



# Astrodienst Ephemeris Tables for the year 2133

tropical geocentric zodiac

contains Sun, Moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, True Node, Moon's Node, Lilith, Chiron

Programming  
Dieter Koch and Alois Treindl  
based on Swiss Ephemeris  
Code D5EPH

ASTRODIENST EPHEMERIS for the year 2133  
geocentric

JANUARY 2133

00:00 UT

| Day  | Sid.t   | ☉        | ☽     | ♀      | ♂     | ♂     | ♂     | ♂    | ♂      | ♂     | ♂     | ♂      | ♂      | ♂    | ♂      | Day  |
|------|---------|----------|-------|--------|-------|-------|-------|------|--------|-------|-------|--------|--------|------|--------|------|
| T 1  | 6 42 58 | 10♌35'18 | 10♍50 | 19♌13  | 28♌30 | 17♌27 | 1°R45 | 4♌44 | 17°R 7 | 28♍19 | 4°R 2 | 14♌3   | 12♌41  | 4♌57 | 22°R12 | T 1  |
| F 2  | 6 46 55 | 11°36'27 | 22°54 | 20°51  | 29°45 | 18°10 | 1♌38  | 4°50 | 17°R 6 | 28°20 | 4♌1   | 14° 5  | 12°38  | 5° 4 | 22°R10 | F 2  |
| S 3  | 6 50 51 | 12°37'37 | 4♌48  | 22°28  | 1♌1   | 18°53 | 1°31  | 4°56 | 17° 5  | 28°22 | 4° 0  | 14° 6  | 12°35  | 5°11 | 22° 9  | S 3  |
| S 4  | 6 54 48 | 13°38'47 | 16°38 | 24° 6  | 2°16  | 19°36 | 1°23  | 5° 2 | 17° 5  | 28°24 | 3°59  | 14°R 6 | 12°31  | 5°17 | 22° 7  | S 4  |
| M 5  | 6 58 44 | 14°39'57 | 28°25 | 25°43  | 3°31  | 20°19 | 1°16  | 5° 8 | 17° 4  | 28°26 | 3°59  | 14° 5  | 12°28  | 5°24 | 22° 5  | M 5  |
| T 6  | 7 2 41  | 15°41'07 | 10♌12 | 27°20  | 4°47  | 21° 3 | 1° 9  | 5°14 | 17° 3  | 28°27 | 3°58  | 14° 3  | 12°25  | 5°31 | 22° 4  | T 6  |
| W 7  | 7 6 37  | 16°42'18 | 22° 3 | 28°58  | 6° 2  | 21°46 | 1° 1  | 5°20 | 17° 2  | 28°29 | 3°57  | 13°58  | 12°22  | 5°37 | 22° 2  | W 7  |
| T 8  | 7 10 34 | 17°43'28 | 3♌57  | 0♌35   | 7°18  | 22°29 | 0°53  | 5°26 | 17° 2  | 28°31 | 3°56  | 13°52  | 12°19  | 5°44 | 22° 1  | T 8  |
| F 9  | 7 14 30 | 18°44'38 | 15°58 | 2°12   | 8°33  | 23°13 | 0°46  | 5°32 | 17° 1  | 28°32 | 3°55  | 13°46  | 12°16  | 5°50 | 22° 0  | F 9  |
| S 10 | 7 18 27 | 19°45'47 | 28° 6 | 3°48   | 9°49  | 23°56 | 0°38  | 5°38 | 17° 0  | 28°34 | 3°55  | 13°39  | 12°12  | 5°57 | 21°58  | S 10 |
| S 11 | 7 22 24 | 20°46'57 | 10♌25 | 5°23   | 11° 4 | 24°39 | 0°30  | 5°44 | 16°59  | 28°35 | 3°54  | 13°33  | 12° 9  | 6° 4 | 21°57  | S 11 |
| M12  | 7 26 20 | 21°48'06 | 22°55 | 6°58   | 12°19 | 25°23 | 0°22  | 5°49 | 16°57  | 28°37 | 3°53  | 13°27  | 12° 6  | 6°10 | 21°56  | M12  |
| T 13 | 7 30 17 | 22°49'14 | 5♌40  | 8°32   | 13°35 | 26° 7 | 0°14  | 5°55 | 16°56  | 28°38 | 3°53  | 13°24  | 12° 3  | 6°17 | 21°55  | T 13 |
