conjunction	1600 Aug 20 17:44	27°♌43’48	0°36’29	
minimum elong	1600 Aug 20 17:44	27°♌43’48	0°36’29	
max. Earth dist.	1600 Aug 19 23:41	27°♌42’07	31.15228	AU
	1600 Nov 05 16:32	0°♍		
retrograde	1600 Dec 02 04:08	0°♍12’00		
	1600 Dec 28 23:28	30°♌		
opposition	1601 Feb 17 09:02	28°♌49’32	0°40’57	
min. Earth dist.	1601 Feb 18 01:02	28°♌48’25	29.15664	AU
direct	1601 May 08 08:16	27°♌24’25		
conjunction	1601 Aug 23 06:30	29°♌56’09	0°40’13	
minimum elong	1601 Aug 23 06:30	29°♌56’09	0°40’13	
max. Earth dist.	1601 Aug 22 12:33	29°♌54’30	31.16003	AU
	1601 Aug 24 23:55	0°♍		
retrograde	1601 Dec 04 12:59	2°♍24’12		
opposition	1602 Feb 19 19:22	1°♍01’47	0°44’54	
min. Earth dist.	1602 Feb 20 12:13	1°♍00’37	29.16375	AU
	1602 Apr 02 02:17	30°♌		
direct	1602 May 10 20:55	29°♌36’37		
	1602 Jun 18 03:08	0°♍		
conjunction	1602 Aug 25 18:59	2°♍08’20	0°43’53	
minimum elong	1602 Aug 25 18:59	2°♍08’20	0°43’53	
max. Earth dist.	1602 Aug 24 23:09	2°♍06’30	31.16665	AU
retrograde	1602 Dec 07 00:17	4°♍36’15		
opposition	1603 Feb 22 05:45	3°♍13’50	0°48’47	
min. Earth dist.	1603 Feb 22 22:48	3°♍12’38	29.17004	AU
direct	1603 May 13 07:59	1°♍48’37		
max. Earth dist.	1603 Aug 27 11:57	4°♍18’30	31.17252	AU
conjunction	1603 Aug 28 07:18	4°♍20’18	0°47’29	
minimum elong	1603 Aug 28 07:18	4°♍20’18	0°47’29	
retrograde	1603 Dec 09 09:34	6°♍48’03		
opposition	1604 Feb 24 16:12	5°♍25’39	0°52’36	
min. Earth dist.	1604 Feb 25 10:29	5°♍24’22	29.17571	AU
direct	1604 May 14 20:31	4°♍00’24		
conjunction	1604 Aug 29 19:25	6°♍32’01	0°51’01	
minimum elong	1604 Aug 29 19:25	6°♍32’01	0°51’01	
max. Earth dist.	1604 Aug 28 22:40	6°♍30’06	31.17814	AU
retrograde	1604 Dec 10 21:28	8°♍59’38		
opposition	1605 Feb 26 02:21	7°♍37’13	0°56’19	
min. Earth dist.	1605 Feb 26 20:13	7°♍35’59	29.18142	AU
direct	1605 May 17 09:53	6°♍11’55		
max. Earth dist.	1605 Aug 31 11:14	8°♍41’38	31.18391	AU
conjunction	1605 Sep 01 07:36	8°♍43’31	0°54’28	
minimum elong	1605 Sep 01 07:35	8°♍43’31	0°54’28	
retrograde	1605 Dec 13 07:05	11°♍11’00		
opposition	1606 Feb 28 12:50	9°♍48’36	0°59’58	
min. Earth dist.	1606 Mar 01 07:58	9°♍47’16	29.18758	AU
direct	1606 May 19 21:59	8°♍23’16		
conjunction	1606 Sep 03 19:26	10°♍54’49	0°57’50	
minimum elong	1606 Sep 03 19:26	10°♍54’49	0°57’50	
max. Earth dist.	1606 Sep 02 22:35	10°♍52’54	31.19049	AU
retrograde	1606 Dec 15 17:48	13°♍22’11		
opposition	1607 Mar 02 23:11	11°♍59’49	1°03’31	
min. Earth dist.	1607 Mar 03 17:24	11°♍58’33	29.19467	AU
direct	1607 May 22 11:00	10°♍34’30		
max. Earth dist.	1607 Sep 05 10:15	13°♍04’05	31.19809	AU
conjunction	1607 Sep 06 07:16	13°♍06’02	1°01’07	
minimum elong	1607 Sep 06 07:16	13°♍06’02	1°01’07	
retrograde	1607 Dec 18 04:04	15°♍33’19		
opposition	1608 Mar 04 09:38	14°♍11’00	1°06’59	
min. Earth dist.	1608 Mar 05 04:44	14°♍09’40	29.20300	AU
direct	1608 May 23 21:42	12°♍45’42		
conjunction	1608 Sep 07 18:58	15°♍17’14	1°04’19	
minimum elong	1608 Sep 07 18:58	15°♍17’14	1°04’19	
max. Earth dist.	1608 Sep 06 22:14	15°♍15’19	31.20693	AU
retrograde	1608 Dec 19 13:56	17°♍44’26		
opposition	1609 Mar 06 20:05	16°♍22’12	1°10’21	
min. Earth dist.	1609 Mar 07 14:49	16°♍20’54	29.21212	AU
direct	1609 May 26 09:48	14°♍56’57		
max. Earth dist.	1609 Sep 09 08:58	17°♍26’29	31.21628	AU
conjunction	1609 Sep 10 06:38	17°♍28’30	1°07’25	
minimum elong	1609 Sep 10 06:38	17°♍28’30	1°07’25	
retrograde	1609 Dec 21 23:44	19°♍55’40		
opposition	1610 Mar 09 06:31	18°♍33’30	1°13’37	
min. Earth dist.	1610 Mar 10 01:52	18°♍32’09	29.22170	AU
direct	1610 May 28 19:58	17°♍08’18		
conjunction	1610 Sep 12 18:22	19°♍39’52	1°10’25	
minimum elong	1610 Sep 12 18:22	19°♍39’52	1°10’25	
max. Earth dist.	1610 Sep 11 21:26	19°♍37’55	31.22574	AU
retrograde	1610 Dec 24 08:34	22°♍06’59		
opposition	1611 Mar 11 17:14	20°♍44’54	1°16’46	
min. Earth dist.	1611 Mar 12 13:03	20°♍43’31	29.23091	AU
direct	1611 May 31 07:37	19°♍19’46		
max. Earth dist.	1611 Sep 14 07:23	21°♍49’14	31.23459	AU
conjunction	1611 Sep 15 05:46	21°♍51’19	1°13’19	
minimum elong	1611 Sep 15 05:46	21°♍51’19	1°13’19	
retrograde	1611 Dec 26 19:58	24°♍18’24		
opposition	1612 Mar 13 03:53	22°♍56’22	1°19’48	
min. Earth dist.	1612 Mar 13 23:38	22°♍55’00	29.23944	AU
direct	1612 Jun 01 17:34	21°♍31’17		
conjunction	1612 Sep 16 17:27	24°♍02’50	1°16’07	
minimum elong	1612 Sep 16 17:27	24°♍02’49	1°16’06	
max. Earth dist.	1612 Sep 15 19:36	24°♍00’48	31.24245	AU
retrograde	1612 Dec 28 05:19	26°♍29’52		
opposition	1613 Mar 15 14:35	25°♍07’53	1°22’44	
min. Earth dist.	1613 Mar 16 11:37	25°♍06’26	29.24672	AU
direct	1613 Jun 04 05:36	23°♍42’49		
max. Earth dist.	1613 Sep 18 05:39	26°♍12’10	31.24911	AU
conjunction	1613 Sep 19 04:57	26°♍14’20	1°18’48	
minimum elong	1613 Sep 19 04:57	26°♍14’20	1°18’48	
retrograde	1613 Dec 30 17:26	28°♍41’19		
opposition	1614 Mar 18 01:21	27°♍19’21	1°25’32	
min. Earth dist.	1614 Mar 18 21:55	27°♍17’56	29.25277	AU
direct	1614 Jun 06 18:50	25°♍54’18		
conjunction	1614 Sep 21 16:23	28°♍25’47	1°21’22	
minimum elong	1614 Sep 21 16:23	28°♍25’47	1°21’21	
max. Earth dist.	1614 Sep 20 17:24	28°♍23’39	31.25443	AU
	1614 Nov 06 06:45	0°♎		
retrograde	1615 Jan 02 03:10	0°♎52’42		
	1615 Mar 02 11:06	30°♍		
opposition	1615 Mar 20 12:17	29°♍30’45	1°28’13	
min. Earth dist.	1615 Mar 21 10:15	29°♍29’14	29.25761	AU
direct	1615 Jun 09 06:41	28°♍05’42		
	1615 Sep 07 08:27	0°♎		
max. Earth dist.	1615 Sep 23 04:04	0°♎34’56	31.25882	AU
conjunction	1615 Sep 24 03:39	0°♎37’08	1°23’49	
minimum elong	1615 Sep 24 03:38	0°♎37’08	1°23’49	
retrograde	1616 Jan 04 13:56	3°♎03’57		
opposition	1616 Mar 21 22:59	1°♎42’00	1°30’46	
min. Earth dist.	1616 Mar 22 20:14	1°♎40’32	29.26157	AU

direct	1616 Jun	10	20:08	0°♎16’56		
conjunction	1616 Sep	25	14:47	2°♎48’18	1°26’08	
minimum elong	1616 Sep	25	14:47	2°♎48’18	1°26’08	
max. Earth dist.	1616 Sep	24	14:56	2°♎46’05	31.26239	AU
retrograde	1617 Jan	06	00:42	5°♎15’03		
opposition	1617 Mar	24	09:52	3°♎53’05	1°33’11	
min. Earth dist.	1617 Mar	25	08:03	3°♎51’33	29.26507	AU
direct	1617 Jun	13	08:14	2°♎28’00		
max. Earth dist.	1617 Sep	27	02:23	4°♎57’07	31.26580	AU
conjunction	1617 Sep	28	01:48	4°♎59’17	1°28’20	
minimum elong	1617 Sep	28	01:48	4°♎59’17	1°28’20	
retrograde	1618 Jan	08	09:52	7°♎25’57		
opposition	1618 Mar	26	20:40	6°♎03’58	1°35’28	
min. Earth dist.	1618 Mar	27	18:21	6°♎02’28	29.26851	AU
direct	1618 Jun	15	21:43	4°♎38’53		
conjunction	1618 Sep	30	12:37	7°♎10’05	1°30’25	
minimum elong	1618 Sep	30	12:37	7°♎10’05	1°30’24	
max. Earth dist.	1618 Sep	29	12:39	7°♎07’51	31.26949	AU
retrograde	1619 Jan	10	19:08	9°♎36’41		
opposition	1619 Mar	29	07:38	8°♎14’42	1°37’37	
min. Earth dist.	1619 Mar	30	05:16	8°♎13’12	29.27275	AU
direct	1619 Jun	18	08:19	6°♎49’36		
conjunction	1619 Oct	02	23:19	9°♎20’44	1°32’21	
minimum elong	1619 Oct	02	23:19	9°♎20’44	1°32’21	
max. Earth dist.	1619 Oct	02	00:43	9°♎18’38	31.27413	AU
retrograde	1620 Jan	13	03:04	11°♎47’18		
opposition	1620 Mar	30	18:37	10°♎25’19	1°39’37	
min. Earth dist.	1620 Mar	31	16:09	10°♎23’50	29.27785	AU
direct	1620 Jun	19	20:14	9°♎00’15		
max. Earth dist.	1620 Oct	03	10:32	11°♎29’09	31.27978	AU
conjunction	1620 Oct	04	09:57	11°♎31’20	1°34’10	
minimum elong	1620 Oct	04	09:57	11°♎31’20	1°34’09	
retrograde	1621 Jan	14	14:06	13°♎57’52		
opposition	1621 Apr	02	05:25	12°♎35’55	1°41’29	
min. Earth dist.	1621 Apr	03	02:11	12°♎34’29	29.28401	AU
direct	1621 Jun	22	06:05	11°♎10’53		
conjunction	1621 Oct	06	20:44	13°♎41’56	1°35’51	
minimum elong	1621 Oct	06	20:43	13°♎41’56	1°35’51	
max. Earth dist.	1621 Oct	05	22:33	13°♎39’52	31.28622	AU
retrograde	1622 Jan	16	22:48	16°♎08’28		
opposition	1622 Apr	04	16:36	14°♎46’33	1°43’12	
min. Earth dist.	1622 Apr	05	14:03	14°♎45’05	29.29066	AU
direct	1622 Jun	24	17:40	13°♎21’37		
max. Earth dist.	1622 Oct	08	08:18	15°♎50’29	31.29298	AU
conjunction	1622 Oct	09	07:08	15°♎52’37	1°37’23	
minimum elong	1622 Oct	09	07:08	15°♎52’37	1°37’23	
retrograde	1623 Jan	19	10:23	18°♎19’09		
opposition	1623 Apr	07	03:43	16°♎57’17	1°44’46	
min. Earth dist.	1623 Apr	08	00:10	16°♎55’53	29.29733	AU
direct	1623 Jun	27	05:20	15°♎32’24		
conjunction	1623 Oct	11	17:47	18°♎03’23	1°38’46	
minimum elong	1623 Oct	11	17:47	18°♎03’23	1°38’47	
max. Earth dist.	1623 Oct	10	19:38	18°♎01’19	31.29933	AU
retrograde	1624 Jan	21	20:27	20°♎29’56		
opposition	1624 Apr	08	14:58	19°♎08’06	1°46’11	
min. Earth dist.	1624 Apr	09	12:33	19°♎06’37	29.30341	AU
direct	1624 Jun	28	15:57	17°♎43’17		
max. Earth dist.	1624 Oct	12	05:53	20°♎12’08	31.30491	AU
conjunction	1624 Oct	13	04:18	20°♎14’13	1°40’02	
minimum elong	1624 Oct	13	04:18	20°♎14’13	1°40’02	
retrograde	1625 Jan	23	07:41	22°♎40’47		
opposition	1625 Apr	11	02:15	21°♎18’59	1°47’27	
min. Earth dist.	1625 Apr	11	22:58	21°♎17’34	29.30832	AU
direct	1625 Jul	01	05:20	19°♎54’13		
conjunction	1625 Oct	15	14:48	22°♎25’07	1°41’08	
minimum elong	1625 Oct	15	14:48	22°♎25’07	1°41’08	
max. Earth dist.	1625 Oct	14	16:07	22°♎23’00	31.30905	AU
retrograde	1626 Jan	25	19:03	24°♎51’42		
opposition	1626 Apr	13	13:46	23°♎29’54	1°48’33	
min. Earth dist.	1626 Apr	14	11:18	23°♎28’26	29.31186	AU
direct	1626 Jul	03	17:15	22°♎05’11		
max. Earth dist.	1626 Oct	17	03:05	24°♎33’57	31.31186	AU
conjunction	1626 Oct	18	01:19	24°♎36’02	1°42’06	
minimum elong	1626 Oct	18	01:18	24°♎36’02	1°42’06	
retrograde	1627 Jan	28	04:46	27°♎02’36		
opposition	1627 Apr	16	01:17	25°♎40’49	1°49’30	
min. Earth dist.	1627 Apr	16	22:23	25°♎39’22	29.31386	AU
direct	1627 Jul	06	06:52	24°♎16’07		
conjunction	1627 Oct	20	11:32	26°♎46’54	1°42’55	
minimum elong	1627 Oct	20	11:32	26°♎46’54	1°42’55	
max. Earth dist.	1627 Oct	19	12:30	26°♎44’45	31.31314	AU
retrograde	1628 Jan	30	14:49	29°♎13’29		
opposition	1628 Apr	17	12:48	27°♎51’41	1°50’18	
min. Earth dist.	1628 Apr	18	10:04	27°♎50’13	29.31454	AU
direct	1628 Jul	07	17:52	26°♎27’00		
conjunction	1628 Oct	21	21:55	28°♎57’42	1°43’36	
minimum elong	1628 Oct	21	21:55	28°♎57’42	1°43’35	
max. Earth dist.	1628 Oct	21	00:00	28°♎55’39	31.31318	AU
	1628 Nov	19	12:15	0°♏		
retrograde	1629 Jan	31	22:53	1°♏24’17		
opposition	1629 Apr	20	00:16	0°♏02’27	1°50’57	
min. Earth dist.	1629 Apr	20	21:44	0°♏00’59	29.31399	AU
	1629 Apr	21	12:04	30°♎		
direct	1629 Jul	10	06:30	28°♎37’47		
	1629 Sep	22	16:32	0°♏		
max. Earth dist.	1629 Oct	23	09:17	1°♏06’16	31.31234	AU
conjunction	1629 Oct	24	08:00	1°♏08’23	1°44’07	
minimum elong	1629 Oct	24	08:00	1°♏08’23	1°44’07	
retrograde	1630 Feb	03	09:55	3°♏34’58		
opposition	1630 Apr	22	11:50	2°♏13’06	1°51’26	
min. Earth dist.	1630 Apr	23	08:23	2°♏11’42	29.31300	AU
direct	1630 Jul	12	17:05	0°♏48’26		
conjunction	1630 Oct	26	17:59	3°♏18’57	1°44’30	
minimum elong	1630 Oct	26	17:59	3°♏18’57	1°44’29	
max. Earth dist.	1630 Oct	25	20:45	3°♏16’58	31.31123	AU
retrograde	1631 Feb	05	18:09	5°♏45’33		
opposition	1631 Apr	24	23:34	4°♏23’38	1°51’46	
min. Earth dist.	1631 Apr	25	20:27	4°♏22’12	29.31203	AU
direct	1631 Jul	15	04:59	2°♏58’59		
max. Earth dist.	1631 Oct	28	06:23	5°♏27’24	31.31059	AU
conjunction	1631 Oct	29	03:49	5°♏29’25	1°44’44	
minimum elong	1631 Oct	29	03:49	5°♏29’25	1°44’44	
retrograde	1632 Feb	08	05:10	7°♏56’01		
opposition	1632 Apr	26	10:59	6°♏34’05	1°51’56	
min. Earth dist.	1632 Apr	27	06:21	6°♏32’46	29.31176	AU
direct	1632 Jul	16	16:00	5°♏09’27		
conjunction	1632 Oct	30	13:45	7°♏39’50	1°44’48	

minimum elong	1632 Oct 30 13:45	7°♑39’50	1°44’48
max. Earth dist.	1632 Oct 29 17:26	7°♑37’55	31.31068 AU
retrograde	1633 Feb 09 15:09	10°♑06’30	
opposition	1633 Apr 28 22:45	8°♑44’32	1°51’56
min. Earth dist.	1633 Apr 29 18:33	8°♑43’12	29.31231 AU
direct	1633 Jul 19 01:48	7°♑19’58	
conjunction	1633 Nov 01 23:29	9°♑50’17	1°44’44
minimum elong	1633 Nov 01 23:29	9°♑50’17	1°44’44
max. Earth dist.	1633 Nov 01 03:44	9°♑48’26	31.31168 AU
retrograde	1634 Feb 12 02:22	12°♑17’00	
opposition	1634 May 01 10:27	10°♑55’04	1°51’46
min. Earth dist.	1634 May 02 04:40	10°♑53’49	29.31349 AU
direct	1634 Jul 21 15:08	9°♑30’33	
conjunction	1634 Nov 04 09:14	12°♑00’50	1°44’30
minimum elong	1634 Nov 04 09:14	12°♑00’50	1°44’31
max. Earth dist.	1634 Nov 03 13:48	11°♑59’00	31.31307 AU
retrograde	1635 Feb 14 14:42	14°♑27’37	
opposition	1635 May 03 22:18	13°♑05’41	1°51’27
min. Earth dist.	1635 May 04 16:44	13°♑04’26	29.31506 AU
direct	1635 Jul 24 02:30	11°♑41’15	
conjunction	1635 Nov 06 18:56	14°♑11’29	1°44’08
minimum elong	1635 Nov 06 18:56	14°♑11’29	1°44’08
max. Earth dist.	1635 Nov 06 00:37	14°♑09’46	31.31458 AU
retrograde	1636 Feb 17 00:37	16°♑38’21	
opposition	1636 May 05 10:11	15°♑16’26	1°50’58
min. Earth dist.	1636 May 06 03:49	15°♑15’14	29.31620 AU
direct	1636 Jul 25 15:40	13°♑52’04	
max. Earth dist.	1636 Nov 07 09:48	16°♑20’29	31.31539 AU
conjunction	1636 Nov 08 04:37	16°♑22’15	1°43’36
minimum elong	1636 Nov 08 04:37	16°♑22’15	1°43’36
retrograde	1637 Feb 18 11:31	18°♑49’11	
opposition	1637 May 07 22:05	17°♑27’16	1°50’20
min. Earth dist.	1637 May 08 15:33	17°♑26’05	29.31664 AU
direct	1637 Jul 28 02:40	16°♑02’58	
conjunction	1637 Nov 10 14:28	18°♑33’05	1°42’56
minimum elong	1637 Nov 10 14:28	18°♑33’05	1°42’56
max. Earth dist.	1637 Nov 09 21:04	18°♑31’27	31.31526 AU
retrograde	1638 Feb 20 20:38	21°♑00’05	
opposition	1638 May 10 10:17	19°♑38’10	1°49’32
min. Earth dist.	1638 May 11 03:44	19°♑36’59	29.31581 AU
direct	1638 Jul 30 16:06	18°♑13’54	
max. Earth dist.	1638 Nov 12 05:55	20°♑42’15	31.31382 AU
conjunction	1638 Nov 13 00:02	20°♑43’57	1°42’07
minimum elong	1638 Nov 13 00:02	20°♑43’57	1°42’06
retrograde	1639 Feb 23 08:15	23°♑11’02	
opposition	1639 May 12 22:24	21°♑49’04	1°48’35
min. Earth dist.	1639 May 13 14:53	21°♑47’57	29.31368 AU
direct	1639 Aug 02 03:18	20°♑24’50	
conjunction	1639 Nov 15 09:50	22°♑54’48	1°41’09
minimum elong	1639 Nov 15 09:50	22°♑54’48	1°41’09
max. Earth dist.	1639 Nov 14 16:53	22°♑53’13	31.31089 AU
retrograde	1640 Feb 25 16:22	25°♑21’56	
opposition	1640 May 14 10:31	23°♑59’55	1°47’29
min. Earth dist.	1640 May 15 03:37	23°♑58’46	29.30998 AU
direct	1640 Aug 03 15:10	22°♑35’42	
conjunction	1640 Nov 16 19:28	25°♑05’34	1°40’02
minimum elong	1640 Nov 16 19:28	25°♑05’34	1°40’02
max. Earth dist.	1640 Nov 16 02:08	25°♑03’57	31.30663 AU
retrograde	1641 Feb 27 03:10	27°♑32’44	
opposition	1641 May 16 22:40	26°♑10’40	1°46’13
min. Earth dist.	1641 May 17 14:25	26°♑09’36	29.30501 AU
direct	1641 Aug 06 02:25	24°♑46’27	
conjunction	1641 Nov 19 04:59	27°♑16’13	1°38’47
minimum elong	1641 Nov 19 04:59	27°♑16’13	1°38’48
max. Earth dist.	1641 Nov 18 12:33	27°♑14’40	31.30112 AU
retrograde	1642 Mar 01 13:07	29°♑43’26	
opposition	1642 May 19 11:01	28°♑21’17	1°44’49
min. Earth dist.	1642 May 20 03:17	28°♑20’11	29.29918 AU
direct	1642 Aug 08 12:44	26°♑57’03	
conjunction	1642 Nov 21 14:23	29°♑26’42	1°37’24
minimum elong	1642 Nov 21 14:23	29°♑26’42	1°37’24
max. Earth dist.	1642 Nov 20 22:44	29°♑25’14	31.29521 AU
	1642 Dec 06 10:50	0°♐	
retrograde	1643 Mar 04 00:00	1°♐53’58	
opposition	1643 May 21 23:11	0°♐31’44	1°43’16
min. Earth dist.	1643 May 22 13:44	0°♐30’45	29.29317 AU
	1643 Jun 10 23:36	30°♑	
direct	1643 Aug 11 01:53	29°♑07’30	
	1643 Oct 08 03:23	0°♐	
conjunction	1643 Nov 23 23:38	1°♐37’03	1°35’53
minimum elong	1643 Nov 23 23:38	1°♐37’03	1°35’53
max. Earth dist.	1643 Nov 23 08:24	1°♐35’37	31.28934 AU
retrograde	1644 Mar 05 11:59	4°♐04’24	
opposition	1644 May 23 11:28	2°♐42’05	1°41’34
min. Earth dist.	1644 May 24 01:50	2°♐41’07	29.28767 AU
direct	1644 Aug 12 12:45	1°♐17’52	
conjunction	1644 Nov 25 08:57	3°♐47’20	1°34’13
minimum elong	1644 Nov 25 08:57	3°♐47’20	1°34’12
max. Earth dist.	1644 Nov 24 19:21	3°♐46’03	31.28427 AU
retrograde	1645 Mar 07 21:50	6°♐14’45	
opposition	1645 May 25 23:41	4°♐52’24	1°39’43
min. Earth dist.	1645 May 26 12:39	4°♐51’32	29.28294 AU
direct	1645 Aug 15 01:36	3°♐28’14	
conjunction	1645 Nov 27 18:09	5°♐57’38	1°32’26
minimum elong	1645 Nov 27 18:09	5°♐57’38	1°32’26
max. Earth dist.	1645 Nov 27 04:36	5°♐56’22	31.28015 AU
retrograde	1646 Mar 10 09:33	8°♐25’10	
opposition	1646 May 28 12:05	7°♐02’47	1°37’44
min. Earth dist.	1646 May 29 00:08	7°♐01’59	29.27933 AU
direct	1646 Aug 17 12:29	5°♐38’41	
conjunction	1646 Nov 30 03:22	8°♐08’02	1°30’30
minimum elong	1646 Nov 30 03:22	8°♐08’02	1°30’29
max. Earth dist.	1646 Nov 29 15:54	8°♐06’57	31.27695 AU
retrograde	1647 Mar 12 19:18	10°♐35’42	
opposition	1647 May 31 00:31	9°♐13’19	1°35’36
min. Earth dist.	1647 May 31 12:00	9°♐12’32	29.27631 AU
direct	1647 Aug 20 01:38	7°♐49’17	
conjunction	1647 Dec 02 12:33	10°♐18’36	1°28’26
minimum elong	1647 Dec 02 12:33	10°♐18’36	1°28’26
max. Earth dist.	1647 Dec 02 00:55	10°♐17’30	31.27423 AU
retrograde	1648 Mar 14 07:29	12°♐46’23	
opposition	1648 Jun 01 12:46	11°♐24’01	1°33’19
min. Earth dist.	1648 Jun 01 22:51	11°♐23’20	29.27364 AU
direct	1648 Aug 21 12:25	10°♐00’03	
conjunction	1648 Dec 03 21:56	12°♐29’21	1°26’14
minimum elong	1648 Dec 03 21:57	12°♐29’21	1°26’14
max. Earth dist.	1648 Dec 03 11:51	12°♐28’24	31.27145 AU
retrograde	1649 Mar 16 16:21	14°♐57’17	

opposition	1649 Jun	04	01:26	13°♐34'54	1°30'55
min. Earth dist.	1649 Jun	04	11:42	13°♐34'13	29.27064 AU
direct	1649 Aug	23	23:58	12°♐11'02	
conjunction	1649 Dec	06	07:07	14°♐40'17	1°23'55
minimum elong	1649 Dec	06	07:08	14°♐40'17	1°23'56
max. Earth dist.	1649 Dec	05	21:11	14°♐39'21	31.26828 AU
retrograde	1650 Mar	19	03:44	17°♐08'22	
opposition	1650 Jun	06	14:03	15°♐45'59	1°28'22
min. Earth dist.	1650 Jun	06	22:40	15°♐45'24	29.26700 AU
direct	1650 Aug	26	10:42	14°♐22'11	
conjunction	1650 Dec	08	16:33	16°♐51'23	1°21'29
minimum elong	1650 Dec	08	16:33	16°♐51'23	1°21'29
max. Earth dist.	1650 Dec	08	07:27	16°♐50'31	31.26412 AU
retrograde	1651 Mar	21	14:35	19°♐19'37	
opposition	1651 Jun	09	02:47	17°♐57'12	1°25'42
min. Earth dist.	1651 Jun	09	11:56	17°♐56'35	29.26233 AU
direct	1651 Aug	28	20:19	16°♐33'27	
conjunction	1651 Dec	11	01:58	19°♐02'36	1°18'55
minimum elong	1651 Dec	11	01:58	19°♐02'36	1°18'56
max. Earth dist.	1651 Dec	10	17:33	19°♐01'48	31.25888 AU
retrograde	1652 Mar	23	02:08	21°♐30'58	
opposition	1652 Jun	10	15:27	20°♐08'31	1°22'54
min. Earth dist.	1652 Jun	10	23:07	20°♐08'00	29.25626 AU
direct	1652 Aug	30	09:07	18°♐44'48	
conjunction	1652 Dec	12	11:19	21°♐13'53	1°16'15
minimum elong	1652 Dec	12	11:19	21°♐13'53	1°16'14
max. Earth dist.	1652 Dec	12	02:50	21°♐13'05	31.25211 AU
retrograde	1653 Mar	25	14:57	23°♐42'22	
opposition	1653 Jun	13	04:17	22°♐19'50	1°20'00
min. Earth dist.	1653 Jun	13	12:04	22°♐19'19	29.24886 AU
direct	1653 Sep	01	19:11	20°♐56'08	
conjunction	1653 Dec	14	20:47	23°♐25'09	1°13'28
minimum elong	1653 Dec	14	20:47	23°♐25'09	1°13'29
max. Earth dist.	1653 Dec	14	13:44	23°♐24'29	31.24420 AU
retrograde	1654 Mar	28	01:21	25°♐53'44	
opposition	1654 Jun	15	17:06	24°♐31'07	1°16'58
min. Earth dist.	1654 Jun	15	23:45	24°♐30'40	29.24032 AU
direct	1654 Sep	04	07:48	23°♐07'25	
conjunction	1654 Dec	17	05:55	25°♐36'20	1°10'35
minimum elong	1654 Dec	17	05:56	25°♐36'20	1°10'35
max. Earth dist.	1654 Dec	16	22:42	25°♐35'39	31.23542 AU
retrograde	1655 Mar	30	13:59	28°♐05'01	
opposition	1655 Jun	18	05:55	26°♐42'18	1°13'50
min. Earth dist.	1655 Jun	18	11:52	26°♐41'54	29.23138 AU
direct	1655 Sep	06	19:25	25°♐18'36	
conjunction	1655 Dec	19	15:18	27°♐47'24	1°07'36
minimum elong	1655 Dec	19	15:18	27°♐47'24	1°07'37
max. Earth dist.	1655 Dec	19	10:04	27°♐46'55	31.22643 AU
	1656 Feb	29	17:53	0°♑	
retrograde	1656 Apr	01	00:32	0°♑16'11	
	1656 May	03	01:43	30°♐	
opposition	1656 Jun	19	18:35	28°♐53'22	1°10'36
min. Earth dist.	1656 Jun	19	23:55	28°♐53'01	29.22246 AU
direct	1656 Sep	08	09:06	27°♐29'40	
conjunction	1656 Dec	21	00:28	29°♐58'24	1°04'32
minimum elong	1656 Dec	21	00:28	29°♐58'24	1°04'31
max. Earth dist.	1656 Dec	20	19:18	29°♐57'55	31.21793 AU
	1656 Dec	21	17:24	0°♑	
retrograde	1657 Apr	03	12:43	2°♑27'17	
opposition	1657 Jun	22	07:22	1°♑04'24	1°07'16
min. Earth dist.	1657 Jun	22	10:54	1°♑04'09	29.21438 AU
	1657 Aug	06	12:42	30°♐	
direct	1657 Sep	10	20:11	29°♐40'42	
	1657 Oct	15	02:44	0°♑	
conjunction	1657 Dec	23	09:39	2°♑09'22	1°01'21
minimum elong	1657 Dec	23	09:40	2°♑09'22	1°01'22
max. Earth dist.	1657 Dec	23	06:21	2°♑09'03	31.21027 AU
retrograde	1658 Apr	05	21:53	4°♑38'23	
opposition	1658 Jun	24	20:21	3°♑15'26	1°03'49
min. Earth dist.	1658 Jun	24	23:34	3°♑15'13	29.20720 AU
direct	1658 Sep	13	08:30	1°♑51'47	
conjunction	1658 Dec	25	18:54	4°♑20'22	0°58'05
minimum elong	1658 Dec	25	18:54	4°♑20'22	0°58'05
max. Earth dist.	1658 Dec	25	16:14	4°♑20'07	31.20371 AU
retrograde	1659 Apr	08	09:36	6°♑49'32	
opposition	1659 Jun	27	09:01	5°♑26'32	1°00'17
min. Earth dist.	1659 Jun	27	10:12	5°♑26'28	29.20097 AU
direct	1659 Sep	15	19:50	4°♑02'56	
conjunction	1659 Dec	28	04:11	6°♑31'29	0°54'44
minimum elong	1659 Dec	28	04:12	6°♑31'29	0°54'45
max. Earth dist.	1659 Dec	28	02:37	6°♑31'21	31.19777 AU
retrograde	1660 Apr	09	20:34	9°♑00'49	
opposition	1660 Jun	28	22:01	7°♑37'47	0°56'39
min. Earth dist.	1660 Jun	28	23:19	7°♑37'42	29.19526 AU
direct	1660 Sep	17	05:56	6°♑14'15	
conjunction	1660 Dec	29	13:30	8°♑42'46	0°51'18
minimum elong	1660 Dec	29	13:30	8°♑42'46	0°51'17
max. Earth dist.	1660 Dec	29	13:13	8°♑42'44	31.19225 AU
retrograde	1661 Apr	12	08:01	11°♑12'15	
opposition	1661 Jul	01	10:57	9°♑49'13	0°52'56
min. Earth dist.	1661 Jul	01	10:24	9°♑49'15	29.18962 AU
direct	1661 Sep	19	17:46	8°♑25'45	
conjunction	1661 Dec	31	22:53	10°♑54'14	0°47'47
minimum elong	1661 Dec	31	22:53	10°♑54'14	0°47'47
max. Earth dist.	1661 Dec	31	22:45	10°♑54'13	31.18654 AU
retrograde	1662 Apr	14	21:04	13°♑23'54	
opposition	1662 Jul	04	00:07	12°♑00'49	0°49'08
min. Earth dist.	1662 Jul	03	23:29	12°♑00'52	29.18377 AU
direct	1662 Sep	22	02:55	10°♑37'25	
conjunction	1663 Jan	03	08:26	13°♑05'53	0°44'11
minimum elong	1663 Jan	03	08:26	13°♑05'53	0°44'10
max. Earth dist.	1663 Jan	03	09:55	13°♑06'01	31.18035 AU
retrograde	1663 Apr	17	08:31	15°♑35'44	
opposition	1663 Jul	06	13:13	14°♑12'37	0°45'15
min. Earth dist.	1663 Jul	06	11:29	14°♑12'44	29.17699 AU
direct	1663 Sep	24	15:00	12°♑49'17	
conjunction	1664 Jan	05	18:00	15°♑17'43	0°40'32
minimum elong	1664 Jan	05	18:00	15°♑17'43	0°40'32
max. Earth dist.	1664 Jan	05	19:03	15°♑17'49	31.17305 AU
retrograde	1664 Apr	18	22:25	17°♑47'44	
opposition	1664 Jul	08	02:17	16°♑24'35	0°41'19
min. Earth dist.	1664 Jul	08	00:08	16°♑24'43	29.16910 AU
direct	1664 Sep	26	01:51	15°♑01'16	
conjunction	1665 Jan	07	03:50	17°♑29'41	0°36'49
minimum elong	1665 Jan	07	03:50	17°♑29'41	0°36'48
max. Earth dist.	1665 Jan	07	06:29	17°♑29'56	31.16442 AU
retrograde	1665 Apr	21	10:24	19°♑59'52	
opposition	1665 Jul	10	15:36	18°♑36'39	0°37'18

