	2005 Feb	26	06:43	6°♓48’44	21.05097 AU	
retrograde	1997 May	13	04:05	8°♒40’25			retrograde	2005 Jun	14	22:38	10°♓45’53		
opposition	1997 Jul	29	19:29	6°♒41’48	0°-38’-51		min. Earth dist.	2005 Aug	31	04:32	8°♓49’15	19.06038 AU	
min. Earth dist.	1997 Jul	28	23:56	6°♒43’45	18.80942 AU		opposition	2005 Sep	01	03:03	8°♓47’00	0°-48’-34	
direct	1997 Oct	14	10:48	4°♒44’12			direct	2005 Nov	16	00:08	6°♓50’34		
conjunction	1998 Jan	28	20:08	8°♒42’15	0°-36’-3		conjunction	2006 Mar	01	11:02	10°♓43’09	0°-44’-4	
minimum elong	1998 Jan	28	20:08	8°♒42’15	0°36’04		minimum elong	2006 Mar	01	11:02	10°♓43’09	0°44’05	
max. Earth dist.	1998 Jan	29	16:39	8°♒45’15	20.83236 AU		max. Earth dist.	2006 Mar	02	10:40	10°♓46’32	21.06796 AU	
retrograde	1998 May	17	15:01	12°♒44’36			retrograde	2006 Jun	19	07:40	14°♓43’45		
min. Earth dist.	1998 Aug	02	10:17	10°♒48’04	18.85458 AU		min. Earth dist.	2006 Sep	04	11:47	12°♓47’10	19.07537 AU	
opposition	1998 Aug	03	07:12	10°♒45’59	0°-40’-51		opposition	2006 Sep	05	10:54	12°♓44’52	0°-48’-45	
direct	1998 Oct	18	21:24	8°♒48’35			direct	2006 Nov	20	06:09	10°♓48’33		
conjunction	1999 Feb	02	01:59	12°♒45’41	0°-37’-46		conjunction	2007 Mar	05	15:39	14°♓40’52	0°-44’-8	
minimum elong	1999 Feb	02	01:58	12°♒45’41	0°37’47		minimum elong	2007 Mar	05	15:40	14°♓40’52	0°44’09	
max. Earth dist.	1999 Feb	02	23:24	12°♒48’48	20.87513 AU		max. Earth dist.	2007 Mar	06	15:50	14°♓44’20	21.08080 AU	
retrograde	1999 May	21	22:24	16°♒47’36			retrograde	2007 Jun	23	14:43	18°♓41’33		
opposition	1999 Aug	07	18:38	14°♒48’58	0°-42’-38		opposition	2007 Sep	09	18:46	16°♓42’39	0°-48’-42	
min. Earth dist.	1999 Aug	06	22:17	14°♒51’00	18.89515 AU		min. Earth dist.	2007 Sep	08	20:34	16°♓44’52	19.08604 AU	
direct	1999 Oct	23	06:12	12°♒51’45			direct	2007 Nov	24	10:15	14°♓46’27		
conjunction	2000 Feb	06	07:14	16°♒47’55	0°-39’-17		conjunction	2008 Mar	08	20:19	18°♓38’34	0°-44’00	
minimum elong	2000 Feb	06	07:14	16°♒47’55	0°39’18		minimum elong	2008 Mar	08	20:19	18°♓38’34	0°44’01	
max. Earth dist.	2000 Feb	07	04:46	16°♒51’03	20.91361 AU		max. Earth dist.	2008 Mar	09	19:41	18°♓41’54	21.08931 AU	
retrograde	2000 May	25	08:20	20°♒49’28			retrograde	2008 Jun	27	00:01	22°♓39’23		
min. Earth dist.	2000 Aug	10	07:36	18°♒52’56	18.93159 AU		min. Earth dist.	2008 Sep	12	04:02	20°♓42’41	19.09214 AU	
opposition	2000 Aug	11	05:20	18°♒50’47	0°-44’-11		opposition	2008 Sep	13	02:21	20°♓40’27	0°-48’-26	
direct	2000 Oct	26	15:24	16°♒53’42			direct	2008 Nov	27	16:08	18°♓44’19		
conjunction	2001 Feb	09	12:19	20°♒49’02	0°-40’-36		conjunction	2009 Mar	13	01:28	22°♓36’21	0°-43’-39	
minimum elong	2001 Feb	09	12:19	20°♒49’02	0°40’38		minimum elong	2009 Mar	13	01:28	22°♓36’21	0°43’39	
max. Earth dist.	2001 Feb	10	10:55	20°♒52’19	20.94798 AU		max. Earth dist.	2009 Mar	14	00:56	22°♓39’42	21.09276 AU	
retrograde	2001 May	29	15:11	24°♒50’16			retrograde	2009 Jul	01	07:37	26°♓37’20		
opposition	2001 Aug	15	15:25	22°♒51’31	0°-45’-31		opposition	2009 Sep	17	09:41	24°♓38’22	0°-47’-56	
min. Earth dist.	2001 Aug	14	18:11	22°♒53’38	18.96419 AU		min. Earth dist.	2009 Sep	16	12:44	24°♓40’28	19.09293 AU	
direct	2001 Oct	30	22:55	20°♒54’34			direct	2009 Dec	01	20:27	22°♓42’16		
conjunction	2002 Feb	13	17:06	24°♒49’10	0°-41’-43		conjunction	2010 Mar	17	06:50	26°♓34’18	0°-43’-6	
minimum elong	2002 Feb	13	17:06	24°♒49’10	0°41’43		minimum elong	2010 Mar	17	06:50	26°♓34’18	0°43’07	
max. Earth dist.	2002 Feb	14	15:39	24°♒52’25	20.97884 AU		max. Earth dist.	2010 Mar	18	04:53	26°♓37’27	21.09087 AU	

	2010 May	28	01:44	0°♈				2018 May	15	15:17	0°♉	
retrograde	2010 Jul	05	16:48	0°♈35’30			retrograde	2018 Aug	07	16:50	2°♉33’39	
	2010 Aug	14	03:36	30°♓			min. Earth dist.	2018 Oct	23	11:51	0°♉34’41	18.87521 AU
opposition	2010 Sep	21	16:58	28°♓36’27	0°-47’-12		opposition	2018 Oct	24	00:47	0°♉33’22	0°-33’-35
min. Earth dist.	2010 Sep	20	20:18	28°♓38’31	19.08816 AU			2018 Nov	06	18:59	30°♈	
direct	2010 Dec	06	01:49	26°♓40’20			direct	2019 Jan	06	20:26	28°♈36’00	
	2011 Mar	12	00:49	0°♈				2019 Mar	06	08:27	0°♉	
conjunction	2011 Mar	21	12:24	0°♈32’25	0°-42’-20		conjunction	2019 Apr	22	23:07	2°♉31’41	0°-29’-15
minimum elong	2011 Mar	21	12:24	0°♈32’25	0°42’20		minimum elong	2019 Apr	22	23:07	2°♉31’41	0°29’16
max. Earth dist.	2011 Mar	22	10:14	0°♈35’32	21.08311 AU		max. Earth dist.	2019 Apr	23	13:07	2°♉33’41	20.85428 AU
retrograde	2011 Jul	10	00:35	4°♈33’52			retrograde	2019 Aug	12	02:27	6°♉36’55	
min. Earth dist.	2011 Sep	25	04:59	2°♈36’38	19.07746 AU		opposition	2019 Oct	28	08:15	4°♉36’31	0°-31’00