| W14  | 7 34 13 | 23°50'22 | 18°42 | 10° 4  | 14°50 | 26°50 | 0° 6  | 6° 1 | 16°55  | 28°40 | 3°52  | 13°D22 | 12° 0  | 6°24 | 21°54  | W14  |
| T 15 | 7 38 10 | 24°51'29 | 2♌ 5  | 11°34  | 16° 6 | 27°34 | 29°58 | 6° 6 | 16°54  | 28°41 | 3°51  | 13°23  | 11°56  | 6°30 | 21°53  | T 15 |
| F 16 | 7 42 6  | 25°52'35 | 15°50 | 13° 3  | 17°21 | 28°17 | 29°50 | 6°11 | 16°53  | 28°43 | 3°51  | 13°24  | 11°53  | 6°37 | 21°52  | F 16 |
| S 17 | 7 46 3  | 26°53'41 | 29°59 | 14°29  | 18°37 | 29° 1 | 29°42 | 6°17 | 16°51  | 28°44 | 3°50  | 13°25  | 11°50  | 6°44 | 21°51  | S 17 |
| S 18 | 7 49 59 | 27°54'47 | 14♌33 | 15°52  | 19°52 | 29°45 | 29°34 | 6°22 | 16°50  | 28°45 | 3°49  | 13°R26 | 11°47  | 6°50 | 21°50  | S 18 |
| M19  | 7 53 56 | 28°55'51 | 29°26 | 17°11  | 21° 7 | 0♌29  | 29°26 | 6°27 | 16°48  | 28°47 | 3°49  | 13°25  | 11°44  | 6°57 | 21°49  | M19  |
| T 20 | 7 57 53 | 29°56'55 | 14♌32 | 18°26  | 22°23 | 1°12  | 29°18 | 6°33 | 16°47  | 28°48 | 3°48  | 13°21  | 11°41  | 7° 4 | 21°48  | T 20 |
| W21  | 8 1 49  | 0♌57'59  | 29°44 | 19°36  | 23°38 | 1°56  | 29°10 | 6°38 | 16°45  | 28°49 | 3°48  | 13°16  | 11°37  | 7°10 | 21°48  | W21  |
| T 22 | 8 5 46  | 1°59'01  | 14♌51 | 20°40  | 24°54 | 2°40  | 29° 2 | 6°43 | 16°44  | 28°51 | 3°47  | 13° 9  | 11°34  | 7°17 | 21°47  | T 22 |
| F 23 | 8 9 42  | 3° 0'03  | 29°42 | 21°38  | 26° 9 | 3°24  | 28°54 | 6°48 | 16°42  | 28°52 | 3°47  | 13° 1  | 11°31  | 7°24 | 21°47  | F 23 |
| S 24 | 8 13 39 | 4° 1'05  | 14♌11 | 22°29  | 27°24 | 4° 8  | 28°46 | 6°53 | 16°40  | 28°53 | 3°46  | 12°52  | 11°28  | 7°30 | 21°46  | S 24 |
| S 25 | 8 17 35 | 5° 2'06  | 28°11 | 23°11  | 28°40 | 4°52  | 28°38 | 6°58 | 16°39  | 28°54 | 3°46  | 12°46  | 11°25  | 7°37 | 21°46  | S 25 |
| M26  | 8 21 32 | 6° 3'06  | 11♌41 | 23°45  | 29°55 | 5°36  | 28°30 | 7° 2 | 16°37  | 28°55 | 3°45  | 12°40  | 11°22  | 7°44 | 21°46  | M26  |
| T 27 | 8 25 28 | 7° 4'06  | 24°43 | 24° 8  | 1♌10  | 6°20  | 28°22 | 7° 7 | 16°35  | 28°57 | 3°45  | 12°38  | 11°18  | 7°50 | 21°45  | T 27 |
| W28  | 8 29 25 | 8° 5'06  | 7♌20  | 24°21  | 2°26  | 7° 4  | 28°14 | 7°12 | 16°33  | 28°58 | 3°44  | 12°D37 | 11°15  | 7°57 | 21°45  | W28  |
| T 29 | 8 33 22 | 9° 6'05  | 19°37 | 24°R23 | 3°41  | 7°49  | 28° 6 | 7°16 | 16°31  | 28°59 | 3°44  | 12°37  | 11°12  | 8° 4 | 21°45  | T 29 |
| F 30 | 8 37 18 | 10° 7'03 | 1♌38  | 24°14  | 4°57  | 8°33  | 27°59 | 7°21 | 16°30  | 29° 0 | 3°43  | 12°38  | 11° 9  | 8°10 | 21°D45 | F 30 |
| S 31 | 8 41 15 | 11♌ 8'01 | 13♌30 | 23♌53  | 6♌12  | 9♌17  | 27°51 | 7♌25 | 16°R28 | 29♌1  | 3°R43 | 12°R39 | 11°R 6 | 8♌17 | 21°R45 | S 31 |