min. Earth dist.	1665 Jul	10	13:07	18°♑36’49	29.15968 AU
direct	1665 Sep	28	15:03	17°♑13’22	
conjunction	1666 Jan	09	13:24	19°♑41’44	0°33’03
minimum elong	1666 Jan	09	13:25	19°♑41’44	0°33’03
max. Earth dist.	1666 Jan	09	15:45	19°♑41’57	31.15444 AU
retrograde	1666 Apr	23	23:38	22°♑12’04	
opposition	1666 Jul	13	04:49	20°♑48’46	0°33’15
min. Earth dist.	1666 Jul	13	01:05	20°♑49’01	29.14905 AU
direct	1666 Oct	01	02:16	19°♑25’29	
conjunction	1667 Jan	11	23:12	21°♑53’48	0°29’14
minimum elong	1667 Jan	11	23:12	21°♑53’48	0°29’14
max. Earth dist.	1667 Jan	12	02:50	21°♑54’08	31.14323 AU
retrograde	1667 Apr	26	09:50	24°♑24’15	
opposition	1667 Jul	15	17:56	23°♑00’52	0°29’09
min. Earth dist.	1667 Jul	15	14:22	23°♑01’06	29.13745 AU
direct	1667 Oct	03	15:06	21°♑37’35	
conjunction	1668 Jan	14	08:53	24°♑05’50	0°25’22
minimum elong	1668 Jan	14	08:53	24°♑05’50	0°25’23
max. Earth dist.	1668 Jan	14	12:59	24°♑06’13	31.13153 AU
retrograde	1668 Apr	27	22:22	26°♑36’25	
opposition	1668 Jul	17	06:59	25°♑12’55	0°25’00
min. Earth dist.	1668 Jul	17	01:32	25°♑13’17	29.12566 AU
direct	1668 Oct	05	03:22	23°♑49’38	
conjunction	1669 Jan	15	18:26	26°♑17’49	0°21’29
minimum elong	1669 Jan	15	18:27	26°♑17’49	0°21’28
max. Earth dist.	1669 Jan	15	23:32	26°♑18’17	31.11980 AU
retrograde	1669 Apr	30	09:07	28°♑48’33	
opposition	1669 Jul	19	20:13	27°♑24’58	0°20’49
min. Earth dist.	1669 Jul	19	14:48	27°♑25’20	29.11431 AU
direct	1669 Oct	07	14:11	26°♑01’40	
conjunction	1670 Jan	18	04:12	28°♑29’48	0°17’34
minimum elong	1670 Jan	18	04:12	28°♑29’48	0°17’34
max. Earth dist.	1670 Jan	18	10:48	28°♑30’25	31.10893 AU
	1670 Mar	01	14:47	0°♒	
retrograde	1670 May	02	20:07	1°♒00’41	
	1670 Jul	08	02:10	30°♑	
opposition	1670 Jul	22	09:13	29°♑37’01	0°16’37
min. Earth dist.	1670 Jul	22	01:46	29°♑37’32	29.10389 AU
direct	1670 Oct	10	02:00	28°♑13’45	
	1671 Jan	01	23:11	0°♒	
conjunction	1671 Jan	20	13:51	0°♒41’51	0°13’37
minimum elong	1671 Jan	20	13:51	0°♒41’51	0°13’36
behind sun begin	1671 Jan	20	10:14	0°♒41’31	
behind sun end	1671 Jan	20	17:29	0°♒42’11	
max. Earth dist.	1671 Jan	20	20:43	0°♒42’29	31.09900 AU
retrograde	1671 May	05	08:40	3°♒12’54	
opposition	1671 Jul	24	22:21	1°♒49’10	0°12’22
min. Earth dist.	1671 Jul	24	14:35	1°♒49’42	29.09453 AU
direct	1671 Oct	12	10:44	0°♒25’55	
conjunction	1672 Jan	22	23:42	2°♒54’00	0°09’39
minimum elong	1672 Jan	22	23:43	2°♒54’00	0°09’39
behind sun begin	1672 Jan	22	18:24	2°♒53’31	
behind sun end	1672 Jan	23	05:02	2°♒54’29	
max. Earth dist.	1672 Jan	23	08:30	2°♒54’49	31.09008 AU
retrograde	1672 May	06	20:13	5°♒25’13	
opposition	1672 Jul	26	11:18	4°♒01’26	0°08’06
min. Earth dist.	1672 Jul	26	02:04	4°♒02’04	29.08593 AU
direct	1672 Oct	13	22:33	2°♒38’14	
conjunction	1673 Jan	24	09:31	5°♒06’18	0°05’40
minimum elong	1673 Jan	24	09:31	5°♒06’18	0°05’40
behind sun begin	1673 Jan	24	03:22	5°♒05’45	
behind sun end	1673 Jan	24	15:40	5°♒06’51	
max. Earth dist.	1673 Jan	24	18:15	5°♒07’07	31.08193 AU
retrograde	1673 May	09	10:36	7°♒37’42	
opposition	1673 Jul	29	00:32	6°♒13’53	0°03’49
min. Earth dist.	1673 Jul	28	14:31	6°♒14’33	29.07811 AU
direct	1673 Oct	16	08:38	4°♒50’42	
conjunction	1674 Jan	26	19:27	7°♒18’47	0°01’39
minimum elong	1674 Jan	26	19:28	7°♒18’47	0°01’39
behind sun begin	1674 Jan	26	13:04	7°♒18’12	
behind sun end	1674 Jan	27	01:52	7°♒19’21	
max. Earth dist.	1674 Jan	27	06:10	7°♒19’47	31.07420 AU
retrograde	1674 May	11	23:07	9°♒50’21	
desc. node	1674 Jun	21	12:57	9°♒25’22	
opposition	1674 Jul	31	13:45	8°♒26’29	0°00’-27
min. Earth dist.	1674 Jul	31	03:15	8°♒27’12	29.07038 AU
direct	1674 Oct	18	20:38	7°♒03’22	
conjunction	1675 Jan	29	05:33	9°♒31’26	0°-2’-28
minimum elong	1675 Jan	29	05:33	9°♒31’26	0°02’30
behind sun begin	1675 Jan	28	23:09	9°♒30’51	
behind sun end	1675 Jan	29	11:56	9°♒32’01	
max. Earth dist.	1675 Jan	29	16:06	9°♒32’25	31.06649 AU
retrograde	1675 May	14	13:05	12°♒03’11	
opposition	1675 Aug	03	02:47	10°♒39’16	0°-4’-45
min. Earth dist.	1675 Aug	02	15:07	10°♒40’04	29.06253 AU
direct	1675 Oct	21	07:01	9°♒16’10	
conjunction	1676 Jan	31	15:50	11°♒44’15	0°-6’-29
minimum elong	1676 Jan	31	15:50	11°♒44’15	0°06’30
behind sun begin	1676 Jan	31	09:48	11°♒43’42	
behind sun end	1676 Jan	31	21:53	11°♒44’48	
max. Earth dist.	1676 Feb	01	03:30	11°♒45’21	31.05820 AU
retrograde	1676 May	16	01:22	14°♒16’10	
opposition	1676 Aug	04	16:06	12°♒52’12	0°-9’-2
min. Earth dist.	1676 Aug	04	04:43	12°♒52’59	29.05385 AU
direct	1676 Oct	22	19:59	11°♒29’08	
conjunction	1677 Feb	02	02:06	13°♒57’12	0°-10’-28
minimum elong	1677 Feb	02	02:05	13°♒57’12	0°10’30
behind sun begin	1677 Feb	01	21:02	13°♒56’45	
behind sun end	1677 Feb	02	07:08	13°♒57’40	
max. Earth dist.	1677 Feb	02	14:03	13°♒58’19	31.04908 AU
retrograde	1677 May	18	15:39	16°♒29’16	
opposition	1677 Aug	07	05:22	15°♒05’14	0°-13’-19
min. Earth dist.	1677 Aug	06	16:28	15°♒06’07	29.04415 AU
direct	1677 Oct	25	08:38	13°♒42’10	
conjunction	1678 Feb	04	12:33	16°♒10’13	0°-14’-27
minimum elong	1678 Feb	04	12:33	16°♒10’13	0°14’27
behind sun begin	1678 Feb	04	09:33	16°♒09’56	
behind sun end	1678 Feb	04	15:33	16°♒10’29	
max. Earth dist.	1678 Feb	05	00:49	16°♒11’22	31.03871 AU
retrograde	1678 May	21	03:01	18°♒42’25	
opposition	1678 Aug	09	18:41	17°♒18’18	0°-17’-34
min. Earth dist.	1678 Aug	09	06:26	17°♒19’08	29.03328 AU
direct	1678 Oct	27	19:51	15°♒55’13	
conjunction	1679 Feb	06	23:06	18°♒23’13	0°-18’-25
minimum elong	1679 Feb	06	23:05	18°♒23’13	0°18’27
max. Earth dist.	1679 Feb	07	12:22	18°♒24’28	31.02736 AU
retrograde	1679 May	23	14:36	20°♒55’33	
opposition	1679 Aug	12	07:47	19°♒31’19	0°-21’-48
min. Earth dist.	1679 Aug	11	18:05	19°♒32’15	29.02142 AU
direct	1679 Oct	30	08:28	18°♒08’13	

conjunction	1680 Feb 09 09:28	20°♒36’10	0°-22’-21
minimum elong	1680 Feb 09 09:28	20°♒36’10	0°22’22
max. Earth dist.	1680 Feb 09 22:30	20°♒37’24	31.01520 AU
retrograde	1680 May 25 02:55	23°♒08’37	
opposition	1680 Aug 13 20:57	21°♒44’16	0°-26’00
min. Earth dist.	1680 Aug 13 07:24	21°♒45’12	29.00927 AU
direct	1680 Oct 31 18:20	20°♒21’08	

conjunction	1681 Feb 10 20:02	22°♒49’03	0°-26’-16
minimum elong	1681 Feb 10 20:02	22°♒49’03	0°26’17
max. Earth dist.	1681 Feb 11 10:51	22°♒50’27	31.00313 AU
retrograde	1681 May 27 14:25	25°♒21’36	
opposition	1681 Aug 16 10:01	23°♒57’10	0°-30’-10
min. Earth dist.	1681 Aug 15 19:05	23°♒58’11	28.99746 AU
direct	1681 Nov 03 06:42	22°♒34’00	

conjunction	1682 Feb 13 06:24	25°♒01’52	0°-30’-8
minimum elong	1682 Feb 13 06:24	25°♒01’52	0°30’08
max. Earth dist.	1682 Feb 13 21:05	25°♒03’16	30.99176 AU
retrograde	1682 May 30 04:05	27°♒34’34	
opposition	1682 Aug 18 23:06	26°♒10’02	0°-34’-17
min. Earth dist.	1682 Aug 18 07:32	26°♒11’06	28.98672 AU
direct	1682 Nov 05 16:35	24°♒46’51	

conjunction	1683 Feb 15 17:07	27°♒14’44	0°-33’-57
minimum elong	1683 Feb 15 17:07	27°♒14’44	0°33’58
max. Earth dist.	1683 Feb 16 09:41	27°♒16’18	30.98148 AU
retrograde	1683 Jun 01 16:03	29°♒47’34	
opposition	1683 Aug 21 11:56	28°♒22’58	0°-38’-21
min. Earth dist.	1683 Aug 20 19:45	28°♒24’04	28.97709 AU
direct	1683 Nov 08 03:57	26°♒59’47	

conjunction	1684 Feb 18 03:43	29°♒27’41	0°-37’-44
minimum elong	1684 Feb 18 03:43	29°♒27’41	0°37’44
max. Earth dist.	1684 Feb 18 20:19	29°♒29’15	30.97256 AU
	1684 Mar 03 10:42	0°♓	
retrograde	1684 Jun 03 06:28	2°♓00’39	
min. Earth dist.	1684 Aug 22 07:20	0°♓37’13	28.96888 AU
opposition	1684 Aug 23 00:53	0°♓36’01	0°-42’-22
	1684 Sep 14 14:48	30°♒	
direct	1684 Nov 09 14:05	29°♒12’51	
	1685 Jan 02 00:37	0°♓	

conjunction	1685 Feb 19 14:21	1°♓40’46	0°-41’-27
minimum elong	1685 Feb 19 14:21	1°♓40’46	0°41’29
max. Earth dist.	1685 Feb 20 08:21	1°♓42’28	30.96483 AU
retrograde	1685 Jun 05 19:32	4°♓13’55	
opposition	1685 Aug 25 13:58	2°♓49’14	0°-46’-19
min. Earth dist.	1685 Aug 24 20:23	2°♓50’27	28.96173 AU
direct	1685 Nov 12 02:34	1°♓26’07	

conjunction	1686 Feb 22 01:14	3°♓54’05	0°-45’-8
minimum elong	1686 Feb 22 01:14	3°♓54’05	0°45’08
max. Earth dist.	1686 Feb 22 19:48	3°♓55’50	30.95824 AU
retrograde	1686 Jun 08 10:45	6°♓27’23	
min. Earth dist.	1686 Aug 27 07:37	5°♓04’00	28.95553 AU
opposition	1686 Aug 28 02:47	5°♓02’41	0°-50’-12
direct	1686 Nov 14 14:38	3°♓39’36	

conjunction	1687 Feb 24 12:12	6°♓07’37	0°-48’-44
minimum elong	1687 Feb 24 12:12	6°♓07’37	0°48’46
max. Earth dist.	1687 Feb 25 07:12	6°♓09’25	30.95218 AU
retrograde	1687 Jun 10 22:56	8°♓41’05	
opposition	1687 Aug 30 15:49	7°♓16’23	0°-54’-1
min. Earth dist.	1687 Aug 29 21:17	7°♓17’39	28.94968 AU
direct	1687 Nov 17 01:26	5°♓53’21	

conjunction	1688 Feb 26 23:23	8°♓21’24	0°-52’-16
minimum elong	1688 Feb 26 23:23	8°♓21’24	0°52’17
max. Earth dist.	1688 Feb 27 19:25	8°♓23’18	30.94631 AU
retrograde	1688 Jun 12 11:56	10°♓55’02	
min. Earth dist.	1688 Aug 31 08:53	9°♓31’41	28.94368 AU
opposition	1688 Sep 01 04:42	9°♓30’19	0°-57’-46
direct	1688 Nov 18 13:58	8°♓07’19	

conjunction	1689 Feb 28 10:39	10°♓35’25	0°-55’-44
minimum elong	1689 Feb 28 10:38	10°♓35’25	0°55’45
max. Earth dist.	1689 Mar 01 06:07	10°♓37’16	30.94000 AU
retrograde	1689 Jun 15 01:40	13°♓09’12	
opposition	1689 Sep 03 17:49	11°♓44’27	-1°-1’-25
min. Earth dist.	1689 Sep 02 22:35	11°♓45’46	28.93714 AU
direct	1689 Nov 20 23:57	10°♓21’29	

conjunction	1690 Mar 02 22:12	12°♓49’36	0°-59’-6
minimum elong	1690 Mar 02 22:12	12°♓49’36	0°59’07
max. Earth dist.	1690 Mar 03 18:51	12°♓51’33	30.93293 AU
retrograde	1690 Jun 17 13:25	15°♓23’30	
min. Earth dist.	1690 Sep 05 10:50	14°♓00’05	28.92949 AU
opposition	1690 Sep 06 06:48	13°♓58’42	-1°-4’-59
direct	1690 Nov 23 12:36	12°♓35’44	

conjunction	1691 Mar 05 09:45	15°♓03’52	-1°-2’-24
minimum elong	1691 Mar 05 09:45	15°♓03’51	1°02’25
max. Earth dist.	1691 Mar 06 05:25	15°♓05’43	30.92476 AU
retrograde	1691 Jun 20 02:28	17°♓37’51	
opposition	1691 Sep 08 19:40	16°♓13’00	-1°-8’-27
min. Earth dist.	1691 Sep 07 23:53	16°♓14’22	28.92092 AU
direct	1691 Nov 25 22:27	14°♓49’59	

conjunction	1692 Mar 06 21:26	17°♓18’07	-1°-5’-35
minimum elong	1692 Mar 06 21:26	17°♓18’07	1°05’36
max. Earth dist.	1692 Mar 07 18:23	17°♓20’06	30.91572 AU
retrograde	1692 Jun 21 14:12	19°♓52’11	
opposition	1692 Sep 10 08:34	18°♓27’15	-1°-11’-49
min. Earth dist.	1692 Sep 09 12:42	18°♓28’37	28.91164 AU
direct	1692 Nov 27 09:46	17°♓04’11	

conjunction	1693 Mar 09 08:53	19°♓32’18	-1°-8’-41
minimum elong	1693 Mar 09 08:53	19°♓32’18	1°08’43
max. Earth dist.	1693 Mar 10 05:26	19°♓34’15	30.90646 AU
retrograde	1693 Jun 24 04:27	22°♓06’27	
opposition	1693 Sep 12 21:24	20°♓41’25	-1°-15’-5
min. Earth dist.	1693 Sep 12 00:45	20°♓42’50	28.90254 AU
direct	1693 Nov 29 20:33	19°♓18’18	

conjunction	1694 Mar 11 20:37	21°♓46’25	-1°-11’-41
minimum elong	1694 Mar 11 20:36	21°♓46’25	1°11’41
max. Earth dist.	1694 Mar 12 18:07	21°♓48’27	30.89745 AU
retrograde	1694 Jun 26 17:07	24°♓20’37	
opposition	1694 Sep 15 10:04	22°♓55’29	-1°-18’-14
min. Earth dist.	1694 Sep 14 13:44	22°♓56’54	28.89400 AU
direct	1694 Dec 02 08:54	21°♓32’20	

conjunction	1695 Mar 14 08:23	24°♓00’27	-1°-14’-34
minimum elong	1695 Mar 14 08:23	24°♓00’27	1°14’36
max. Earth dist.	1695 Mar 15 06:10	24°♓02’31	30.88944 AU
retrograde	1695 Jun 29 07:38	26°♓34’43	
opposition	1695 Sep 17 22:38	25°♓09’32	-1°-21’-15
min. Earth dist.	1695 Sep 17 00:54	25°♓11’02	28.88658 AU
direct	1695 Dec 04 20:53	23°♓46’20	

conjunction	1696 Mar 15 20:03	26°♓14’29	-1°-17’-21
minimum elong	1696 Mar 15 20:03	26°♓14’29	1°17’21
max. Earth dist.	1696 Mar 16 18:13	26°♓16’34	30.88248 AU

retrograde	1696 Jun 30 20:22	28°♓48’49	
opposition	1696 Sep 19 11:21	27°♓23’35	-1°-24’-10
min. Earth dist.	1696 Sep 18 14:10	27°♓25’03	28.88040 AU
direct	1696 Dec 06 08:01	26°♓00’22	
conjunction	1697 Mar 18 08:01	28°♓28’32	-1°-20’00
minimum elong	1697 Mar 18 08:01	28°♓28’32	1°20’02
max. Earth dist.	1697 Mar 19 07:16	28°♓30’44	30.87701 AU
	1697 Apr 30 09:55	0°♈	
retrograde	1697 Jul 03 10:37	1°♈02’57	
	1697 Sep 08 10:48	30°♓	
opposition	1697 Sep 21 23:51	29°♓37’41	-1°-26’-57
min. Earth dist.	1697 Sep 21 01:18	29°♓39’15	28.87557 AU
direct	1697 Dec 08 21:05	28°♓14’29	
	1698 Mar 01 18:55	0°♈	
conjunction	1698 Mar 20 19:56	0°♈42’42	-1°-22’-33
minimum elong	1698 Mar 20 19:56	0°♈42’42	1°22’34
max. Earth dist.	1698 Mar 21 18:45	0°♈44’51	30.87272 AU
retrograde	1698 Jul 06 00:36	3°♈17’12	
opposition	1698 Sep 24 12:31	1°♈51’55	-1°-29’-36
min. Earth dist.	1698 Sep 23 14:30	1°♈53’27	28.87190 AU
direct	1698 Dec 11 07:42	0°♈28’44	
conjunction	1699 Mar 23 08:11	2°♈57’00	-1°-24’-58
minimum elong	1699 Mar 23 08:11	2°♈57’00	1°25’00
max. Earth dist.	1699 Mar 24 08:17	2°♈59’17	30.86942 AU
retrograde	1699 Jul 08 12:37	5°♈31’35	
min. Earth dist.	1699 Sep 26 02:06	4°♈07’55	28.86890 AU
opposition	1699 Sep 27 00:52	4°♈06’20	-1°-32’-7
direct	1699 Dec 13 20:01	2°♈43’10	
conjunction	1700 Mar 25 20:23	5°♈11’30	-1°-27’-15
minimum elong	1700 Mar 25 20:23	5°♈11’30	1°27’16
max. Earth dist.	1700 Mar 26 19:35	5°♈13’42	30.86666 AU
retrograde	1700 Jul 11 02:18	7°♈46’12	
opposition	1700 Sep 29 13:29	6°♈20’56	-1°-34’-29
min. Earth dist.	1700 Sep 28 14:58	6°♈22’31	28.86632 AU
direct	1700 Dec 16 05:47	4°♈57’48	
conjunction	1701 Mar 28 08:49	7°♈26’13	-1°-29’-25
minimum elong	1701 Mar 28 08:49	7°♈26’13	1°29’26
max. Earth dist.	1701 Mar 29 09:08	7°♈28’31	30.86389 AU
retrograde	1701 Jul 13 14:40	10°♈01’00	
min. Earth dist.	1701 Oct 01 03:47	8°♈37’19	28.86331 AU
opposition	1701 Oct 02 02:02	8°♈35’45	-1°-36’-43
direct	1701 Dec 18 16:55	7°♈12’38	
conjunction	1702 Mar 30 21:28	9°♈41’07	-1°-31’-26
minimum elong	1702 Mar 30 21:27	9°♈41’07	1°31’26
max. Earth dist.	1702 Mar 31 20:42	9°♈43’19	30.86057 AU
retrograde	1702 Jul 16 05:00	12°♈15’58	
opposition	1702 Oct 04 14:27	10°♈50’44	-1°-38’-49
min. Earth dist.	1702 Oct 03 16:08	10°♈52’17	28.85957 AU
direct	1702 Dec 21 03:30	9°♈27’36	
conjunction	1703 Apr 02 10:18	11°♈56’09	-1°-33’-19
minimum elong	1703 Apr 02 10:18	11°♈56’09	1°33’20
max. Earth dist.	1703 Apr 03 09:44	11°♈58’22	30.85613 AU
retrograde	1703 Jul 18 17:28	14°♈31’03	
min. Earth dist.	1703 Oct 06 05:37	13°♈07’17	28.85462 AU
opposition	1703 Oct 07 02:59	13°♈05’48	-1°-40’-45
direct	1703 Dec 23 15:29	11°♈42’38	
conjunction	1704 Apr 03 22:58	14°♈11’13	-1°-35’-3
minimum elong	1704 Apr 03 22:58	14°♈11’13	1°35’04
max. Earth dist.	1704 Apr 04 21:55	14°♈13’23	30.85077 AU
retrograde	1704 Jul 20 07:53	16°♈46’09	
opposition	1704 Oct 08 15:21	15°♈20’51	-1°-42’-32
min. Earth dist.	1704 Oct 07 17:17	15°♈22’24	28.84885 AU
direct	1704 Dec 25 03:26	13°♈57’38	
conjunction	1705 Apr 06 11:49	16°♈26’16	-1°-36’-39
minimum elong	1705 Apr 06 11:48	16°♈26’16	1°36’41
max. Earth dist.	1705 Apr 07 10:28	16°♈28’25	30.84467 AU
retrograde	1705 Jul 22 20:56	19°♈01’13	
min. Earth dist.	1705 Oct 10 06:52	17°♈37’19	28.84272 AU
opposition	1705 Oct 11 03:41	17°♈35’52	-1°-44’-10
direct	1705 Dec 27 14:53	16°♈12’36	
conjunction	1706 Apr 09 00:45	18°♈41’15	-1°-38’-6
minimum elong	1706 Apr 09 00:44	18°♈41’15	1°38’07
max. Earth dist.	1706 Apr 09 23:52	18°♈43’26	30.83864 AU
retrograde	1706 Jul 25 11:44	21°♈16’11	
opposition	1706 Oct 13 15:46	19°♈50’47	-1°-45’-38
min. Earth dist.	1706 Oct 12 18:06	19°♈52’18	28.83682 AU
direct	1706 Dec 30 04:47	18°♈27’28	
conjunction	1707 Apr 11 13:34	20°♈56’10	-1°-39’-24
minimum elong	1707 Apr 11 13:34	20°♈56’10	1°39’26
max. Earth dist.	1707 Apr 12 11:52	20°♈58’16	30.83297 AU
retrograde	1707 Jul 28 01:16	23°♈31’06	
min. Earth dist.	1707 Oct 15 07:06	22°♈07’06	28.83171 AU
opposition	1707 Oct 16 03:51	22°♈05’39	-1°-46’-56
direct	1708 Jan 01 16:13	20°♈42’16	
conjunction	1708 Apr 13 02:34	23°♈11’01	-1°-40’-33
minimum elong	1708 Apr 13 02:34	23°♈11’01	1°40’34
max. Earth dist.	1708 Apr 14 01:55	23°♈13’13	30.82839 AU
retrograde	1708 Jul 29 13:31	25°♈45’56	
opposition	1708 Oct 17 15:49	24°♈20’28	-1°-48’-5
min. Earth dist.	1708 Oct 16 18:18	24°♈21’59	28.82773 AU
direct	1709 Jan 03 04:58	22°♈57’03	
conjunction	1709 Apr 15 15:23	25°♈25’50	-1°-41’-33
minimum elong	1709 Apr 15 15:23	25°♈25’50	1°41’34
max. Earth dist.	1709 Apr 16 13:44	25°♈27’56	30.82510 AU
retrograde	1709 Aug 01 03:32	28°♈00’45	
min. Earth dist.	1709 Oct 19 06:38	26°♈36’46	28.82520 AU
opposition	1709 Oct 20 03:51	26°♈35’16	-1°-49’-4
direct	1710 Jan 05 15:39	25°♈11’49	
conjunction	1710 Apr 18 04:35	27°♈40’40	-1°-42’-24
minimum elong	1710 Apr 18 04:35	27°♈40’40	1°42’24
max. Earth dist.	1710 Apr 19 04:03	27°♈42’53	30.82318 AU
	1710 Jul 03 16:22	0°♉	
retrograde	1710 Aug 03 15:32	0°♉15’35	
	1710 Sep 03 23:09	30°♈	
opposition	1710 Oct 22 15:38	28°♈50’07	-1°-49’-53
min. Earth dist.	1710 Oct 21 18:31	28°♈51’36	28.82393 AU
direct	1711 Jan 08 03:09	27°♈26’39	
conjunction	1711 Apr 20 17:42	29°♈55’33	-1°-43’-5
minimum elong	1711 Apr 20 17:42	29°♈55’33	1°43’06
max. Earth dist.	1711 Apr 21 16:13	29°♈57’41	30.82264 AU
	1711 Apr 22 16:50	0°♉	
retrograde	1711 Aug 06 04:42	2°♉30’28	
min. Earth dist.	1711 Oct 24 06:10	1°♉06’32	28.82398 AU
opposition	1711 Oct 25 03:31	1°♉05’02	-1°-50’-32
	1711 Dec 08 06:23	30°♈	
direct	1712 Jan 10 13:47	29°♈41’33	
	1712 Feb 12 07:16	0°♉	
conjunction	1712 Apr 22 06:51	2°♉10’32	-1°-43’-36

minimum elong	1712 Apr 22 06:51	2°♉10’32	1°43’37
max. Earth dist.	1712 Apr 23 05:57	2°♉12’43	30.82307 AU
retrograde	1712 Aug 07 16:06	4°♉45’28	
opposition	1712 Oct 26 15:27	3°♉20’03	-1°-51’00
min. Earth dist.	1712 Oct 25 18:59	3°♉21’30	28.82476 AU
direct	1713 Jan 12 00:42	1°♉56’35	
conjunction	1713 Apr 24 20:17	4°♉25’39	-1°-43’-58
minimum elong	1713 Apr 24 20:17	4°♉25’39	1°44’00
max. Earth dist.	1713 Apr 25 18:43	4°♉27’46	30.82418 AU
retrograde	1713 Aug 10 06:37	7°♉00’34	
min. Earth dist.	1713 Oct 28 06:15	5°♉36’40	28.82591 AU
opposition	1713 Oct 29 03:09	5°♉35’12	-1°-51’-19
direct	1714 Jan 14 11:31	4°♉11’42	
conjunction	1714 Apr 27 09:53	6°♉40’52	-1°-44’-11
minimum elong	1714 Apr 27 09:53	6°♉40’52	1°44’11
max. Earth dist.	1714 Apr 28 07:44	6°♉42’55	30.82511 AU
retrograde	1714 Aug 12 19:06	9°♉15’46	
opposition	1714 Oct 31 15:03	7°♉50’26	-1°-51’-27
min. Earth dist.	1714 Oct 30 19:45	7°♉51’47	28.82662 AU
direct	1715 Jan 16 22:52	6°♉26’55	
conjunction	1715 Apr 29 23:36	8°♉56’08	-1°-44’-13
minimum elong	1715 Apr 29 23:36	8°♉56’08	1°44’15
max. Earth dist.	1715 Apr 30 21:13	8°♉58’10	30.82547 AU
retrograde	1715 Aug 15 09:22	11°♉31’00	
min. Earth dist.	1715 Nov 02 07:06	10°♉07’03	28.82649 AU
opposition	1715 Nov 03 02:44	10°♉05’40	-1°-51’-25
direct	1716 Jan 19 12:29	8°♉42’06	
conjunction	1716 May 01 13:15	11°♉11’24	-1°-44’-7
minimum elong	1716 May 01 13:15	11°♉11’24	1°44’07
max. Earth dist.	1716 May 02 09:26	11°♉13’18	30.82492 AU
retrograde	1716 Aug 16 22:41	13°♉46’12	
opposition	1716 Nov 04 14:31	12°♉20’52	-1°-51’-12
min. Earth dist.	1716 Nov 03 20:24	12°♉22’09	28.82562 AU
direct	1717 Jan 20 23:57	10°♉57’14	
conjunction	1717 May 04 03:02	13°♉26’35	-1°-43’-51
minimum elong	1717 May 04 03:02	13°♉26’35	1°43’52
max. Earth dist.	1717 May 04 23:31	13°♉28’30	30.82379 AU
retrograde	1717 Aug 19 11:53	16°♉01’17	
min. Earth dist.	1717 Nov 06 07:53	14°♉37’14	28.82417 AU
opposition	1717 Nov 07 02:05	14°♉35’57	-1°-50’-50
direct	1718 Jan 23 13:21	13°♉12’15	
conjunction	1718 May 06 16:45	15°♉41’38	-1°-43’-25
minimum elong	1718 May 06 16:45	15°♉41’38	1°43’26
max. Earth dist.	1718 May 07 11:31	15°♉43’23	30.82232 AU
retrograde	1718 Aug 22 02:08	18°♉16’15	
opposition	1718 Nov 09 13:29	16°♉50’53	-1°-50’-18
min. Earth dist.	1718 Nov 08 20:10	16°♉52’07	28.82281 AU
direct	1719 Jan 26 00:57	15°♉27’07	
conjunction	1719 May 09 06:34	17°♉56’33	-1°-42’-51
minimum elong	1719 May 09 06:34	17°♉56’33	1°42’52
max. Earth dist.	1719 May 10 02:02	17°♉58’22	30.82114 AU
retrograde	1719 Aug 24 13:43	20°♉31’04	
min. Earth dist.	1719 Nov 11 07:57	19°♉06’54	28.82191 AU
opposition	1719 Nov 12 00:53	19°♉05’42	-1°-49’-36
direct	1720 Jan 28 13:25	17°♉41’53	
conjunction	1720 May 10 20:05	20°♉11’20	-1°-42’-7
minimum elong	1720 May 10 20:05	20°♉11’20	1°42’07
max. Earth dist.	1720 May 11 14:17	20°♉13’03	30.82079 AU
retrograde	1720 Aug 26 02:42	22°♉45’47	
opposition	1720 Nov 13 12:12	21°♉20’25	-1°-48’-44
min. Earth dist.	1720 Nov 12 19:17	21°♉21’37	28.82214 AU
direct	1721 Jan 30 00:33	19°♉56’32	
conjunction	1721 May 13 09:55	22°♉26’04	-1°-41’-13
minimum elong	1721 May 13 09:55	22°♉26’04	1°41’15
max. Earth dist.	1721 May 14 04:33	22°♉27’48	30.82158 AU
retrograde	1721 Aug 28 13:39	25°♉00’25	
opposition	1721 Nov 15 23:24	23°♉35’05	-1°-47’-42
min. Earth dist.	1721 Nov 15 07:26	23°♉36’13	28.82362 AU
direct	1722 Feb 01 11:26	22°♉11’09	
conjunction	1722 May 15 23:45	24°♉40’45	-1°-40’-11
minimum elong	1722 May 15 23:45	24°♉40’45	1°40’12
max. Earth dist.	1722 May 16 17:30	24°♉42’25	30.82391 AU
retrograde	1722 Aug 31 03:28	27°♉15’02	
opposition	1722 Nov 18 10:32	25°♉49’45	-1°-46’-30
min. Earth dist.	1722 Nov 17 17:59	25°♉50’55	28.82665 AU
direct	1723 Feb 03 22:02	24°♉25’47	
conjunction	1723 May 18 13:30	26°♉55’28	-1°-38’-59
minimum elong	1723 May 18 13:30	26°♉55’28	1°39’00
max. Earth dist.	1723 May 19 07:00	26°♉57’07	30.82762 AU
retrograde	1723 Sep 02 14:32	29°♉29’41	
opposition	1723 Nov 20 21:45	28°♉04’28	-1°-45’-8
min. Earth dist.	1723 Nov 20 06:30	28°♉05’33	28.83111 AU
direct	1724 Feb 06 09:00	26°♉40’30	
conjunction	1724 May 20 03:25	29°♉10’17	-1°-37’-38
minimum elong	1724 May 20 03:25	29°♉10’17	1°37’39
max. Earth dist.	1724 May 20 20:50	29°♉11’55	30.83288 AU
	1724 Jun 11 15:16	0°♊	
retrograde	1724 Sep 04 04:05	1°♊44’25	
opposition	1724 Nov 22 08:46	0°♊19’18	-1°-43’-36
min. Earth dist.	1724 Nov 21 17:03	0°♊20’24	28.83683 AU
	1724 Dec 03 19:47	30°♉	
direct	1725 Feb 07 21:42	28°♉55’19	
	1725 Apr 12 11:47	0°♊	
conjunction	1725 May 22 17:21	1°♊25’13	-1°-36’-8
minimum elong	1725 May 22 17:21	1°♊25’13	1°36’09
max. Earth dist.	1725 May 23 09:35	1°♊26’44	30.83904 AU
retrograde	1725 Sep 06 17:05	3°♊59’18	
opposition	1725 Nov 24 19:57	2°♊34’16	-1°-41’-55
min. Earth dist.	1725 Nov 24 05:47	2°♊35’16	28.84327 AU
direct	1726 Feb 10 08:22	1°♊10’17	
conjunction	1726 May 25 07:35	3°♊40’18	-1°-34’-29
minimum elong	1726 May 25 07:36	3°♊40’18	1°34’29
max. Earth dist.	1726 May 25 23:52	3°♊41’49	30.84558 AU
retrograde	1726 Sep 09 06:41	6°♊14’18	
opposition	1726 Nov 27 06:52	4°♊49’21	-1°-40’-4
min. Earth dist.	1726 Nov 26 16:54	4°♊50’20	28.84960 AU
direct	1727 Feb 12 21:25	3°♊25’23	
conjunction	1727 May 27 21:44	5°♊55’29	-1°-32’-41
minimum elong	1727 May 27 21:44	5°♊55’29	1°32’42
max. Earth dist.	1727 May 28 11:57	5°♊56’49	30.85172 AU
retrograde	1727 Sep 11 21:37	8°♊29’24	
opposition	1727 Nov 29 18:03	7°♊04’31	-1°-38’-4
min. Earth dist.	1727 Nov 29 05:14	7°♊05’25	28.85545 AU
direct	1728 Feb 15 09:35	5°♊40’31	
conjunction	1728 May 29 11:58	8°♊10’42	-1°-30’-45
minimum elong	1728 May 29 11:58	8°♊10’42	1°30’46
max. Earth dist.	1728 May 30 02:18	8°♊12’03	30.85712 AU
retrograde	1728 Sep 13 09:15	10°♊44’30	