opposition	2011 Sep	26	00:15	2°♈34’42	0°-46’-14		min. Earth dist.	2019 Oct	27	20:37	4°♉37’43	18.83282 AU
direct	2011 Dec	10	07:04	0°♈38’31			direct	2020 Jan	11	01:48	2°♉39’00	
conjunction	2012 Mar	24	18:20	4°♈30’44	0°-41’-21		conjunction	2020 Apr	26	09:01	6°♉35’33	0°-26’-51
minimum elong	2012 Mar	24	18:20	4°♈30’44	0°41’23		minimum elong	2020 Apr	26	09:01	6°♉35’33	0°26’52
max. Earth dist.	2012 Mar	25	14:32	4°♈33’36	21.06973 AU		max. Earth dist.	2020 Apr	26	20:53	6°♉37’15	20.81059 AU
retrograde	2012 Jul	13	09:49	8°♈32’28			retrograde	2020 Aug	15	14:26	10°♉41’31	
opposition	2012 Sep	29	07:15	6°♈33’08	0°-45’-3		opposition	2020 Oct	31	15:53	8°♉41’02	0°-28’-16
min. Earth dist.	2012 Sep	28	12:29	6°♈35’02	19.06129 AU		min. Earth dist.	2020 Oct	31	05:28	8°♉42’06	18.78760 AU
direct	2012 Dec	13	12:02	4°♈36’50			direct	2021 Jan	14	08:36	6°♉43’18	
conjunction	2013 Mar	29	00:38	8°♈29’15	0°-40’-11		conjunction	2021 Apr	30	19:54	10°♉40’51	0°-24’-17
minimum elong	2013 Mar	29	00:38	8°♈29’15	0°40’12		minimum elong	2021 Apr	30	19:54	10°♉40’51	0°24’19
max. Earth dist.	2013 Mar	29	20:30	8°♈32’05	21.05087 AU		max. Earth dist.	2021 May	01	07:09	10°♉42’28	20.76376 AU
retrograde	2013 Jul	17	17:20	12°♈31’19			retrograde	2021 Aug	20	01:40	14°♉47’35	
opposition	2013 Oct	03	14:12	10°♈31’49	0°-43’-39		opposition	2021 Nov	04	23:58	12°♉47’01	0°-25’-22
min. Earth dist.	2013 Oct	02	20:50	10°♈33’34	19.03988 AU		min. Earth dist.	2021 Nov	04	15:06	12°♉47’56	18.73907 AU
direct	2013 Dec	17	17:39	8°♈35’22			direct	2022 Jan	18	15:26	10°♉49’06	
conjunction	2014 Apr	02	07:09	12°♈28’04	0°-38’-49		conjunction	2022 May	05	07:21	14°♉47’42	0°-21’-36
minimum elong	2014 Apr	02	07:09	12°♈28’04	0°38’50		minimum elong	2022 May	05	07:21	14°♉47’42	0°21’37
max. Earth dist.	2014 Apr	03	01:23	12°♈30’40	21.02726 AU		max. Earth dist.	2022 May	05	15:59	14°♉48’57	20.71364 AU
retrograde	2014 Jul	22	02:53	16°♈30’31			retrograde	2022 Aug	24	13:53	18°♉55’15	
opposition	2014 Oct	07	20:58	14°♈30’49	0°-42’-2		opposition	2022 Nov	09	08:26	16°♉54’36	0°-22’-19
min. Earth dist.	2014 Oct	07	04:08	14°♈32’32	19.01407 AU		min. Earth dist.	2022 Nov	09	01:10	16°♉55’21	18.68717 AU
direct	2014 Dec	21	22:45	12°♈34’11			direct	2023 Jan	22	22:58	14°♉56’26	
conjunction	2015 Apr	06	14:08	16°♈27’18	0°-37’-15		conjunction	2023 May	09	19:56	18°♉56’10	0°-18’-47
minimum elong	2015 Apr	06	14:08	16°♈27’18	0°37’17		minimum elong	2023 May	09	19:56	18°♉56’10	0°18’47
max. Earth dist.	2015 Apr	07	08:11	16°♈29’52	20.99938 AU		max. Earth dist.	2023 May	10	03:39	18°♉57’16	20.65986 AU
retrograde	2015 Jul	26	10:38	20°♈30’10			retrograde	2023 Aug	29	02:38	23°♉04’31	
opposition	2015 Oct	12	03:49	18°♈30’18	0°-40’-12		opposition	2023 Nov	13	17:20	21°♉03’45	0°-19’-7
min. Earth dist.	2015 Oct	11	12:12	18°♈31’54	18.98428 AU		min. Earth dist.	2023 Nov	13	11:44	21°♉04’20	18.63148 AU
direct	2015 Dec	26	03:52	16°♈33’30			direct	2024 Jan	27	07:35	19°♉05’19	
conjunction	2016 Apr	09	21:27	20°♈27’05	0°-35’-31		conjunction	2024 May	13	09:13	23°♉06’13	0°-15’-50
minimum elong	2016 Apr	09	21:27	20°♈27’05	0°35’31		minimum elong	2024 May	13	09:13	23°♉06’13	0°15’51
max. Earth dist.	2016 Apr	10	13:51	20°♈29’26	20.96793 AU		max. Earth dist.	2024 May	13	13:50	23°♉06’53	20.60242 AU
retrograde	2016 Jul	29	21:06	24°♈30’28			retrograde	2024 Sep	01	15:17	27°♉15’24	
opposition	2016 Oct	15	10:43	22°♈30’26	0°-38’-11		opposition	2024 Nov	17	02:45	25°♉14’29	0°-15’-48
min. Earth dist.	2016 Oct	14	19:43	22°♈31’58	18.95110 AU		min. Earth dist.	2024 Nov	16	23:02	25°♉14’52	18.57218 AU
direct	2016 Dec	29	09:29	20°♈33’26			direct	2025 Jan	30	16:22	23°♉15’42	
conjunction	2017 Apr	14	05:30	24°♈27’38	0°-33’-35		conjunction	2025 May	17	23:32	27°♉17’50	0°-12’-47
minimum elong	2017 Apr	14	05:30	24°♈27’38	0°33’37		minimum elong	2025 May	17	23:32	27°♉17’50	0°12’48
max. Earth dist.	2017 Apr	14	21:38	24°♈29’56	20.93304 AU		behind sun begin	2025 May	17	19:26	27°♉17’15	
retrograde	2017 Aug	03	05:31	28°♈31’33			behind sun end	2025 May	18	03:38	27°♉18’25	
opposition	2017 Oct	19	17:35	26°♈31’24	0°-35’-58		max. Earth dist.	2025 May	18	03:06	27°♉18’20	20.54132 AU
min. Earth dist.	2017 Oct	19	03:52	26°♈32’48	18.91459 AU			2025 Jul	07	07:45	0°♊	
direct	2018 Jan	02	14:11	24°♈34’13			retrograde	2025 Sep	06	04:51	1°♊27’50	
								2025 Nov	08	02:21	30°♉	
conjunction	2018 Apr	18	14:00	28°♈29’06	0°-31’-30		opposition	2025 Nov	21	12:25	29°♉26’44	0°-12’-23
minimum elong	2018 Apr	18	14:00	28°♈29’06	0°31’30		min. Earth dist.	2025 Nov	21	10:16	29°♉26’58	18.50939 AU