Delta T = 110.74 sec

FEBRUARY 2133

00:00 UT

| Day  | Sid.t    | ☉        | ☽     | ♀      | ♂     | ♂     | ♂      | ♂    | ♂      | ♂     | ♂     | ♂      | ♂      | ♂     | ♂      | Day  |
|------|----------|----------|-------|--------|-------|-------|--------|------|--------|-------|-------|--------|--------|-------|--------|------|
| S 1  | 8 45 11  | 12♌ 8'58 | 25♌17 | 23°R21 | 7♌27  | 10♌1  | 27°R43 | 7♌29 | 16°R26 | 29♌2  | 3°R43 | 12°R38 | 11°R 2 | 8♌24  | 21°R45 | S 1  |
| M 2  | 8 49 8   | 13° 9'54 | 7♌ 3  | 22°R39 | 8°43  | 10°46 | 27°R36 | 7°34 | 16°R24 | 29° 3 | 3°R42 | 12°R34 | 10°59  | 8°30  | 21°45  | M 2  |
| T 3  | 8 53 4   | 14°10'50 | 18°52 | 21°47  | 9°58  | 11°30 | 27°28  | 7°38 | 16°22  | 29° 3 | 3°42  | 12°28  | 10°56  | 8°37  | 21°46  | T 3  |
| W 4  | 8 57 1   | 15°11'45 | 0♌48  | 20°48  | 11°13 | 12°14 | 27°21  | 7°42 | 16°19  | 29° 4 | 3°42  | 12°20  | 10°53  | 8°44  | 21°46  | W 4  |
| T 5  | 9 0 58   | 16°12'38 | 12°51 | 19°42  | 12°29 | 12°59 | 27°14  | 7°46 | 16°17  | 29° 5 | 3°42  | 12° 9  | 10°50  | 8°50  | 21°46  | T 5  |
| F 6  | 9 4 54   | 17°13'31 | 25° 4 | 18°31  | 13°44 | 13°43 | 27° 6  | 7°50 | 16°15  | 29° 6 | 3°41  | 11°56  | 10°47  | 8°57  | 21°47  | F 6  |
| S 7  | 9 8 51   | 18°14'22 | 7♌26  | 17°19  | 14°59 | 14°28 | 26°59  | 7°54 | 16°13  | 29° 7 | 3°41  | 11°44  | 10°43  | 9° 4  | 21°47  | S 7  |
| S 8  | 9 12 47  | 19°15'12 | 19°59 | 16° 6  | 16°15 | 15°12 | 26°52  | 7°57 | 16°11  | 29° 7 | 3°41  | 11°31  | 10°40  | 9°10  | 21°48  | S 8  |
| M 9  | 9 16 44  | 20°16'00 | 2♌43  | 14°55  | 17°30 | 15°57 | 26°45  | 8° 1 | 16° 8  | 29° 8 | 3°41  | 11°21  | 10°37  | 9°17  | 21°48  | M 9  |
| T 10 | 9 20 40  | 21°16'48 | 15°39 | 13°47  | 18°45 | 16°41 | 26°39  | 8° 5 | 16° 6  | 29° 9 | 3°41  | 11°13  | 10°34  | 9°24  | 21°49  | T 10 |
| W11  | 9 24 37  | 22°17'33 | 28°47 | 12°45  | 20° 0 | 17°26 | 26°32  | 8° 8 | 16° 4  | 29° 9 | 3°41  | 11° 8  | 10°31  | 9°30  | 21°50  | W11  |
| T 12 | 9 28 33  | 23°18'18 | 12♌ 9 | 11°48  | 21°16 | 18°11 | 26°25  | 8°11 | 16° 2  | 29°10 | 3°40  | 11° 6  | 10°28  | 9°37  | 21°50  | T 12 |
| F 13 | 9 32 30  | 24°19'00 | 25°48 | 10°59  | 22°31 | 18°55 | 26°19  | 8°15 | 15°59  | 29°11 | 3°40  | 11°D 6 | 10°24  | 9°44  | 21°51  | F 13 |