opposition	1728 Dec 01 05:09	9°♊19’40	-1°-35’-56
min. Earth dist.	1728 Nov 30 17:17	9°♊20’30	28.86027 AU
direct	1729 Feb 16 22:41	7°♊55’38	
conjunction	1729 Jun 01 02:13	10°♊25’52	-1°-28’-41
minimum elong	1729 Jun 01 02:14	10°♊25’52	1°28’42
max. Earth dist.	1729 Jun 01 14:28	10°♊27’00	30.86166 AU
retrograde	1729 Sep 15 22:58	12°♊59’30	
opposition	1729 Dec 03 16:03	11°♊34’42	-1°-33’-39
min. Earth dist.	1729 Dec 03 04:49	11°♊35’30	28.86440 AU
direct	1730 Feb 19 10:27	10°♊10’36	
conjunction	1730 Jun 03 16:36	12°♊40’54	-1°-26’-28
minimum elong	1730 Jun 03 16:36	12°♊40’54	1°26’30
max. Earth dist.	1730 Jun 04 04:42	12°♊42’01	30.86546 AU
retrograde	1730 Sep 18 10:25	15°♊14’22	
opposition	1730 Dec 06 03:01	13°♊49’36	-1°-31’-13
min. Earth dist.	1730 Dec 05 17:16	13°♊50’17	28.86797 AU
direct	1731 Feb 21 22:14	12°♊25’25	
conjunction	1731 Jun 06 06:39	14°♊55’44	-1°-24’-9
minimum elong	1731 Jun 06 06:39	14°♊55’44	1°24’10
max. Earth dist.	1731 Jun 06 17:18	14°♊56’44	30.86910 AU
retrograde	1731 Sep 20 23:13	17°♊29’03	
opposition	1731 Dec 08 13:45	16°♊04’17	-1°-28’-40
min. Earth dist.	1731 Dec 08 03:49	16°♊05’00	28.87162 AU
direct	1732 Feb 24 09:47	14°♊40’02	
conjunction	1732 Jun 07 20:48	17°♊10’22	-1°-21’-41
minimum elong	1732 Jun 07 20:48	17°♊10’22	1°21’43
max. Earth dist.	1732 Jun 08 06:54	17°♊11’19	30.87291 AU
retrograde	1732 Sep 22 08:57	19°♊43’31	
opposition	1732 Dec 10 00:30	18°♊18’47	-1°-25’-58
min. Earth dist.	1732 Dec 09 16:13	18°♊19’22	28.87576 AU
direct	1733 Feb 25 20:57	16°♊54’27	
conjunction	1733 Jun 10 10:56	19°♊24’49	-1°-19’-7
minimum elong	1733 Jun 10 10:56	19°♊24’49	1°19’08
max. Earth dist.	1733 Jun 10 20:30	19°♊25’43	30.87756 AU
retrograde	1733 Sep 24 21:14	21°♊57’48	
opposition	1733 Dec 12 11:04	20°♊33’06	-1°-23’-9
min. Earth dist.	1733 Dec 12 02:27	20°♊33’42	28.88077 AU
direct	1734 Feb 28 09:19	19°♊08’41	
conjunction	1734 Jun 13 00:59	21°♊39’07	-1°-16’-25
minimum elong	1734 Jun 13 00:59	21°♊39’07	1°16’26
max. Earth dist.	1734 Jun 13 09:24	21°♊39’54	30.88309 AU
retrograde	1734 Sep 27 08:37	24°♊11’55	
opposition	1734 Dec 14 21:42	22°♊47’16	-1°-20’-13
min. Earth dist.	1734 Dec 14 14:30	22°♊47’47	28.88698 AU
direct	1735 Mar 02 19:36	21°♊22’48	
conjunction	1735 Jun 15 15:06	23°♊53’17	-1°-13’-37
minimum elong	1735 Jun 15 15:06	23°♊53’17	1°13’38
max. Earth dist.	1735 Jun 15 23:42	23°♊54’05	30.89004 AU
retrograde	1735 Sep 29 20:47	26°♊25’57	
opposition	1735 Dec 17 08:15	25°♊01’22	-1°-17’-9
min. Earth dist.	1735 Dec 17 00:51	25°♊01’53	28.89450 AU
direct	1736 Mar 04 08:50	23°♊36’53	
conjunction	1736 Jun 17 04:57	26°♊07’26	-1°-10’-41
minimum elong	1736 Jun 17 04:58	26°♊07’26	1°10’42
max. Earth dist.	1736 Jun 17 11:54	26°♊08’04	30.89831 AU
retrograde	1736 Oct 01 10:15	28°♊39’58	
opposition	1736 Dec 18 18:52	27°♊15’27	-1°-13’-58
min. Earth dist.	1736 Dec 18 12:21	27°♊15’55	28.90336 AU
direct	1737 Mar 06 20:33	25°♊50’58	

conjunction	1737 Jun 19 19:14	28°♊21’36	-1°-7’-39
minimum elong	1737 Jun 19 19:14	28°♊21’36	1°07’40
max. Earth dist.	1737 Jun 20 02:31	28°♊22’17	30.90767 AU
	1737 Aug 06 12:01	0°♋	
retrograde	1737 Oct 03 21:51	0°♋54’00	
	1737 Dec 02 22:29	30°♊	
opposition	1737 Dec 21 05:18	29°♊29’37	-1°-10’-40
min. Earth dist.	1737 Dec 20 23:39	29°♊30’01	28.91293 AU
direct	1738 Mar 09 09:10	28°♊05’08	
	1738 Jun 06 04:37	0°♋	
conjunction	1738 Jun 22 09:22	0°♋35’52	-1°-4’-31
minimum elong	1738 Jun 22 09:22	0°♋35’52	1°04’32
max. Earth dist.	1738 Jun 22 14:40	0°♋36’22	30.91754 AU
retrograde	1738 Oct 06 11:57	3°♋08’09	
opposition	1738 Dec 23 15:51	1°♋43’52	-1°-7’-15
min. Earth dist.	1738 Dec 23 10:45	1°♋44’14	28.92280 AU
direct	1739 Mar 11 20:48	0°♋19’23	
conjunction	1739 Jun 24 23:33	2°♋50’14	-1°-1’-17
minimum elong	1739 Jun 24 23:33	2°♋50’14	1°01’18
max. Earth dist.	1739 Jun 25 04:47	2°♋50’43	30.92716 AU
retrograde	1739 Oct 08 23:46	5°♋22’23	
opposition	1739 Dec 26 02:30	3°♋58’13	-1°-3’-45
min. Earth dist.	1739 Dec 25 23:03	3°♋58’28	28.93207 AU
direct	1740 Mar 13 08:41	2°♋33’44	
conjunction	1740 Jun 26 13:46	5°♋04’39	0°-57’-58
minimum elong	1740 Jun 26 13:46	5°♋04’39	0°57’59
max. Earth dist.	1740 Jun 26 17:02	5°♋04’57	30.93610 AU
retrograde	1740 Oct 10 12:45	7°♋36’40	
opposition	1740 Dec 27 12:55	6°♋12’35	-1°00’-9
min. Earth dist.	1740 Dec 27 09:39	6°♋12’49	28.94046 AU
direct	1741 Mar 15 20:26	4°♋48’04	
conjunction	1741 Jun 29 04:05	7°♋19’04	0°-54’-33
minimum elong	1741 Jun 29 04:05	7°♋19’04	0°54’34
max. Earth dist.	1741 Jun 29 06:23	7°♋19’16	30.94388 AU
retrograde	1741 Oct 12 22:45	9°♋50’55	
opposition	1741 Dec 29 23:33	8°♋26’55	0°-56’-27
min. Earth dist.	1741 Dec 29 22:20	8°♋27’00	28.94768 AU
direct	1742 Mar 18 07:38	7°♋02’21	
conjunction	1742 Jul 01 18:16	9°♋33’23	0°-51’-4
minimum elong	1742 Jul 01 18:17	9°♋33’23	0°51’05
max. Earth dist.	1742 Jul 01 19:22	9°♋33’30	30.95070 AU
retrograde	1742 Oct 15 10:52	12°♋05’04	
opposition	1743 Jan 01 09:53	10°♋41’07	0°-52’-42
min. Earth dist.	1743 Jan 01 08:45	10°♋41’12	28.95397 AU
direct	1743 Mar 20 19:41	9°♋16’30	
conjunction	1743 Jul 04 08:20	11°♋47’35	0°-47’-31
minimum elong	1743 Jul 04 08:20	11°♋47’35	0°47’31
max. Earth dist.	1743 Jul 04 07:59	11°♋47’33	30.95671 AU
retrograde	1743 Oct 17 21:18	14°♋19’05	
opposition	1744 Jan 03 20:19	12°♋55’10	0°-48’-51
min. Earth dist.	1744 Jan 03 20:57	12°♋55’07	28.95986 AU
direct	1744 Mar 22 05:38	11°♋30’28	
conjunction	1744 Jul 05 22:19	14°♋01’35	0°-43’-53
minimum elong	1744 Jul 05 22:19	14°♋01’35	0°43’54
max. Earth dist.	1744 Jul 05 21:44	14°♋01’31	30.96257 AU
retrograde	1744 Oct 19 08:07	16°♋32’54	
opposition	1745 Jan 05 06:36	15°♋09’01	0°-44’-57
min. Earth dist.	1745 Jan 05 07:26	15°♋08’58	28.96559 AU
direct	1745 Mar 24 19:24	13°♋44’15	

conjunction	1745 Jul	08	12:12	16°♋15’23	0°-40’-12
minimum elong	1745 Jul	08	12:12	16°♋15’23	0°40’13
max. Earth dist.	1745 Jul	08	09:43	16°♋15’09	30.96848 AU
retrograde	1745 Oct	21	20:06	18°♋46’31	
opposition	1746 Jan	07	16:47	17°♋22’40	0°-40’-59
min. Earth dist.	1746 Jan	07	18:38	17°♋22’32	28.97183 AU
direct	1746 Mar	27	07:10	15°♋57’49	
conjunction	1746 Jul	11	02:08	18°♋29’00	0°-36’-28
minimum elong	1746 Jul	11	02:08	18°♋29’00	0°36’29
max. Earth dist.	1746 Jul	10	23:59	18°♋28’48	30.97508 AU
retrograde	1746 Oct	24	06:44	20°♋59’56	
opposition	1747 Jan	10	03:03	19°♋36’08	0°-36’-58
min. Earth dist.	1747 Jan	10	05:34	19°♋35’57	28.97884 AU
direct	1747 Mar	29	19:41	18°♋11’14	
conjunction	1747 Jul	13	15:36	20°♋42’25	0°-32’-41
minimum elong	1747 Jul	13	15:36	20°♋42’25	0°32’42
max. Earth dist.	1747 Jul	13	11:47	20°♋42’04	30.98273 AU
retrograde	1747 Oct	26	20:02	23°♋13’11	
opposition	1748 Jan	12	13:15	21°♋49’26	0°-32’-53
min. Earth dist.	1748 Jan	12	15:51	21°♋49’15	28.98717 AU
direct	1748 Mar	31	08:05	20°♋24’30	
conjunction	1748 Jul	15	05:21	22°♋55’44	0°-28’-51
minimum elong	1748 Jul	15	05:21	22°♋55’44	0°28’52
max. Earth dist.	1748 Jul	15	01:56	22°♋55’25	30.99169 AU
retrograde	1748 Oct	28	07:03	25°♋26’20	
opposition	1749 Jan	13	23:24	24°♋02’38	0°-28’-46
min. Earth dist.	1749 Jan	14	03:16	24°♋02’22	28.99676 AU
direct	1749 Apr	02	20:43	22°♋37’41	
conjunction	1749 Jul	17	18:58	25°♋08’58	0°-24’-58
minimum elong	1749 Jul	17	18:58	25°♋08’58	0°24’59
max. Earth dist.	1749 Jul	17	14:03	25°♋08’31	31.00200 AU
retrograde	1749 Oct	30	19:27	27°♋39’25	
opposition	1750 Jan	16	09:31	26°♋15’49	0°-24’-35
min. Earth dist.	1750 Jan	16	13:05	26°♋15’34	29.00753 AU
direct	1750 Apr	05	08:59	24°♋50’52	
conjunction	1750 Jul	20	08:33	27°♋22’13	0°-21’-3
minimum elong	1750 Jul	20	08:33	27°♋22’13	0°21’04
max. Earth dist.	1750 Jul	20	03:21	27°♋21’44	31.01308 AU
retrograde	1750 Nov	02	05:45	29°♋52’30	
opposition	1751 Jan	18	19:45	28°♋29’01	0°-20’-23
min. Earth dist.	1751 Jan	19	01:02	28°♋28’39	29.01886 AU
direct	1751 Apr	07	19:44	27°♋04’05	
conjunction	1751 Jul	22	22:08	29°♋35’28	0°-17’-6
minimum elong	1751 Jul	22	22:08	29°♋35’28	0°17’07
max. Earth dist.	1751 Jul	22	15:55	29°♋34’55	31.02455 AU
	1751 Aug	02	23:31	0°♌	
retrograde	1751 Nov	04	18:07	2°♌05’37	
opposition	1752 Jan	21	05:51	0°♌42’15	0°-16’-9
min. Earth dist.	1752 Jan	21	11:07	0°♌41’52	29.03015 AU
	1752 Feb	16	08:23	30°♋	
direct	1752 Apr	09	07:32	29°♋17’18	
	1752 May	31	02:49	0°♌	
conjunction	1752 Jul	24	11:43	1°♌48’44	0°-13’-8
minimum elong	1752 Jul	24	11:43	1°♌48’44	0°13’09
behind sun begin	1752 Jul	24	07:57	1°♌48’24	
behind sun end	1752 Jul	24	15:29	1°♌49’05	
max. Earth dist.	1752 Jul	24	04:11	1°♌48’03	31.03550 AU
retrograde	1752 Nov	06	04:03	4°♌18’45	
opposition	1753 Jan	22	16:11	2°♌55’27	0°-11’-54
min. Earth dist.	1753 Jan	22	23:16	2°♌54’57	29.04077 AU
direct	1753 Apr	11	17:29	1°♌30’29	
conjunction	1753 Jul	27	01:25	4°♌01’58	0°-9’-10
minimum elong	1753 Jul	27	01:25	4°♌01’58	0°09’10
behind sun begin	1753 Jul	26	19:52	4°♌01’29	
behind sun end	1753 Jul	27	06:58	4°♌02’28	
max. Earth dist.	1753 Jul	26	17:22	4°♌01’15	31.04561 AU
retrograde	1753 Nov	08	14:09	6°♌31’49	
opposition	1754 Jan	25	02:21	5°♌08’36	0°-7’-37
min. Earth dist.	1754 Jan	25	09:53	5°♌08’04	29.05024 AU
direct	1754 Apr	14	06:41	3°♌43’36	
conjunction	1754 Jul	29	14:56	6°♌15’07	0°-5’-11
minimum elong	1754 Jul	29	14:56	6°♌15’07	0°05’12
behind sun begin	1754 Jul	29	08:33	6°♌14’33	
behind sun end	1754 Jul	29	21:19	6°♌15’40	
max. Earth dist.	1754 Jul	29	04:48	6°♌14’11	31.05458 AU
retrograde	1754 Nov	11	01:30	8°♌44’47	
opposition	1755 Jan	27	12:40	7°♌21’37	0°-3’-21
min. Earth dist.	1755 Jan	27	21:18	7°♌21’01	29.05882 AU
direct	1755 Apr	16	17:33	5°♌56’35	
conjunction	1755 Aug	01	04:19	8°♌28’06	0°-1’-9
minimum elong	1755 Aug	01	04:18	8°♌28’06	0°01’10
behind sun begin	1755 Jul	31	21:43	8°♌27’31	
behind sun end	1755 Aug	01	10:54	8°♌28’41	
max. Earth dist.	1755 Jul	31	18:14	8°♌27’11	31.06267 AU
retrograde	1755 Nov	13	11:33	10°♌57’37	
asc. node	1755 Nov	12	20:31	10°♌57’36	
opposition	1756 Jan	29	22:55	9°♌34’29	0°00’54
min. Earth dist.	1756 Jan	30	08:34	9°♌33’48	29.06646 AU
direct	1756 Apr	18	06:00	8°♌09’24	
conjunction	1756 Aug	02	17:34	10°♌40’55	0°02’56
minimum elong	1756 Aug	02	17:35	10°♌40’55	0°02’56
behind sun begin	1756 Aug	02	11:00	10°♌40’20	
behind sun end	1756 Aug	03	00:09	10°♌41’30	
max. Earth dist.	1756 Aug	02	05:26	10°♌39’48	31.07010 AU
retrograde	1756 Nov	14	23:58	13°♌10’15	
opposition	1757 Jan	31	08:55	11°♌47’09	0°05’10
min. Earth dist.	1757 Jan	31	18:59	11°♌46’27	29.07374 AU
direct	1757 Apr	20	18:33	10°♌22’01	
conjunction	1757 Aug	05	06:56	12°♌53’33	0°06’55
minimum elong	1757 Aug	05	06:55	12°♌53’33	0°06’55
behind sun begin	1757 Aug	05	00:49	12°♌53’01	
behind sun end	1757 Aug	05	13:01	12°♌54’06	
max. Earth dist.	1757 Aug	04	19:01	12°♌52’28	31.07722 AU
retrograde	1757 Nov	17	10:12	15°♌22’43	
opposition	1758 Feb	02	19:08	13°♌59’39	0°09’26
min. Earth dist.	1758 Feb	03	06:38	13°♌58’50	29.08089 AU
direct	1758 Apr	23	07:34	12°♌34’28	
conjunction	1758 Aug	07	19:49	15°♌06’00	0°10’52
minimum elong	1758 Aug	07	19:49	15°♌06’00	0°10’52
behind sun begin	1758 Aug	07	14:52	15°♌05’33	
behind sun end	1758 Aug	08	00:46	15°♌06’26	
max. Earth dist.	1758 Aug	07	06:29	15°♌04’46	31.08457 AU
retrograde	1758 Nov	19	21:58	17°♌34’59	
opposition	1759 Feb	05	05:10	16°♌11’58	0°13’40
min. Earth dist.	1759 Feb	05	16:13	16°♌11’11	29.08855 AU
direct	1759 Apr	25	20:18	14°♌46’45	
conjunction	1759 Aug	10	08:47	17°♌18’17	0°14’49
minimum elong	1759 Aug	10	08:46	17°♌18’17	0°14’49
behind sun begin	1759 Aug	10	06:25	17°♌18’04	
behind sun end	1759 Aug	10	11:08	17°♌18’29	

max. Earth dist.	1759 Aug 09	19:25	17°♌17'03	31.09256 AU
retrograde	1759 Nov 22	07:55	19°♌47'07	
opposition	1760 Feb 07	15:19	18°♌24'08	0°17'53
min. Earth dist.	1760 Feb 08	03:45	18°♌23'16	29.09716 AU
direct	1760 Apr 27	07:29	16°♌58'54	
conjunction	1760 Aug 11	21:35	19°♌30'27	0°18'44
minimum elong	1760 Aug 11	21:35	19°♌30'27	0°18'44
max. Earth dist.	1760 Aug 11	07:35	19°♌29'10	31.10179 AU
retrograde	1760 Nov 23	19:45	21°♌59'08	
opposition	1761 Feb 09	01:23	20°♌36'14	0°22'04
min. Earth dist.	1761 Feb 09	13:17	20°♌35'24	29.10694 AU
direct	1761 Apr 29	19:39	19°♌11'00	
conjunction	1761 Aug 14	10:23	21°♌42'35	0°22'38
minimum elong	1761 Aug 14	10:23	21°♌42'35	0°22'39
max. Earth dist.	1761 Aug 13	19:44	21°♌41'14	31.11213 AU
retrograde	1761 Nov 26	04:58	24°♌11'09	
opposition	1762 Feb 11	11:33	22°♌48'20	0°26'13
min. Earth dist.	1762 Feb 12	00:38	22°♌47'25	29.11796 AU
direct	1762 May 02	05:26	21°♌23'08	
conjunction	1762 Aug 16	23:10	23°♌54'44	0°26'30
minimum elong	1762 Aug 16	23:10	23°♌54'44	0°26'30
max. Earth dist.	1762 Aug 16	08:42	23°♌53'24	31.12368 AU
retrograde	1762 Nov 28	14:27	26°♌23'12	
opposition	1763 Feb 13	21:43	25°♌00'30	0°30'20
min. Earth dist.	1763 Feb 14	10:47	24°♌59'35	29.12978 AU
direct	1763 May 04	17:44	23°♌35'20	
conjunction	1763 Aug 19	11:39	26°♌06'59	0°30'20
minimum elong	1763 Aug 19	11:39	26°♌06'59	0°30'21
max. Earth dist.	1763 Aug 18	19:45	26°♌05'31	31.13567 AU
retrograde	1763 Dec 01	01:29	28°♌35'21	
opposition	1764 Feb 16	07:57	27°♌12'45	0°34'24
min. Earth dist.	1764 Feb 16	21:46	27°♌11'47	29.14188 AU
direct	1764 May 06	03:14	25°♌47'37	
max. Earth dist.	1764 Aug 20	08:48	28°♌17'51	31.14751 AU
conjunction	1764 Aug 21	00:27	28°♌19'18	0°34'07
minimum elong	1764 Aug 21	00:27	28°♌19'18	0°34'07
	1764 Oct 09	12:34	0°♍	
retrograde	1764 Dec 02	11:11	0°♍47'35	
	1765 Jan 27	06:01	30°♌	
opposition	1765 Feb 17	18:10	29°♌25'04	0°38'25
min. Earth dist.	1765 Feb 18	09:01	29°♌24'02	29.15336 AU
direct	1765 May 08	14:47	27°♌59'57	
	1765 Aug 09	05:13	0°♍	
conjunction	1765 Aug 23	13:03	0°♍31'40	0°37'51
minimum elong	1765 Aug 23	13:03	0°♍31'40	0°37'52
max. Earth dist.	1765 Aug 22	19:26	0°♍30'02	31.15853 AU
retrograde	1765 Dec 04	23:18	2°♍59'50	
opposition	1766 Feb 20	04:31	1°♍37'24	0°42'23
min. Earth dist.	1766 Feb 20	19:37	1°♍36'20	29.16392 AU
direct	1766 May 11	03:11	0°♍12'18	
max. Earth dist.	1766 Aug 25	08:16	2°♍42'24	31.16836 AU
conjunction	1766 Aug 26	01:37	2°♍44'00	0°41'32
minimum elong	1766 Aug 26	01:37	2°♍44'00	0°41'31
retrograde	1766 Dec 07	09:10	5°♍12'04	
opposition	1767 Feb 22	15:03	3°♍49'40	0°46'16
min. Earth dist.	1767 Feb 23	07:41	3°♍48'30	29.17317 AU
direct	1767 May 13	15:56	2°♍24'34	
conjunction	1767 Aug 28	14:02	4°♍56'16	0°45'09
minimum elong	1767 Aug 28	14:02	4°♍56'16	0°45'09
max. Earth dist.	1767 Aug 27	19:01	4°♍54'30	31.17702 AU
retrograde	1767 Dec 09	20:59	7°♍24'11	
opposition	1768 Feb 25	01:16	6°♍01'50	0°50'06
min. Earth dist.	1768 Feb 25	17:40	6°♍00'41	29.18126 AU
direct	1768 May 15	04:36	4°♍36'42	
max. Earth dist.	1768 Aug 29	07:12	7°♍06'35	31.18446 AU
conjunction	1768 Aug 30	02:30	7°♍08'22	0°48'41
minimum elong	1768 Aug 30	02:30	7°♍08'22	0°48'41
retrograde	1768 Dec 11	07:21	9°♍36'09	
opposition	1769 Feb 26	11:46	8°♍13'49	0°53'50
min. Earth dist.	1769 Feb 27	05:51	8°♍12'33	29.18827 AU
direct	1769 May 17	17:01	6°♍48'40	
conjunction	1769 Sep 01	14:45	9°♍20'17	0°52'09
minimum elong	1769 Sep 01	14:45	9°♍20'17	0°52'10
max. Earth dist.	1769 Aug 31	18:38	9°♍18'26	31.19107 AU
retrograde	1769 Dec 13	18:44	11°♍47'55	
opposition	1770 Feb 28	22:05	10°♍25'36	0°57'30
min. Earth dist.	1770 Mar 01	15:50	10°♍24'21	29.19453 AU
direct	1770 May 20	06:42	9°♍00'24	
max. Earth dist.	1770 Sep 03	06:06	11°♍30'04	31.19710 AU
conjunction	1770 Sep 04	02:52	11°♍31'59	0°55'33
minimum elong	1770 Sep 04	02:52	11°♍31'59	0°55'32
retrograde	1770 Dec 16	03:40	13°♍59'29	
opposition	1771 Mar 03	08:33	12°♍37'09	1°01'05
min. Earth dist.	1771 Mar 04	03:26	12°♍35'50	29.20069 AU
direct	1771 May 22	17:28	11°♍11'56	
conjunction	1771 Sep 06	14:45	13°♍43'27	0°58'51
minimum elong	1771 Sep 06	14:45	13°♍43'27	0°58'52
max. Earth dist.	1771 Sep 05	18:21	13°♍41'33	31.20331 AU
retrograde	1771 Dec 18	12:30	16°♍10'48	
opposition	1772 Mar 04	18:56	14°♍48'30	1°04'34
min. Earth dist.	1772 Mar 05	13:39	14°♍47'12	29.20704 AU
direct	1772 May 24	06:18	13°♍23'15	
max. Earth dist.	1772 Sep 07	05:03	15°♍52'44	31.20994 AU
conjunction	1772 Sep 08	02:34	15°♍54'43	1°02'04
minimum elong	1772 Sep 08	02:34	15°♍54'43	1°02'03
retrograde	1772 Dec 19	22:45	18°♍21'58	
opposition	1773 Mar 07	05:17	16°♍59'41	1°07'58
min. Earth dist.	1773 Mar 08	00:11	16°♍58'22	29.21424 AU
direct	1773 May 26	16:03	15°♍34'25	
conjunction	1773 Sep 10	14:26	18°♍05'52	1°05'12
minimum elong	1773 Sep 10	14:26	18°♍05'52	1°05'12
max. Earth dist.	1773 Sep 09	17:49	18°♍03'58	31.21755 AU
retrograde	1773 Dec 22	07:29	20°♍33'02	
opposition	1774 Mar 09	15:51	19°♍10'48	1°11'15
min. Earth dist.	1774 Mar 10	11:08	19°♍09'27	29.22231 AU
direct	1774 May 29	03:52	17°♍45'34	
max. Earth dist.	1774 Sep 12	04:07	20°♍14'58	31.22611 AU
conjunction	1774 Sep 13	01:54	20°♍17'00	1°08'14
minimum elong	1774 Sep 13	01:54	20°♍17'00	1°08'13
retrograde	1774 Dec 24	18:45	22°♍44'06	
opposition	1775 Mar 12	02:19	21°♍21'55	1°14'26
min. Earth dist.	1775 Mar 12	21:08	21°♍20'37	29.23131 AU
direct	1775 May 31	15:05	19°♍56'44	
conjunction	1775 Sep 15	13:36	22°♍28'10	1°11'10
minimum elong	1775 Sep 15	13:36	22°♍28'10	1°11'10
max. Earth dist.	1775 Sep 14	16:43	22°♍26'14	31.23526 AU
retrograde	1775 Dec 27	04:18	24°♍55'14	
opposition	1776 Mar 13	12:50	23°♍33'07	1°17'31

min. Earth dist.	1776 Mar	14	08:52	23°♑31’44	29.24055 AU
direct	1776 Jun	02	02:34	22°♑07’59	
max. Earth dist.	1776 Sep	16	03:08	24°♑37’24	31.24443 AU
conjunction	1776 Sep	17	01:09	24°♑39’27	1°13’59
minimum elong	1776 Sep	17	01:09	24°♑39’27	1°13’59
retrograde	1776 Dec	28	16:13	27°♑06’28	
opposition	1777 Mar	15	23:25	25°♑44’26	1°20’29
min. Earth dist.	1777 Mar	16	18:50	25°♑43’05	29.24947 AU
direct	1777 Jun	04	14:41	24°♑19’21	
conjunction	1777 Sep	19	12:44	26°♑50’49	1°16’43
minimum elong	1777 Sep	19	12:44	26°♑50’49	1°16’43
max. Earth dist.	1777 Sep	18	14:48	26°♑48’47	31.25281 AU
retrograde	1777 Dec	31	02:56	29°♑17’48	
opposition	1778 Mar	18	10:16	27°♑55’50	1°23’19
min. Earth dist.	1778 Mar	19	07:06	27°♑54’23	29.25747 AU
direct	1778 Jun	07	02:53	26°♑30’48	
max. Earth dist.	1778 Sep	21	01:41	29°♑00’10	31.26022 AU
conjunction	1778 Sep	22	00:13	29°♑02’15	1°19’19
minimum elong	1778 Sep	22	00:12	29°♑02’15	1°19’19
	1778 Oct	18	13:00	0°♎	
retrograde	1779 Jan	02	14:39	1°♎29’12	
opposition	1779 Mar	20	21:02	0°♎07’16	1°26’03
min. Earth dist.	1779 Mar	21	17:26	0°♎05’51	29.26423 AU
	1779 Mar	25	06:20	30°♑	
direct	1779 Jun	09	16:31	28°♑42’16	
	1779 Aug	20	23:19	0°♎	
conjunction	1779 Sep	24	11:35	1°♎13’42	1°21’49
minimum elong	1779 Sep	24	11:35	1°♎13’42	1°21’49
max. Earth dist.	1779 Sep	23	12:21	1°♎11’33	31.26621 AU
retrograde	1780 Jan	05	00:02	3°♎40’36	
opposition	1780 Mar	22	07:55	2°♎18’42	1°28’39
min. Earth dist.	1780 Mar	23	05:28	2°♎17’12	29.26963 AU
direct	1780 Jun	11	03:26	0°♎53’43	
conjunction	1780 Sep	25	22:59	3°♎25’07	1°24’11
minimum elong	1780 Sep	25	22:59	3°♎25’07	1°24’10
max. Earth dist.	1780 Sep	24	23:57	3°♎22’58	31.27086 AU
retrograde	1781 Jan	06	08:55	5°♎51’56	
opposition	1781 Mar	24	18:42	4°♎30’03	1°31’07
min. Earth dist.	1781 Mar	25	16:18	4°♎28’34	29.27356 AU
direct	1781 Jun	13	16:36	3°♎05’04	
max. Earth dist.	1781 Sep	27	09:56	5°♎34’10	31.27420 AU
conjunction	1781 Sep	28	10:11	5°♎36’25	1°26’26
minimum elong	1781 Sep	28	10:11	5°♎36’25	1°26’26
retrograde	1782 Jan	08	19:23	8°♎03’10	
opposition	1782 Mar	27	05:37	6°♎41’17	1°33’27
min. Earth dist.	1782 Mar	28	03:27	6°♎39’47	29.27652 AU
direct	1782 Jun	16	02:43	5°♎16’18	
conjunction	1782 Sep	30	21:11	7°♎47’34	1°28’33
minimum elong	1782 Sep	30	21:11	7°♎47’34	1°28’33
max. Earth dist.	1782 Sep	29	21:51	7°♎45’24	31.27670 AU
retrograde	1783 Jan	11	03:19	10°♎14’16	
opposition	1783 Mar	29	16:34	8°♎52’21	1°35’39
min. Earth dist.	1783 Mar	30	14:53	8°♎50’49	29.27871 AU
direct	1783 Jun	18	15:14	7°♎27’21	
max. Earth dist.	1783 Oct	02	07:35	9°♎56’16	31.27879 AU
conjunction	1783 Oct	03	08:00	9°♎58’32	1°30’33
minimum elong	1783 Oct	03	07:59	9°♎58’32	1°30’34
retrograde	1784 Jan	13	13:27	12°♎25’09	
opposition	1784 Mar	31	03:17	11°♎03’13	1°37’43
min. Earth dist.	1784 Apr	01	01:00	11°♎01’44	29.28090 AU
direct	1784 Jun	20	02:10	9°♎38’11	
conjunction	1784 Oct	04	18:53	12°♎09’19	1°32’25
minimum elong	1784 Oct	04	18:53	12°♎09’19	1°32’24
max. Earth dist.	1784 Oct	03	19:40	12°♎07’09	31.28104 AU
retrograde	1785 Jan	14	22:12	14°♎35’53	
opposition	1785 Apr	02	14:20	13°♎13’55	1°39’39
min. Earth dist.	1785 Apr	03	12:46	13°♎12’23	29.28349 AU
direct	1785 Jun	22	13:06	11°♎48’53	
max. Earth dist.	1785 Oct	06	05:47	14°♎17’44	31.28407 AU
conjunction	1785 Oct	07	05:25	14°♎19’56	1°34’09
minimum elong	1785 Oct	07	05:25	14°♎19’56	1°34’09
retrograde	1786 Jan	17	09:18	16°♎46’28	
opposition	1786 Apr	05	01:18	15°♎24’30	1°41’26
min. Earth dist.	1786 Apr	05	22:20	15°♎23’04	29.28703 AU
direct	1786 Jun	25	01:05	13°♎59’29	
conjunction	1786 Oct	09	16:04	16°♎30’29	1°35’45
minimum elong	1786 Oct	09	16:03	16°♎30’29	1°35’45
max. Earth dist.	1786 Oct	08	17:11	16°♎28’21	31.28806 AU
retrograde	1787 Jan	19	19:52	18°♎57’00	
opposition	1787 Apr	07	12:22	17°♎35’03	1°43’04
min. Earth dist.	1787 Apr	08	10:05	17°♎33’33	29.29161 AU
direct	1787 Jun	27	13:08	16°♎10’04	
max. Earth dist.	1787 Oct	11	03:52	18°♎38’55	31.29308 AU
conjunction	1787 Oct	12	02:30	18°♎41’01	1°37’12
minimum elong	1787 Oct	12	02:30	18°♎41’01	1°37’13
retrograde	1788 Jan	22	07:07	21°♎07’32	
opposition	1788 Apr	08	23:23	19°♎45’36	1°44’33
min. Earth dist.	1788 Apr	09	20:05	19°♎44’11	29.29676 AU
direct	1788 Jun	29	02:29	18°♎20’41	
conjunction	1788 Oct	13	12:59	20°♎51’37	1°38’32
minimum elong	1788 Oct	13	12:59	20°♎51’37	1°38’31
max. Earth dist.	1788 Oct	12	14:14	20°♎49’29	31.29830 AU
retrograde	1789 Jan	23	17:04	23°♎18’08	
opposition	1789 Apr	11	10:32	21°♎56’14	1°45’53
min. Earth dist.	1789 Apr	12	07:49	21°♎54’47	29.30208 AU
direct	1789 Jul	01	13:07	20°♎31’23	
conjunction	1789 Oct	15	23:30	23°♎02’16	1°39’42
minimum elong	1789 Oct	15	23:29	23°♎02’16	1°39’43
max. Earth dist.	1789 Oct	15	01:37	23°♎00’14	31.30344 AU
retrograde	1790 Jan	26	02:43	25°♎28’47	
opposition	1790 Apr	13	21:52	24°♎06’56	1°47’04
min. Earth dist.	1790 Apr	14	18:47	24°♎05’30	29.30686 AU
direct	1790 Jul	04	02:34	22°♎42’08	
max. Earth dist.	1790 Oct	17	11:00	25°♎10’51	31.30781 AU
conjunction	1790 Oct	18	09:44	25°♎12’59	1°40’44
minimum elong	1790 Oct	18	09:44	25°♎12’59	1°40’43
retrograde	1791 Jan	28	13:45	27°♎39’31	
opposition	1791 Apr	16	09:13	26°♎17’41	1°48’05
min. Earth dist.	1791 Apr	17	06:03	26°♎16’15	29.31083 AU
direct	1791 Jul	06	13:14	24°♎52’56	
conjunction	1791 Oct	20	20:14	27°♎23’43	1°41’38
minimum elong	1791 Oct	20	20:14	27°♎23’43	1°41’38
max. Earth dist.	1791 Oct	19	22:29	27°♎21’41	31.31111 AU
retrograde	1792 Jan	30	21:58	29°♎50’16	
opposition	1792 Apr	17	20:34	28°♎28’27	1°48’58
min. Earth dist.	1792 Apr	18	17:56	28°♎26’59	29.31344 AU
direct	1792 Jul	08	01:41	27°♎03’44	
max. Earth dist.	1792 Oct	21	07:42	29°♎32’20	31.31309 AU