max. Earth dist.	2018 Apr	19	04:16	28°♈31’08	20.89516 AU		direct	2026 Feb	04	02:33	27°♉27’35	

	2026 Apr 26 00:50	0°♊	
conjunction	2026 May 22 14:26	1°♊31’00	0°-9’-40
minimum elong	2026 May 22 14:26	1°♊31’00	0°09’41
behind sun begin	2026 May 22 08:56	1°♊30’13	
behind sun end	2026 May 22 19:56	1°♊31’47	
max. Earth dist.	2026 May 22 14:55	1°♊31’03	20.47725 AU
retrograde	2026 Sep 10 18:27	5°♊41’49	
opposition	2026 Nov 25 22:41	3°♊40’32	0°-8’-52
min. Earth dist.	2026 Nov 25 22:27	3°♊40’33	18.44410 AU
direct	2027 Feb 08 12:29	1°♊40’58	
conjunction	2027 May 27 06:12	5°♊45’41	0°-6’-28
minimum elong	2027 May 27 06:12	5°♊45’41	0°06’29
behind sun begin	2027 May 26 23:52	5°♊44’47	
behind sun end	2027 May 27 12:31	5°♊46’35	
max. Earth dist.	2027 May 27 05:58	5°♊45’39	20.41088 AU
retrograde	2027 Sep 15 09:09	9°♊57’21	
opposition	2027 Nov 30 09:22	7°♊55’51	0°-5’-17
min. Earth dist.	2027 Nov 30 10:22	7°♊55’45	18.37679 AU
direct	2028 Feb 12 23:49	5°♊55’52	
conjunction	2028 May 30 22:46	10°♊01’57	0°-3’-13
minimum elong	2028 May 30 22:47	10°♊01’57	0°03’13
behind sun begin	2028 May 30 16:04	10°♊01’00	
behind sun end	2028 May 31 05:30	10°♊02’55	
max. Earth dist.	2028 May 30 19:33	10°♊01’31	20.34297 AU
retrograde	2028 Sep 19 00:01	14°♊14’28	
opposition	2028 Dec 03 20:28	12°♊12’46	0°-1’-38
min. Earth dist.	2028 Dec 03 23:28	12°♊12’27	18.30842 AU
direct	2029 Feb 16 10:51	10°♊12’20	
asc. node	2029 May 19 20:30	13°♊24’17	
conjunction	2029 Jun 04 16:23	14°♊19’51	0°00’09
minimum elong	2029 Jun 04 16:23	14°♊19’51	0°00’08
behind sun begin	2029 Jun 04 09:45	14°♊18’54	
behind sun end	2029 Jun 04 23:01	14°♊20’48	
max. Earth dist.	2029 Jun 04 12:33	14°♊19’20	20.27419 AU
retrograde	2029 Sep 23 16:21	18°♊33’12	
opposition	2029 Dec 08 08:11	16°♊31’20	0°02’01
min. Earth dist.	2029 Dec 08 12:06	16°♊30’55	18.23945 AU
direct	2030 Feb 20 23:22	14°♊30’28	
conjunction	2030 Jun 09 10:27	18°♊39’25	0°03’32
minimum elong	2030 Jun 09 10:27	18°♊39’25	0°03’33
behind sun begin	2030 Jun 09 03:44	18°♊38’27	
behind sun end	2030 Jun 09 17:10	18°♊40’23	
max. Earth dist.	2030 Jun 09 03:50	18°♊38’28	20.20523 AU
retrograde	2030 Sep 28 08:26	22°♊53’39	
opposition	2030 Dec 12 20:35	20°♊51’37	0°05’42
min. Earth dist.	2030 Dec 13 02:25	20°♊50’59	18.17072 AU
direct	2031 Feb 25 11:24	18°♊50’19	
conjunction	2031 Jun 14 05:44	23°♊00’47	0°06’50
minimum elong	2031 Jun 14 05:43	23°♊00’47	0°06’50
behind sun begin	2031 Jun 13 23:26	22°♊59’53	
behind sun end	2031 Jun 14 12:00	23°♊01’42	
max. Earth dist.	2031 Jun 13 22:38	22°♊59’45	20.13674 AU
retrograde	2031 Oct 03 02:42	27°♊15’53	
opposition	2031 Dec 17 09:27	25°♊13’43	0°09’23
min. Earth dist.	2031 Dec 17 15:57	25°♊13’01	18.10261 AU
direct	2032 Mar 01 01:34	23°♊12’01	
conjunction	2032 Jun 18 01:46	27°♊24’02	0°10’07
minimum elong	2032 Jun 18 01:45	27°♊24’02	0°10’07
behind sun begin	2032 Jun 17 20:23	27°♊23’15	
behind sun end	2032 Jun 18 07:07	27°♊24’48	
max. Earth dist.	2032 Jun 17 15:55	27°♊22’35	20.06914 AU
	2032 Aug 03 18:20	0°♋	
retrograde	2032 Oct 06 19:52	1°♋40’01	
	2032 Dec 12 06:21	30°♊	
opposition	2032 Dec 20 23:11	29°♊37’44	0°13’01
min. Earth dist.	2032 Dec 21 07:44	29°♊36’49	18.03566 AU
direct	2033 Mar 05 14:41	27°♊35’40	
	2033 May 22 13:15	0°♋	
conjunction	2033 Jun 22 22:48	1°♋49’16	0°13’23
minimum elong	2033 Jun 22 22:48	1°♋49’16	0°13’23
behind sun begin	2033 Jun 22 19:06	1°♋48’43	
behind sun end	2033 Jun 23 02:30	1°♋49’48	
max. Earth dist.	2033 Jun 22 12:27	1°♋47’44	20.00279 AU
retrograde	2033 Oct 11 16:04	6°♋06’08	
opposition	2033 Dec 25 13:28	4°♋03’47	0°16’38
min. Earth dist.	2033 Dec 25 22:35	4°♋02’49	17.96994 AU
direct	2034 Mar 10 06:48	2°♋01’23	
conjunction	2034 Jun 27 20:38	6°♋16’34	0°16’35
minimum elong	2034 Jun 27 20:38	6°♋16’34	0°16’34
max. Earth dist.	2034 Jun 27 07:44	6°♋14’39	19.93777 AU
retrograde	2034 Oct 16 10:16	10°♋34’20	
opposition	2034 Dec 30 04:38	8°♋31’57	0°20’10
min. Earth dist.	2034 Dec 30 16:00	8°♋30’44	17.90571 AU
direct	2035 Mar 14 21:30	6°♋29’13	
conjunction	2035 Jul 02 19:30	10°♋46’01	0°19’43
minimum elong	2035 Jul 02 19:30	10°♋46’01	0°19’43
max. Earth dist.	2035 Jul 02 05:48	10°♋43’57	19.87415 AU
retrograde	2035 Oct 21 08:02	15°♋04’39	
opposition	2036 Jan 03 20:30	13°♋02’13	0°23’36
min. Earth dist.	2036 Jan 04 08:27	13°♋00’56	17.84264 AU
direct	2036 Mar 18 15:29	10°♋59’09	
conjunction	2036 Jul 06 19:19	15°♋17’33	0°22’45
minimum elong	2036 Jul 06 19:19	15°♋17’33	0°22’45
max. Earth dist.	2036 Jul 06 03:06	15°♋15’06	19.81156 AU
retrograde	2036 Oct 25 03:23	19°♋37’00	