| S 14 | 9 36 26  | 25°19'41 | 9♌44  | 10°17  | 23°46 | 19°40 | 26°13  | 8°18 | 15°57  | 29°11 | 3°40  | 11°R 6 | 10°21  | 9°50  | 21°52  | S 14 |
| S 15 | 9 40 23  | 26°20'21 | 23°58 | 9°44   | 25° 1 | 20°25 | 26° 7  | 8°21 | 15°54  | 29°12 | 3°40  | 11° 5  | 10°18  | 9°57  | 21°53  | S 15 |
| M16  | 9 44 20  | 27°20'59 | 8♌28  | 9°18   | 26°17 | 21°10 | 26° 1  | 8°24 | 15°52  | 29°12 | 3°D40 | 11° 3  | 10°15  | 10° 4 | 21°54  | M16  |
| T 17 | 9 48 16  | 28°21'35 | 23°12 | 9° 0   | 27°32 | 21°54 | 25°55  | 8°27 | 15°50  | 29°13 | 3°40  | 10°58  | 10°12  | 10°10 | 21°55  | T 17 |
| W18  | 9 52 13  | 29°22'09 | 8♌ 4  | 8°50   | 28°47 | 22°39 | 25°49  | 8°30 | 15°47  | 29°13 | 3°40  | 10°50  | 10° 8  | 10°17 | 21°57  | W18  |
| T 19 | 9 56 9   | 0♌22'42  | 22°55 | 8°D47  | 0♌ 2  | 23°24 | 25°44  | 8°33 | 15°45  | 29°13 | 3°40  | 10°40  | 10° 5  | 10°24 | 21°58  | T 19 |
| F 20 | 10 0 6   | 1°23'13  | 7♌37  | 8°52   | 1°17  | 24° 9 | 25°38  | 8°35 | 15°42  | 29°14 | 3°40  | 10°28  | 10° 2  | 10°30 | 21°59  | F 20 |
| S 21 | 10 4 2   | 2°23'43  | 22° 2 | 9° 2   | 2°32  | 24°54 | 25°33  | 8°38 | 15°40  | 29°14 | 3°41  | 10°16  | 9°59   | 10°37 | 22° 1  | S 21 |
| S 22 | 10 7 59  | 3°24'11  | 6♌ 3  | 9°19   | 3°48  | 25°39 | 25°28  | 8°41 | 15°37  | 29°14 | 3°41  | 10° 5  | 9°56   | 10°44 | 22° 2  | S 22 |
| M23  | 10 11 55 | 4°24'38  | 19°38 | 9°42   | 5° 3  | 26°24 | 25°23  | 8°43 | 15°34  | 29°14 | 3°41  | 9°56   | 9°53   | 10°50 | 22° 4  | M23  |
| T 24 | 10 15 52 | 5°25'03  | 2♌45  | 10°10  | 6°18  | 27° 9 | 25°19  | 8°45 | 15°32  | 29°15 | 3°41  | 9°51   | 9°49   | 10°57 | 22° 5  | T 24 |
| W25  | 10 19 49 | 6°25'27  | 15°26 | 10°43  | 7°33  | 27°54 | 25°14  | 8°47 | 15°29  | 29°15 | 3°41  | 9°47   | 9°46   | 11° 4 | 22° 7  | W25  |
| T 26 | 10 23 45 | 7°25'50  | 27°47 | 11°21  | 8°48  | 28°39 | 25°10  | 8°50 | 15°27  | 29°15 | 3°41  | 9°46   | 9°43   | 11°10 | 22° 8  | T 26 |
| F 27 | 10 27 42 | 8°26'11  | 9♌51  | 12° 2  | 10° 3 | 29°24 | 25° 6  | 8°52 | 15°24  | 29°15 | 3°42  | 9°46   | 9°40   | 11°17 | 22°10  | F 27 |
| S 28 | 10 31 38 | 9♌26'32  | 21♌44 | 12♌48  | 11♌18 | 0♌ 9  | 25°52  | 8♌53 | 15°R22 | 29♌15 | 3°R42 | 9°R46  | 9°R37  | 11♌24 | 22°R12 | S 28 |