conjunction	1792 Oct 22 06:34	29°♎34’28	1°42’22
minimum elong	1792 Oct 22 06:34	29°♎34’28	1°42’22
	1792 Nov 02 16:54	0°♏	
retrograde	1793 Feb 01 08:29	2°♏01’01	
opposition	1793 Apr 20 08:02	0°♏39’12	1°49’41
min. Earth dist.	1793 Apr 21 04:44	0°♏37’47	29.31478 AU
	1793 May 15 04:52	30°♎	
direct	1793 Jul 10 12:26	29°♎14’30	
	1793 Sep 02 17:08	0°♏	
conjunction	1793 Oct 24 16:52	1°♏45’10	1°42’58
minimum elong	1793 Oct 24 16:52	1°♏45’10	1°42’59
max. Earth dist.	1793 Oct 23 19:03	1°♏43’08	31.31369 AU
retrograde	1794 Feb 03 17:28	4°♏11’45	
opposition	1794 Apr 22 19:43	2°♏49’53	1°50’15
min. Earth dist.	1794 Apr 23 17:16	2°♏48’25	29.31478 AU
direct	1794 Jul 12 23:16	1°♏25’13	
max. Earth dist.	1794 Oct 26 04:41	3°♏53’42	31.31325 AU
conjunction	1794 Oct 27 02:59	3°♏55’47	1°43’25
minimum elong	1794 Oct 27 02:59	3°♏55’47	1°43’25
retrograde	1795 Feb 06 04:29	6°♏22’22	
opposition	1795 Apr 25 07:05	5°♏00’29	1°50’39
min. Earth dist.	1795 Apr 26 03:27	4°♏59’06	29.31388 AU
direct	1795 Jul 15 11:13	3°♏35’49	
conjunction	1795 Oct 29 13:03	6°♏06’18	1°43’44
minimum elong	1795 Oct 29 13:03	6°♏06’18	1°43’45
max. Earth dist.	1795 Oct 28 15:19	6°♏04’16	31.31197 AU
retrograde	1796 Feb 08 15:03	8°♏32’54	
opposition	1796 Apr 26 18:43	7°♏10’58	1°50’54
min. Earth dist.	1796 Apr 27 15:46	7°♏09’32	29.31246 AU
direct	1796 Jul 16 23:10	5°♏46’18	
conjunction	1796 Oct 30 22:56	8°♏16’42	1°43’54
minimum elong	1796 Oct 30 22:56	8°♏16’42	1°43’53
max. Earth dist.	1796 Oct 30 01:44	8°♏14’43	31.31057 AU
retrograde	1797 Feb 10 01:57	10°♏43’18	
opposition	1797 Apr 29 06:14	9°♏21’20	1°51’00
min. Earth dist.	1797 Apr 30 01:57	9°♏19’59	29.31113 AU
direct	1797 Jul 19 12:23	7°♏56’41	
max. Earth dist.	1797 Nov 01 11:45	10°♏25’03	31.30953 AU
conjunction	1797 Nov 02 08:42	10°♏27’01	1°43’54
minimum elong	1797 Nov 02 08:42	10°♏27’01	1°43’55
retrograde	1798 Feb 12 12:08	12°♏53’39	
opposition	1798 May 01 17:58	11°♏31’39	1°50’56
min. Earth dist.	1798 May 02 13:36	11°♏30’19	29.31065 AU
direct	1798 Jul 21 23:03	10°♏07’02	
conjunction	1798 Nov 04 18:23	12°♏37’18	1°43’46
minimum elong	1798 Nov 04 18:23	12°♏37’18	1°43’46
max. Earth dist.	1798 Nov 03 22:59	12°♏35’29	31.30954 AU
retrograde	1799 Feb 14 21:51	15°♏03’59	
opposition	1799 May 04 05:39	13°♏41’59	1°50’43
min. Earth dist.	1799 May 05 00:19	13°♏40’43	29.31102 AU
direct	1799 Jul 24 12:50	12°♏17’25	
max. Earth dist.	1799 Nov 06 08:18	14°♏45’48	31.31042 AU
conjunction	1799 Nov 07 04:02	14°♏47’39	1°43’29
minimum elong	1799 Nov 07 04:02	14°♏47’39	1°43’30
retrograde	1800 Feb 17 09:20	17°♏14’23	
opposition	1800 May 06 17:14	15°♏52’24	1°50’20
min. Earth dist.	1800 May 07 11:09	15°♏51’11	29.31231 AU
direct	1800 Jul 26 23:40	14°♏27’55	
conjunction	1800 Nov 09 13:49	16°♏58’06	1°43’03
minimum elong	1800 Nov 09 13:49	16°♏58’06	1°43’03
max. Earth dist.	1800 Nov 08 19:45	16°♏56’24	31.31196 AU
retrograde	1801 Feb 19 17:43	19°♏24’55	
opposition	1801 May 09 05:11	18°♏02’58	1°49’48
min. Earth dist.	1801 May 09 23:02	18°♏01’45	29.31388 AU
direct	1801 Jul 29 11:57	16°♏38’34	
conjunction	1801 Nov 11 23:18	19°♏08’42	1°42’28
minimum elong	1801 Nov 11 23:18	19°♏08’42	1°42’29
max. Earth dist.	1801 Nov 11 04:50	19°♏06’58	31.31362 AU
retrograde	1802 Feb 22 04:15	21°♏35’36	
opposition	1802 May 11 17:07	20°♏13’40	1°49’06
min. Earth dist.	1802 May 12 09:46	20°♏12’32	29.31540 AU
direct	1802 Jul 31 22:25	18°♏49’20	
conjunction	1802 Nov 14 09:04	21°♏19’26	1°41’44
minimum elong	1802 Nov 14 09:04	21°♏19’26	1°41’44
max. Earth dist.	1802 Nov 13 15:56	21°♏17’50	31.31480 AU
retrograde	1803 Feb 24 13:47	23°♏46’26	
opposition	1803 May 14 05:08	22°♏24’30	1°48’14
min. Earth dist.	1803 May 14 22:27	22°♏23’20	29.31620 AU
direct	1803 Aug 03 08:37	21°♏00’15	
conjunction	1803 Nov 16 18:43	23°♏30’17	1°40’52
minimum elong	1803 Nov 16 18:43	23°♏30’17	1°40’52
max. Earth dist.	1803 Nov 16 01:23	23°♏28’40	31.31515 AU
retrograde	1804 Feb 27 01:00	25°♏57’22	
opposition	1804 May 15 17:11	24°♏35’26	1°47’13
min. Earth dist.	1804 May 16 09:08	24°♏34’21	29.31586 AU
direct	1804 Aug 04 20:23	23°♏11’14	
max. Earth dist.	1804 Nov 17 11:33	25°♏39’38	31.31406 AU
conjunction	1804 Nov 18 04:25	25°♏41’13	1°39’50
minimum elong	1804 Nov 18 04:25	25°♏41’13	1°39’50
retrograde	1805 Feb 28 12:00	28°♏08’23	
opposition	1805 May 18 05:30	26°♏46’25	1°46’03
min. Earth dist.	1805 May 18 22:06	26°♏45’17	29.31410 AU
direct	1805 Aug 07 07:21	25°♏22’15	
conjunction	1805 Nov 20 14:07	27°♏52’09	1°38’40
minimum elong	1805 Nov 20 14:07	27°♏52’09	1°38’41
max. Earth dist.	1805 Nov 19 21:45	27°♏50’37	31.31163 AU
	1806 Jan 28 00:12	0°♐	
retrograde	1806 Mar 02 23:10	0°♐19’22	
	1806 Apr 06 22:21	30°♏	
opposition	1806 May 20 17:45	28°♏57’22	1°44’44
min. Earth dist.	1806 May 21 09:10	28°♏56’19	29.31080 AU
direct	1806 Aug 09 19:41	27°♏33’13	
	1806 Nov 21 15:23	0°♐	
conjunction	1806 Nov 22 23:38	0°♐03’02	1°37’22
minimum elong	1806 Nov 22 23:38	0°♐03’02	1°37’22
max. Earth dist.	1806 Nov 22 07:06	0°♐01’29	31.30762 AU
retrograde	1807 Mar 05 10:19	2°♐30’19	
opposition	1807 May 23 06:03	1°♐08’15	1°43’16
min. Earth dist.	1807 May 23 21:44	1°♐07’11	29.30616 AU
	1807 Jul 11 05:22	30°♏	
direct	1807 Aug 12 06:56	29°♏44’07	
	1807 Sep 12 18:01	0°♐	
conjunction	1807 Nov 25 09:16	2°♐13’49	1°35’56
minimum elong	1807 Nov 25 09:16	2°♐13’49	1°35’56
max. Earth dist.	1807 Nov 24 18:03	2°♐12’23	31.30242 AU
retrograde	1808 Mar 06 20:41	4°♐41’08	
opposition	1808 May 24 18:14	3°♐18’59	1°41’39
min. Earth dist.	1808 May 25 09:12	3°♐17’59	29.30035 AU
direct	1808 Aug 13 21:13	1°♐54’51	

conjunction	1808 Nov 26	18:39	4°♐24’27	1°34’21
minimum elong	1808 Nov 26	18:39	4°♐24’27	1°34’21
max. Earth dist.	1808 Nov 26	03:04	4°♐22’59	31.29643 AU
retrograde	1809 Mar 09	08:25	6°♐51’49	
opposition	1809 May 27	06:36	5°♐29’35	1°39’54
min. Earth dist.	1809 May 27	20:41	5°♐28’38	29.29430 AU
direct	1809 Aug 16	08:48	4°♐05’27	
conjunction	1809 Nov 29	03:59	6°♐34’56	1°32’39
minimum elong	1809 Nov 29	03:59	6°♐34’56	1°32’39
max. Earth dist.	1809 Nov 28	14:19	6°♐33’39	31.29040 AU
retrograde	1810 Mar 11	16:57	9°♐02’23	
opposition	1810 May 29	19:02	7°♐40’05	1°38’01
min. Earth dist.	1810 May 30	08:42	7°♐39’09	29.28842 AU
direct	1810 Aug 18	21:40	6°♐15’57	
conjunction	1810 Dec 01	13:14	8°♐45’21	1°30’48
minimum elong	1810 Dec 01	13:14	8°♐45’21	1°30’48
max. Earth dist.	1810 Nov 30	23:31	8°♐44’03	31.28497 AU
retrograde	1811 Mar 14	03:39	11°♐12’52	
opposition	1811 Jun 01	07:11	9°♐50’31	1°35’58
min. Earth dist.	1811 Jun 01	19:12	9°♐49’42	29.28340 AU
direct	1811 Aug 21	08:52	8°♐26’25	
conjunction	1811 Dec 03	22:38	10°♐55’45	1°28’50
minimum elong	1811 Dec 03	22:38	10°♐55’45	1°28’50
max. Earth dist.	1811 Dec 03	10:35	10°♐54’37	31.28034 AU
retrograde	1812 Mar 15	13:21	13°♐23’23	
opposition	1812 Jun 02	19:40	12°♐01’00	1°33’48
min. Earth dist.	1812 Jun 03	07:43	12°♐00’11	29.27913 AU
direct	1812 Aug 22	19:42	10°♐36’58	
conjunction	1812 Dec 05	07:46	13°♐06’14	1°26’44
minimum elong	1812 Dec 05	07:47	13°♐06’14	1°26’43
max. Earth dist.	1812 Dec 04	20:17	13°♐05’09	31.27654 AU
retrograde	1813 Mar 18	00:28	15°♐34’00	
opposition	1813 Jun 05	08:04	14°♐11’37	1°31’29
min. Earth dist.	1813 Jun 05	18:08	14°♐10’56	29.27549 AU
direct	1813 Aug 25	07:04	12°♐47’38	
conjunction	1813 Dec 07	17:04	15°♐16’53	1°24’30
minimum elong	1813 Dec 07	17:05	15°♐16’53	1°24’31
max. Earth dist.	1813 Dec 07	06:28	15°♐15’53	31.27307 AU
retrograde	1814 Mar 20	11:51	17°♐44’48	
opposition	1814 Jun 07	20:40	16°♐22’24	1°29’02
min. Earth dist.	1814 Jun 08	06:55	16°♐21’42	29.27212 AU
direct	1814 Aug 27	16:53	14°♐58’30	
conjunction	1814 Dec 10	02:19	17°♐27’42	1°22’09
minimum elong	1814 Dec 10	02:19	17°♐27’42	1°22’08
max. Earth dist.	1814 Dec 09	16:49	17°♐26’49	31.26968 AU
retrograde	1815 Mar 22	23:22	19°♐55’46	
opposition	1815 Jun 10	09:11	18°♐33’22	1°26’27
min. Earth dist.	1815 Jun 10	17:56	18°♐32’46	29.26836 AU
direct	1815 Aug 30	04:11	17°♐09’32	
conjunction	1815 Dec 12	11:36	19°♐38’43	1°19’40
minimum elong	1815 Dec 12	11:36	19°♐38’43	1°19’40
max. Earth dist.	1815 Dec 12	02:05	19°♐37’50	31.26560 AU
retrograde	1816 Mar 24	11:35	22°♐06’57	
opposition	1816 Jun 11	21:52	20°♐44’31	1°23’45
min. Earth dist.	1816 Jun 12	06:39	20°♐43’56	29.26389 AU
direct	1816 Aug 31	14:44	19°♐20’46	
conjunction	1816 Dec 13	21:06	21°♐49’55	1°17’05
minimum elong	1816 Dec 13	21:06	21°♐49’55	1°17’04
max. Earth dist.	1816 Dec 13	13:08	21°♐49’10	31.26065 AU

retrograde	1817 Mar 26	23:24	24°♐18’16	
opposition	1817 Jun 14	10:43	22°♐55’49	1°20’55
min. Earth dist.	1817 Jun 14	18:39	22°♐55’17	29.25822 AU
direct	1817 Sep 03	04:19	21°♐32’08	
conjunction	1817 Dec 16	06:22	24°♐01’14	1°14’22
minimum elong	1817 Dec 16	06:22	24°♐01’14	1°14’23
max. Earth dist.	1817 Dec 15	21:55	24°♐00’26	31.25439 AU
retrograde	1818 Mar 29	12:22	26°♐29’44	
opposition	1818 Jun 16	23:35	25°♐07’14	1°17’58
min. Earth dist.	1818 Jun 17	06:48	25°♐06’45	29.25128 AU
direct	1818 Sep 05	15:31	23°♐43’34	
conjunction	1818 Dec 18	15:57	26°♐12’37	1°11’34
minimum elong	1818 Dec 18	15:58	26°♐12’37	1°11’34
max. Earth dist.	1818 Dec 18	08:58	26°♐11’58	31.24668 AU
retrograde	1819 Mar 31	21:51	28°♐41’14	
opposition	1819 Jun 19	12:20	27°♐18’40	1°14’55
min. Earth dist.	1819 Jun 19	19:31	27°♐18’11	29.24277 AU
direct	1819 Sep 08	04:25	25°♐55’02	
conjunction	1819 Dec 21	01:21	28°♐24’00	1°08’39
minimum elong	1819 Dec 21	01:21	28°♐24’00	1°08’40
max. Earth dist.	1819 Dec 20	18:02	28°♐23’19	31.23766 AU
	1820 Feb 04	23:34	0°♑	
retrograde	1820 Apr 02	09:23	0°♑52’43	
	1820 Jun 02	03:35	30°♐	
opposition	1820 Jun 21	01:09	29°♐30’04	1°11’46
min. Earth dist.	1820 Jun 21	06:58	29°♐29’41	29.23312 AU
direct	1820 Sep 09	16:51	28°♐06’25	
	1820 Dec 06	18:04	0°♑	
conjunction	1820 Dec 22	10:40	0°♑35’19	1°05’39
minimum elong	1820 Dec 22	10:40	0°♑35’19	1°05’39
max. Earth dist.	1820 Dec 22	04:48	0°♑34’45	31.22757 AU
retrograde	1821 Apr 04	19:37	3°♑04’08	
opposition	1821 Jun 23	14:09	1°♑41’23	1°08’30
min. Earth dist.	1821 Jun 23	20:07	1°♑40’59	29.22278 AU
direct	1821 Sep 12	04:51	0°♑17’44	
conjunction	1821 Dec 24	19:56	2°♑46’30	1°02’33
minimum elong	1821 Dec 24	19:56	2°♑46’30	1°02’34
max. Earth dist.	1821 Dec 24	14:45	2°♑46’01	31.21731 AU
retrograde	1822 Apr 07	05:56	5°♑15’26	
opposition	1822 Jun 26	02:51	3°♑52’35	1°05’09
min. Earth dist.	1822 Jun 26	06:47	3°♑52’19	29.21260 AU
direct	1822 Sep 14	16:39	2°♑28’55	
conjunction	1822 Dec 27	05:08	4°♑57’36	0°59’22
minimum elong	1822 Dec 27	05:09	4°♑57’36	0°59’22
max. Earth dist.	1822 Dec 27	00:51	4°♑57’12	31.20736 AU
retrograde	1823 Apr 09	16:31	7°♑26’39	
opposition	1823 Jun 28	15:45	6°♑03’42	1°01’42
min. Earth dist.	1823 Jun 28	19:33	6°♑03’27	29.20310 AU
direct	1823 Sep 17	02:40	4°♑40’03	
conjunction	1823 Dec 29	14:24	7°♑08’39	0°56’06
minimum elong	1823 Dec 29	14:24	7°♑08’39	0°56’06
max. Earth dist.	1823 Dec 29	11:39	7°♑08’24	31.19839 AU
retrograde	1824 Apr 11	03:31	9°♑37’50	
opposition	1824 Jun 30	04:29	8°♑14’49	0°58’09
min. Earth dist.	1824 Jun 30	06:16	8°♑14’42	29.19453 AU
direct	1824 Sep 18	13:47	6°♑51’11	
conjunction	1824 Dec 30	23:37	9°♑19’44	0°52’45
minimum elong	1824 Dec 30	23:37	9°♑19’44	0°52’44
max. Earth dist.	1824 Dec 30	21:14	9°♑19’30	31.19042 AU

retrograde	1825 Apr	13	16:08	11°♑49’04	
opposition	1825 Jul	02	17:28	10°♑26’00	0°54’31
min. Earth dist.	1825 Jul	02	18:44	10°♑25’54	29.18711 AU
direct	1825 Sep	21	00:07	9°♑02’24	
conjunction	1826 Jan	02	08:55	11°♑30’54	0°49’18
minimum elong	1826 Jan	02	08:55	11°♑30’54	0°49’19
max. Earth dist.	1826 Jan	02	08:39	11°♑30’52	31.18344 AU
retrograde	1826 Apr	16	04:08	14°♑00’23	
opposition	1826 Jul	05	06:24	12°♑37’16	0°50’48
min. Earth dist.	1826 Jul	05	06:24	12°♑37’16	29.18032 AU
direct	1826 Sep	23	12:24	11°♑13’44	
conjunction	1827 Jan	04	18:14	13°♑42’12	0°45’48
minimum elong	1827 Jan	04	18:14	13°♑42’12	0°45’47
max. Earth dist.	1827 Jan	04	17:50	13°♑42’10	31.17696 AU
retrograde	1827 Apr	18	17:23	16°♑11’51	
opposition	1827 Jul	07	19:11	14°♑48’42	0°47’01
min. Earth dist.	1827 Jul	07	18:12	14°♑48’46	29.17397 AU
direct	1827 Sep	25	22:28	13°♑25’13	
conjunction	1828 Jan	07	03:46	15°♑53’40	0°42’12
minimum elong	1828 Jan	07	03:46	15°♑53’40	0°42’13
max. Earth dist.	1828 Jan	07	05:11	15°♑53’48	31.17056 AU
retrograde	1828 Apr	20	04:25	18°♑23’30	
opposition	1828 Jul	09	08:18	17°♑00’19	0°43’09
min. Earth dist.	1828 Jul	09	06:57	17°♑00’24	29.16740 AU
direct	1828 Sep	27	11:03	15°♑36’53	
conjunction	1829 Jan	08	13:09	18°♑05’19	0°38’34
minimum elong	1829 Jan	08	13:09	18°♑05’19	0°38’33
max. Earth dist.	1829 Jan	08	14:35	18°♑05’27	31.16388 AU
retrograde	1829 Apr	22	17:43	20°♑35’18	
opposition	1829 Jul	11	21:23	19°♑12’05	0°39’13
min. Earth dist.	1829 Jul	11	18:34	19°♑12’17	29.16038 AU
direct	1829 Sep	29	23:06	17°♑48’43	
conjunction	1830 Jan	10	22:51	20°♑17’08	0°34’51
minimum elong	1830 Jan	10	22:51	20°♑17’08	0°34’52
max. Earth dist.	1830 Jan	11	01:29	20°♑17’22	31.15633 AU
retrograde	1830 Apr	25	05:06	22°♑47’17	
opposition	1830 Jul	14	10:32	21°♑24’01	0°35’13
min. Earth dist.	1830 Jul	14	08:06	21°♑24’11	29.15234 AU
direct	1830 Oct	02	10:46	20°♑00’42	
conjunction	1831 Jan	13	08:35	22°♑29’04	0°31’06
minimum elong	1831 Jan	13	08:35	22°♑29’04	0°31’05
max. Earth dist.	1831 Jan	13	11:36	22°♑29’21	31.14779 AU
retrograde	1831 Apr	27	16:35	24°♑59’23	
opposition	1831 Jul	16	23:37	23°♑36’04	0°31’11
min. Earth dist.	1831 Jul	16	19:33	23°♑36’21	29.14306 AU
direct	1831 Oct	04	22:46	22°♑12’46	
conjunction	1832 Jan	15	18:16	24°♑41’06	0°27’17
minimum elong	1832 Jan	15	18:16	24°♑41’06	0°27’18
max. Earth dist.	1832 Jan	15	21:34	24°♑41’24	31.13782 AU
retrograde	1832 Apr	29	03:47	27°♑11’35	
opposition	1832 Jul	18	12:54	25°♑48’10	0°27’05
min. Earth dist.	1832 Jul	18	09:10	25°♑48’26	29.13254 AU
direct	1832 Oct	06	09:13	24°♑24’53	
conjunction	1833 Jan	17	04:05	26°♑53’09	0°23’27
minimum elong	1833 Jan	17	04:05	26°♑53’09	0°23’27
max. Earth dist.	1833 Jan	17	08:39	26°♑53’35	31.12692 AU
retrograde	1833 May	01	15:18	29°♑23’46	
opposition	1833 Jul	21	02:03	28°♑00’17	0°22’58
min. Earth dist.	1833 Jul	20	20:41	28°♑00’38	29.12119 AU
direct	1833 Oct	08	20:49	26°♑36’58	
conjunction	1834 Jan	19	13:40	29°♑05’11	0°19’35
minimum elong	1834 Jan	19	13:40	29°♑05’11	0°19’35
max. Earth dist.	1834 Jan	19	18:18	29°♑05’37	31.11541 AU
	1834 Feb	13	04:26	0°♒	
retrograde	1834 May	04	04:00	1°♒35’57	
opposition	1834 Jul	23	15:16	0°♒12’21	0°18’48
min. Earth dist.	1834 Jul	23	09:42	0°♒12’44	29.10975 AU
	1834 Jul	31	05:54	30°♑	
direct	1834 Oct	11	07:17	28°♑49’02	
	1834 Dec	17	08:11	0°♒	
conjunction	1835 Jan	21	23:31	1°♒17’12	0°15’41
minimum elong	1835 Jan	21	23:31	1°♒17’12	0°15’40
behind sun begin	1835 Jan	21	21:45	1°♒17’02	
behind sun end	1835 Jan	22	01:16	1°♒17’22	
max. Earth dist.	1835 Jan	22	06:07	1°♒17’49	31.10408 AU
retrograde	1835 May	06	15:59	3°♒48’06	
opposition	1835 Jul	26	04:12	2°♒24’25	0°14’37
min. Earth dist.	1835 Jul	25	21:24	2°♒24’53	29.09866 AU
direct	1835 Oct	13	19:11	1°♒01’06	
conjunction	1836 Jan	24	09:12	3°♒29’14	0°11’45
minimum elong	1836 Jan	24	09:12	3°♒29’14	0°11’46
behind sun begin	1836 Jan	24	04:38	3°♒28’49	
behind sun end	1836 Jan	24	13:46	3°♒29’39	
max. Earth dist.	1836 Jan	24	15:47	3°♒29’50	31.09349 AU
retrograde	1836 May	08	05:27	6°♒00’17	
opposition	1836 Jul	27	17:21	4°♒36’31	0°10’24
min. Earth dist.	1836 Jul	27	09:21	4°♒37’04	29.08867 AU
direct	1836 Oct	15	04:52	3°♒13’13	
conjunction	1837 Jan	25	18:58	5°♒41’20	0°07’49
minimum elong	1837 Jan	25	18:58	5°♒41’20	0°07’49
behind sun begin	1837 Jan	25	13:11	5°♒40’48	
behind sun end	1837 Jan	26	00:45	5°♒41’51	
max. Earth dist.	1837 Jan	26	03:34	5°♒42’08	31.08397 AU
retrograde	1837 May	10	17:19	8°♒12’33	
opposition	1837 Jul	30	06:32	6°♒48’44	0°06’10
min. Earth dist.	1837 Jul	29	21:49	6°♒49’19	29.07969 AU
direct	1837 Oct	17	17:25	5°♒25’28	
conjunction	1838 Jan	28	04:49	7°♒53’34	0°03’52
minimum elong	1838 Jan	28	04:48	7°♒53’34	0°03’53
behind sun begin	1838 Jan	27	22:29	7°♒52’59	
behind sun end	1838 Jan	28	11:08	7°♒54’08	
max. Earth dist.	1838 Jan	28	13:43	7°♒54’23	31.07563 AU
retrograde	1838 May	13	07:51	10°♒24’57	
opposition	1838 Aug	01	19:29	9°♒01’05	0°01’55
min. Earth dist.	1838 Aug	01	09:06	9°♒01’47	29.07184 AU
direct	1838 Oct	20	05:24	7°♒37’52	
desc. node	1839 Jan	14	10:54	9°♒29’29	
conjunction	1839 Jan	30	14:47	10°♒05’58	0°00’-10
minimum elong	1839 Jan	30	14:47	10°♒05’58	0°00’11
behind sun begin	1839 Jan	30	08:27	10°♒05’24	
behind sun end	1839 Jan	30	21:08	10°♒06’32	
max. Earth dist.	1839 Jan	31	01:05	10°♒06’55	31.06807 AU
retrograde	1839 May	15	19:55	12°♒37’32	
opposition	1839 Aug	04	08:41	11°♒13’38	0°-2’-19
min. Earth dist.	1839 Aug	03	22:24	11°♒14’20	29.06459 AU
direct	1839 Oct	22	16:49	9°♒50’28	
conjunction	1840 Feb	02	00:45	12°♒18’34	0°-4’-13
minimum elong	1840 Feb	02	00:45	12°♒18’34	0°04’14
behind sun begin	1840 Feb	01	18:26	12°♒17’59	

behind sun end	1840 Feb 02 07:03	12°♒19’08	
max. Earth dist.	1840 Feb 02 11:53	12°♒19’36	31.06110 AU
retrograde	1840 May 17 08:01	14°♒50’19	
opposition	1840 Aug 05 21:49	13°♒26’23	0°-6’-35
min. Earth dist.	1840 Aug 05 09:42	13°♒27’12	29.05768 AU
direct	1840 Oct 24 04:57	12°♒03’16	
conjunction	1841 Feb 03 10:54	14°♒31’22	0°-8’-10
minimum elong	1841 Feb 03 10:54	14°♒31’22	0°08’12
behind sun begin	1841 Feb 03 05:12	14°♒30’51	
behind sun end	1841 Feb 03 16:36	14°♒31’54	
max. Earth dist.	1841 Feb 03 22:26	14°♒32’27	31.05412 AU
retrograde	1841 May 19 20:21	17°♒03’19	
opposition	1841 Aug 08 11:09	15°♒39’20	0°-10’-50
min. Earth dist.	1841 Aug 07 23:23	15°♒40’09	29.05067 AU
direct	1841 Oct 26 15:40	14°♒16’17	
conjunction	1842 Feb 05 21:16	16°♒44’23	0°-12’-8
minimum elong	1842 Feb 05 21:16	16°♒44’23	0°12’09
behind sun begin	1842 Feb 05 16:52	16°♒43’59	
behind sun end	1842 Feb 06 01:39	16°♒44’47	
max. Earth dist.	1842 Feb 06 10:03	16°♒45’35	31.04685 AU
retrograde	1842 May 22 08:36	19°♒16’29	
min. Earth dist.	1842 Aug 10 11:10	17°♒53’23	29.04294 AU
opposition	1842 Aug 11 00:20	17°♒52’29	0°-15’-4
direct	1842 Oct 29 03:41	16°♒29’27	
conjunction	1843 Feb 08 07:42	18°♒57’33	0°-16’-5
minimum elong	1843 Feb 08 07:41	18°♒57’32	0°16’06
behind sun begin	1843 Feb 08 06:55	18°♒57’28	
behind sun end	1843 Feb 08 08:28	18°♒57’37	
max. Earth dist.	1843 Feb 08 20:01	18°♒58’42	31.03856 AU
retrograde	1843 May 24 21:08	21°♒29’49	
opposition	1843 Aug 13 13:35	20°♒05’45	0°-19’-17
min. Earth dist.	1843 Aug 13 00:43	20°♒06’37	29.03415 AU
direct	1843 Oct 31 13:50	18°♒42’44	
conjunction	1844 Feb 10 18:23	21°♒10’48	0°-20’00
minimum elong	1844 Feb 10 18:23	21°♒10’48	0°20’01
max. Earth dist.	1844 Feb 11 08:10	21°♒12’06	31.02910 AU
retrograde	1844 May 26 08:52	23°♒43’13	
opposition	1844 Aug 15 02:53	22°♒19’04	0°-23’-29
min. Earth dist.	1844 Aug 14 13:15	22°♒20’00	29.02402 AU
direct	1844 Nov 02 01:31	20°♒56’02	
conjunction	1845 Feb 12 04:49	23°♒24’05	0°-23’-54
minimum elong	1845 Feb 12 04:49	23°♒24’05	0°23’55
max. Earth dist.	1845 Feb 12 18:00	23°♒25’19	31.01845 AU
retrograde	1845 May 28 22:49	25°♒56’37	
opposition	1845 Aug 17 16:10	24°♒32’22	0°-27’-38
min. Earth dist.	1845 Aug 17 02:04	24°♒33’20	29.01292 AU
direct	1845 Nov 04 11:35	23°♒09’18	
conjunction	1846 Feb 14 15:35	25°♒37’18	0°-27’-46
minimum elong	1846 Feb 14 15:34	25°♒37’18	0°27’47
max. Earth dist.	1846 Feb 15 06:11	25°♒38’41	31.00690 AU
retrograde	1846 May 31 10:54	28°♒09’56	
opposition	1846 Aug 20 05:12	26°♒45’35	0°-31’-45
min. Earth dist.	1846 Aug 19 14:57	26°♒46’34	29.00117 AU
direct	1846 Nov 07 00:13	25°♒22’29	
conjunction	1847 Feb 17 02:11	27°♒50’27	0°-31’-35
minimum elong	1847 Feb 17 02:10	27°♒50’27	0°31’37
max. Earth dist.	1847 Feb 17 16:45	27°♒51’50	30.99519 AU
	1847 Apr 26 02:21	0°♓	
retrograde	1847 Jun 03 01:33	0°♓23’11	
	1847 Jul 11 23:43	30°♒	
opposition	1847 Aug 22 18:15	28°♒58’44	0°-35’-49
min. Earth dist.	1847 Aug 22 02:38	28°♒59’48	28.98965 AU
direct	1847 Nov 09 12:02	27°♒35’35	
	1848 Feb 17 23:27	0°♓	
conjunction	1848 Feb 19 12:45	0°♓03’32	0°-35’-22
minimum elong	1848 Feb 19 12:45	0°♓03’32	0°35’23
max. Earth dist.	1848 Feb 20 04:34	0°♓05’02	30.98382 AU
retrograde	1848 Jun 04 13:31	2°♓36’24	
opposition	1848 Aug 24 07:26	1°♓11’50	0°-39’-50
min. Earth dist.	1848 Aug 23 15:56	1°♓12’54	28.97877 AU
	1848 Oct 15 19:05	30°♒	
direct	1848 Nov 10 23:34	29°♒48’41	
	1848 Dec 06 16:29	0°♓	
conjunction	1849 Feb 20 23:31	2°♓16’37	0°-39’-6
minimum elong	1849 Feb 20 23:31	2°♓16’37	0°39’07
max. Earth dist.	1849 Feb 21 16:12	2°♓18’12	30.97352 AU
retrograde	1849 Jun 07 02:56	4°♓49’36	
opposition	1849 Aug 26 20:21	3°♓24’58	0°-43’-47
min. Earth dist.	1849 Aug 26 03:02	3°♓26’10	28.96907 AU
direct	1849 Nov 13 12:05	2°♓01’49	
conjunction	1850 Feb 23 10:17	4°♓29’46	0°-42’-46
minimum elong	1850 Feb 23 10:16	4°♓29’46	0°42’47
max. Earth dist.	1850 Feb 24 03:20	4°♓31’23	30.96428 AU
retrograde	1850 Jun 09 16:01	7°♓02’54	
opposition	1850 Aug 29 09:26	5°♓38’12	0°-47’-41
min. Earth dist.	1850 Aug 28 16:21	5°♓39’23	28.96049 AU
direct	1850 Nov 15 23:09	4°♓15’05	
conjunction	1851 Feb 25 21:13	6°♓43’02	0°-46’-23
minimum elong	1851 Feb 25 21:13	6°♓43’02	0°46’24
max. Earth dist.	1851 Feb 26 15:44	6°♓44’48	30.95623 AU
retrograde	1851 Jun 12 04:25	9°♓16’19	
opposition	1851 Aug 31 22:16	7°♓51’36	0°-51’-30
min. Earth dist.	1851 Aug 31 03:33	7°♓52’53	28.95290 AU
direct	1851 Nov 18 11:18	6°♓28’30	
conjunction	1852 Feb 28 08:08	8°♓56’30	0°-49’-55
minimum elong	1852 Feb 28 08:08	8°♓56’29	0°49’56
max. Earth dist.	1852 Feb 29 02:28	8°♓58’14	30.94908 AU
retrograde	1852 Jun 13 17:06	11°♓29’57	
opposition	1852 Sep 02 11:23	10°♓05’12	0°-55’-16
min. Earth dist.	1852 Sep 01 16:46	10°♓06’29	28.94623 AU
direct	1852 Nov 19 21:05	8°♓42’09	
conjunction	1853 Mar 01 19:16	11°♓10’10	0°-53’-23
minimum elong	1853 Mar 01 19:16	11°♓10’10	0°53’25
max. Earth dist.	1853 Mar 02 15:20	11°♓12’05	30.94260 AU
retrograde	1853 Jun 16 05:02	13°♓43’47	
min. Earth dist.	1853 Sep 04 04:57	12°♓20’22	28.93985 AU
opposition	1853 Sep 05 00:22	12°♓19’02	0°-58’-56
direct	1853 Nov 22 08:13	10°♓56’01	
conjunction	1854 Mar 04 06:32	13°♓24’06	0°-56’-47
minimum elong	1854 Mar 04 06:32	13°♓24’06	0°56’48
max. Earth dist.	1854 Mar 05 01:57	13°♓25’56	30.93625 AU
retrograde	1854 Jun 18 19:31	15°♓57’52	
opposition	1854 Sep 07 13:15	14°♓33’06	-1°-2’-31
min. Earth dist.	1854 Sep 06 17:39	14°♓34’27	28.93348 AU
direct	1854 Nov 24 17:34	13°♓10’06	
conjunction	1855 Mar 06 18:05	15°♓38’14	-1°00’-6
minimum elong	1855 Mar 06 18:04	15°♓38’14	1°00’07
max. Earth dist.	1855 Mar 07 14:38	15°♓40’11	30.92947 AU
retrograde	1855 Jun 21 08:03	18°♓12’09	