opposition	2037 Jan 07 13:14	17°♋34’33	0°26’56
min. Earth dist.	2037 Jan 08 03:39	17°♋32’59	17.78074 AU
direct	2037 Mar 23 08:26	15°♋31’07	
conjunction	2037 Jul 11 19:59	19°♋51’05	0°25’40
minimum elong	2037 Jul 11 19:59	19°♋51’05	0°25’40
max. Earth dist.	2037 Jul 11 02:33	19°♋48’27	19.75022 AU
retrograde	2037 Oct 30 01:59	24°♋11’18	
opposition	2038 Jan 12 06:42	22°♋08’47	0°30’06
min. Earth dist.	2038 Jan 12 21:30	22°♋07’11	17.72006 AU
direct	2038 Mar 28 04:26	20°♋05’01	
conjunction	2038 Jul 16 21:10	24°♋26’29	0°28’27
minimum elong	2038 Jul 16 21:10	24°♋26’29	0°28’27
max. Earth dist.	2038 Jul 16 01:47	24°♋23’32	19.69021 AU
retrograde	2038 Nov 03 22:01	28°♋47’25	
opposition	2039 Jan 17 01:03	26°♋44’50	0°33’07
min. Earth dist.	2039 Jan 17 18:07	26°♋42’58	17.66103 AU
direct	2039 Apr 01 23:32	24°♋40’41	
conjunction	2039 Jul 21 23:10	29°♋03’36	0°31’03
minimum elong	2039 Jul 21 23:10	29°♋03’36	0°31’02
max. Earth dist.	2039 Jul 21 02:25	29°♋00’25	19.63222 AU
	2039 Aug 06 10:00	0°♌	
retrograde	2039 Nov 08 21:04	3°♌25’10	
opposition	2040 Jan 21 19:46	1°♌22’30	0°35’56
min. Earth dist.	2040 Jan 22 13:04	1°♌20’37	17.60421 AU
	2040 Feb 25 07:37	30°♋	

direct	2040 Apr	05	21:44	29°♋18’00	
	2040 May	15	22:14	0°♌	
max. Earth dist.	2040 Jul	25	03:52	3°♌38’55	19.57664 AU
conjunction	2040 Jul	26	01:48	3°♌42’17	0°33’28
minimum elong	2040 Jul	26	01:48	3°♌42’17	0°33’29
retrograde	2040 Nov	12	17:53	8°♌04’26	
opposition	2041 Jan	25	15:27	6°♌01’41	0°38’31
min. Earth dist.	2041 Jan	26	10:43	5°♌59’35	17.55024 AU
direct	2041 Apr	10	19:05	3°♌56’49	
max. Earth dist.	2041 Jul	30	05:24	8°♌18’48	19.52440 AU
conjunction	2041 Jul	31	04:40	8°♌22’23	0°35’41
minimum elong	2041 Jul	31	04:40	8°♌22’23	0°35’40
retrograde	2041 Nov	17	17:16	12°♌45’04	
opposition	2042 Jan	30	11:35	10°♌42’14	0°40’52
min. Earth dist.	2042 Jan	31	06:44	10°♌40’08	17.49993 AU
direct	2042 Apr	15	18:57	8°♌37’00	
max. Earth dist.	2042 Aug	04	08:38	13°♌00’09	19.47605 AU
conjunction	2042 Aug	05	08:06	13°♌03’47	0°37’39
minimum elong	2042 Aug	05	08:05	13°♌03’47	0°37’40
retrograde	2042 Nov	22	15:15	17°♌26’54	
opposition	2043 Feb	04	08:26	15°♌24’00	0°42’57
min. Earth dist.	2043 Feb	05	05:00	15°♌21’45	17.45392 AU
direct	2043 Apr	20	17:49	13°♌18’27	
max. Earth dist.	2043 Aug	09	10:57	17°♌42’29	19.43248 AU
conjunction	2043 Aug	10	11:44	17°♌46’20	0°39’23
minimum elong	2043 Aug	10	11:44	17°♌46’20	0°39’24
retrograde	2043 Nov	27	15:38	22°♌09’50	
opposition	2044 Feb	09	05:50	20°♌06’53	0°44’45
min. Earth dist.	2044 Feb	10	02:05	20°♌04’40	17.41295 AU
direct	2044 Apr	24	18:50	18°♌01’02	
conjunction	2044 Aug	14	15:48	22°♌29’56	0°40’51
minimum elong	2044 Aug	14	15:48	22°♌29’56	0°40’51
max. Earth dist.	2044 Aug	13	15:38	22°♌26’11	19.39408 AU
retrograde	2044 Dec	01	14:46	26°♌53’44	
opposition	2045 Feb	13	03:56	24°♌50’47	0°46’14
min. Earth dist.	2045 Feb	14	00:58	24°♌48’28	17.37747 AU
direct	2045 Apr	29	18:20	22°♌44’42	
conjunction	2045 Aug	19	19:53	27°♌14’30	0°42’03
minimum elong	2045 Aug	19	19:53	27°♌14’30	0°42’03
max. Earth dist.	2045 Aug	18	18:35	27°♌10’33	19.36164 AU
	2045 Oct	06	07:11	0°♍	
retrograde	2045 Dec	06	16:02	1°♍38’33	
	2046 Feb	08	18:51	30°♌	
opposition	2046 Feb	18	02:35	29°♌35’37	0°47’25
min. Earth dist.	2046 Feb	18	23:08	29°♌33’21	17.34819 AU
direct	2046 May	04	19:51	27°♌29’21	
	2046 Jul	22	22:30	0°♍	
max. Earth dist.	2046 Aug	24	00:10	1°♍56’11	19.33542 AU
conjunction	2046 Aug	25	00:11	1°♍59’57	0°42’58
minimum elong	2046 Aug	25	00:11	1°♍59’57	0°42’57
retrograde	2046 Dec	11	16:09	6°♍24’11	
opposition	2047 Feb	23	01:50	4°♍21’19	0°48’17
min. Earth dist.	2047 Feb	23	22:37	4°♍19’02	17.32503 AU
direct	2047 May	09	20:09	2°♍14’58	
max. Earth dist.	2047 Aug	29	03:32	6°♍42’18	19.31540 AU
conjunction	2047 Aug	30	04:34	6°♍46’14	0°43’35
minimum elong	2047 Aug	30	04:34	6°♍46’14	0°43’35
retrograde	2047 Dec	16	17:21	11°♍10’35	
opposition	2048 Feb	28	01:26	9°♍07’48	0°48’49
min. Earth dist.	2048 Feb	28	22:05	9°♍05’32	17.30806 AU
direct	2048 May	13	22:36	7°♍01’23	
max. Earth dist.	2048 Sep	02	09:31	11°♍29’30	19.30130 AU
conjunction	2048 Sep	03	09:09	11°♍33’13	0°43’54
minimum elong	2048 Sep	03	09:09	11°♍33’13	0°43’54
retrograde	2048 Dec	20	17:42	15°♍57’35	
opposition	2049 Mar	04	01:45	13°♍54’57	0°49’01
min. Earth dist.	2049 Mar	04	22:12	13°♍52’42	17.29672 AU
direct	2049 May	19	00:46	11°♍48’31	
conjunction	2049 Sep	08	13:21	16°♍20’44	0°43’56
minimum elong	2049 Sep	08	13:21	16°♍20’44	0°43’55
max. Earth dist.	2049 Sep	07	13:03	16°♍16’55	19.29269 AU
retrograde	2049 Dec	25	18:11	20°♍45’05	
opposition	2050 Mar	09	02:29	18°♍42’32	0°48’53
min. Earth dist.	2050 Mar	09	22:59	18°♍40’17	17.29085 AU
direct	2050 May	24	04:12	16°♍36’06	
conjunction	2050 Sep	13	17:40	21°♍08’34	0°43’39
minimum elong	2050 Sep	13	17:40	21°♍08’34	0°43’39
max. Earth dist.	2050 Sep	12	18:37	21°♍04’56	19.28934 AU
retrograde	2050 Dec	30	18:43	25°♍32’45	
opposition	2051 Mar	14	03:28	23°♍30’19	0°48’24
min. Earth dist.	2051 Mar	14	23:17	23°♍28’09	17.28989 AU
direct	2051 May	29	08:24	21°♍23’55	
conjunction	2051 Sep	18	21:42	25°♍56’28	0°43’03
minimum elong	2051 Sep	18	21:42	25°♍56’28	0°43’03
max. Earth dist.	2051 Sep	17	22:23	25°♍52’48	19.29081 AU
	2051 Dec	08	20:42	0°♎	
retrograde	2052 Jan	04	18:24	0°♎20’25	
	2052 Feb	01	03:06	30°♍	
opposition	2052 Mar	18	04:55	28°♍18’05	0°47’35
min. Earth dist.	2052 Mar	19	00:58	28°♍15’54	17.29382 AU
direct	2052 Jun	02	12:15	26°♍11’43	
	2052 Sep	11	08:07	0°♎	
max. Earth dist.	2052 Sep	22	03:06	0°♎40’42	19.29712 AU
conjunction	2052 Sep	23	01:19	0°♎44’12	0°42’10
minimum elong	2052 Sep	23	01:19	0°♎44’12	0°42’10
retrograde	2053 Jan	08	19:06	5°♎07’50	
opposition	2053 Mar	23	06:31	3°♎05’36	0°46’25
min. Earth dist.	2053 Mar	24	01:15	3°♎03’33	17.30239 AU
direct	2053 Jun	07	17:36	0°♎59’16	
max. Earth dist.	2053 Sep	27	06:53	5°♎28’07	19.30813 AU
conjunction	2053 Sep	28	04:29	5°♎31’32	0°40’59
minimum elong	2053 Sep	28	04:29	5°♎31’32	0°40’59
retrograde	2054 Jan	13	17:59	9°♎54’45	
opposition	2054 Mar	28	08:15	7°♎52’36	0°44’56
min. Earth dist.	2054 Mar	29	03:10	7°♎50’33	17.31589 AU
direct	2054 Jun	12	21:06	5°♎46’21	
max. Earth dist.	2054 Oct	02	10:21	10°♎14’58	19.32414 AU
conjunction	2054 Oct	03	07:00	10°♎18’13	0°39’31
minimum elong	2054 Oct	03	07:00	10°♎18’13	0°39’30
retrograde	2055 Jan	18	18:30	14°♎40’58	
opposition	2055 Apr	02	09:54	12°♎38’54	0°43’09
min. Earth dist.	2055 Apr	03	03:00	12°♎37’03	17.33422 AU
direct	2055 Jun	18	02:39	10°♎32’44	
conjunction	2055 Oct	08	08:58	15°♎04’05	0°37’46
minimum elong	2055 Oct	08	08:58	15°♎04’05	0°37’47
max. Earth dist.	2055 Oct	07	13:49	15°♎01’04	19.34500 AU
retrograde	2056 Jan	23	16:28	19°♎26’16	
opposition	2056 Apr	06	11:36	17°♎24’17	0°41’03

min. Earth dist.	2056 Apr 07 04:39	17°♎22’27	17.35767 AU
direct	2056 Jun 22 05:32	15°♎18’13	
conjunction	2056 Oct 12 10:03	19°♎48’54	0°35’47
minimum elong	2056 Oct 12 10:03	19°♎48’54	0°35’47
max. Earth dist.	2056 Oct 11 15:53	19°♎46’03	19.37121 AU
retrograde	2057 Jan 27 16:29	24°♎10’28	
opposition	2057 Apr 11 13:09	22°♎08’34	0°38’42
min. Earth dist.	2057 Apr 12 03:49	22°♎07’00	17.38652 AU
direct	2057 Jun 27 10:04	20°♎02’39	
conjunction	2057 Oct 17 10:19	24°♎32’33	0°33’33
minimum elong	2057 Oct 17 10:19	24°♎32’33	0°33’33
max. Earth dist.	2057 Oct 16 18:37	24°♎30’05	19.40284 AU
retrograde	2058 Feb 01 14:06	28°♎53’27	
opposition	2058 Apr 16 14:39	26°♎51’40	0°36’05
min. Earth dist.	2058 Apr 17 04:47	26°♎50’09	17.42097 AU
direct	2058 Jul 02 12:05	24°♎45’56	
conjunction	2058 Oct 22 09:47	29°♎14’56	0°31’07
minimum elong	2058 Oct 22 09:47	29°♎14’56	0°31’07
max. Earth dist.	2058 Oct 21 19:01	29°♎12’37	19.44024 AU
	2058 Nov 03 09:24	0°♏	
retrograde	2059 Feb 06 13:03	3°♏35’07	
opposition	2059 Apr 21 15:37	1°♏33’28	0°33’15
min. Earth dist.	2059 Apr 22 03:09	1°♏32’14	17.46114 AU
	2059 Jun 01 19:18	30°♎	
direct	2059 Jul 07 15:18	29°♎28’00	
	2059 Aug 11 18:44	0°♏	
conjunction	2059 Oct 27 08:37	3°♏56’02	0°28’29
minimum elong	2059 Oct 27 08:37	3°♏56’02	0°28’28
max. Earth dist.	2059 Oct 26 20:45	3°♏54’10	19.48322 AU
retrograde	2060 Feb 11 10:14	8°♏15’27	
opposition	2060 Apr 25 16:40	6°♏13’59	0°30’12
min. Earth dist.	2060 Apr 26 03:21	6°♏12’51	17.50676 AU
direct	2060 Jul 11 16:54	4°♏08’51	
conjunction	2060 Oct 31 06:19	8°♏35’47	0°25’41
minimum elong	2060 Oct 31 06:19	8°♏35’47	0°25’41
max. Earth dist.	2060 Oct 30 19:23	8°♏34’04	19.53153 AU
retrograde	2061 Feb 15 08:01	12°♏54’27	
opposition	2061 Apr 30 17:18	10°♏53’11	0°26’59
min. Earth dist.	2061 May 01 01:24	10°♏52’20	17.55743 AU
direct	2061 Jul 16 19:11	8°♏48’24	
conjunction	2061 Nov 05 03:26	13°♏14’11	0°22’43
minimum elong	2061 Nov 05 03:26	13°♏14’11	0°22’43
max. Earth dist.	2061 Nov 04 19:33	13°♏12’57	19.58446 AU
retrograde	2062 Feb 20 04:16	17°♏32’02	
opposition	2062 May 05 17:34	15°♏31’00	0°23’36
min. Earth dist.	2062 May 06 00:40	15°♏30’15	17.61231 AU
direct	2062 Jul 21 20:54	13°♏26’37	
conjunction	2062 Nov 09 23:34	17°♏51’08	0°19’38
minimum elong	2062 Nov 09 23:34	17°♏51’08	0°19’38
max. Earth dist.	2062 Nov 09 16:23	17°♏50’02	19.64125 AU
retrograde	2063 Feb 25 00:10	22°♏08’11	
opposition	2063 May 10 17:30	20°♏07’21	0°20’05