min. Earth dist.	1855 Sep 09 06:47	16°♓48’42	28.92636 AU
opposition	1855 Sep 10 02:16	16°♓47’22	-1°-6’00
direct	1855 Nov 27 05:41	15°♓24’23	
conjunction	1856 Mar 08 05:32	17°♓52’33	-1°-3’-19
minimum elong	1856 Mar 08 05:31	17°♓52’33	1°03’19
max. Earth dist.	1856 Mar 09 01:34	17°♓54’27	30.92195 AU
retrograde	1856 Jun 22 23:15	20°♓26’36	
opposition	1856 Sep 11 15:19	19°♓01’45	-1°-9’-24
min. Earth dist.	1856 Sep 10 19:02	19°♓03’09	28.91837 AU
direct	1856 Nov 28 17:04	17°♓38’45	
conjunction	1857 Mar 10 17:16	20°♓06’57	-1°-6’-26
minimum elong	1857 Mar 10 17:16	20°♓06’57	1°06’27
max. Earth dist.	1857 Mar 11 13:49	20°♓08’54	30.91331 AU
retrograde	1857 Jun 25 11:43	22°♓41’06	
min. Earth dist.	1857 Sep 13 08:49	21°♓17’31	28.90932 AU
opposition	1857 Sep 14 04:17	21°♓16’11	-1°-12’-41
direct	1857 Dec 01 04:10	19°♓53’09	
conjunction	1858 Mar 13 05:03	22°♓21’21	-1°-9’-28
minimum elong	1858 Mar 13 05:03	22°♓21’21	1°09’29
max. Earth dist.	1858 Mar 14 01:47	22°♓23’19	30.90394 AU
retrograde	1858 Jun 28 02:26	24°♓55’33	
opposition	1858 Sep 16 17:04	23°♓30’34	-1°-15’-52
min. Earth dist.	1858 Sep 15 20:29	23°♓31’59	28.89966 AU
direct	1858 Dec 03 17:43	22°♓07’29	
conjunction	1859 Mar 15 16:42	24°♓35’41	-1°-12’-23
minimum elong	1859 Mar 15 16:41	24°♓35’41	1°12’25
max. Earth dist.	1859 Mar 16 13:19	24°♓37’38	30.89406 AU
retrograde	1859 Jun 30 16:14	27°♓09’57	
min. Earth dist.	1859 Sep 18 10:01	25°♓46’14	28.88997 AU
opposition	1859 Sep 19 05:52	25°♓44’51	-1°-18’-56
direct	1859 Dec 06 05:45	24°♓21’43	
conjunction	1860 Mar 17 04:31	26°♓49’55	-1°-15’-12
minimum elong	1860 Mar 17 04:31	26°♓49’55	1°15’13
max. Earth dist.	1860 Mar 18 02:17	26°♓51’59	30.88465 AU
retrograde	1860 Jul 02 04:39	29°♓24’14	
opposition	1860 Sep 20 18:29	27°♓59’04	-1°-21’-53
min. Earth dist.	1860 Sep 19 21:15	28°♓00’32	28.88097 AU
direct	1860 Dec 07 18:45	26°♓35’53	
conjunction	1861 Mar 19 16:14	29°♓04’04	-1°-17’-54
minimum elong	1861 Mar 19 16:13	29°♓04’04	1°17’55
max. Earth dist.	1861 Mar 20 13:35	29°♓06’05	30.87610 AU
	1861 Apr 13 20:12	0°♈	
retrograde	1861 Jul 04 17:20	1°♈38’27	
min. Earth dist.	1861 Sep 22 10:14	0°♈14’39	28.87315 AU
opposition	1861 Sep 23 07:10	0°♈13’12	-1°-24’-43
	1861 Oct 01 06:07	30°♓	
direct	1861 Dec 10 05:19	28°♓49’59	
	1862 Feb 14 00:06	0°♈	
conjunction	1862 Mar 22 04:15	1°♈18’11	-1°-20’-29
minimum elong	1862 Mar 22 04:14	1°♈18’11	1°20’29
max. Earth dist.	1862 Mar 23 03:10	1°♈20’22	30.86885 AU
retrograde	1862 Jul 07 05:13	3°♈52’37	
opposition	1862 Sep 25 19:30	2°♈27’19	-1°-27’-25
min. Earth dist.	1862 Sep 24 21:46	2°♈28’50	28.86660 AU
direct	1862 Dec 12 17:19	1°♈04’05	
conjunction	1863 Mar 24 16:09	3°♈32’19	-1°-22’-57
minimum elong	1863 Mar 24 16:09	3°♈32’19	1°22’57
max. Earth dist.	1863 Mar 25 14:29	3°♈34’26	30.86305 AU
retrograde	1863 Jul 09 18:54	6°♈06’50	

min. Earth dist.	1863 Sep 27 09:59	4°♈43’02	28.86162 AU
opposition	1863 Sep 28 08:03	4°♈41’30	-1°-29’-59
direct	1863 Dec 15 03:16	3°♈18’15	
conjunction	1864 Mar 26 04:09	5°♈46’31	-1°-25’-17
minimum elong	1864 Mar 26 04:09	5°♈46’31	1°25’18
max. Earth dist.	1864 Mar 27 03:53	5°♈48’45	30.85864 AU
retrograde	1864 Jul 11 06:13	8°♈21’06	
opposition	1864 Sep 29 20:36	6°♈55’45	-1°-32’-25
min. Earth dist.	1864 Sep 28 22:24	6°♈57’18	28.85784 AU
direct	1864 Dec 16 14:45	5°♈32’31	
conjunction	1865 Mar 28 16:21	8°♈00’50	-1°-27’-30
minimum elong	1865 Mar 28 16:21	8°♈00’50	1°27’30
max. Earth dist.	1865 Mar 29 15:41	8°♈03’03	30.85550 AU
retrograde	1865 Jul 13 20:49	10°♈35’30	
min. Earth dist.	1865 Oct 01 10:01	9°♈11’46	28.85520 AU
opposition	1865 Oct 02 08:57	9°♈10’10	-1°-34’-42
direct	1865 Dec 19 01:02	7°♈46’56	
conjunction	1866 Mar 31 04:46	10°♈15’20	-1°-29’-34
minimum elong	1866 Mar 31 04:46	10°♈15’20	1°29’35
max. Earth dist.	1866 Apr 01 04:42	10°♈17’35	30.85304 AU
retrograde	1866 Jul 16 09:29	12°♈50’05	
opposition	1866 Oct 04 21:28	11°♈24’45	-1°-36’-51
min. Earth dist.	1866 Oct 03 23:24	11°♈26’17	28.85296 AU
direct	1866 Dec 21 11:32	10°♈01’32	
conjunction	1867 Apr 02 17:14	12°♈30’00	-1°-31’-31
minimum elong	1867 Apr 02 17:14	12°♈30’00	1°31’32
max. Earth dist.	1867 Apr 03 17:11	12°♈32’16	30.85088 AU
retrograde	1867 Jul 19 00:40	15°♈04’50	
min. Earth dist.	1867 Oct 06 10:58	13°♈41’07	28.85070 AU
opposition	1867 Oct 07 09:51	13°♈39’31	-1°-38’-51
direct	1867 Dec 24 00:26	12°♈16’19	
conjunction	1868 Apr 04 05:54	14°♈44’52	-1°-33’-19
minimum elong	1868 Apr 04 05:54	14°♈44’52	1°33’20
max. Earth dist.	1868 Apr 05 05:19	14°♈47’05	30.84827 AU
retrograde	1868 Jul 20 14:47	17°♈19’46	
opposition	1868 Oct 08 22:24	15°♈54’27	-1°-40’-42
min. Earth dist.	1868 Oct 08 00:47	15°♈55’57	28.84785 AU
direct	1868 Dec 25 11:57	14°♈31’14	
conjunction	1869 Apr 06 18:48	16°♈59’51	-1°-34’-59
minimum elong	1869 Apr 06 18:48	16°♈59’51	1°35’00
max. Earth dist.	1869 Apr 07 18:33	17°♈02’06	30.84499 AU
retrograde	1869 Jul 23 04:33	19°♈34’47	
opposition	1869 Oct 11 10:46	18°♈09’28	-1°-42’-24
min. Earth dist.	1869 Oct 10 12:28	18°♈11’01	28.84402 AU
direct	1869 Dec 28 01:07	16°♈46’14	
conjunction	1870 Apr 09 07:39	19°♈14’53	-1°-36’-30
minimum elong	1870 Apr 09 07:39	19°♈14’53	1°36’31
max. Earth dist.	1870 Apr 10 06:08	19°♈17’01	30.84069 AU
retrograde	1870 Jul 25 18:22	21°♈49’50	
opposition	1870 Oct 13 23:04	20°♈24’29	-1°-43’-57
min. Earth dist.	1870 Oct 13 01:52	20°♈25’58	28.83943 AU
direct	1870 Dec 30 12:14	19°♈01’13	
conjunction	1871 Apr 11 20:39	21°♈29’55	-1°-37’-52
minimum elong	1871 Apr 11 20:39	21°♈29’55	1°37’53
max. Earth dist.	1871 Apr 12 20:03	21°♈32’07	30.83585 AU
retrograde	1871 Jul 28 07:18	24°♈04’51	
opposition	1871 Oct 16 11:16	22°♈39’28	-1°-45’-20
min. Earth dist.	1871 Oct 15 13:48	22°♈40’58	28.83445 AU
direct	1872 Jan 02 01:02	21°♈16’09	

conjunction	1872 Apr 13 09:22	23°♈44’52	-1°-39’-6
minimum elong	1872 Apr 13 09:22	23°♈44’52	1°39’07
max. Earth dist.	1872 Apr 14 07:39	23°♈46’59	30.83099 AU
retrograde	1872 Jul 29 20:26	26°♈19’49	
opposition	1872 Oct 17 23:28	24°♈54’23	-1°-46’-34
min. Earth dist.	1872 Oct 17 02:17	24°♈55’53	28.82988 AU
direct	1873 Jan 03 11:48	23°♈31’01	
conjunction	1873 Apr 15 22:27	25°♈59’47	-1°-40’-10
minimum elong	1873 Apr 15 22:27	25°♈59’47	1°40’11
max. Earth dist.	1873 Apr 16 21:42	26°♈01’58	30.82664 AU
retrograde	1873 Aug 01 07:14	28°♈34’43	
opposition	1873 Oct 20 11:25	27°♈09’16	-1°-47’-38
min. Earth dist.	1873 Oct 19 14:28	27°♈10’44	28.82598 AU
direct	1874 Jan 05 23:30	25°♈45’51	
conjunction	1874 Apr 18 11:28	28°♈14’39	-1°-41’-6
minimum elong	1874 Apr 18 11:27	28°♈14’39	1°41’07
max. Earth dist.	1874 Apr 19 09:53	28°♈16’46	30.82335 AU
	1874 Jun 08 14:57	0°♉	
retrograde	1874 Aug 03 21:20	0°♉49’34	
	1874 Sep 30 23:09	30°♈	
opposition	1874 Oct 22 23:21	29°♈24’06	-1°-48’-32
min. Earth dist.	1874 Oct 22 01:51	29°♈25’37	28.82335 AU
direct	1875 Jan 08 09:42	28°♈00’39	
	1875 Apr 07 21:36	0°♉	
conjunction	1875 Apr 21 00:26	0°♉29’30	-1°-41’-52
minimum elong	1875 Apr 21 00:26	0°♉29’30	1°41’52
max. Earth dist.	1875 Apr 21 23:26	0°♉31’40	30.82125 AU
retrograde	1875 Aug 06 08:49	3°♉04’26	
opposition	1875 Oct 25 11:21	1°♉38’58	-1°-49’-17
min. Earth dist.	1875 Oct 24 14:37	1°♉40’25	28.82199 AU
direct	1876 Jan 10 20:04	0°♉15’29	
conjunction	1876 Apr 22 13:35	2°♉44’24	-1°-42’-28
minimum elong	1876 Apr 22 13:35	2°♉44’24	1°42’30
max. Earth dist.	1876 Apr 23 12:32	2°♉46’33	30.82073 AU
retrograde	1876 Aug 07 23:00	5°♉19’19	
opposition	1876 Oct 26 23:06	3°♉53’52	-1°-49’-51
min. Earth dist.	1876 Oct 26 01:30	3°♉55’23	28.82216 AU
direct	1877 Jan 12 08:50	2°♉30’22	
conjunction	1877 Apr 25 02:46	4°♉59’22	-1°-42’-56
minimum elong	1877 Apr 25 02:46	4°♉59’22	1°42’57
max. Earth dist.	1877 Apr 26 01:24	5°♉01’29	30.82147 AU
retrograde	1877 Aug 10 12:02	7°♉34’17	
opposition	1877 Oct 29 11:02	6°♉08’52	-1°-50’-15
min. Earth dist.	1877 Oct 28 14:34	6°♉10’18	28.82351 AU
direct	1878 Jan 14 19:42	4°♉45’21	
conjunction	1878 Apr 27 16:13	7°♉14’27	-1°-43’-13
minimum elong	1878 Apr 27 16:13	7°♉14’27	1°43’15
max. Earth dist.	1878 Apr 28 15:12	7°♉16’36	30.82334 AU
retrograde	1878 Aug 13 02:10	9°♉49’21	
opposition	1878 Oct 31 22:39	8°♉23’59	-1°-50’-28
min. Earth dist.	1878 Oct 31 01:32	8°♉25’28	28.82566 AU
direct	1879 Jan 17 08:22	7°♉00’29	
conjunction	1879 Apr 30 05:36	9°♉29’39	-1°-43’-22
minimum elong	1879 Apr 30 05:36	9°♉29’39	1°43’22
max. Earth dist.	1879 May 01 03:23	9°♉31’42	30.82572 AU
retrograde	1879 Aug 15 16:55	12°♉04’33	
opposition	1879 Nov 03 10:30	10°♉39’14	-1°-50’-32
min. Earth dist.	1879 Nov 02 14:36	10°♉40’38	28.82819 AU
direct	1880 Jan 19 19:47	9°♉15’44	
conjunction	1880 May 01 19:16	11°♉45’00	-1°-43’-20
minimum elong	1880 May 01 19:16	11°♉45’00	1°43’21
max. Earth dist.	1880 May 02 17:37	11°♉47’06	30.82812 AU
retrograde	1880 Aug 17 06:38	14°♉19’52	
opposition	1880 Nov 04 22:16	12°♉54’35	-1°-50’-25
min. Earth dist.	1880 Nov 04 02:32	12°♉55’58	28.83023 AU
direct	1881 Jan 21 09:19	11°♉31’05	
conjunction	1881 May 04 09:02	14°♉00’25	-1°-43’-9
minimum elong	1881 May 04 09:02	14°♉00’25	1°43’09
max. Earth dist.	1881 May 05 05:32	14°♉02’20	30.82980 AU
retrograde	1881 Aug 19 20:08	16°♉35’14	
opposition	1881 Nov 07 09:58	15°♉09’59	-1°-50’-8
min. Earth dist.	1881 Nov 06 15:10	15°♉11’18	28.83147 AU
direct	1882 Jan 23 20:22	13°♉46’26	
conjunction	1882 May 06 23:01	16°♉15’50	-1°-42’-49
minimum elong	1882 May 06 23:01	16°♉15’50	1°42’50
max. Earth dist.	1882 May 07 19:43	16°♉17’46	30.83045 AU
retrograde	1882 Aug 22 08:06	18°♉50’34	
opposition	1882 Nov 09 21:42	17°♉25’19	-1°-49’-41
min. Earth dist.	1882 Nov 09 03:46	17°♉26’35	28.83156 AU
direct	1883 Jan 26 08:51	16°♉01’44	
conjunction	1883 May 09 12:41	18°♉31’09	-1°-42’-19
minimum elong	1883 May 09 12:42	18°♉31’09	1°42’20
max. Earth dist.	1883 May 10 07:47	18°♉32’57	30.83025 AU
retrograde	1883 Aug 24 22:10	21°♉05’49	
opposition	1883 Nov 12 09:19	19°♉40’33	-1°-49’-5
min. Earth dist.	1883 Nov 11 15:28	19°♉41’49	28.83103 AU
direct	1884 Jan 28 20:00	18°♉16’52	
conjunction	1884 May 11 02:36	20°♉46’20	-1°-41’-40
minimum elong	1884 May 11 02:36	20°♉46’20	1°41’42
max. Earth dist.	1884 May 11 21:40	20°♉48’08	30.82949 AU
retrograde	1884 Aug 26 08:43	23°♉20’54	
opposition	1884 Nov 13 20:48	21°♉55’37	-1°-48’-18
min. Earth dist.	1884 Nov 13 04:20	21°♉56’47	28.83021 AU
direct	1885 Jan 30 07:09	20°♉31’52	
conjunction	1885 May 13 16:29	23°♉01’22	-1°-40’-52
minimum elong	1885 May 13 16:29	23°♉01’22	1°40’53
max. Earth dist.	1885 May 14 10:48	23°♉03’05	30.82889 AU
retrograde	1885 Aug 28 21:43	25°♉35’49	
opposition	1885 Nov 16 08:07	24°♉10’32	-1°-47’-22
min. Earth dist.	1885 Nov 15 15:15	24°♉11’44	28.82975 AU
direct	1886 Feb 01 19:42	22°♉46’42	
conjunction	1886 May 16 06:16	25°♉16’15	-1°-39’-55
minimum elong	1886 May 16 06:16	25°♉16’15	1°39’56
max. Earth dist.	1886 May 17 00:00	25°♉17’54	30.82867 AU
retrograde	1886 Aug 31 09:22	27°♉50’36	
opposition	1886 Nov 18 19:26	26°♉25’19	-1°-46’-16
min. Earth dist.	1886 Nov 18 03:59	26°♉26’25	28.83003 AU
direct	1887 Feb 04 06:18	25°♉01’25	
conjunction	1887 May 18 20:08	27°♉31’01	-1°-38’-48
minimum elong	1887 May 18 20:08	27°♉31’01	1°38’49
max. Earth dist.	1887 May 19 13:56	27°♉32’41	30.82958 AU
	1887 Aug 16 04:09	0°♊	
retrograde	1887 Sep 02 22:41	0°♊05’16	
	1887 Sep 20 20:47	30°♉	
opposition	1887 Nov 21 06:34	28°♉40’00	-1°-45’00
min. Earth dist.	1887 Nov 20 14:27	28°♉41’09	28.83150 AU
direct	1888 Feb 06 19:08	27°♉16’03	
conjunction	1888 May 20 09:50	29°♉45’43	-1°-37’-33

minimum elong	1888 May 20 09:50	29°♉45’43	1°37’34
max. Earth dist.	1888 May 21 02:27	29°♉47’16	30.83173 AU
	1888 May 26 18:28	0°♊	
retrograde	1888 Sep 04 12:21	2°♊19’53	
opposition	1888 Nov 22 17:50	0°♊54’39	-1°-43’-34
min. Earth dist.	1888 Nov 22 02:49	0°♊55’43	28.83438 AU
	1888 Dec 27 18:01	30°♉	
direct	1889 Feb 08 06:39	29°♉30’40	
	1889 Mar 22 01:29	0°♊	
conjunction	1889 May 22 23:52	2°♊00’25	-1°-36’-9
minimum elong	1889 May 22 23:52	2°♊00’25	1°36’09
max. Earth dist.	1889 May 23 17:05	2°♊02’02	30.83535 AU
retrograde	1889 Sep 07 01:19	4°♊34’29	
opposition	1889 Nov 25 04:48	3°♊09’20	-1°-41’-59
min. Earth dist.	1889 Nov 24 13:43	3°♊10’24	28.83857 AU
direct	1890 Feb 10 20:03	1°♊45’20	
conjunction	1890 May 25 13:44	4°♊15’11	-1°-34’-36
minimum elong	1890 May 25 13:44	4°♊15’11	1°34’37
max. Earth dist.	1890 May 26 05:26	4°♊16’39	30.84028 AU
retrograde	1890 Sep 09 14:59	6°♊49’11	
opposition	1890 Nov 27 15:57	5°♊24’06	-1°-40’-15
min. Earth dist.	1890 Nov 27 01:32	5°♊25’07	28.84408 AU
direct	1891 Feb 13 06:48	4°♊00’05	
conjunction	1891 May 28 03:39	6°♊30’02	-1°-32’-54
minimum elong	1891 May 28 03:40	6°♊30’02	1°32’54
max. Earth dist.	1891 May 28 19:56	6°♊31’34	30.84622 AU
retrograde	1891 Sep 12 03:41	9°♊03’58	
opposition	1891 Nov 30 03:02	7°♊38’58	-1°-38’-21
min. Earth dist.	1891 Nov 29 13:23	7°♊39’56	28.85023 AU
direct	1892 Feb 15 19:15	6°♊14’59	
conjunction	1892 May 29 17:44	8°♊45’02	-1°-31’-3
minimum elong	1892 May 29 17:44	8°♊45’02	1°31’05
max. Earth dist.	1892 May 30 08:14	8°♊46’23	30.85262 AU
retrograde	1892 Sep 13 18:02	11°♊18’53	
opposition	1892 Dec 01 13:57	9°♊53’59	-1°-36’-18
min. Earth dist.	1892 Dec 01 00:38	9°♊54’55	28.85658 AU
direct	1893 Feb 17 06:12	8°♊29’58	
conjunction	1893 Jun 01 08:04	11°♊00’08	-1°-29’-4
minimum elong	1893 Jun 01 08:04	11°♊00’08	1°29’05
max. Earth dist.	1893 Jun 01 22:16	11°♊01’27	30.85867 AU
retrograde	1893 Sep 16 04:38	13°♊33’53	
opposition	1893 Dec 04 01:03	12°♊09’03	-1°-34’-7
min. Earth dist.	1893 Dec 03 13:25	12°♊09’53	28.86226 AU
direct	1894 Feb 19 17:21	10°♊45’02	
conjunction	1894 Jun 03 22:15	13°♊15’15	-1°-26’-57
minimum elong	1894 Jun 03 22:16	13°♊15’15	1°26’58
max. Earth dist.	1894 Jun 04 11:01	13°♊16’27	30.86404 AU
retrograde	1894 Sep 18 17:22	15°♊48’53	
opposition	1894 Dec 06 11:57	14°♊24’07	-1°-31’-47
min. Earth dist.	1894 Dec 06 00:21	14°♊24’57	28.86711 AU
direct	1895 Feb 22 05:25	13°♊00’03	
conjunction	1895 Jun 06 12:31	15°♊30’20	-1°-24’-42
minimum elong	1895 Jun 06 12:31	15°♊30’20	1°24’43
max. Earth dist.	1895 Jun 07 00:14	15°♊31’26	30.86845 AU
retrograde	1895 Sep 21 04:46	18°♊03’50	
opposition	1895 Dec 08 22:56	16°♊39’06	-1°-29’-18
min. Earth dist.	1895 Dec 08 13:14	16°♊39’47	28.87117 AU
direct	1896 Feb 24 15:12	15°♊14’57	
conjunction	1896 Jun 08 02:45	17°♊45’17	-1°-22’-20
minimum elong	1896 Jun 08 02:45	17°♊45’17	1°22’22
max. Earth dist.	1896 Jun 08 13:49	17°♊46’19	30.87235 AU
retrograde	1896 Sep 22 16:43	20°♊18’37	
opposition	1896 Dec 10 09:41	18°♊53’54	-1°-26’-42
min. Earth dist.	1896 Dec 09 23:54	18°♊54’36	28.87472 AU
direct	1897 Feb 26 04:31	17°♊29’41	
conjunction	1897 Jun 10 16:56	20°♊00’03	-1°-19’-51
minimum elong	1897 Jun 10 16:56	20°♊00’03	1°19’51
max. Earth dist.	1897 Jun 11 02:18	20°♊00’55	30.87585 AU
retrograde	1897 Sep 25 04:41	22°♊33’12	
opposition	1897 Dec 12 20:24	21°♊08’31	-1°-23’-59
min. Earth dist.	1897 Dec 12 12:09	21°♊09’06	28.87830 AU
direct	1898 Feb 28 16:11	19°♊44’12	
conjunction	1898 Jun 13 07:08	22°♊14’36	-1°-17’-14
minimum elong	1898 Jun 13 07:09	22°♊14’36	1°17’16
max. Earth dist.	1898 Jun 13 16:43	22°♊15’29	30.87966 AU
retrograde	1898 Sep 27 16:34	24°♊47’34	
opposition	1898 Dec 15 07:01	23°♊22’54	-1°-21’-8
min. Earth dist.	1898 Dec 14 22:56	23°♊23’29	28.88230 AU
direct	1899 Mar 03 05:43	21°♊58’30	
conjunction	1899 Jun 15 20:58	24°♊28’56	-1°-14’-31
minimum elong	1899 Jun 15 20:58	24°♊28’56	1°14’31
max. Earth dist.	1899 Jun 16 04:51	24°♊29’40	30.88414 AU
retrograde	1899 Sep 30 05:37	27°♊01’45	
opposition	1899 Dec 17 17:39	25°♊37’06	-1°-18’-10
min. Earth dist.	1899 Dec 17 10:19	25°♊37’37	28.88734 AU
direct	1900 Mar 05 16:54	24°♊12’37	
conjunction	1900 Jun 18 11:07	26°♊43’06	-1°-11’-41
minimum elong	1900 Jun 18 11:07	26°♊43’06	1°11’43
max. Earth dist.	1900 Jun 18 19:30	26°♊43’53	30.88974 AU
retrograde	1900 Oct 02 17:48	29°♊15’43	
opposition	1900 Dec 20 04:06	27°♊51’07	-1°-15’-5
min. Earth dist.	1900 Dec 19 21:31	27°♊51’35	28.89352 AU
direct	1901 Mar 08 06:24	26°♊26’36	
conjunction	1901 Jun 21 01:06	28°♊57’07	-1°-8’-45
minimum elong	1901 Jun 21 01:06	28°♊57’07	1°08’46
max. Earth dist.	1901 Jun 21 07:46	28°♊57’44	30.89675 AU
	1901 Jul 19 23:51	0°♋	
retrograde	1901 Oct 05 06:56	1°♋29’35	
opposition	1901 Dec 22 14:35	0°♋05’02	-1°-11’-53
min. Earth dist.	1901 Dec 22 07:56	0°♋05’30	28.90125 AU
	1901 Dec 25 13:37	30°♊	
direct	1902 Mar 10 18:15	28°♊40’28	
	1902 May 21 13:29	0°♋	
conjunction	1902 Jun 23 15:04	1°♋11’04	-1°-5’-42
minimum elong	1902 Jun 23 15:04	1°♋11’04	1°05’44
max. Earth dist.	1902 Jun 23 21:57	1°♋11’42	30.90515 AU
retrograde	1902 Oct 07 17:36	3°♋43’23	
opposition	1902 Dec 25 01:08	2°♋18’55	-1°-8’-34
min. Earth dist.	1902 Dec 24 19:46	2°♋19’18	28.91029 AU
direct	1903 Mar 13 05:33	0°♋54’21	
conjunction	1903 Jun 26 05:01	3°♋25’00	-1°-2’-34
minimum elong	1903 Jun 26 05:02	3°♋25’00	1°02’35
max. Earth dist.	1903 Jun 26 10:45	3°♋25’32	30.91497 AU
retrograde	1903 Oct 10 06:37	5°♋57’11	
opposition	1903 Dec 27 11:26	4°♋32’50	-1°-5’-10
min. Earth dist.	1903 Dec 27 05:52	4°♋33’14	28.92051 AU
direct	1904 Mar 14 17:03	3°♋08’16	
conjunction	1904 Jun 27 19:06	5°♋39’01	0°-59’-19

minimum elong	1904 Jun	27	19:06	5°♋39’01	0°59’21
max. Earth dist.	1904 Jun	28	00:09	5°♋39’29	30.92547 AU
retrograde	1904 Oct	11	17:47	8°♋11’04	
opposition	1904 Dec	28	21:58	6°♋46’50	-1°-1’-39
min. Earth dist.	1904 Dec	28	18:17	6°♋47’06	28.93113 AU
direct	1905 Mar	17	02:33	5°♋22’16	
conjunction	1905 Jun	30	09:17	7°♋53’07	0°-56’00
minimum elong	1905 Jun	30	09:17	7°♋53’07	0°56’00
max. Earth dist.	1905 Jun	30	13:30	7°♋53’30	30.93609 AU
retrograde	1905 Oct	14	05:22	10°♋25’02	
opposition	1905 Dec	31	08:18	9°♋00’55	0°-58’-2
min. Earth dist.	1905 Dec	31	04:41	9°♋01’10	28.94143 AU
direct	1906 Mar	19	15:17	7°♋36’21	
conjunction	1906 Jul	02	23:24	10°♋07’16	0°-52’-35
minimum elong	1906 Jul	02	23:24	10°♋07’16	0°52’36
max. Earth dist.	1906 Jul	03	01:47	10°♋07’29	30.94604 AU
retrograde	1906 Oct	16	16:57	12°♋39’04	
opposition	1907 Jan	02	18:54	11°♋15’02	0°-54’-21
min. Earth dist.	1907 Jan	02	16:57	11°♋15’10	28.95102 AU
direct	1907 Mar	22	01:58	9°♋50’26	
conjunction	1907 Jul	05	13:28	12°♋21’26	0°-49’-5
minimum elong	1907 Jul	05	13:29	12°♋21’26	0°49’06
max. Earth dist.	1907 Jul	05	15:34	12°♋21’37	30.95518 AU
retrograde	1907 Oct	19	04:32	14°♋53’04	
opposition	1908 Jan	05	05:22	13°♋29’07	0°-50’-35
min. Earth dist.	1908 Jan	05	04:01	13°♋29’12	28.95952 AU
direct	1908 Mar	23	15:01	12°♋04’29	
conjunction	1908 Jul	07	03:32	14°♋35’32	0°-45’-32
minimum elong	1908 Jul	07	03:32	14°♋35’32	0°45’34
max. Earth dist.	1908 Jul	07	03:22	14°♋35’31	30.96329 AU
retrograde	1908 Oct	20	17:12	17°♋07’00	
opposition	1909 Jan	06	15:40	15°♋43’06	0°-46’-44
min. Earth dist.	1909 Jan	06	15:32	15°♋43’07	28.96726 AU
direct	1909 Mar	26	02:12	14°♋18’25	
conjunction	1909 Jul	09	17:41	16°♋49’31	0°-41’-54
minimum elong	1909 Jul	09	17:41	16°♋49’31	0°41’55
max. Earth dist.	1909 Jul	09	17:33	16°♋49’30	30.97069 AU
retrograde	1909 Oct	23	05:03	19°♋20’48	
opposition	1910 Jan	09	02:04	17°♋56’57	0°-42’-50
min. Earth dist.	1910 Jan	09	03:04	17°♋56’53	28.97433 AU
direct	1910 Mar	28	16:14	16°♋32’14	
conjunction	1910 Jul	12	07:24	19°♋03’21	0°-38’-14
minimum elong	1910 Jul	12	07:24	19°♋03’21	0°38’15
max. Earth dist.	1910 Jul	12	05:14	19°♋03’09	30.97774 AU
retrograde	1910 Oct	25	17:30	21°♋34’27	
opposition	1911 Jan	11	12:17	20°♋10’38	0°-38’-52
min. Earth dist.	1911 Jan	11	13:30	20°♋10’33	28.98140 AU
direct	1911 Mar	31	04:41	18°♋45’51	
conjunction	1911 Jul	14	21:17	21°♋17’00	0°-34’-30
minimum elong	1911 Jul	14	21:17	21°♋17’00	0°34’30
max. Earth dist.	1911 Jul	14	19:07	21°♋16’48	30.98487 AU
retrograde	1911 Oct	28	04:02	23°♋47’55	
opposition	1912 Jan	13	22:29	22°♋24’10	0°-34’-51
min. Earth dist.	1912 Jan	14	01:15	22°♋23’58	28.98875 AU
direct	1912 Apr	01	16:37	20°♋59’19	
conjunction	1912 Jul	16	11:00	23°♋30’29	0°-30’-43
minimum elong	1912 Jul	16	11:01	23°♋30’29	0°30’44
max. Earth dist.	1912 Jul	16	07:27	23°♋30’10	30.99265 AU
retrograde	1912 Oct	29	16:52	26°♋01’13	
opposition	1913 Jan	15	08:36	24°♋37’31	0°-30’-47
min. Earth dist.	1913 Jan	15	11:06	24°♋37’20	28.99688 AU
direct	1913 Apr	04	04:57	23°♋12’37	
conjunction	1913 Jul	19	00:42	25°♋43’49	0°-26’-54
minimum elong	1913 Jul	19	00:42	25°♋43’49	0°26’54
max. Earth dist.	1913 Jul	18	20:44	25°♋43’28	31.00119 AU
retrograde	1913 Nov	01	03:02	28°♋14’23	
opposition	1914 Jan	17	18:49	26°♋50’44	0°-26’-41
min. Earth dist.	1914 Jan	17	22:52	26°♋50’27	29.00606 AU
direct	1914 Apr	06	14:48	25°♋25’49	
conjunction	1914 Jul	21	14:18	27°♋57’03	0°-23’-2
minimum elong	1914 Jul	21	14:18	27°♋57’03	0°23’03
max. Earth dist.	1914 Jul	21	09:50	27°♋56’38	31.01108 AU
	1914 Sep	23	20:20	0°♌	
retrograde	1914 Nov	03	13:17	0°♌27’26	
	1914 Dec	14	20:43	30°♋	
opposition	1915 Jan	20	04:56	29°♋03’53	0°-22’-32
min. Earth dist.	1915 Jan	20	08:33	29°♋03’37	29.01649 AU
direct	1915 Apr	09	03:32	27°♋38’57	
	1915 Jul	19	13:30	0°♌	
conjunction	1915 Jul	24	03:43	0°♌10’13	0°-19’-8
minimum elong	1915 Jul	24	03:43	0°♌10’13	0°19’09
max. Earth dist.	1915 Jul	23	22:06	0°♌09’43	31.02209 AU
retrograde	1915 Nov	05	23:53	2°♌40’28	
opposition	1916 Jan	22	15:11	1°♌17’00	0°-18’-21
min. Earth dist.	1916 Jan	22	20:04	1°♌16’40	29.02803 AU
	1916 Mar	19	15:33	30°♋	
direct	1916 Apr	10	13:12	29°♋52’05	
	1916 May	02	10:39	0°♌	
conjunction	1916 Jul	25	17:24	2°♌23’25	0°-15’-13
minimum elong	1916 Jul	25	17:24	2°♌23’25	0°15’14
behind sun begin	1916 Jul	25	15:40	2°♌23’15	
behind sun end	1916 Jul	25	19:07	2°♌23’34	
max. Earth dist.	1916 Jul	25	11:46	2°♌22’54	31.03401 AU
retrograde	1916 Nov	07	10:37	4°♌53’31	
opposition	1917 Jan	24	01:14	3°♌30’10	0°-14’-9
min. Earth dist.	1917 Jan	24	06:34	3°♌29’47	29.04000 AU
direct	1917 Apr	13	01:02	2°♌05’14	
conjunction	1917 Jul	28	06:56	4°♌36’38	0°-11’-17
minimum elong	1917 Jul	28	06:56	4°♌36’38	0°11’17
behind sun begin	1917 Jul	28	02:10	4°♌36’12	
behind sun end	1917 Jul	28	11:42	4°♌37’03	
max. Earth dist.	1917 Jul	27	23:24	4°♌35’57	31.04602 AU
retrograde	1917 Nov	09	22:27	7°♌06’36	
opposition	1918 Jan	26	11:29	5°♌43’21	0°-9’-55
min. Earth dist.	1918 Jan	26	17:48	5°♌42’54	29.05194 AU
direct	1918 Apr	15	11:59	4°♌18’26	
conjunction	1918 Jul	30	20:26	6°♌49’52	0°-7’-20
minimum elong	1918 Jul	30	20:27	6°♌49’52	0°07’21
behind sun begin	1918 Jul	30	14:25	6°♌49’20	
behind sun end	1918 Jul	31	02:28	6°♌50’24	
max. Earth dist.	1918 Jul	30	13:03	6°♌49’12	31.05755 AU
retrograde	1918 Nov	12	09:18	9°♌19’42	
opposition	1919 Jan	28	21:48	7°♌56’32	0°-5’-40
min. Earth dist.	1919 Jan	29	05:21	7°♌56’00	29.06298 AU
direct	1919 Apr	18	01:28	6°♌31’36	
conjunction	1919 Aug	02	09:54	9°♌03’05	0°-3’-22
minimum elong	1919 Aug	02	09:54	9°♌03’05	0°03’23
behind sun begin	1919 Aug	02	03:21	9°♌02’30	
behind sun end	1919 Aug	02	16:27	9°♌03’39	