min. Earth dist.	2063 May 10 22:27	20°♏06’50	17.67071 AU
direct	2063 Jul 26 22:06	18°♏03’21	
conjunction	2063 Nov 14 18:58	22°♏26’34	0°16’26
minimum elong	2063 Nov 14 18:58	22°♏26’34	0°16’26
max. Earth dist.	2063 Nov 14 14:41	22°♏25’55	19.70105 AU
retrograde	2064 Feb 29 19:27	26°♏42’44	
opposition	2064 May 14 17:07	24°♏42’08	0°16’28
min. Earth dist.	2064 May 14 20:46	24°♏41’45	17.73166 AU
direct	2064 Jul 30 23:15	22°♏38’33	
conjunction	2064 Nov 18 13:23	27°♏00’21	0°13’09
minimum elong	2064 Nov 18 13:23	27°♏00’21	0°13’09
behind sun begin	2064 Nov 18 09:24	26°♏59’45	
behind sun end	2064 Nov 18 17:22	27°♏00’57	
max. Earth dist.	2064 Nov 18 09:47	26°♏59’48	19.76315 AU
	2065 Jan 10 19:51	0°♐	
retrograde	2065 Mar 05 13:49	1°♐15’38	
	2065 May 01 09:02	30°♏	
opposition	2065 May 19 16:13	29°♏15’13	0°12’45
min. Earth dist.	2065 May 19 18:05	29°♏15’01	17.79476 AU
direct	2065 Aug 04 22:38	27°♏12’00	
	2065 Oct 28 21:01	0°♐	
conjunction	2065 Nov 23 07:01	1°♐32’22	0°09’48
minimum elong	2065 Nov 23 07:00	1°♐32’22	0°09’48
behind sun begin	2065 Nov 23 01:35	1°♐31’33	
behind sun end	2065 Nov 23 12:25	1°♐33’11	
max. Earth dist.	2065 Nov 23 06:02	1°♐32’14	19.82697 AU
retrograde	2066 Mar 10 07:57	5°♐46’44	
opposition	2066 May 24 14:46	3°♐46’30	0°08’59
min. Earth dist.	2066 May 24 15:07	3°♐46’28	17.85904 AU
direct	2066 Aug 09 22:07	1°♐43’40	
conjunction	2066 Nov 27 23:38	6°♐02’31	0°06’25
minimum elong	2066 Nov 27 23:39	6°♐02’31	0°06’24
behind sun begin	2066 Nov 27 17:26	6°♐01’35	
behind sun end	2066 Nov 28 05:51	6°♐03’27	
max. Earth dist.	2066 Nov 27 23:19	6°♐02’29	19.89171 AU
retrograde	2067 Mar 15 01:06	10°♐15’58	
opposition	2067 May 29 12:39	8°♐15’52	0°05’12
min. Earth dist.	2067 May 29 11:38	8°♐15’58	17.92420 AU
direct	2067 Aug 14 19:40	6°♐13’23	
conjunction	2067 Dec 02 15:31	10°♐30’43	0°03’01
minimum elong	2067 Dec 02 15:31	10°♐30’43	0°03’01
behind sun begin	2067 Dec 02 08:58	10°♐29’44	
behind sun end	2067 Dec 02 22:03	10°♐31’41	
max. Earth dist.	2067 Dec 02 17:35	10°♐30’58	19.95715 AU
retrograde	2068 Mar 18 18:12	14°♐43’12	
opposition	2068 Jun 02 10:03	12°♐43’14	0°01’24
min. Earth dist.	2068 Jun 02 07:07	12°♐43’32	17.98972 AU
direct	2068 Aug 18 17:27	10°♐41’06	
desc. node	2068 Oct 16 07:35	12°♐05’50	
conjunction	2068 Dec 06 06:11	14°♐56’50	0°00’-28
minimum elong	2068 Dec 06 06:10	14°♐56’50	0°00’29
behind sun begin	2068 Dec 05 23:38	14°♐55’51	
behind sun end	2068 Dec 06 12:43	14°♐57’48	
max. Earth dist.	2068 Dec 06 09:13	14°♐57’14	20.02287 AU
retrograde	2069 Mar 23 10:01	19°♐08’23	
opposition	2069 Jun 07 06:45	17°♐08’30	0°-2’-22
min. Earth dist.	2069 Jun 07 02:39	17°♐08’55	18.05570 AU
direct	2069 Aug 23 13:17	15°♐06’41	
conjunction	2069 Dec 10 20:04	19°♐20’50	0°-3’-54
minimum elong	2069 Dec 10 20:05	19°♐20’50	0°03’55
behind sun begin	2069 Dec 10 13:36	19°♐19’52	
behind sun end	2069 Dec 11 02:33	19°♐21’47	
max. Earth dist.	2069 Dec 11 01:27	19°♐21’37	20.08903 AU
retrograde	2070 Mar 28 01:55	23°♐31’25	
opposition	2070 Jun 12 02:27	21°♐31’37	0°-6’-6
min. Earth dist.	2070 Jun 11 20:08	21°♐32’16	18.12197 AU
direct	2070 Aug 28 09:38	19°♐30’07	

conjunction	2070 Dec 15	08:57	23°♐42’41	0°-7’-14	
minimum elong	2070 Dec 15	08:57	23°♐42’41	0°07’14	
behind sun begin	2070 Dec 15	02:55	23°♐41’48		
behind sun end	2070 Dec 15	15:00	23°♐43’35		
max. Earth dist.	2070 Dec 15	15:36	23°♐43’41	20.15553 AU	
retrograde	2071 Apr 01	16:04	27°♐52’22		
opposition	2071 Jun 16	21:42	25°♐52’39	0°-9’-46	
min. Earth dist.	2071 Jun 16	14:17	25°♐53’24	18.18889 AU	
direct	2071 Sep 02	03:16	23°♐51’29		
conjunction	2071 Dec 19	20:54	28°♐02’30	0°-10’-29	
minimum elong	2071 Dec 19	20:54	28°♐02’30	0°10’30	
behind sun begin	2071 Dec 19	15:44	28°♐01’44		
behind sun end	2071 Dec 20	02:04	28°♐03’15		
max. Earth dist.	2071 Dec 20	05:51	28°♐03’50	20.22272 AU	
	2072 Jan 22	11:25	0°♑		
retrograde	2072 Apr 05	07:15	2°♑11’17		
opposition	2072 Jun 20	16:06	0°♑11’40	0°-13’-21	
min. Earth dist.	2072 Jun 20	06:04	0°♑12’42	18.25632 AU	
	2072 Jun 25	10:31	30°♐		
direct	2072 Sep 05	22:04	28°♐10’52		
	2072 Nov 12	04:57	0°♑		
conjunction	2072 Dec 23	08:04	2°♑20’22	0°-13’-39	
minimum elong	2072 Dec 23	08:04	2°♑20’22	0°13’39	
behind sun begin	2072 Dec 23	04:23	2°♑19’49		
behind sun end	2072 Dec 23	11:45	2°♑20’54		
max. Earth dist.	2072 Dec 23	18:33	2°♑21’56	20.29038 AU	
retrograde	2073 Apr 09	19:55	6°♑28’19		
opposition	2073 Jun 25	09:49	4°♑28’50	0°-16’-49	
min. Earth dist.	2073 Jun 24	22:54	4°♑29’56	18.32428 AU	
direct	2073 Sep 10	13:22	2°♑28’25		
conjunction	2073 Dec 27	18:29	6°♑36’26	0°-16’-44	
minimum elong	2073 Dec 27	18:29	6°♑36’26	0°16’45	
max. Earth dist.	2073 Dec 28	06:53	6°♑38’18	20.35837 AU	
retrograde	2074 Apr 14	10:38	10°♑43’36		
opposition	2074 Jun 30	02:42	8°♑44’15	0°-20’-11	
min. Earth dist.	2074 Jun 29	13:15	8°♑45’37	18.39207 AU	
direct	2074 Sep 15	06:19	6°♑44’15		
conjunction	2075 Jan 01	04:09	10°♑50’52	0°-19’-42	
minimum elong	2075 Jan 01	04:08	10°♑50’52	0°19’43	
max. Earth dist.	2075 Jan 01	18:00	10°♑52’56	20.42582 AU	
retrograde	2075 Apr 18	22:10	14°♑57’17		
opposition	2075 Jul 04	19:04	12°♑58’06	0°-23’-24	
min. Earth dist.	2075 Jul 04	05:08	12°♑59’30	18.45919 AU	
direct	2075 Sep 19	19:45	10°♑58’30		
conjunction	2076 Jan 05	13:14	15°♑03’45	0°-22’-32	
minimum elong	2076 Jan 05	13:14	15°♑03’45	0°22’34	
max. Earth dist.	2076 Jan 06	04:38	15°♑06’02	20.49237 AU	
retrograde	2076 Apr 22	11:54	19°♑09’28		
opposition	2076 Jul 08	10:43	17°♑10’26	0°-26’-29	
min. Earth dist.	2076 Jul 07	18:26	17°♑12’05	18.52493 AU	
direct	2076 Sep 23	11:32	15°♑11’15		
conjunction	2077 Jan 08	21:39	19°♑15’10	0°-25’-15	
minimum elong	2077 Jan 08	21:38	19°♑15’10	0°25’17	
max. Earth dist.	2077 Jan 09	14:22	19°♑17’39	20.55707 AU	
retrograde	2077 Apr 26	22:53	23°♑20’15		
min. Earth dist.	2077 Jul 12	09:31	21°♑23’00	18.58860 AU	
opposition	2077 Jul 13	01:51	21°♑21’21	0°-29’-24	
direct	2077 Sep 27	23:22	19°♑22’34		
conjunction	2078 Jan 13	05:40	23°♑25’13	0°-27’-49	
minimum elong	2078 Jan 13	05:40	23°♑25’13	0°27’50	
max. Earth dist.	2078 Jan 13	23:21	23°♑27’50	20.61938 AU	
retrograde	2078 May 01	11:08	27°♑29’40		
opposition	2078 Jul 17	16:02	25°♑30’54	0°-32’-9	
min. Earth dist.	2078 Jul 16	21:45	25°♑32’45	18.64940 AU	
direct	2078 Oct 02	13:51	23°♑32’28		
conjunction	2079 Jan 17	13:11	27°♑33’56	0°-30’-14	
minimum elong	2079 Jan 17	13:11	27°♑33’56	0°30’16	
max. Earth dist.	2079 Jan 18	07:52	27°♑36’41	20.67840 AU	
	2079 Mar 02	17:01	0°♒		
retrograde	2079 May 05	21:20	1°♒37’49		
	2079 Jul 13	12:35	30°♑		
min. Earth dist.	2079 Jul 21	11:57	29°♑40’56	18.70670 AU	
opposition	2079 Jul 22	05:57	29°♑39’08	0°-34’-44	
direct	2079 Oct 07	00:43	27°♑41’02		
	2079 Dec 23	06:28	0°♒		
conjunction	2080 Jan 21	20:08	1°♒41’19	0°-32’-29	
minimum elong	2080 Jan 21	20:08	1°♒41’19	0°32’29	
max. Earth dist.	2080 Jan 22	15:23	1°♒44’09	20.73373 AU	
retrograde	2080 May 09	08:24	5°♒44’40		
opposition	2080 Jul 25	19:07	3°♒46’03	0°-37’-6	
min. Earth dist.	2080 Jul 24	23:23	3°♒48’01	18.75996 AU	
direct	2080 Oct 10	13:27	1°♒48’13		
conjunction	2081 Jan 25	02:47	5°♒47’24	0°-34’-33	
minimum elong	2081 Jan 25	02:47	5°♒47’24	0°34’34	
max. Earth dist.	2081 Jan 25	22:50	5°♒50’20	20.78470 AU	
retrograde	2081 May 13	17:25	9°♒50’14		
opposition	2081 Jul 30	07:38	7°♒51’38	0°-39’-17	
min. Earth dist.	2081 Jul 29	12:27	7°♒53’33	18.80880 AU	
direct	2081 Oct 14	23:16	5°♒54’03		
conjunction	2082 Jan 29	08:57	9°♒52’10	0°-36’-26	
minimum elong	2082 Jan 29	08:57	9°♒52’10	0°36’26	
max. Earth dist.	2082 Jan 30	05:13	9°♒55’08	20.83136 AU	
retrograde	2082 May 18	03:12	13°♒54’31		
opposition	2082 Aug 03	19:25	11°♒55’54	0°-41’-15	
min. Earth dist.	2082 Aug 02	22:42	11°♒57’58	18.85325 AU	
direct	2082 Oct 19	10:12	9°♒58’29		
conjunction	2083 Feb 02	14:34	13°♒55’37	0°-38’-7	
minimum elong	2083 Feb 02	14:34	13°♒55’37	0°38’08	
max. Earth dist.	2083 Feb 03	11:44	13°♒58’42	20.87360 AU	
retrograde	2083 May 22	11:03	17°♒57’32		
min. Earth dist.	2083 Aug 07	10:32	16°♒00’53	18.89356 AU	
opposition	2083 Aug 08	06:47	15°♒58’52	0°-43’00	
direct	2083 Oct 23	18:41	14°♒01’37		
conjunction	2084 Feb 06	19:53	17°♒57’49	0°-39’-36	
minimum elong	2084 Feb 06	19:52	17°♒57’49	0°39’37	
max. Earth dist.	2084 Feb 07	17:23	18°♒00’56	20.91209 AU	
retrograde	2084 May 25	20:17	21°♒59’20		
opposition	2084 Aug 11	17:21	20°♒00’37	0°-44’-31	
min. Earth dist.	2084 Aug 10	19:33	20°♒02’47	18.93030 AU	
direct	2084 Oct 27	04:02	18°♒03’30		
conjunction	2085 Feb 10	00:52	21°♒58’52	0°-40’-53	
minimum elong	2085 Feb 10	00:52	21°♒58’52	0°40’54	
max. Earth dist.	2085 Feb 10	23:20	22°♒02’07	20.94700 AU	
retrograde	2085 May 30	03:19	26°♒00’03		
min. Earth dist.	2085 Aug 15	06:10	24°♒03’26	18.96361 AU	
opposition	2085 Aug 16	03:31	24°♒01’18	0°-45’-49	
direct	2085 Oct 31	10:57	22°♒04’20		
conjunction	2086 Feb 14	05:39	25°♒58’56	0°-41’-57	
minimum elong	2086 Feb 14	05:38	25°♒58’56	0°41’59	

max. Earth dist.	2086 Feb 15 04:17	26°♒02’13	20.97868 AU
retrograde	2086 Jun 03 12:32	29°♒59’52	
opposition	2086 Aug 20 12:55	28°♒01’04	0°-46’-52
min. Earth dist.	2086 Aug 19 14:12	28°♒03’20	18.99367 AU