max. Earth dist.	1919 Aug 02 00:15	9°♑02’12	31.06809 AU	
retrograde	1919 Nov 14 21:39	11°♑32’45		
opposition	1920 Jan 31 07:56	10°♑09’39	0°-1’-25	
min. Earth dist.	1920 Jan 31 15:52	10°♑09’05	29.07298 AU	
direct	1920 Apr 19 13:37	8°♑44’41		
asc. node	1920 Jun 03 20:30	9°♑17’34		
conjunction	1920 Aug 03 23:31	11°♑16’11	0°00’41	
minimum elong	1920 Aug 03 23:31	11°♑16’11	0°00’41	
behind sun begin	1920 Aug 03 16:57	11°♑15’37		
behind sun end	1920 Aug 04 06:06	11°♑16’46		
max. Earth dist.	1920 Aug 03 13:33	11°♑15’17	31.07737 AU	
retrograde	1920 Nov 16 08:24	13°♑45’41		
opposition	1921 Feb 01 18:17	12°♑22’38	0°02’48	
min. Earth dist.	1921 Feb 02 04:03	12°♑21’57	29.08164 AU	
direct	1921 Apr 22 02:07	10°♑57’39		
conjunction	1921 Aug 06 12:49	13°♑29’09	0°04’42	
minimum elong	1921 Aug 06 12:49	13°♑29’09	0°04’42	
behind sun begin	1921 Aug 06 06:23	13°♑28’35		
behind sun end	1921 Aug 06 19:16	13°♑29’43		
max. Earth dist.	1921 Aug 06 01:06	13°♑28’05	31.08554 AU	
retrograde	1921 Nov 18 20:57	15°♑58’28		
opposition	1922 Feb 04 04:25	14°♑35’27	0°07’02	
min. Earth dist.	1922 Feb 04 14:10	14°♑34’46	29.08930 AU	
direct	1922 Apr 24 15:22	13°♑10’25		
conjunction	1922 Aug 09 02:07	15°♑41’55	0°08’38	
minimum elong	1922 Aug 09 02:07	15°♑41’55	0°08’38	
behind sun begin	1922 Aug 08 20:25	15°♑41’25		
behind sun end	1922 Aug 09 07:49	15°♑42’26		
max. Earth dist.	1922 Aug 08 13:48	15°♑40’48	31.09276 AU	
retrograde	1922 Nov 21 06:47	18°♑11’04		
opposition	1923 Feb 06 14:40	16°♑48’05	0°11’15	
min. Earth dist.	1923 Feb 07 02:13	16°♑47’16	29.09634 AU	
direct	1923 Apr 27 02:19	15°♑22’59		
conjunction	1923 Aug 11 15:09	17°♑54’29	0°12’33	
minimum elong	1923 Aug 11 15:09	17°♑54’29	0°12’34	
behind sun begin	1923 Aug 11 11:01	17°♑54’07		
behind sun end	1923 Aug 11 19:17	17°♑54’51		
max. Earth dist.	1923 Aug 11 02:07	17°♑53’17	31.09966 AU	
retrograde	1923 Nov 23 16:52	20°♑23’26		
opposition	1924 Feb 09 00:44	19°♑00’29	0°15’27	
min. Earth dist.	1924 Feb 09 12:07	18°♑59’41	29.10306 AU	
direct	1924 Apr 28 15:25	17°♑35’21		
conjunction	1924 Aug 13 04:09	20°♑06’50	0°16’28	
minimum elong	1924 Aug 13 04:09	20°♑06’50	0°16’27	
max. Earth dist.	1924 Aug 12 13:55	20°♑05’31	31.10637 AU	
retrograde	1924 Nov 25 02:48	22°♑35’37		
opposition	1925 Feb 10 10:51	21°♑12’42	0°19’37	
min. Earth dist.	1925 Feb 10 23:27	21°♑11’49	29.11008 AU	
direct	1925 May 01 01:21	19°♑47’30		
conjunction	1925 Aug 15 17:03	22°♑18’59	0°20’20	
minimum elong	1925 Aug 15 17:03	22°♑18’59	0°20’21	
max. Earth dist.	1925 Aug 15 03:03	22°♑17’42	31.11368 AU	
retrograde	1925 Nov 27 12:22	24°♑47’37		
opposition	1926 Feb 12 21:01	23°♑24’45	0°23’45	
min. Earth dist.	1926 Feb 13 09:40	23°♑23’52	29.11776 AU	
direct	1926 May 03 13:12	21°♑59’32		
conjunction	1926 Aug 18 05:33	24°♑31’00	0°24’11	
minimum elong	1926 Aug 18 05:33	24°♑31’00	0°24’11	
max. Earth dist.	1926 Aug 17 14:12	24°♑29’35	31.12188 AU	
retrograde	1926 Nov 29 23:02	26°♑59’31		

opposition	1927 Feb 15 07:10	25°♑36’41	0°27’51	
min. Earth dist.	1927 Feb 15 20:09	25°♑35’47	29.12665 AU	
direct	1927 May 05 23:55	24°♑11’28		
conjunction	1927 Aug 20 18:18	26°♑42’58	0°28’00	
minimum elong	1927 Aug 20 18:18	26°♑42’58	0°28’00	
max. Earth dist.	1927 Aug 20 03:42	26°♑41’37	31.13131 AU	
retrograde	1927 Dec 02 08:53	29°♑11’21		
opposition	1928 Feb 17 17:14	27°♑48’36	0°31’54	
min. Earth dist.	1928 Feb 18 06:59	27°♑47’38	29.13660 AU	
direct	1928 May 07 12:31	26°♑23’24		
conjunction	1928 Aug 22 06:53	28°♑54’56	0°31’46	
minimum elong	1928 Aug 22 06:53	28°♑54’56	0°31’46	
max. Earth dist.	1928 Aug 21 14:42	28°♑53’26	31.14180 AU	
	1928 Sep 21 12:02	0°♒		
retrograde	1928 Dec 03 20:48	1°♒23’14		
opposition	1929 Feb 19 03:20	0°♒00’34	0°35’54	
	1929 Feb 19 11:26	30°♑		
min. Earth dist.	1929 Feb 19 16:52	29°♑59’37	29.14748 AU	
direct	1929 May 09 23:42	28°♑35’23		
	1929 Jul 24 15:02	0°♒		
conjunction	1929 Aug 24 19:28	1°♒06’58	0°35’30	
minimum elong	1929 Aug 24 19:28	1°♒06’58	0°35’30	
max. Earth dist.	1929 Aug 24 03:42	1°♒05’31	31.15277 AU	
retrograde	1929 Dec 06 07:27	3°♒35’11		
opposition	1930 Feb 21 13:39	2°♒12’37	0°39’51	
min. Earth dist.	1930 Feb 22 04:39	2°♒11’34	29.15853 AU	
direct	1930 May 12 11:55	0°♒47’29		
conjunction	1930 Aug 27 07:56	3°♒19’06	0°39’10	
minimum elong	1930 Aug 27 07:56	3°♒19’06	0°39’10	
max. Earth dist.	1930 Aug 26 14:47	3°♒17’31	31.16374 AU	
retrograde	1930 Dec 08 20:17	5°♒47’12		
opposition	1931 Feb 23 23:47	4°♒24’43	0°43’45	
min. Earth dist.	1931 Feb 24 14:32	4°♒23’42	29.16925 AU	
direct	1931 May 15 01:10	2°♒59’37		
conjunction	1931 Aug 29 20:28	5°♒31’16	0°42’47	
minimum elong	1931 Aug 29 20:28	5°♒31’16	0°42’47	
max. Earth dist.	1931 Aug 29 02:54	5°♒29’38	31.17392 AU	
retrograde	1931 Dec 11 06:19	7°♒59’17		
opposition	1932 Feb 26 10:13	6°♒36’52	0°47’35	
min. Earth dist.	1932 Feb 27 02:44	6°♒35’43	29.17901 AU	
direct	1932 May 16 12:32	5°♒11’47		
conjunction	1932 Aug 31 08:58	7°♒43’25	0°46’20	
minimum elong	1932 Aug 31 08:58	7°♒43’25	0°46’20	
max. Earth dist.	1932 Aug 30 14:36	7°♒41’43	31.18308 AU	
retrograde	1932 Dec 12 16:30	10°♒11’18		
opposition	1933 Feb 27 20:30	8°♒48’58	0°51’20	
min. Earth dist.	1933 Feb 28 12:55	8°♒47’49	29.18751 AU	
direct	1933 May 19 01:36	7°♒23’52		
conjunction	1933 Sep 02 21:21	9°♒55’30	0°49’49	
minimum elong	1933 Sep 02 21:21	9°♒55’30	0°49’49	
max. Earth dist.	1933 Sep 02 01:44	9°♒53’41	31.19092 AU	
retrograde	1933 Dec 15 02:59	12°♒23’16		
opposition	1934 Mar 02 06:59	11°♒00’57	0°55’00	
min. Earth dist.	1934 Mar 03 00:36	10°♒59’43	29.19494 AU	
direct	1934 May 21 11:52	9°♒35’50		
conjunction	1934 Sep 05 09:30	12°♒07’26	0°53’13	
minimum elong	1934 Sep 05 09:30	12°♒07’26	0°53’12	
max. Earth dist.	1934 Sep 04 13:58	12°♒05’37	31.19778 AU	
retrograde	1934 Dec 17 11:48	14°♒35’04		

opposition	1935 Mar 04 17:21	13°♑12’46	0°58’36
min. Earth dist.	1935 Mar 05 11:21	13°♑11’31	29.20126 AU
direct	1935 May 24 00:15	11°♑47’38	
conjunction	1935 Sep 07 21:35	14°♑19’10	0°56’32
minimum elong	1935 Sep 07 21:35	14°♑19’10	0°56’32
max. Earth dist.	1935 Sep 07 00:27	14°♑17’13	31.20372 AU
retrograde	1935 Dec 19 21:24	16°♑46’40	
opposition	1936 Mar 06 03:34	15°♑24’23	1°02’06
min. Earth dist.	1936 Mar 06 22:05	15°♑23’06	29.20703 AU
direct	1936 May 25 11:08	13°♑59’12	
conjunction	1936 Sep 09 09:41	16°♑30’42	0°59’46
minimum elong	1936 Sep 09 09:41	16°♑30’42	0°59’46
max. Earth dist.	1936 Sep 08 13:14	16°♑28’48	31.20925 AU
retrograde	1936 Dec 21 05:56	18°♑58’03	
opposition	1937 Mar 08 14:01	17°♑35’46	1°05’31
min. Earth dist.	1937 Mar 09 09:22	17°♑34’25	29.21250 AU
direct	1937 May 27 23:14	16°♑10’33	
conjunction	1937 Sep 11 21:18	18°♑41’59	1°02’55
minimum elong	1937 Sep 11 21:18	18°♑41’59	1°02’55
max. Earth dist.	1937 Sep 10 23:35	18°♑39’58	31.21483 AU
retrograde	1937 Dec 23 16:57	21°♑09’13	
opposition	1938 Mar 11 00:21	19°♑46’56	1°08’50
min. Earth dist.	1938 Mar 11 19:06	19°♑45’37	29.21843 AU
direct	1938 May 30 10:13	18°♑21’40	
conjunction	1938 Sep 14 09:02	20°♑53’04	1°05’59
minimum elong	1938 Sep 14 09:02	20°♑53’03	1°05’58
max. Earth dist.	1938 Sep 13 12:07	20°♑51’07	31.22102 AU
retrograde	1938 Dec 26 02:27	23°♑20’12	
opposition	1939 Mar 13 10:45	21°♑57’55	1°12’03
min. Earth dist.	1939 Mar 14 06:31	21°♑56’32	29.22519 AU
direct	1939 Jun 01 22:38	20°♑32’39	
conjunction	1939 Sep 16 20:34	23°♑04’00	1°08’56
minimum elong	1939 Sep 16 20:33	23°♑04’00	1°08’56
max. Earth dist.	1939 Sep 15 22:52	23°♑01’59	31.22836 AU
retrograde	1939 Dec 28 14:15	25°♑31’02	
opposition	1940 Mar 14 21:08	24°♑08’47	1°15’09
min. Earth dist.	1940 Mar 15 15:57	24°♑07’29	29.23306 AU
direct	1940 Jun 03 11:47	22°♑43’33	
max. Earth dist.	1940 Sep 17 10:44	25°♑12’55	31.23666 AU
conjunction	1940 Sep 18 08:07	25°♑14’53	1°11’48
minimum elong	1940 Sep 18 08:06	25°♑14’53	1°11’48
retrograde	1940 Dec 30 00:05	27°♑41’52	
opposition	1941 Mar 17 07:40	26°♑19’41	1°18’09
min. Earth dist.	1941 Mar 18 03:33	26°♑18’18	29.24192 AU
direct	1941 Jun 05 22:54	24°♑54’29	
conjunction	1941 Sep 20 19:33	27°♑25’49	1°14’33
minimum elong	1941 Sep 20 19:32	27°♑25’49	1°14’33
max. Earth dist.	1941 Sep 19 22:12	27°♑23’50	31.24591 AU
retrograde	1942 Jan 01 10:32	29°♑52’45	
opposition	1942 Mar 19 18:12	28°♑30’38	1°21’02
min. Earth dist.	1942 Mar 20 13:26	28°♑29’18	29.25131 AU
direct	1942 Jun 08 11:44	27°♑05’30	
max. Earth dist.	1942 Sep 22 08:50	29°♑34’48	31.25526 AU
conjunction	1942 Sep 23 06:49	29°♑36’51	1°17’12
minimum elong	1942 Sep 23 06:48	29°♑36’50	1°17’12
	1942 Oct 03 16:59	0°♎	
retrograde	1943 Jan 03 21:21	2°♎03’44	
opposition	1943 Mar 22 04:51	0°♎41’42	1°23’49
min. Earth dist.	1943 Mar 23 00:54	0°♎40’18	29.26064 AU
	1943 Apr 17 10:58	30°♑	
direct	1943 Jun 10 22:05	29°♑16’38	
	1943 Aug 02 19:07	0°♎	
conjunction	1943 Sep 25 18:16	1°♎47’58	1°19’44
minimum elong	1943 Sep 25 18:16	1°♎47’58	1°19’44
max. Earth dist.	1943 Sep 24 20:40	1°♎45’58	31.26422 AU
retrograde	1944 Jan 06 06:23	4°♎14’49	
opposition	1944 Mar 23 15:29	2°♎52’52	1°26’27
min. Earth dist.	1944 Mar 24 11:49	2°♎51’27	29.26909 AU
direct	1944 Jun 12 10:25	1°♎27’51	
max. Earth dist.	1944 Sep 26 06:37	3°♎57’02	31.27211 AU
conjunction	1944 Sep 27 05:37	3°♎59’11	1°22’09
minimum elong	1944 Sep 27 05:36	3°♎59’11	1°22’09
retrograde	1945 Jan 07 16:34	6°♎26’00	
opposition	1945 Mar 26 02:19	5°♎04’05	1°28’59
min. Earth dist.	1945 Mar 26 22:55	5°♎02’40	29.27651 AU
direct	1945 Jun 14 20:50	3°♎39’07	
conjunction	1945 Sep 29 16:53	6°♎10’26	1°24’27
minimum elong	1945 Sep 29 16:53	6°♎10’26	1°24’27
max. Earth dist.	1945 Sep 28 18:40	6°♎08’22	31.27875 AU
retrograde	1946 Jan 10 01:15	8°♎37’13	
opposition	1946 Mar 28 13:18	7°♎15’20	1°31’22
min. Earth dist.	1946 Mar 29 10:47	7°♎13’51	29.28246 AU
direct	1946 Jun 17 08:19	5°♎50’24	
max. Earth dist.	1946 Oct 01 04:23	8°♎19’28	31.28403 AU
conjunction	1946 Oct 02 04:03	8°♎21’40	1°26’38
minimum elong	1946 Oct 02 04:02	8°♎21’40	1°26’38
retrograde	1947 Jan 12 12:25	10°♎48’25	
opposition	1947 Mar 31 00:01	9°♎26’33	1°33’38
min. Earth dist.	1947 Mar 31 21:03	9°♎25’06	29.28714 AU
direct	1947 Jun 19 18:47	8°♎01’37	
conjunction	1947 Oct 04 15:18	10°♎32’51	1°28’41
minimum elong	1947 Oct 04 15:17	10°♎32’51	1°28’41
max. Earth dist.	1947 Oct 03 16:08	10°♎30’41	31.28797 AU
retrograde	1948 Jan 14 22:02	12°♎59’33	
opposition	1948 Apr 01 11:02	11°♎37’41	1°35’46
min. Earth dist.	1948 Apr 02 09:20	11°♎36’09	29.29054 AU
direct	1948 Jun 21 07:28	10°♎12’45	
max. Earth dist.	1948 Oct 05 02:15	12°♎41’41	31.29093 AU
conjunction	1948 Oct 06 02:12	12°♎43’55	1°30’37
minimum elong	1948 Oct 06 02:12	12°♎43’55	1°30’37
retrograde	1949 Jan 16 09:36	15°♎10’33	
opposition	1949 Apr 03 21:54	13°♎48’40	1°37’45
min. Earth dist.	1949 Apr 04 19:22	13°♎47’12	29.29311 AU
direct	1949 Jun 23 20:46	12°♎23’44	
conjunction	1949 Oct 08 13:05	14°♎54’50	1°32’24
minimum elong	1949 Oct 08 13:05	14°♎54’50	1°32’25
max. Earth dist.	1949 Oct 07 13:27	14°♎52’38	31.29323 AU
retrograde	1950 Jan 18 19:19	17°♎21’25	
opposition	1950 Apr 06 08:56	15°♎59’31	1°39’36
min. Earth dist.	1950 Apr 07 07:21	15°♎57’58	29.29549 AU
direct	1950 Jun 26 08:04	14°♎34’34	
conjunction	1950 Oct 10 23:40	17°♎05’35	1°34’04
minimum elong	1950 Oct 10 23:40	17°♎05’35	1°34’04
max. Earth dist.	1950 Oct 10 00:25	17°♎03’25	31.29568 AU
retrograde	1951 Jan 21 05:28	19°♎32’07	
opposition	1951 Apr 08 19:52	18°♎10’12	1°41’18
min. Earth dist.	1951 Apr 09 17:19	18°♎08’44	29.29808 AU
direct	1951 Jun 28 21:51	16°♎45’15	

max. Earth dist.	1951 Oct	12	10:44	19°♎14’02	31.29854 AU
conjunction	1951 Oct	13	10:16	19°♎16’13	1°35’36
minimum elong	1951 Oct	13	10:16	19°♎16’13	1°35’35
retrograde	1952 Jan	23	16:29	21°♎42’43	
opposition	1952 Apr	10	06:51	20°♎20’48	1°42’51
min. Earth dist.	1952 Apr	11	04:28	20°♎19’19	29.30150 AU
direct	1952 Jun	30	09:24	18°♎55’52	
conjunction	1952 Oct	14	20:53	21°♎26’47	1°36’59
minimum elong	1952 Oct	14	20:52	21°♎26’47	1°36’59
max. Earth dist.	1952 Oct	13	22:27	21°♎24’42	31.30239 AU
retrograde	1953 Jan	25	00:57	23°♎53’15	
opposition	1953 Apr	12	18:00	22°♎31’22	1°44’16
min. Earth dist.	1953 Apr	13	15:10	22°♎29’55	29.30568 AU
direct	1953 Jul	02	22:13	21°♎06’29	
max. Earth dist.	1953 Oct	16	08:06	23°♎35’12	31.30697 AU
conjunction	1953 Oct	17	07:08	23°♎37’21	1°38’14
minimum elong	1953 Oct	17	07:08	23°♎37’21	1°38’14
retrograde	1954 Jan	27	10:50	26°♎03’50	
opposition	1954 Apr	15	05:07	24°♎41’58	1°45’31
min. Earth dist.	1954 Apr	16	01:50	24°♎40’33	29.31058 AU
direct	1954 Jul	05	08:34	23°♎17’09	
conjunction	1954 Oct	19	17:38	25°♎47’58	1°39’20
minimum elong	1954 Oct	19	17:38	25°♎47’58	1°39’21
max. Earth dist.	1954 Oct	18	19:58	25°♎45’57	31.31192 AU
retrograde	1955 Jan	29	19:18	28°♎14’28	
opposition	1955 Apr	17	16:16	26°♎52’38	1°46’38
min. Earth dist.	1955 Apr	18	13:31	26°♎51’11	29.31545 AU
direct	1955 Jul	07	19:39	25°♎27’53	
max. Earth dist.	1955 Oct	21	05:24	27°♎56’33	31.31662 AU
conjunction	1955 Oct	22	03:58	27°♎58’40	1°40’18
minimum elong	1955 Oct	22	03:58	27°♎58’40	1°40’18
	1955 Dec	24	15:19	0°♏	
retrograde	1956 Feb	01	06:32	0°♏25’11	
	1956 Mar	12	01:56	30°♎	
opposition	1956 Apr	19	03:31	29°♎03’23	1°47’35
min. Earth dist.	1956 Apr	19	23:53	29°♎01’59	29.31983 AU
direct	1956 Jul	09	06:09	27°♎38’40	
	1956 Oct	19	09:26	0°♏	
conjunction	1956 Oct	23	14:21	0°♏09’25	1°41’07
minimum elong	1956 Oct	23	14:21	0°♏09’25	1°41’07
max. Earth dist.	1956 Oct	22	16:40	0°♏07’24	31.32044 AU
retrograde	1957 Feb	02	15:51	2°♏35’58	
opposition	1957 Apr	21	15:06	1°♏14’11	1°48’23
min. Earth dist.	1957 Apr	22	12:26	1°♏12’43	29.32314 AU
	1957 Jun	15	20:11	30°♎	
direct	1957 Jul	11	17:50	29°♎49’32	
	1957 Aug	06	08:21	0°♏	
max. Earth dist.	1957 Oct	25	02:25	2°♏18’08	31.32317 AU
conjunction	1957 Oct	26	00:39	2°♏20’13	1°41’47
minimum elong	1957 Oct	26	00:39	2°♏20’13	1°41’47
retrograde	1958 Feb	05	03:15	4°♏46’47	
opposition	1958 Apr	24	02:31	3°♏24’59	1°49’01
min. Earth dist.	1958 Apr	24	22:52	3°♏23’36	29.32518 AU
direct	1958 Jul	14	05:52	2°♏00’22	
conjunction	1958 Oct	28	10:55	4°♏31’00	1°42’19
minimum elong	1958 Oct	28	10:54	4°♏31’00	1°42’19
max. Earth dist.	1958 Oct	27	12:51	4°♏28’56	31.32440 AU
retrograde	1959 Feb	07	13:36	6°♏57’35	
opposition	1959 Apr	26	14:09	5°♏35’47	1°49’31
min. Earth dist.	1959 Apr	27	11:30	5°♏34’19	29.32572 AU
direct	1959 Jul	16	16:51	4°♏11’10	
conjunction	1959 Oct	30	21:10	6°♏41’44	1°42’42
minimum elong	1959 Oct	30	21:10	6°♏41’44	1°42’42
max. Earth dist.	1959 Oct	29	23:23	6°♏39’42	31.32422 AU
retrograde	1960 Feb	10	00:07	9°♏08’19	
opposition	1960 Apr	28	01:38	7°♏46’29	1°49’50
min. Earth dist.	1960 Apr	28	22:13	7°♏45’05	29.32472 AU
direct	1960 Jul	18	06:55	6°♏21’54	
max. Earth dist.	1960 Oct	31	09:02	8°♏50’18	31.32260 AU
conjunction	1960 Nov	01	07:18	8°♏52’23	1°42’56
minimum elong	1960 Nov	01	07:18	8°♏52’23	1°42’57
retrograde	1961 Feb	11	11:33	11°♏18’58	
opposition	1961 Apr	30	13:21	9°♏57’06	1°50’01
min. Earth dist.	1961 May	01	10:09	9°♏55’41	29.32267 AU
direct	1961 Jul	20	18:48	8°♏32’31	
conjunction	1961 Nov	03	17:14	11°♏02’54	1°43’02
minimum elong	1961 Nov	03	17:14	11°♏02’54	1°43’02
max. Earth dist.	1961 Nov	02	20:10	11°♏00’56	31.32014 AU
retrograde	1962 Feb	13	20:07	13°♏29’30	
opposition	1962 May	03	01:01	12°♏07’35	1°50’03
min. Earth dist.	1962 May	03	21:27	12°♏06’11	29.31983 AU
direct	1962 Jul	23	08:12	10°♏42’59	
max. Earth dist.	1962 Nov	05	05:24	13°♏11’16	31.31725 AU
conjunction	1962 Nov	06	03:02	13°♏13’17	1°42’59
minimum elong	1962 Nov	06	03:02	13°♏13’17	1°42’59
retrograde	1963 Feb	16	06:05	15°♏39’54	
opposition	1963 May	05	12:29	14°♏17’56	1°49’55
min. Earth dist.	1963 May	06	08:14	14°♏16’35	29.31708 AU
direct	1963 Jul	25	19:14	12°♏53’20	
conjunction	1963 Nov	08	12:56	15°♏23’34	1°42’47
minimum elong	1963 Nov	08	12:56	15°♏23’34	1°42’46
max. Earth dist.	1963 Nov	07	17:01	15°♏21’42	31.31465 AU
retrograde	1964 Feb	18	14:29	17°♏50’12	
opposition	1964 May	07	00:18	16°♏28’12	1°49’37
min. Earth dist.	1964 May	07	20:00	16°♏26’52	29.31479 AU
direct	1964 Jul	27	07:01	15°♏03’38	
conjunction	1964 Nov	09	22:28	17°♏33’47	1°42’26
minimum elong	1964 Nov	09	22:28	17°♏33’47	1°42’26
max. Earth dist.	1964 Nov	09	02:22	17°♏31’54	31.31288 AU
retrograde	1965 Feb	20	01:23	20°♏00’29	
opposition	1965 May	09	12:01	18°♏38’28	1°49’11
min. Earth dist.	1965 May	10	06:02	18°♏37’15	29.31350 AU
direct	1965 Jul	29	17:41	17°♏13’57	
conjunction	1965 Nov	12	08:12	19°♏44’03	1°41’56
minimum elong	1965 Nov	12	08:12	19°♏44’03	1°41’57
max. Earth dist.	1965 Nov	11	13:32	19°♏42’18	31.31203 AU
retrograde	1966 Feb	22	10:42	22°♏10’49	
opposition	1966 May	11	23:49	20°♏48’48	1°48’34
min. Earth dist.	1966 May	12	18:11	20°♏47’33	29.31308 AU
direct	1966 Aug	01	04:30	19°♏24’21	
conjunction	1966 Nov	14	17:43	21°♏54’24	1°41’18
minimum elong	1966 Nov	14	17:43	21°♏54’24	1°41’19
max. Earth dist.	1966 Nov	13	23:19	21°♏52’41	31.31202 AU
retrograde	1967 Feb	24	22:06	24°♏21’16	
opposition	1967 May	14	11:34	22°♏59’16	1°47’49
min. Earth dist.	1967 May	15	04:21	22°♏58’07	29.31313 AU
direct	1967 Aug	03	15:20	21°♏34’52	
max. Earth dist.	1967 Nov	16	09:33	24°♏03’14	31.31208 AU

conjunction	1967 Nov 17 03:19	24°♏04’54	1°40’31
minimum elong	1967 Nov 17 03:19	24°♏04’54	1°40’30
retrograde	1968 Feb 27 08:55	26°♏31’52	
opposition	1968 May 15 23:33	25°♏09’52	1°46’54
min. Earth dist.	1968 May 16 16:49	25°♏08’42	29.31317 AU
direct	1968 Aug 05 01:17	23°♏45’34	
conjunction	1968 Nov 18 12:57	26°♏15’33	1°39’35
minimum elong	1968 Nov 18 12:57	26°♏15’33	1°39’35
max. Earth dist.	1968 Nov 17 20:06	26°♏13’58	31.31201 AU
retrograde	1969 Feb 28 20:20	28°♏42’36	
opposition	1969 May 18 11:36	27°♏20’37	1°45’50
min. Earth dist.	1969 May 19 03:41	27°♏19’32	29.31268 AU
direct	1969 Aug 07 14:55	25°♏56’23	
conjunction	1969 Nov 20 22:25	28°♏26’19	1°38’31
minimum elong	1969 Nov 20 22:25	28°♏26’19	1°38’30
max. Earth dist.	1969 Nov 20 05:20	28°♏24’43	31.31111 AU
	1970 Jan 04 19:54	0°♐	
retrograde	1970 Mar 03 09:01	0°♐53’28	
	1970 May 03 01:32	30°♏	
opposition	1970 May 20 23:45	29°♏31’28	1°44’36
min. Earth dist.	1970 May 21 15:50	29°♏30’23	29.31135 AU
direct	1970 Aug 10 02:21	28°♏07’17	
	1970 Nov 06 16:31	0°♐	
conjunction	1970 Nov 23 08:07	0°♐37’11	1°37’18
minimum elong	1970 Nov 23 08:07	0°♐37’11	1°37’18
max. Earth dist.	1970 Nov 22 16:16	0°♐35’41	31.30917 AU
retrograde	1971 Mar 05 18:07	3°♐04’24	
opposition	1971 May 23 11:49	1°♐42’23	1°43’14
min. Earth dist.	1971 May 24 03:34	1°♐41’19	29.30865 AU
direct	1971 Aug 12 15:14	0°♐18’14	
conjunction	1971 Nov 25 17:43	2°♐48’04	1°35’56
minimum elong	1971 Nov 25 17:43	2°♐48’04	1°35’56
max. Earth dist.	1971 Nov 25 01:09	2°♐46’30	31.30587 AU
retrograde	1972 Mar 07 05:19	5°♐15’21	
opposition	1972 May 25 00:06	3°♐53’18	1°41’43
min. Earth dist.	1972 May 25 15:11	3°♐52’16	29.30469 AU
direct	1972 Aug 14 03:09	2°♐29’10	
conjunction	1972 Nov 27 03:16	4°♐58’55	1°34’27
minimum elong	1972 Nov 27 03:17	4°♐58’55	1°34’28
max. Earth dist.	1972 Nov 26 12:13	4°♐57’30	31.30121 AU
retrograde	1973 Mar 09 14:32	7°♐26’16	
opposition	1973 May 27 12:31	6°♐04’09	1°40’03
min. Earth dist.	1973 May 28 03:48	6°♐03’07	29.29935 AU
direct	1973 Aug 16 16:06	4°♐40’02	
conjunction	1973 Nov 29 12:42	7°♐09’40	1°32’50
minimum elong	1973 Nov 29 12:42	7°♐09’40	1°32’50
max. Earth dist.	1973 Nov 28 21:18	7°♐08’13	31.29549 AU
retrograde	1974 Mar 12 01:20	9°♐37’05	
opposition	1974 May 30 00:40	8°♐14’53	1°38’15
min. Earth dist.	1974 May 30 14:30	8°♐13’57	29.29320 AU
direct	1974 Aug 19 03:38	6°♐50’46	
conjunction	1974 Dec 01 22:08	9°♐20’17	1°31’05
minimum elong	1974 Dec 01 22:08	9°♐20’17	1°31’05
max. Earth dist.	1974 Dec 01 07:57	9°♐18’57	31.28905 AU
retrograde	1975 Mar 14 10:02	11°♐47’46	
opposition	1975 Jun 01 13:03	10°♐25’29	1°36’19
min. Earth dist.	1975 Jun 02 03:12	10°♐24’31	29.28664 AU
direct	1975 Aug 21 14:53	9°♐01’21	
conjunction	1975 Dec 04 07:20	11°♐30’46	1°29’12
minimum elong	1975 Dec 04 07:21	11°♐30’46	1°29’12
max. Earth dist.	1975 Dec 03 17:46	11°♐29’29	31.28266 AU
retrograde	1976 Mar 15 20:39	13°♐58’18	
opposition	1976 Jun 03 01:20	12°♐35’57	1°34’15
min. Earth dist.	1976 Jun 03 13:32	12°♐35’07	29.28041 AU
direct	1976 Aug 23 02:04	11°♐11’49	
conjunction	1976 Dec 05 16:36	13°♐41’09	1°27’12
minimum elong	1976 Dec 05 16:37	13°♐41’09	1°27’12
max. Earth dist.	1976 Dec 05 03:55	13°♐39’57	31.27682 AU
retrograde	1977 Mar 18 07:35	16°♐08’47	
opposition	1977 Jun 05 13:50	14°♐46’22	1°32’02
min. Earth dist.	1977 Jun 06 01:57	14°♐45’32	29.27513 AU
direct	1977 Aug 25 12:07	13°♐22’16	
conjunction	1977 Dec 08 01:48	15°♐51’31	1°25’04
minimum elong	1977 Dec 08 01:48	15°♐51’31	1°25’04
max. Earth dist.	1977 Dec 07 14:40	15°♐50’28	31.27210 AU
retrograde	1978 Mar 20 18:47	18°♐19’15	
opposition	1978 Jun 08 02:11	16°♐56’48	1°29’42
min. Earth dist.	1978 Jun 08 12:35	16°♐56’06	29.27073 AU
direct	1978 Aug 28 00:54	15°♐32’45	
conjunction	1978 Dec 10 11:00	18°♐01’57	1°22’49
minimum elong	1978 Dec 10 11:00	18°♐01’57	1°22’49
max. Earth dist.	1978 Dec 09 23:58	18°♐00’55	31.26819 AU
retrograde	1979 Mar 23 07:35	20°♐29’49	
opposition	1979 Jun 10 14:33	19°♐07’21	1°27’13
min. Earth dist.	1979 Jun 11 00:25	19°♐06’41	29.26719 AU
direct	1979 Aug 30 11:15	17°♐43’22	
conjunction	1979 Dec 12 20:21	20°♐12’33	1°20’26
minimum elong	1979 Dec 12 20:21	20°♐12’33	1°20’26
max. Earth dist.	1979 Dec 12 11:11	20°♐11’41	31.26491 AU
retrograde	1980 Mar 24 17:42	22°♐40’33	
opposition	1980 Jun 12 03:11	21°♐18’05	1°24’37
min. Earth dist.	1980 Jun 12 12:09	21°♐17’28	29.26389 AU
direct	1980 Aug 31 23:38	19°♐54’11	
conjunction	1980 Dec 14 05:26	22°♐23’20	1°17’56
minimum elong	1980 Dec 14 05:26	22°♐23’20	1°17’56
max. Earth dist.	1980 Dec 13 20:06	22°♐22’27	31.26173 AU
retrograde	1981 Mar 27 06:08	24°♐51’29	
opposition	1981 Jun 14 15:51	23°♐29’00	1°21’53
min. Earth dist.	1981 Jun 14 23:46	23°♐28’28	29.26059 AU
direct	1981 Sep 03 11:07	22°♐05’12	
conjunction	1981 Dec 16 14:53	24°♐34’19	1°15’19
minimum elong	1981 Dec 16 14:53	24°♐34’19	1°15’19
max. Earth dist.	1981 Dec 16 07:18	24°♐33’36	31.25813 AU
retrograde	1982 Mar 29 16:38	27°♐02’37	
opposition	1982 Jun 17 04:31	25°♐40’08	1°19’01
min. Earth dist.	1982 Jun 17 12:32	25°♐39’36	29.25658 AU
direct	1982 Sep 05 23:36	24°♐16’24	
conjunction	1982 Dec 19 00:14	26°♐45’29	1°12’35
minimum elong	1982 Dec 19 00:15	26°♐45’29	1°12’36
max. Earth dist.	1982 Dec 18 16:25	26°♐44’45	31.25374 AU
retrograde	1983 Apr 01 04:27	29°♐13’57	
opposition	1983 Jun 19 17:15	27°♐51’27	1°16’03
min. Earth dist.	1983 Jun 19 23:46	27°♐51’00	29.25155 AU
direct	1983 Sep 08 11:00	26°♐27’47	
conjunction	1983 Dec 21 09:41	28°♐56’49	1°09’45
minimum elong	1983 Dec 21 09:41	28°♐56’49	1°09’45
max. Earth dist.	1983 Dec 21 02:52	28°♐56’11	31.24799 AU
	1984 Jan 19 02:55	0°♑	