direct	2086 Nov 04 18:51	26°♒04’14	
conjunction	2087 Feb 18 10:16	29°♒58’13	0°-42’-49
minimum elong	2087 Feb 18 10:15	29°♒58’13	0°42’49
	2087 Feb 18 22:41	0°♓	
max. Earth dist.	2087 Feb 19 09:46	0°♓01’36	21.00700 AU
retrograde	2087 Jun 07 19:10	3°♓58’57	
opposition	2087 Aug 24 22:10	2°♓00’08	0°-47’-43
min. Earth dist.	2087 Aug 24 00:01	2°♓02’21	19.02036 AU
direct	2087 Nov 09 00:47	0°♓03’28	
conjunction	2088 Feb 22 14:41	3°♓56’52	0°-43’-29
minimum elong	2088 Feb 22 14:41	3°♓56’52	0°43’30
max. Earth dist.	2088 Feb 23 14:13	4°♓00’15	21.03203 AU
retrograde	2088 Jun 11 04:34	7°♓57’30	
min. Earth dist.	2088 Aug 27 07:41	6°♓00’59	19.04356 AU
opposition	2088 Aug 28 06:55	5°♓58’40	0°-48’-19
direct	2088 Nov 12 07:29	4°♓02’08	
conjunction	2089 Feb 25 19:14	7°♓55’05	0°-43’-56
minimum elong	2089 Feb 25 19:14	7°♓55’05	0°43’56
max. Earth dist.	2089 Feb 26 19:22	7°♓58’33	21.05323 AU
retrograde	2089 Jun 15 11:15	11°♓55’40	
opposition	2089 Sep 01 15:15	9°♓56’49	0°-48’-42
min. Earth dist.	2089 Aug 31 16:57	9°♓59’03	19.06279 AU
direct	2089 Nov 16 12:50	8°♓00’26	
conjunction	2090 Mar 01 23:48	11°♓53’02	0°-44’-10
minimum elong	2090 Mar 01 23:48	11°♓53’02	0°44’11
max. Earth dist.	2090 Mar 02 23:30	11°♓56’25	21.07046 AU
retrograde	2090 Jun 19 20:35	15°♓53’37	
opposition	2090 Sep 05 23:20	13°♓54’47	0°-48’-50
min. Earth dist.	2090 Sep 05 00:23	13°♓57’04	19.07780 AU
direct	2090 Nov 20 18:36	11°♓58’30	
conjunction	2091 Mar 06 04:24	15°♓50’50	0°-44’-12
minimum elong	2091 Mar 06 04:24	15°♓50’50	0°44’13
max. Earth dist.	2091 Mar 07 04:23	15°♓54’16	21.08305 AU
retrograde	2091 Jun 24 03:31	19°♓51’31	
min. Earth dist.	2091 Sep 09 09:32	17°♓54’50	19.08798 AU
opposition	2091 Sep 10 07:21	17°♓52’40	0°-48’-45
direct	2091 Nov 24 23:45	15°♓56’30	
conjunction	2092 Mar 09 09:20	19°♓48’39	0°-44’-1
minimum elong	2092 Mar 09 09:20	19°♓48’39	0°44’02
max. Earth dist.	2092 Mar 10 08:27	19°♓51’57	21.09078 AU
retrograde	2092 Jun 27 13:00	23°♓49’28	
opposition	2092 Sep 13 14:57	21°♓50’34	0°-48’-26
min. Earth dist.	2092 Sep 12 16:59	21°♓52’46	19.09304 AU
direct	2092 Nov 28 05:12	19°♓54’27	
conjunction	2093 Mar 13 14:33	23°♓46’32	0°-43’-38
minimum elong	2093 Mar 13 14:33	23°♓46’32	0°43’39
max. Earth dist.	2093 Mar 14 13:25	23°♓49’48	21.09293 AU
retrograde	2093 Jul 01 20:01	27°♓47’31	
opposition	2093 Sep 17 22:32	25°♓48’34	0°-47’-53
min. Earth dist.	2093 Sep 17 02:01	25°♓50’37	19.09229 AU
direct	2093 Dec 02 09:54	23°♓52’28	
conjunction	2094 Mar 17 19:54	27°♓44’31	0°-43’-2
minimum elong	2094 Mar 17 19:54	27°♓44’31	0°43’02
max. Earth dist.	2094 Mar 18 17:29	27°♓47’36	21.08935 AU
	2094 Apr 28 18:09	0°♈	
retrograde	2094 Jul 06 05:34	1°♈45’43	
	2094 Sep 16 16:27	30°♓	
min. Earth dist.	2094 Sep 21 09:24	29°♓48’42	19.08575 AU
opposition	2094 Sep 22 05:48	29°♓46’40	0°-47’-6
direct	2094 Dec 06 15:39	27°♓50’31	
	2095 Feb 19 02:56	0°♈	
conjunction	2095 Mar 22 01:34	1°♈42’38	0°-42’-13
minimum elong	2095 Mar 22 01:34	1°♈42’38	0°42’15
max. Earth dist.	2095 Mar 22 22:47	1°♈45’39	21.07993 AU
retrograde	2095 Jul 10 12:34	5°♈44’05	
opposition	2095 Sep 26 13:03	3°♈44’53	0°-46’-5
min. Earth dist.	2095 Sep 25 18:08	3°♈46’47	19.07355 AU
direct	2095 Dec 10 19:45	1°♈48’40	
conjunction	2096 Mar 25 07:21	5°♈40’54	0°-41’-12
minimum elong	2096 Mar 25 07:21	5°♈40’54	0°41’13
max. Earth dist.	2096 Mar 26 03:17	5°♈43’44	21.06526 AU
retrograde	2096 Jul 13 22:08	9°♈42’39	
opposition	2096 Sep 29 20:02	7°♈43’17	0°-44’-51
min. Earth dist.	2096 Sep 29 01:22	7°♈45’10	19.05634 AU
direct	2096 Dec 14 01:48	5°♈46’55	
conjunction	2097 Mar 29 13:34	9°♈39’23	0°-39’-59
minimum elong	2097 Mar 29 13:34	9°♈39’23	0°40’00
max. Earth dist.	2097 Mar 30 09:12	9°♈42’11	21.04563 AU
retrograde	2097 Jul 18 05:35	13°♈41’28	
min. Earth dist.	2097 Oct 03 09:37	11°♈43’40	19.03449 AU
opposition	2097 Oct 04 02:48	11°♈41’56	0°-43’-24
direct	2097 Dec 18 05:44	9°♈45’26	
conjunction	2098 Apr 02 20:03	13°♈38’12	0°-38’-34
minimum elong	2098 Apr 02 20:03	13°♈38’12	0°38’35
max. Earth dist.	2098 Apr 03 14:23	13°♈40’49	21.02188 AU
retrograde	2098 Jul 22 15:04	17°♈40’41	
opposition	2098 Oct 08 09:35	15°♈40’59	0°-41’-44
min. Earth dist.	2098 Oct 07 16:39	15°♈42’41	19.00881 AU
direct	2098 Dec 22 11:31	13°♈44’19	
conjunction	2099 Apr 07 02:50	17°♈37’30	0°-36’-58
minimum elong	2099 Apr 07 02:50	17°♈37’30	0°36’59
max. Earth dist.	2099 Apr 07 20:58	17°♈40’05	20.99429 AU
retrograde	2099 Jul 26 23:35	21°♈40’26	
opposition	2099 Oct 12 16:28	19°♈40’34	0°-39’-53
min. Earth dist.	2099 Oct 12 00:52	19°♈42’09	18.97946 AU
direct	2099 Dec 26 16:10	17°♈43’45	