retrograde	1984 Apr	02	14:04	1°♑25’26	
opposition	1984 Jun	21	06:15	0°♑02’54	1°12’58
min. Earth dist.	1984 Jun	21	13:12	0°♑02’26	29.24510 AU
	1984 Jun	23	01:10	30°♐	
direct	1984 Sep	09	22:13	28°♐39’17	
	1984 Nov	21	13:20	0°♑	
conjunction	1984 Dec	22	19:10	1°♑08’16	1°06’49
minimum elong	1984 Dec	22	19:11	1°♑08’16	1°06’50
max. Earth dist.	1984 Dec	22	12:45	1°♑07’39	31.24093 AU
retrograde	1985 Apr	05	01:26	3°♑37’01	
opposition	1985 Jun	23	19:05	2°♑14’25	1°09’47
min. Earth dist.	1985 Jun	24	00:25	2°♑14’04	29.23723 AU
direct	1985 Sep	12	09:16	0°♑50’49	
conjunction	1985 Dec	25	04:35	3°♑19’44	1°03’48
minimum elong	1985 Dec	25	04:35	3°♑19’44	1°03’48
max. Earth dist.	1985 Dec	24	22:28	3°♑19’10	31.23237 AU
retrograde	1986 Apr	07	12:51	5°♑48’37	
opposition	1986 Jun	26	08:03	4°♑25’57	1°06’30
min. Earth dist.	1986 Jun	26	13:47	4°♑25’34	29.22806 AU
direct	1986 Sep	14	19:39	3°♑02’21	
conjunction	1986 Dec	27	14:04	5°♑31’11	1°00’41
minimum elong	1986 Dec	27	14:04	5°♑31’11	1°00’41
max. Earth dist.	1986 Dec	27	09:16	5°♑30’44	31.22277 AU
retrograde	1987 Apr	10	00:12	8°♑00’10	
opposition	1987 Jun	28	20:47	6°♑37’24	1°03’08
min. Earth dist.	1987 Jun	29	01:04	6°♑37’07	29.21798 AU
direct	1987 Sep	17	08:22	5°♑13’48	
conjunction	1987 Dec	29	23:20	7°♑42’33	0°57’29
minimum elong	1987 Dec	29	23:21	7°♑42’33	0°57’28
max. Earth dist.	1987 Dec	29	18:31	7°♑42’06	31.21262 AU
retrograde	1988 Apr	11	13:17	10°♑11’39	
opposition	1988 Jun	30	09:46	8°♑48’47	0°59’40
min. Earth dist.	1988 Jun	30	13:28	8°♑48’32	29.20793 AU
direct	1988 Sep	18	18:19	7°♑25’11	
conjunction	1988 Dec	31	08:39	9°♑53’51	0°54’12
minimum elong	1988 Dec	31	08:39	9°♑53’51	0°54’12
max. Earth dist.	1988 Dec	31	05:54	9°♑53’35	31.20275 AU
retrograde	1989 Apr	13	23:35	12°♑23’04	
opposition	1989 Jul	02	22:43	11°♑00’07	0°56’07
min. Earth dist.	1989 Jul	03	01:16	10°♑59’57	29.19830 AU
direct	1989 Sep	21	06:53	9°♑36’31	
conjunction	1990 Jan	02	17:55	12°♑05’07	0°50’50
minimum elong	1990 Jan	02	17:56	12°♑05’07	0°50’50
max. Earth dist.	1990 Jan	02	15:12	12°♑04’52	31.19362 AU
retrograde	1990 Apr	16	12:55	14°♑34’28	
opposition	1990 Jul	05	11:27	13°♑11’26	0°52’29
min. Earth dist.	1990 Jul	05	12:38	13°♑11’21	29.18966 AU
direct	1990 Sep	23	18:36	11°♑47’51	
conjunction	1991 Jan	05	03:22	14°♑16’25	0°47’24
minimum elong	1991 Jan	05	03:22	14°♑16’25	0°47’24
max. Earth dist.	1991 Jan	05	02:38	14°♑16’21	31.18539 AU
retrograde	1991 Apr	19	00:11	16°♑45’55	
opposition	1991 Jul	08	00:27	15°♑22’49	0°48’46
min. Earth dist.	1991 Jul	08	01:14	15°♑22’46	29.18179 AU
direct	1991 Sep	26	07:13	13°♑59’18	
conjunction	1992 Jan	07	12:35	16°♑27’48	0°43’53
minimum elong	1992 Jan	07	12:36	16°♑27’48	0°43’53
max. Earth dist.	1992 Jan	07	12:15	16°♑27’46	31.17800 AU
retrograde	1992 Apr	20	12:14	18°♑57’27	
opposition	1992 Jul	09	13:25	17°♑34’20	0°44’58
min. Earth dist.	1992 Jul	09	12:14	17°♑34’25	29.17464 AU
direct	1992 Sep	27	18:35	16°♑10’51	
conjunction	1993 Jan	08	22:03	18°♑39’20	0°40’18
minimum elong	1993 Jan	08	22:03	18°♑39’20	0°40’19
max. Earth dist.	1993 Jan	08	23:01	18°♑39’25	31.17101 AU
retrograde	1993 Apr	22	22:32	21°♑09’09	
opposition	1993 Jul	12	02:31	19°♑45’59	0°41’06
min. Earth dist.	1993 Jul	12	01:26	19°♑46’03	29.16777 AU
direct	1993 Sep	30	06:09	18°♑22’34	
conjunction	1994 Jan	11	07:32	20°♑51’01	0°36’39
minimum elong	1994 Jan	11	07:33	20°♑51’01	0°36’39
max. Earth dist.	1994 Jan	11	09:22	20°♑51’11	31.16421 AU
retrograde	1994 Apr	25	10:36	23°♑21’00	
opposition	1994 Jul	14	15:31	21°♑57’48	0°37’11
min. Earth dist.	1994 Jul	14	12:38	21°♑58’00	29.16069 AU
direct	1994 Oct	02	17:47	20°♑34’26	
conjunction	1995 Jan	13	17:06	23°♑02’51	0°32’57
minimum elong	1995 Jan	13	17:06	23°♑02’51	0°32’57
max. Earth dist.	1995 Jan	13	19:17	23°♑03’03	31.15681 AU
retrograde	1995 Apr	27	22:14	25°♑33’01	
opposition	1995 Jul	17	04:42	24°♑09’46	0°33’12
min. Earth dist.	1995 Jul	17	02:08	24°♑09’57	29.15299 AU
direct	1995 Oct	05	03:56	22°♑46’27	
conjunction	1996 Jan	16	02:54	25°♑14’50	0°29’12
minimum elong	1996 Jan	16	02:54	25°♑14’50	0°29’12
max. Earth dist.	1996 Jan	16	06:28	25°♑15’11	31.14869 AU
retrograde	1996 Apr	29	09:52	27°♑45’11	
opposition	1996 Jul	18	17:55	26°♑21’53	0°29’10
min. Earth dist.	1996 Jul	18	13:59	26°♑22’09	29.14422 AU
direct	1996 Oct	06	15:55	24°♑58’36	
conjunction	1997 Jan	17	12:34	27°♑26’57	0°25’25
minimum elong	1997 Jan	17	12:34	27°♑26’57	0°25’25
max. Earth dist.	1997 Jan	17	15:45	27°♑27’15	31.13932 AU
retrograde	1997 May	01	23:20	29°♑57’28	
opposition	1997 Jul	21	07:15	28°♑34’06	0°25’05
min. Earth dist.	1997 Jul	21	03:09	28°♑34’22	29.13425 AU
direct	1997 Oct	09	01:28	27°♑10’49	
conjunction	1998 Jan	19	22:34	29°♑39’08	0°21’35
minimum elong	1998 Jan	19	22:34	29°♑39’08	0°21’35
max. Earth dist.	1998 Jan	20	03:15	29°♑39’34	31.12863 AU
	1998 Jan	29	02:52	0°♒	
retrograde	1998 May	04	10:39	2°♒09’47	
opposition	1998 Jul	23	20:19	0°♒46’20	0°20’58
min. Earth dist.	1998 Jul	23	15:35	0°♒46’39	29.12281 AU
	1998 Aug	23	00:13	30°♑	
direct	1998 Oct	11	14:03	29°♑23’03	
	1998 Nov	28	01:19	0°♒	
conjunction	1999 Jan	22	08:22	1°♒51’19	0°17’44
minimum elong	1999 Jan	22	08:22	1°♒51’19	0°17’44
max. Earth dist.	1999 Jan	22	12:39	1°♒51’43	31.11675 AU
retrograde	1999 May	07	00:51	4°♒22’06	
opposition	1999 Jul	26	09:32	2°♒58’33	0°16’50
min. Earth dist.	1999 Jul	26	03:52	2°♒58’56	29.11053 AU
direct	1999 Oct	14	01:35	1°♒35’15	
conjunction	2000 Jan	24	18:08	4°♒03’28	0°13’51
minimum elong	2000 Jan	24	18:08	4°♒03’28	0°13’50
behind sun begin	2000 Jan	24	14:40	4°♒03’09	
behind sun end	2000 Jan	24	21:37	4°♒03’47	

max. Earth dist.	2000 Jan 25 00:11	4°♒04’02	31.10414 AU
retrograde	2000 May 08 12:30	6°♒34’24	
opposition	2000 Jul 27 22:49	5°♒10’43	0°12’40
min. Earth dist.	2000 Jul 27 16:54	5°♒11’07	29.09784 AU
direct	2000 Oct 15 14:12	3°♒47’25	
conjunction	2001 Jan 26 03:55	6°♒15’34	0°09’57
minimum elong	2001 Jan 26 03:55	6°♒15’34	0°09’58
behind sun begin	2001 Jan 25 22:41	6°♒15’06	
behind sun end	2001 Jan 26 09:08	6°♒16’03	
max. Earth dist.	2001 Jan 26 10:19	6°♒16’10	31.09168 AU
retrograde	2001 May 11 01:13	8°♒46’38	
opposition	2001 Jul 30 11:48	7°♒22’51	0°08’29
min. Earth dist.	2001 Jul 30 04:04	7°♒23’23	29.08570 AU
direct	2001 Oct 18 01:49	5°♒59’32	
conjunction	2002 Jan 28 13:45	8°♒27’40	0°06’03
minimum elong	2002 Jan 28 13:45	8°♒27’40	0°06’03
behind sun begin	2002 Jan 28 07:39	8°♒27’07	
behind sun end	2002 Jan 28 19:51	8°♒28’13	
max. Earth dist.	2002 Jan 28 21:22	8°♒28’22	31.07984 AU
retrograde	2002 May 13 12:10	10°♒58’52	
opposition	2002 Aug 02 00:57	9°♒35’01	0°04’17
min. Earth dist.	2002 Aug 01 17:08	9°♒35’33	29.07441 AU
direct	2002 Oct 20 13:52	8°♒11’42	
conjunction	2003 Jan 30 23:34	10°♒39’48	0°02’07
minimum elong	2003 Jan 30 23:34	10°♒39’48	0°02’07
behind sun begin	2003 Jan 30 17:11	10°♒39’14	
behind sun end	2003 Jan 31 05:58	10°♒40’23	
max. Earth dist.	2003 Jan 31 08:22	10°♒40’37	31.06917 AU
retrograde	2003 May 16 00:46	13°♒11’10	
opposition	2003 Aug 04 13:54	11°♒47’15	0°00’05
min. Earth dist.	2003 Aug 04 03:57	11°♒47’56	29.06429 AU
desc. node	2003 Aug 11 05:47	11°♒36’25	
direct	2003 Oct 23 01:54	10°♒23’58	
conjunction	2004 Feb 02 09:29	12°♒52’04	0°-1’-55
minimum elong	2004 Feb 02 09:29	12°♒52’04	0°01’57
behind sun begin	2004 Feb 02 03:05	12°♒51’29	
behind sun end	2004 Feb 02 15:53	12°♒52’38	
max. Earth dist.	2004 Feb 02 18:51	12°♒52’56	31.05962 AU
retrograde	2004 May 17 12:13	15°♒23’37	
opposition	2004 Aug 06 03:08	13°♒59’38	0°-4’-7
min. Earth dist.	2004 Aug 05 17:08	14°♒00’19	29.05539 AU
direct	2004 Oct 24 11:56	12°♒36’24	
conjunction	2005 Feb 03 19:28	15°♒04’29	0°-5’-52
minimum elong	2005 Feb 03 19:29	15°♒04’29	0°05’53
behind sun begin	2005 Feb 03 13:21	15°♒03’55	
behind sun end	2005 Feb 04 01:37	15°♒05’02	
max. Earth dist.	2005 Feb 04 06:42	15°♒05’32	31.05123 AU
retrograde	2005 May 19 23:35	17°♒36’13	
opposition	2005 Aug 08 16:11	16°♒12’12	0°-8’-20
min. Earth dist.	2005 Aug 08 04:32	16°♒13’00	29.04732 AU
direct	2005 Oct 26 23:24	14°♒49’01	
conjunction	2006 Feb 06 05:33	17°♒17’06	0°-9’-47
minimum elong	2006 Feb 06 05:33	17°♒17’06	0°09’48
behind sun begin	2006 Feb 06 00:16	17°♒16’38	
behind sun end	2006 Feb 06 10:49	17°♒17’35	
max. Earth dist.	2006 Feb 06 16:36	17°♒18’08	31.04347 AU
retrograde	2006 May 22 13:05	19°♒49’01	
opposition	2006 Aug 11 05:14	18°♒24’59	0°-12’-32
min. Earth dist.	2006 Aug 10 17:18	18°♒25’48	29.03985 AU
direct	2006 Oct 29 07:56	17°♒01’50	

conjunction	2007 Feb 08 15:52	19°♒29’57	0°-13’-42
minimum elong	2007 Feb 08 15:52	19°♒29’57	0°13’42
behind sun begin	2007 Feb 08 12:19	19°♒29’37	
behind sun end	2007 Feb 08 19:25	19°♒30’16	
max. Earth dist.	2007 Feb 09 04:43	19°♒31’09	31.03604 AU
retrograde	2007 May 25 01:08	22°♒02’03	
opposition	2007 Aug 13 18:25	20°♒37’59	0°-16’-43
min. Earth dist.	2007 Aug 13 05:39	20°♒38’51	29.03236 AU
direct	2007 Oct 31 20:07	19°♒14’53	
conjunction	2008 Feb 11 02:04	21°♒43’00	0°-17’-36
minimum elong	2008 Feb 11 02:03	21°♒43’00	0°17’37
max. Earth dist.	2008 Feb 11 14:36	21°♒44’10	31.02846 AU
retrograde	2008 May 26 16:14	24°♒15’17	
opposition	2008 Aug 15 07:43	22°♒51’10	0°-20’-53
min. Earth dist.	2008 Aug 14 18:10	22°♒52’05	29.02459 AU
direct	2008 Nov 02 06:38	21°♒28’06	
conjunction	2009 Feb 12 12:41	23°♒56’13	0°-21’-29
minimum elong	2009 Feb 12 12:41	23°♒56’13	0°21’29
max. Earth dist.	2009 Feb 13 02:35	23°♒57’32	31.02018 AU
retrograde	2009 May 29 04:30	26°♒28’40	
opposition	2009 Aug 17 20:55	25°♒04’30	0°-25’-2
min. Earth dist.	2009 Aug 17 07:34	25°♒05’25	29.01586 AU
direct	2009 Nov 04 18:10	23°♒41’27	
conjunction	2010 Feb 14 23:19	26°♒09’34	0°-25’-20
minimum elong	2010 Feb 14 23:19	26°♒09’34	0°25’21
max. Earth dist.	2010 Feb 15 13:02	26°♒10’52	31.01097 AU
retrograde	2010 May 31 18:48	28°♒42’09	
opposition	2010 Aug 20 10:07	27°♒17’54	0°-29’-8
min. Earth dist.	2010 Aug 19 19:32	27°♒18’54	29.00607 AU
direct	2010 Nov 07 06:04	25°♒54’50	
conjunction	2011 Feb 17 09:56	28°♒22’57	0°-29’-9
minimum elong	2011 Feb 17 09:56	28°♒22’57	0°29’10
max. Earth dist.	2011 Feb 18 00:13	28°♒24’18	31.00052 AU
	2011 Apr 04 13:51	0°♓	
retrograde	2011 Jun 03 07:28	0°♓55’39	
	2011 Aug 05 02:53	30°♒	
opposition	2011 Aug 22 23:26	29°♒31’18	0°-33’-12
min. Earth dist.	2011 Aug 22 09:20	29°♒32’16	28.99521 AU
direct	2011 Nov 09 18:54	28°♒08’13	
	2012 Feb 03 19:03	0°♓	
conjunction	2012 Feb 19 20:41	0°♓36’17	0°-32’-55
minimum elong	2012 Feb 19 20:40	0°♓36’17	0°32’57
max. Earth dist.	2012 Feb 20 11:43	0°♓37’42	30.98943 AU
retrograde	2012 Jun 04 21:04	3°♓09’05	
opposition	2012 Aug 24 12:32	1°♓44’38	0°-37’-12
min. Earth dist.	2012 Aug 23 20:49	1°♓45’43	28.98393 AU
direct	2012 Nov 11 07:52	0°♓21’31	
conjunction	2013 Feb 21 07:19	2°♓49’32	0°-36’-39
minimum elong	2013 Feb 21 07:18	2°♓49’32	0°36’40
max. Earth dist.	2013 Feb 21 22:31	2°♓50’58	30.97808 AU
retrograde	2013 Jun 07 08:25	5°♓22’27	
min. Earth dist.	2013 Aug 26 10:22	3°♓58’57	28.97285 AU
opposition	2013 Aug 27 01:43	3°♓57’54	0°-41’-10
direct	2013 Nov 13 18:42	2°♓34’44	
conjunction	2014 Feb 23 18:11	5°♓02’43	0°-40’-19
minimum elong	2014 Feb 23 18:11	5°♓02’43	0°40’20
max. Earth dist.	2014 Feb 24 11:00	5°♓04’19	30.96727 AU
retrograde	2014 Jun 09 19:50	7°♓35’44	
opposition	2014 Aug 29 14:33	6°♓11’06	0°-45’-4
min. Earth dist.	2014 Aug 28 21:42	6°♓12’15	28.96247 AU

direct	2014 Nov 16 07:06	4°♓47’55		
conjunction	2015 Feb 26 04:55	7°♓15’54	0°-43’-56	
minimum elong	2015 Feb 26 04:54	7°♓15’54	0°43’56	
max. Earth dist.	2015 Feb 26 21:31	7°♓17’28	30.95741 AU	
retrograde	2015 Jun 12 09:08	9°♓49’02		
min. Earth dist.	2015 Aug 31 10:28	8°♓25’30	28.95335 AU	
opposition	2015 Sep 01 03:38	8°♓24’19	0°-48’-54	
direct	2015 Nov 18 16:31	7°♓01’08		
conjunction	2016 Feb 28 15:47	9°♓29’07	0°-47’-29	
minimum elong	2016 Feb 28 15:47	9°♓29’07	0°47’30	
max. Earth dist.	2016 Feb 29 10:18	9°♓30’52	30.94884 AU	
retrograde	2016 Jun 13 20:42	12°♓02’24		
opposition	2016 Sep 02 16:38	10°♓37’37	0°-52’-39	
min. Earth dist.	2016 Sep 01 22:27	10°♓38’53	28.94541 AU	
direct	2016 Nov 20 04:38	9°♓14’28		
conjunction	2017 Mar 02 02:44	11°♓42’27	0°-50’-58	
minimum elong	2017 Mar 02 02:44	11°♓42’27	0°50’58	
max. Earth dist.	2017 Mar 02 21:01	11°♓44’11	30.94156 AU	
retrograde	2017 Jun 16 11:10	14°♓15’53		
min. Earth dist.	2017 Sep 04 10:28	12°♓52’23	28.93878 AU	
opposition	2017 Sep 05 05:27	12°♓51’04	0°-56’-21	
direct	2017 Nov 22 14:20	11°♓27’56		
conjunction	2018 Mar 04 13:54	13°♓55’58	0°-54’-22	
minimum elong	2018 Mar 04 13:54	13°♓55’58	0°54’24	
max. Earth dist.	2018 Mar 05 09:42	13°♓57’51	30.93528 AU	
retrograde	2018 Jun 18 23:26	16°♓29’33		
opposition	2018 Sep 07 18:27	15°♓04’44	0°-59’-57	
min. Earth dist.	2018 Sep 06 23:26	15°♓06’02	28.93292 AU	
direct	2018 Nov 25 01:08	13°♓41’38		
conjunction	2019 Mar 07 01:00	16°♓09’43	0°-57’-42	
minimum elong	2019 Mar 07 01:00	16°♓09’43	0°57’43	
max. Earth dist.	2019 Mar 07 20:55	16°♓11’36	30.92980 AU	
retrograde	2019 Jun 21 14:35	18°♓43’27		
min. Earth dist.	2019 Sep 09 11:07	17°♓20’01	28.92767 AU	
opposition	2019 Sep 10 07:24	17°♓18’37	-1°-3’-28	
direct	2019 Nov 27 12:32	15°♓55’34		
conjunction	2020 Mar 08 12:23	18°♓23’42	-1°00’-57	
minimum elong	2020 Mar 08 12:23	18°♓23’42	1°00’59	
max. Earth dist.	2020 Mar 09 08:53	18°♓25’39	30.92450 AU	
retrograde	2020 Jun 23 04:31	20°♓57’36		
opposition	2020 Sep 11 20:26	19°♓32’46	-1°-6’-53	
min. Earth dist.	2020 Sep 11 00:50	19°♓34’07	28.92241 AU	
direct	2020 Nov 29 00:36	18°♓09’45		
conjunction	2021 Mar 11 00:01	20°♓37’57	-1°-4’-6	
minimum elong	2021 Mar 11 00:01	20°♓37’57	1°04’07	
max. Earth dist.	2021 Mar 11 20:58	20°♓39’56	30.91906 AU	
retrograde	2021 Jun 25 19:21	23°♓11’59		
opposition	2021 Sep 14 09:21	21°♓47’08	-1°-10’-13	
min. Earth dist.	2021 Sep 13 12:34	21°♓48’34	28.91660 AU	
direct	2021 Dec 01 13:22	20°♓24’09		
conjunction	2022 Mar 13 11:43	22°♓52’24	-1°-7’-10	
minimum elong	2022 Mar 13 11:43	22°♓52’23	1°07’11	
max. Earth dist.	2022 Mar 14 08:12	22°♓54’20	30.91265 AU	
retrograde	2022 Jun 28 07:55	25°♓26’33		
opposition	2022 Sep 16 22:21	24°♓01’41	-1°-13’-26	
min. Earth dist.	2022 Sep 16 02:33	24°♓03’03	28.90978 AU	
direct	2022 Dec 04 00:14	22°♓38’42		
conjunction	2023 Mar 15 23:39	25°♓06’58	-1°-10’-8	
minimum elong	2023 Mar 15 23:39	25°♓06’58	1°10’08	
max. Earth dist.	2023 Mar 16 21:04	25°♓09’00	30.90527 AU	
retrograde	2023 Jun 30 21:07	27°♓41’13		
opposition	2023 Sep 19 11:17	26°♓16’17	-1°-16’-33	
min. Earth dist.	2023 Sep 18 14:37	26°♓17’43	28.90182 AU	
direct	2023 Dec 06 13:22	24°♓53’17		
conjunction	2024 Mar 17 11:22	27°♓21’34	-1°-12’-59	
minimum elong	2024 Mar 17 11:22	27°♓21’34	1°13’00	
max. Earth dist.	2024 Mar 18 07:53	27°♓23’31	30.89687 AU	
retrograde	2024 Jul 02 10:41	29°♓55’55		
min. Earth dist.	2024 Sep 20 04:06	28°♓32’18	28.89315 AU	
opposition	2024 Sep 21 00:16	28°♓30’54	-1°-19’-33	
direct	2024 Dec 07 23:43	27°♓07’52		
conjunction	2025 Mar 19 23:25	29°♓36’08	-1°-15’-44	
minimum elong	2025 Mar 19 23:25	29°♓36’08	1°15’44	
max. Earth dist.	2025 Mar 20 21:10	29°♓38’12	30.88792 AU	
	2025 Mar 30 12:00	0°♈		
retrograde	2025 Jul 04 21:33	2°♈10’32		
opposition	2025 Sep 23 12:53	0°♈45’27	-1°-22’-25	
min. Earth dist.	2025 Sep 22 16:17	0°♈46’53	28.88416 AU	
	2025 Oct 22 09:46	30°♓		
direct	2025 Dec 10 12:24	29°♓22’21		
	2026 Jan 26 17:38	0°♈		
conjunction	2026 Mar 22 11:18	1°♈50’38	-1°-18’-22	
minimum elong	2026 Mar 22 11:18	1°♈50’38	1°18’23	
max. Earth dist.	2026 Mar 23 08:22	1°♈52’37	30.87908 AU	
retrograde	2026 Jul 07 10:54	4°♈25’05		
min. Earth dist.	2026 Sep 25 04:36	3°♈01’23	28.87568 AU	
opposition	2026 Sep 26 01:36	2°♈59’55	-1°-25’-10	
direct	2026 Dec 12 22:18	1°♈36’46		
conjunction	2027 Mar 24 23:12	4°♈05’03	-1°-20’-52	
minimum elong	2027 Mar 24 23:12	4°♈05’03	1°20’53	
max. Earth dist.	2027 Mar 25 21:36	4°♈07’11	30.87085 AU	
retrograde	2027 Jul 09 22:41	6°♈39’34		
opposition	2027 Sep 28 14:18	5°♈14’20	-1°-27’-48	
min. Earth dist.	2027 Sep 27 17:22	5°♈15’48	28.86800 AU	
direct	2027 Dec 15 09:06	3°♈51’09		
conjunction	2028 Mar 26 11:15	6°♈19’27	-1°-23’-16	
minimum elong	2028 Mar 26 11:15	6°♈19’27	1°23’17	
max. Earth dist.	2028 Mar 27 09:34	6°♈21’34	30.86382 AU	
retrograde	2028 Jul 11 13:03	8°♈54’01		
min. Earth dist.	2028 Sep 29 04:47	7°♈30’16	28.86167 AU	
opposition	2028 Sep 30 02:48	7°♈28’44	-1°-30’-17	
direct	2028 Dec 16 20:43	6°♈05’31		
conjunction	2029 Mar 28 23:25	8°♈33’51	-1°-25’-32	
minimum elong	2029 Mar 28 23:24	8°♈33’51	1°25’32	
max. Earth dist.	2029 Mar 29 22:16	8°♈36’00	30.85797 AU	
retrograde	2029 Jul 14 02:09	11°♈08’28		
opposition	2029 Oct 02 15:24	9°♈43’09	-1°-32’-38	
min. Earth dist.	2029 Oct 01 17:56	9°♈44’39	28.85653 AU	
direct	2029 Dec 19 08:23	8°♈19’55		
conjunction	2030 Mar 31 11:38	10°♈48’17	-1°-27’-40	
minimum elong	2030 Mar 31 11:38	10°♈48’17	1°27’41	
max. Earth dist.	2030 Apr 01 11:01	10°♈50’30	30.85349 AU	
retrograde	2030 Jul 16 16:28	13°♈22’59		
min. Earth dist.	2030 Oct 04 04:58	11°♈59’14	28.85260 AU	
opposition	2030 Oct 05 03:45	11°♈57’38	-1°-34’-51	
direct	2030 Dec 21 20:39	10°♈34’24		
conjunction	2031 Apr 02 23:54	13°♈02’50	-1°-29’-40	

minimum elong	2031 Apr 02 23:54	13°♈02’50	1°29’41
max. Earth dist.	2031 Apr 03 23:05	13°♈05’01	30.85003 AU
retrograde	2031 Jul 19 06:11	15°♈37’35	
opposition	2031 Oct 07 16:21	14°♈12’15	-1°-36’-55
min. Earth dist.	2031 Oct 06 18:23	14°♈13’46	28.84970 AU
direct	2031 Dec 24 07:40	12°♈49’01	
conjunction	2032 Apr 04 12:24	15°♈17’30	-1°-31’-32
minimum elong	2032 Apr 04 12:23	15°♈17’30	1°31’34
max. Earth dist.	2032 Apr 05 12:38	15°♈19’48	30.84746 AU
retrograde	2032 Jul 20 20:42	17°♈52’19	
min. Earth dist.	2032 Oct 08 06:00	16°♈28’35	28.84726 AU
opposition	2032 Oct 09 04:44	16°♈26’59	-1°-38’-50
direct	2032 Dec 25 21:01	15°♈03’47	
conjunction	2033 Apr 07 01:01	17°♈32’20	-1°-33’-16
minimum elong	2033 Apr 07 01:01	17°♈32’20	1°33’16
max. Earth dist.	2033 Apr 08 00:10	17°♈34’31	30.84504 AU
retrograde	2033 Jul 23 10:25	20°♈07’13	
opposition	2033 Oct 11 17:06	18°♈41’54	-1°-40’-36
min. Earth dist.	2033 Oct 10 19:14	18°♈43’25	28.84484 AU
direct	2033 Dec 28 07:35	17°♈18’41	
conjunction	2034 Apr 09 13:56	19°♈47’18	-1°-34’-51
minimum elong	2034 Apr 09 13:56	19°♈47’18	1°34’52
max. Earth dist.	2034 Apr 10 13:55	19°♈49’34	30.84229 AU
retrograde	2034 Jul 25 22:30	22°♈22’14	
min. Earth dist.	2034 Oct 13 07:33	20°♈58’27	28.84173 AU
opposition	2034 Oct 14 05:29	20°♈56’55	-1°-42’-13
direct	2034 Dec 30 20:08	19°♈33’42	
conjunction	2035 Apr 12 02:39	22°♈02’23	-1°-36’-17
minimum elong	2035 Apr 12 02:39	22°♈02’23	1°36’17
max. Earth dist.	2035 Apr 13 01:17	22°♈04’31	30.83879 AU
retrograde	2035 Jul 28 12:27	24°♈37’21	
opposition	2035 Oct 16 17:57	23°♈12’01	-1°-43’-41
min. Earth dist.	2035 Oct 15 20:16	23°♈13’32	28.83782 AU
direct	2036 Jan 02 06:32	21°♈48’45	
conjunction	2036 Apr 13 15:47	24°♈17’29	-1°-37’-35
minimum elong	2036 Apr 13 15:47	24°♈17’29	1°37’36
max. Earth dist.	2036 Apr 14 14:59	24°♈19’40	30.83434 AU
retrograde	2036 Jul 30 00:18	26°♈52’28	
min. Earth dist.	2036 Oct 17 09:18	25°♈28’34	28.83298 AU
opposition	2036 Oct 18 06:12	25°♈27’06	-1°-44’-59
direct	2037 Jan 03 17:44	24°♈03’48	
conjunction	2037 Apr 16 04:49	26°♈32’33	-1°-38’-44
minimum elong	2037 Apr 16 04:49	26°♈32’33	1°38’44
max. Earth dist.	2037 Apr 17 03:08	26°♈34’39	30.82935 AU
retrograde	2037 Aug 01 13:56	29°♈07’31	
opposition	2037 Oct 20 18:21	27°♈42’07	-1°-46’-8
min. Earth dist.	2037 Oct 19 21:04	27°♈43’36	28.82784 AU
direct	2038 Jan 06 05:32	26°♈18’44	
conjunction	2038 Apr 18 17:47	28°♈47’32	-1°-39’-43
minimum elong	2038 Apr 18 17:47	28°♈47’32	1°39’45
max. Earth dist.	2038 Apr 19 16:13	28°♈49’39	30.82410 AU
	2038 May 22 00:18	0°♉	
retrograde	2038 Aug 04 01:56	1°♉22’30	
	2038 Oct 21 12:18	30°♈	
min. Earth dist.	2038 Oct 22 10:13	29°♈58’28	28.82284 AU
opposition	2038 Oct 23 06:29	29°♈57’03	-1°-47’-7
direct	2039 Jan 08 16:59	28°♈33’37	
	2039 Mar 23 20:41	0°♉	
conjunction	2039 Apr 21 06:52	1°♉02’27	-1°-40’-34
minimum elong	2039 Apr 21 06:51	1°♉02’27	1°40’35
max. Earth dist.	2039 Apr 22 05:21	1°♉04’34	30.81953 AU
retrograde	2039 Aug 06 15:57	3°♉37’23	
opposition	2039 Oct 25 18:23	2°♉11’54	-1°-47’-57
min. Earth dist.	2039 Oct 24 21:08	2°♉13’24	28.81871 AU
direct	2040 Jan 11 05:08	0°♉48’25	
conjunction	2040 Apr 22 19:52	3°♉17’18	-1°-41’-16
minimum elong	2040 Apr 22 19:52	3°♉17’18	1°41’17
max. Earth dist.	2040 Apr 23 17:54	3°♉19’22	30.81588 AU
retrograde	2040 Aug 08 05:24	5°♉52’13	
min. Earth dist.	2040 Oct 26 10:10	4°♉28’08	28.81578 AU
opposition	2040 Oct 27 06:23	4°♉26’43	-1°-48’-36
direct	2041 Jan 12 16:36	3°♉03’11	
conjunction	2041 Apr 25 09:08	5°♉32’07	-1°-41’-48
minimum elong	2041 Apr 25 09:08	5°♉32’07	1°41’48
max. Earth dist.	2041 Apr 26 07:58	5°♉34’17	30.81364 AU
retrograde	2041 Aug 10 19:55	8°♉07’01	
opposition	2041 Oct 29 18:01	6°♉41’31	-1°-49’-6
min. Earth dist.	2041 Oct 28 21:01	6°♉43’00	28.81423 AU
direct	2042 Jan 15 06:18	5°♉17’57	
conjunction	2042 Apr 27 22:14	7°♉46’58	-1°-42’-11
minimum elong	2042 Apr 27 22:14	7°♉46’58	1°42’13
max. Earth dist.	2042 Apr 28 20:05	7°♉49’02	30.81286 AU
retrograde	2042 Aug 13 09:09	10°♉21’51	
min. Earth dist.	2042 Oct 31 09:33	8°♉57’48	28.81430 AU
opposition	2042 Nov 01 05:55	8°♉56’22	-1°-49’-25
direct	2043 Jan 17 17:04	7°♉32’48	
conjunction	2043 Apr 30 11:27	10°♉01’52	-1°-42’-25
minimum elong	2043 Apr 30 11:27	10°♉01’52	1°42’25
max. Earth dist.	2043 May 01 10:23	10°♉04’02	30.81365 AU
retrograde	2043 Aug 15 21:56	12°♉36’45	
opposition	2043 Nov 03 17:41	11°♉11’18	-1°-49’-35
min. Earth dist.	2043 Nov 02 21:03	11°♉12’45	28.81569 AU
direct	2044 Jan 20 05:44	9°♉47’44	
conjunction	2044 May 02 00:48	12°♉16’53	-1°-42’-29
minimum elong	2044 May 02 00:48	12°♉16’53	1°42’31
max. Earth dist.	2044 May 02 22:29	12°♉18’56	30.81573 AU
retrograde	2044 Aug 17 12:37	14°♉51’45	
min. Earth dist.	2044 Nov 04 08:58	13°♉27’47	28.81827 AU
opposition	2044 Nov 05 05:19	13°♉26’21	-1°-49’-34
direct	2045 Jan 21 16:16	12°♉02’47	
conjunction	2045 May 04 14:26	14°♉32’03	-1°-42’-24
minimum elong	2045 May 04 14:26	14°♉32’03	1°42’25
max. Earth dist.	2045 May 05 12:45	14°♉34’09	30.81855 AU
retrograde	2045 Aug 20 00:17	17°♉06’53	
opposition	2045 Nov 07 17:03	15°♉41’33	-1°-49’-23
min. Earth dist.	2045 Nov 06 21:33	15°♉42’56	28.82122 AU
direct	2046 Jan 24 03:35	14°♉18’00	
conjunction	2046 May 07 03:58	16°♉47’19	-1°-42’-9
minimum elong	2046 May 07 03:58	16°♉47’19	1°42’11
max. Earth dist.	2046 May 08 01:07	16°♉49’19	30.82159 AU
retrograde	2046 Aug 22 13:24	19°♉22’09	
min. Earth dist.	2046 Nov 09 09:09	17°♉58’14	28.82412 AU
opposition	2046 Nov 10 04:43	17°♉56’52	-1°-49’-2
direct	2047 Jan 26 14:52	16°♉33’17	
conjunction	2047 May 09 17:46	19°♉02’42	-1°-41’-45
minimum elong	2047 May 09 17:46	19°♉02’42	1°41’46
max. Earth dist.	2047 May 10 14:36	19°♉04’39	30.82412 AU
retrograde	2047 Aug 25 01:14	21°♉37’28	

opposition	2047 Nov 12 16:27	20°♉12’13	-1°-48’-31
min. Earth dist.	2047 Nov 11 22:26	20°♉13’29	28.82630 AU
direct	2048 Jan 29 01:24	18°♉48’37	
conjunction	2048 May 11 07:40	21°♉18’05	-1°-41’-12
minimum elong	2048 May 11 07:40	21°♉18’05	1°41’13
max. Earth dist.	2048 May 12 03:39	21°♉19’58	30.82598 AU
retrograde	2048 Aug 26 14:59	23°♉52’47	
min. Earth dist.	2048 Nov 13 09:42	22°♉28’50	28.82763 AU
opposition	2048 Nov 14 04:01	22°♉27’33	-1°-47’-50
direct	2049 Jan 30 13:23	21°♉03’52	
conjunction	2049 May 13 21:32	23°♉33’23	-1°-40’-29
minimum elong	2049 May 13 21:32	23°♉33’23	1°40’29
max. Earth dist.	2049 May 14 16:21	23°♉35’09	30.82688 AU
retrograde	2049 Aug 29 03:11	26°♉07’59	
opposition	2049 Nov 16 15:32	24°♉42’45	-1°-47’00
min. Earth dist.	2049 Nov 15 22:53	24°♉43’56	28.82826 AU
direct	2050 Feb 02 01:12	23°♉19’01	
conjunction	2050 May 16 11:28	25°♉48’34	-1°-39’-37
minimum elong	2050 May 16 11:28	25°♉48’34	1°39’39
max. Earth dist.	2050 May 17 06:22	25°♉50’20	30.82745 AU
retrograde	2050 Aug 31 16:34	28°♉23’03	
min. Earth dist.	2050 Nov 18 09:58	26°♉59’00	28.82871 AU
opposition	2050 Nov 19 02:53	26°♉57’48	-1°-46’00
direct	2051 Feb 04 14:58	25°♉33’59	
conjunction	2051 May 19 01:08	28°♉03’34	-1°-38’-37
minimum elong	2051 May 19 01:08	28°♉03’34	1°38’37
max. Earth dist.	2051 May 19 18:36	28°♉05’12	30.82804 AU
	2051 Jul 16 12:05	0°♊	
retrograde	2051 Sep 03 05:38	0°♊37’56	
	2051 Oct 22 23:36	30°♉	
opposition	2051 Nov 21 14:17	29°♉12’41	-1°-44’-50
min. Earth dist.	2051 Nov 20 22:33	29°♉13’48	28.82958 AU
direct	2052 Feb 07 02:10	27°♉48’47	
	2052 May 12 10:16	0°♊	
conjunction	2052 May 20 15:08	0°♊18’25	-1°-37’-27
minimum elong	2052 May 20 15:08	0°♊18’25	1°37’28
max. Earth dist.	2052 May 21 09:11	0°♊20’06	30.82925 AU
retrograde	2052 Sep 04 18:30	2°♊52’39	
min. Earth dist.	2052 Nov 22 09:43	1°♊28’31	28.83114 AU
opposition	2052 Nov 23 01:21	1°♊27’25	-1°-43’-31
direct	2053 Feb 08 15:35	0°♊03’28	
conjunction	2053 May 23 04:58	2°♊33’08	-1°-36’-9
minimum elong	2053 May 23 04:58	2°♊33’08	1°36’09
max. Earth dist.	2053 May 23 21:25	2°♊34’41	30.83143 AU
retrograde	2053 Sep 07 08:46	5°♊07’16	
opposition	2053 Nov 25 12:33	3°♊42’03	-1°-42’-2
min. Earth dist.	2053 Nov 24 21:15	3°♊43’08	28.83398 AU
direct	2054 Feb 11 03:05	2°♊18’03	
conjunction	2054 May 25 18:47	4°♊47’47	-1°-34’-41
minimum elong	2054 May 25 18:47	4°♊47’47	1°34’43
max. Earth dist.	2054 May 26 11:55	4°♊49’23	30.83487 AU
retrograde	2054 Sep 09 19:51	7°♊21’49	
opposition	2054 Nov 27 23:42	5°♊56’38	-1°-40’-24
min. Earth dist.	2054 Nov 27 09:04	5°♊57’40	28.83809 AU
direct	2055 Feb 13 15:02	4°♊32’36	
conjunction	2055 May 28 08:39	7°♊02’24	-1°-33’-6
minimum elong	2055 May 28 08:39	7°♊02’24	1°33’07
max. Earth dist.	2055 May 29 00:36	7°♊03’54	30.83986 AU
retrograde	2055 Sep 12 09:04	9°♊36’20	

opposition	2055 Nov 30 10:41	8°♊11’14	-1°-38’-37
min. Earth dist.	2055 Nov 29 19:50	8°♊12’17	28.84376 AU
direct	2056 Feb 16 02:08	6°♊47’11	
conjunction	2056 May 29 22:41	9°♊17’05	-1°-31’-21
minimum elong	2056 May 29 22:41	9°♊17’05	1°31’23
max. Earth dist.	2056 May 30 14:39	9°♊18’35	30.84614 AU
retrograde	2056 Sep 13 20:46	11°♊50’56	
opposition	2056 Dec 01 21:48	10°♊25’55	-1°-36’-41
min. Earth dist.	2056 Dec 01 08:19	10°♊26’53	28.85056 AU
direct	2057 Feb 17 12:14	9°♊01’53	
conjunction	2057 Jun 01 12:43	11°♊31’52	-1°-29’-28
minimum elong	2057 Jun 01 12:44	11°♊31’52	1°29’28
max. Earth dist.	2057 Jun 02 03:53	11°♊33’18	30.85351 AU
retrograde	2057 Sep 16 09:52	14°♊05’39	
opposition	2057 Dec 04 08:39	12°♊40’44	-1°-34’-35
min. Earth dist.	2057 Dec 03 18:50	12°♊41’43	28.85813 AU
direct	2058 Feb 19 23:28	11°♊16’42	
conjunction	2058 Jun 04 02:49	13°♊46’48	-1°-27’-26
minimum elong	2058 Jun 04 02:49	13°♊46’48	1°27’28
max. Earth dist.	2058 Jun 04 16:58	13°♊48’08	30.86121 AU
retrograde	2058 Sep 18 21:35	16°♊20’31	
opposition	2058 Dec 06 19:45	14°♊55’42	-1°-32’-21
min. Earth dist.	2058 Dec 06 07:41	14°♊56’33	28.86585 AU
direct	2059 Feb 22 10:32	13°♊31’40	
conjunction	2059 Jun 06 17:02	16°♊01’52	-1°-25’-17
minimum elong	2059 Jun 06 17:02	16°♊01’52	1°25’17
max. Earth dist.	2059 Jun 07 06:50	16°♊03’10	30.86879 AU
retrograde	2059 Sep 21 10:43	18°♊35’29	
opposition	2059 Dec 09 06:42	17°♊10’45	-1°-29’-58
min. Earth dist.	2059 Dec 08 18:46	17°♊11’36	28.87294 AU
direct	2060 Feb 24 23:37	15°♊46’42	
conjunction	2060 Jun 08 07:21	18°♊17’00	-1°-23’00
minimum elong	2060 Jun 08 07:21	18°♊17’00	1°23’01
max. Earth dist.	2060 Jun 08 19:08	18°♊18’06	30.87542 AU
retrograde	2060 Sep 22 23:44	20°♊50’30	
opposition	2060 Dec 10 17:41	19°♊25’50	-1°-27’-27
min. Earth dist.	2060 Dec 10 07:26	19°♊26’33	28.87908 AU
direct	2061 Feb 26 10:23	18°♊01’44	
conjunction	2061 Jun 10 21:48	20°♊32’07	-1°-20’-35
minimum elong	2061 Jun 10 21:48	20°♊32’07	1°20’36
max. Earth dist.	2061 Jun 11 09:28	20°♊33’12	30.88106 AU
retrograde	2061 Sep 25 12:51	23°♊05’27	
opposition	2061 Dec 13 04:36	21°♊40’50	-1°-24’-49
min. Earth dist.	2061 Dec 12 18:57	21°♊41’31	28.88410 AU
direct	2062 Mar 01 00:24	20°♊16’42	
conjunction	2062 Jun 13 11:50	22°♊47’07	-1°-18’-3
minimum elong	2062 Jun 13 11:50	22°♊47’07	1°18’05
max. Earth dist.	2062 Jun 13 21:19	22°♊48’00	30.88579 AU
retrograde	2062 Sep 28 02:45	25°♊20’18	
opposition	2062 Dec 15 15:28	23°♊55’42	-1°-22’-3
min. Earth dist.	2062 Dec 15 06:39	23°♊56’20	28.88854 AU
direct	2063 Mar 03 12:59	22°♊31’29	
conjunction	2063 Jun 16 02:09	25°♊01’57	-1°-15’-25
minimum elong	2063 Jun 16 02:09	25°♊01’57	1°15’26
max. Earth dist.	2063 Jun 16 11:45	25°♊02’50	30.89003 AU
retrograde	2063 Sep 30 13:39	27°♊34’57	
opposition	2063 Dec 18 02:09	26°♊10’23	-1°-19’-10
min. Earth dist.	2063 Dec 17 18:34	26°♊10’55	28.89263 AU
direct	2064 Mar 05 01:39	24°♊46’05	

conjunction	2064 Jun 17	16:17	27°♊16’34	-1°-12’-40	
minimum elong	2064 Jun 17	16:17	27°♊16’34	1°12’41	
max. Earth dist.	2064 Jun 18	00:07	27°♊17’18	30.89430 AU	
retrograde	2064 Oct 02	03:05	29°♊49’24		
opposition	2064 Dec 19	12:44	28°♊24’51	-1°-16’-10	
min. Earth dist.	2064 Dec 19	05:17	28°♊25’23	28.89702 AU	
direct	2065 Mar 07	13:47	27°♊00’28		
conjunction	2065 Jun 20	06:22	29°♊30’59	-1°-9’-48	
minimum elong	2065 Jun 20	06:22	29°♊30’59	1°09’49	
max. Earth dist.	2065 Jun 20	14:07	29°♊31’43	30.89889 AU	
	2065 Jul 03	07:20	0°♋		
retrograde	2065 Oct 04	14:10	2°♋03’38		
opposition	2065 Dec 21	23:22	0°♋39’07	-1°-13’-3	
min. Earth dist.	2065 Dec 21	17:23	0°♋39’32	28.90201 AU	
	2066 Jan 14	20:50	30°♊		
direct	2066 Mar 10	00:46	29°♊14’40		
	2066 May 01	21:57	0°♋		
conjunction	2066 Jun 22	20:20	1°♋45’12	-1°-6’-51	
minimum elong	2066 Jun 22	20:21	1°♋45’12	1°06’52	
max. Earth dist.	2066 Jun 23	03:07	1°♋45’50	30.90452 AU	
retrograde	2066 Oct 07	01:50	4°♋17’40		
opposition	2066 Dec 24	09:46	2°♋53’11	-1°-9’-50	
min. Earth dist.	2066 Dec 24	03:18	2°♋53’39	28.90817 AU	
direct	2067 Mar 12	12:40	1°♋28’41		
conjunction	2067 Jun 25	10:15	3°♋59’15	-1°-3’-47	
minimum elong	2067 Jun 25	10:15	3°♋59’15	1°03’48	
max. Earth dist.	2067 Jun 25	16:16	3°♋59’49	30.91128 AU	
retrograde	2067 Oct 09	12:00	6°♋31’33		
opposition	2067 Dec 26	20:21	5°♋07’08	-1°-6’-30	
min. Earth dist.	2067 Dec 26	15:22	5°♋07’29	28.91562 AU	
direct	2068 Mar 13	23:22	3°♋42’35		
conjunction	2068 Jun 27	00:21	6°♋13’12	-1°00’-38	
minimum elong	2068 Jun 27	00:21	6°♋13’12	1°00’39	
max. Earth dist.	2068 Jun 27	06:09	6°♋13’44	30.91950 AU	
retrograde	2068 Oct 10	23:52	8°♋45’20		
opposition	2068 Dec 28	06:38	7°♋21’00	-1°-3’-5	
min. Earth dist.	2068 Dec 28	01:26	7°♋21’22	28.92434 AU	
direct	2069 Mar 16	11:22	5°♋56’25		
conjunction	2069 Jun 29	14:18	8°♋27’07	0°-57’-23	
minimum elong	2069 Jun 29	14:18	8°♋27’07	0°57’24	
max. Earth dist.	2069 Jun 29	18:40	8°♋27’31	30.92886 AU	
retrograde	2069 Oct 13	11:42	10°♋59’07		
opposition	2069 Dec 30	17:09	9°♋34’52	0°-59’-34	
min. Earth dist.	2069 Dec 30	13:13	9°♋35’08	28.93422 AU	
direct	2070 Mar 18	21:32	8°♋10’16		
conjunction	2070 Jul 02	04:15	10°♋41’02	0°-54’-2	
minimum elong	2070 Jul 02	04:15	10°♋41’03	0°54’04	
max. Earth dist.	2070 Jul 02	08:53	10°♋41’28	30.93911 AU	
retrograde	2070 Oct 15	23:36	13°♋12’55		
opposition	2071 Jan 02	03:33	11°♋48’46	0°-55’-57	
min. Earth dist.	2071 Jan 02	00:09	11°♋49’00	28.94451 AU	
direct	2071 Mar 21	10:56	10°♋24’10		
conjunction	2071 Jul 04	18:16	12°♋55’02	0°-50’-37	
minimum elong	2071 Jul 04	18:16	12°♋55’02	0°50’39	
max. Earth dist.	2071 Jul 04	20:44	12°♋55’15	30.94945 AU	
retrograde	2071 Oct 18	12:57	15°♋26’46		
opposition	2072 Jan 04	13:53	14°♋02’43	0°-52’-15	
min. Earth dist.	2072 Jan 04	11:24	14°♋02’53	28.95471 AU	
direct	2072 Mar 22	22:46	12°♋38’06		
conjunction	2072 Jul 06	08:32	15°♋09’03	0°-47’-8	
minimum elong	2072 Jul 06	08:33	15°♋09’03	0°47’09	
max. Earth dist.	2072 Jul 06	10:52	15°♋09’16	30.95925 AU	
retrograde	2072 Oct 20	00:16	17°♋40’38		
opposition	2073 Jan 06	00:23	16°♋16’40	0°-48’-29	
min. Earth dist.	2073 Jan 05	23:21	16°♋16’44	28.96400 AU	
direct	2073 Mar 25	11:16	14°♋52’03		
conjunction	2073 Jul 08	22:29	17°♋23’03	0°-43’-34	
minimum elong	2073 Jul 08	22:29	17°♋23’03	0°43’35	
max. Earth dist.	2073 Jul 08	22:38	17°♋23’04	30.96813 AU	
retrograde	2073 Oct 22	13:54	19°♋54’28		
opposition	2074 Jan 08	10:45	18°♋30’34	0°-44’-39	
min. Earth dist.	2074 Jan 08	10:04	18°♋30’37	28.97238 AU	
direct	2074 Mar 27	23:45	17°♋05’55		
conjunction	2074 Jul 11	12:34	19°♋36’58	0°-39’-57	
minimum elong	2074 Jul 11	12:34	19°♋36’58	0°39’58	
max. Earth dist.	2074 Jul 11	12:18	19°♋36’56	30.97601 AU	
retrograde	2074 Oct 25	00:55	22°♋08’13		
opposition	2075 Jan 10	21:08	20°♋44’22	0°-40’-45	
min. Earth dist.	2075 Jan 10	22:22	20°♋44’17	28.97984 AU	
direct	2075 Mar 30	11:11	19°♋19’40		
conjunction	2075 Jul 14	02:28	21°♋50’45	0°-36’-17	
minimum elong	2075 Jul 14	02:28	21°♋50’45	0°36’18	
max. Earth dist.	2075 Jul 14	00:40	21°♋50’35	30.98326 AU	
retrograde	2075 Oct 27	12:33	24°♋21’49		
opposition	2076 Jan 13	07:21	22°♋58’02	0°-36’-47	
min. Earth dist.	2076 Jan 13	08:30	22°♋57’57	28.98673 AU	
direct	2076 Mar 31	23:41	21°♋33’15		
conjunction	2076 Jul 15	16:22	24°♋04’22	0°-32’-33	
minimum elong	2076 Jul 15	16:22	24°♋04’22	0°32’34	
max. Earth dist.	2076 Jul 15	13:31	24°♋04’06	30.98995 AU	
retrograde	2076 Oct 28	22:20	26°♋35’15		
opposition	2077 Jan 14	17:35	25°♋11’30	0°-32’-47	
min. Earth dist.	2077 Jan 14	20:32	25°♋11’18	28.99345 AU	
direct	2077 Apr 03	10:20	23°♋46’40		
conjunction	2077 Jul 18	06:08	26°♋17’48	0°-28’-48	
minimum elong	2077 Jul 18	06:08	26°♋17’48	0°28’49	
max. Earth dist.	2077 Jul 18	02:48	26°♋17’30	30.99684 AU	
retrograde	2077 Oct 31	09:29	28°♋48’30		
opposition	2078 Jan 17	03:43	27°♋24’48	0°-28’-45	
min. Earth dist.	2078 Jan 17	06:33	27°♋24’36	29.00046 AU	
direct	2078 Apr 05	22:01	25°♋59’54		
conjunction	2078 Jul 20	19:33	28°♋31’03	0°-24’-59	
minimum elong	2078 Jul 20	19:33	28°♋31’03	0°25’00	
max. Earth dist.	2078 Jul 20	14:53	28°♋30’38	31.00419 AU	
	2078 Sep 01	09:46	0°♌		
retrograde	2078 Nov 02	19:48	1°♌01’35		
	2079 Jan 06	09:45	30°♋		
opposition	2079 Jan 19	13:55	29°♋37’56	0°-24’-40	
min. Earth dist.	2079 Jan 19	17:56	29°♋37’39	29.00833 AU	
direct	2079 Apr 08	08:14	28°♋12’59		
	2079 Jul 03	06:13	0°♌		
conjunction	2079 Jul 23	09:12	0°♌44’09	0°-21’-9	
minimum elong	2079 Jul 23	09:12	0°♌44’09	0°21’11	
max. Earth dist.	2079 Jul 23	04:50	0°♌43’45	31.01257 AU	
retrograde	2079 Nov 05	06:08	3°♌14’30		
opposition	2080 Jan 21	23:54	1°♌50’54	0°-20’-32	
min. Earth dist.	2080 Jan 22	04:14	1°♌50’36	29.01723 AU	
direct	2080 Apr 09	21:29	0°♌25’56		

conjunction	2080 Jul	24	22:38	2°♑57’08	0°-17’-17
minimum elong	2080 Jul	24	22:38	2°♑57’08	0°17’19
max. Earth dist.	2080 Jul	24	16:31	2°♑56’35	31.02218 AU
retrograde	2080 Nov	06	18:19	5°♑27’20	
opposition	2081 Jan	23	10:02	4°♑03’48	0°-16’-24
min. Earth dist.	2081 Jan	23	14:41	4°♑03’29	29.02758 AU
direct	2081 Apr	12	08:53	2°♑38’48	
conjunction	2081 Jul	27	12:01	5°♑10’04	0°-13’-24
minimum elong	2081 Jul	27	12:01	5°♑10’04	0°13’26
behind sun begin	2081 Jul	27	08:27	5°♑09’45	
behind sun end	2081 Jul	27	15:36	5°♑10’23	
max. Earth dist.	2081 Jul	27	06:26	5°♑09’34	31.03313 AU
retrograde	2081 Nov	09	04:54	7°♑40’07	
opposition	2082 Jan	25	20:10	6°♑16’41	0°-12’-13
min. Earth dist.	2082 Jan	26	01:47	6°♑16’17	29.03906 AU
direct	2082 Apr	14	20:42	4°♑51’42	
conjunction	2082 Jul	30	01:19	7°♑23’01	0°-9’-30
minimum elong	2082 Jul	30	01:18	7°♑23’01	0°09’31
behind sun begin	2082 Jul	29	19:52	7°♑22’32	
behind sun end	2082 Jul	30	06:45	7°♑23’29	
max. Earth dist.	2082 Jul	29	18:03	7°♑22’21	31.04521 AU
retrograde	2082 Nov	11	18:29	9°♑52’55	
opposition	2083 Jan	28	06:08	8°♑29’36	0°-8’-2
min. Earth dist.	2083 Jan	28	11:46	8°♑29’12	29.05147 AU
direct	2083 Apr	17	09:30	7°♑04’37	
conjunction	2083 Aug	01	14:47	9°♑36’00	0°-5’-36
minimum elong	2083 Aug	01	14:48	9°♑36’00	0°05’37
behind sun begin	2083 Aug	01	08:28	9°♑35’26	
behind sun end	2083 Aug	01	21:08	9°♑36’34	
max. Earth dist.	2083 Aug	01	07:32	9°♑35’21	31.05769 AU
retrograde	2083 Nov	14	05:13	12°♑05’46	
opposition	2084 Jan	30	16:21	10°♑42’33	0°-3’-50
min. Earth dist.	2084 Jan	30	23:47	10°♑42’02	29.06390 AU
direct	2084 Apr	18	21:24	9°♑17’36	
conjunction	2084 Aug	03	04:11	11°♑49’01	0°-1’-39
minimum elong	2084 Aug	03	04:10	11°♑49’01	0°01’39
behind sun begin	2084 Aug	02	21:35	11°♑48’26	
behind sun end	2084 Aug	03	10:46	11°♑49’36	
max. Earth dist.	2084 Aug	02	19:25	11°♑48’14	31.06993 AU
retrograde	2084 Nov	15	17:07	14°♑18’39	
asc. node	2084 Dec	31	03:49	13°♑45’45	
opposition	2085 Feb	01	02:25	12°♑55’32	0°00’22
min. Earth dist.	2085 Feb	01	09:46	12°♑55’01	29.07576 AU
direct	2085 Apr	21	10:00	11°♑30’34	
conjunction	2085 Aug	05	17:35	14°♑02’02	0°02’24
minimum elong	2085 Aug	05	17:36	14°♑02’02	0°02’23
behind sun begin	2085 Aug	05	11:00	14°♑01’27	
behind sun end	2085 Aug	06	00:11	14°♑02’37	
max. Earth dist.	2085 Aug	05	07:50	14°♑01’09	31.08126 AU
retrograde	2085 Nov	18	03:40	16°♑31’30	
opposition	2086 Feb	03	12:46	15°♑08’28	0°04’34
min. Earth dist.	2086 Feb	03	21:56	15°♑07’49	29.08668 AU
direct	2086 Apr	23	20:37	13°♑43’30	
conjunction	2086 Aug	08	06:50	16°♑14’58	0°06’19
minimum elong	2086 Aug	08	06:50	16°♑14’58	0°06’20
behind sun begin	2086 Aug	08	00:37	16°♑14’25	
behind sun end	2086 Aug	08	13:02	16°♑15’31	
max. Earth dist.	2086 Aug	07	20:16	16°♑14’00	31.09165 AU
retrograde	2086 Nov	20	14:41	18°♑44’16	
opposition	2087 Feb	05	22:57	17°♑21’17	0°08’46
min. Earth dist.	2087 Feb	06	08:19	17°♑20’37	29.09642 AU
direct	2087 Apr	26	08:45	15°♑56’17	
conjunction	2087 Aug	10	20:06	18°♑27’45	0°10’13
minimum elong	2087 Aug	10	20:07	18°♑27’45	0°10’12
behind sun begin	2087 Aug	10	14:55	18°♑27’18	
behind sun end	2087 Aug	11	01:19	18°♑28’13	
max. Earth dist.	2087 Aug	10	07:51	18°♑26’38	31.10083 AU
retrograde	2087 Nov	23	00:16	20°♑56’53	
opposition	2088 Feb	08	09:05	19°♑33’57	0°12’56
min. Earth dist.	2088 Feb	08	19:56	19°♑33’11	29.10521 AU
direct	2088 Apr	27	19:21	18°♑08’54	
conjunction	2088 Aug	12	09:23	20°♑40’22	0°14’06
minimum elong	2088 Aug	12	09:23	20°♑40’22	0°14’06
behind sun begin	2088 Aug	12	06:19	20°♑40’06	
behind sun end	2088 Aug	12	12:27	20°♑40’38	
max. Earth dist.	2088 Aug	11	21:06	20°♑39’14	31.10920 AU
retrograde	2088 Nov	24	09:35	23°♑09’19	
opposition	2089 Feb	09	19:16	21°♑46’25	0°17’05
min. Earth dist.	2089 Feb	10	06:45	21°♑45’37	29.11319 AU
direct	2089 Apr	30	08:08	20°♑21’20	
conjunction	2089 Aug	14	22:11	22°♑52’46	0°17’58
minimum elong	2089 Aug	14	22:11	22°♑52’46	0°17’58
max. Earth dist.	2089 Aug	14	08:03	22°♑51’28	31.11699 AU
retrograde	2089 Nov	26	20:51	25°♑21’34	
opposition	2090 Feb	12	05:23	23°♑58’41	0°21’12
min. Earth dist.	2090 Feb	12	17:18	23°♑57’51	29.12097 AU
direct	2090 May	02	19:08	22°♑33’32	
conjunction	2090 Aug	17	11:09	25°♑04’58	0°21’48
minimum elong	2090 Aug	17	11:08	25°♑04’58	0°21’49
max. Earth dist.	2090 Aug	16	21:25	25°♑03’42	31.12471 AU
retrograde	2090 Nov	29	06:23	27°♑33’35	
opposition	2091 Feb	14	15:27	26°♑10’44	0°25’18
min. Earth dist.	2091 Feb	15	04:30	26°♑09’49	29.12882 AU
direct	2091 May	05	07:16	24°♑45’34	
conjunction	2091 Aug	19	23:51	27°♑16’59	0°25’37
minimum elong	2091 Aug	19	23:51	27°♑16’58	0°25’36
max. Earth dist.	2091 Aug	19	08:31	27°♑15’34	31.13285 AU
retrograde	2091 Dec	01	18:49	29°♑45’26	
opposition	2092 Feb	17	01:30	28°♑22’37	0°29’20
min. Earth dist.	2092 Feb	17	14:16	28°♑21’44	29.13735 AU
direct	2092 May	06	20:19	26°♑57’25	
conjunction	2092 Aug	21	12:33	29°♑28’51	0°29’22
minimum elong	2092 Aug	21	12:33	29°♑28’51	0°29’23
max. Earth dist.	2092 Aug	20	21:38	29°♑27’28	31.14169 AU
	2092 Sep	04	15:06	0°♒	
retrograde	2092 Dec	03	04:41	1°♒57’10	
opposition	2093 Feb	18	11:44	0°♒34’25	0°33’20
min. Earth dist.	2093 Feb	19	01:47	0°♒33’25	29.14677 AU
	2093 Mar	11	13:05	30°♑	
direct	2093 May	09	08:21	29°♑09’13	
	2093 Jul	05	13:09	0°♒	
max. Earth dist.	2093 Aug	23	09:16	1°♒39’11	31.15173 AU
conjunction	2093 Aug	24	01:04	1°♒40’39	0°33’06
minimum elong	2093 Aug	24	01:04	1°♒40’39	0°33’05
retrograde	2093 Dec	05	16:14	4°♒08’51	
opposition	2094 Feb	20	21:48	2°♒46’10	0°37’17
min. Earth dist.	2094 Feb	21	11:09	2°♒45’14	29.15734 AU
direct	2094 May	11	20:51	1°♒21’00	
conjunction	2094 Aug	26	13:30	3°♒52’28	0°36’46
minimum elong	2094 Aug	26	13:30	3°♒52’28	0°36’46

max. Earth dist.	2094 Aug 25 21:25	3°♑50’59	31.16269 AU
retrograde	2094 Dec 08 02:48	6°♑20’34	
opposition	2095 Feb 23 08:03	4°♑57’59	0°41’11
min. Earth dist.	2095 Feb 23 22:45	4°♑56’57	29.16870 AU
direct	2095 May 14 07:28	3°♑32’51	
max. Earth dist.	2095 Aug 28 09:36	6°♑02’50	31.17424 AU
conjunction	2095 Aug 29 02:01	6°♑04’21	0°40’23
minimum elong	2095 Aug 29 02:01	6°♑04’21	0°40’22
retrograde	2095 Dec 10 13:39	8°♑32’22	
opposition	2096 Feb 25 18:09	7°♑09’54	0°45’01
min. Earth dist.	2096 Feb 26 08:47	7°♑08’52	29.18017 AU
direct	2096 May 15 19:18	5°♑44’49	
conjunction	2096 Aug 30 14:27	8°♑16’21	0°43’56
minimum elong	2096 Aug 30 14:27	8°♑16’21	0°43’57
max. Earth dist.	2096 Aug 29 20:48	8°♑14’43	31.18550 AU
retrograde	2096 Dec 11 23:18	10°♑44’17	
opposition	2097 Feb 27 04:31	9°♑21’54	0°48’47
min. Earth dist.	2097 Feb 27 20:17	9°♑20’48	29.19127 AU
direct	2097 May 18 05:32	7°♑56’51	
max. Earth dist.	2097 Sep 01 09:21	10°♑26’48	31.19606 AU
conjunction	2097 Sep 02 02:47	10°♑28’25	0°47’26
minimum elong	2097 Sep 02 02:47	10°♑28’25	0°47’25
retrograde	2097 Dec 14 08:14	12°♑56’16	
opposition	2098 Mar 01 14:56	11°♑33’58	0°52’28
min. Earth dist.	2098 Mar 02 07:19	11°♑32’49	29.20124 AU
direct	2098 May 20 17:30	10°♑08’56	
conjunction	2098 Sep 04 15:03	12°♑40’30	0°50’51
minimum elong	2098 Sep 04 15:03	12°♑40’30	0°50’51
max. Earth dist.	2098 Sep 03 19:43	12°♑38’42	31.20538 AU
retrograde	2098 Dec 16 19:29	15°♑08’15	
opposition	2099 Mar 04 01:10	13°♑46’00	0°56’05
min. Earth dist.	2099 Mar 04 18:02	13°♑44’49	29.21001 AU
direct	2099 May 23 03:30	12°♑20’58	
max. Earth dist.	2099 Sep 06 08:21	14°♑50’45	31.21334 AU
conjunction	2099 Sep 07 03:29	14°♑52’31	0°54’12
minimum elong	2099 Sep 07 03:28	14°♑52’31	0°54’11
retrograde	2099 Dec 19 04:38	17°♑20’10	