Delta T = 110.79 sec

## ASTRODIENST EPHEMERIS for the year 2133

geocentric

MARCH 2133

00:00 UT

| Day  | Sid.t    | ☉         | ☽      | ♀      | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | Day  |
|------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| S 1  | 10 35 35 | 10°16'50  | 3°32   | 13°37  | 12°33  | 0°55   | 24°R58 | 8°55   | 15°R19 | 29°R15 | 3°II42 | 9°R44  | 9°II33 | 11°30  | 22°R14 | S 1  |
| M 2  | 10 39 31 | 11°27'07  | 15°20  | 14°29  | 13°48  | 1°40   | 24°54  | 8°57   | 15°16  | 29°M15 | 3°42   | 9°II41 | 9°30   | 11°37  | 22°16  | M 2  |
| T 3  | 10 43 28 | 12°27'23  | 27°12  | 15°25  | 15° 3  | 2°25   | 24°51  | 8°59   | 15°14  | 29°15  | 3°43   | 9°34   | 9°27   | 11°44  | 22°18  | T 3  |
| W 4  | 10 47 24 | 13°27'37  | 9°13   | 16°24  | 16°18  | 3°10   | 24°47  | 9° 0   | 15°11  | 29°15  | 3°43   | 9°25   | 9°24   | 11°50  | 22°20  | W 4  |
| T 5  | 10 51 21 | 14°27'49  | 21°25  | 17°25  | 17°33  | 3°56   | 24°44  | 9° 1   | 15° 8  | 29°15  | 3°43   | 9°13   | 9°21   | 11°57  | 22°22  | T 5  |
| F 6  | 10 55 18 | 15°28'00  | 3°51   | 18°28  | 18°48  | 4°41   | 24°41  | 9° 3   | 15° 6  | 29°15  | 3°44   | 9° 0   | 9°18   | 12° 4  | 22°24  | F 6  |
| S 7  | 10 59 14 | 16°28'09  | 16°29  | 19°34  | 20° 3  | 5°26   | 24°39  | 9° 4   | 15° 3  | 29°14  | 3°44   | 8°46   | 9°14   | 12°10  | 22°26  | S 7  |
| S 8  | 11 3 11  | 17°28'16  | 29°21  | 20°43  | 21°18  | 6°12   | 24°36  | 9° 5   | 15° 1  | 29°14  | 3°45   | 8°32   | 9°11   | 12°17  | 22°28  | S 8  |
| M 9  | 11 7 7   | 18°28'21  | 12°Y26 | 21°53  | 22°33  | 6°57   | 24°34  | 9° 6   | 14°58  | 29°14  | 3°45   | 8°21   | 9° 8   | 12°24  | 22°31  | M 9  |
| T 10 | 11 11 4  | 19°28'24  | 25°41  | 23° 5  | 23°48  | 7°42   | 24°32  | 9° 7   | 14°55  | 29°14  | 3°45   | 8°12   | 9° 5   | 12°30  | 22°33  | T 10 |
| W 11 | 11 15 0  | 20°28'25  | 9°8 7  | 24°19  | 25° 3  | 8°28   | 24°30  | 9° 8   | 14°53  | 29°13  | 3°46   | 8° 7   | 9° 2   | 12°37  | 22°35  | W 11 |
| T 12 | 11 18 57 | 21°28'24  | 22°43  | 25°35  | 26°18  | 9°13   | 24°28  | 9° 9   | 14°50  | 29°13  | 3°46   | 8° 4   | 8°59   | 12°44  | 22°38  | T 12 |
| F 13 | 11 22 53 | 22°28'21  | 6°II28 | 26°53  | 27°32  | 9°59   | 24°26  | 9° 9   | 14°48  | 29°13  | 3°47   | 8°D 3  | 8°55   | 12°50  | 22°40  | F 13 |
| S 14 | 11 26 50 | 23°28'16  | 20°23  | 28°12  | 28°47  | 10°44  | 24°25  | 9°10   | 14°45  | 29°12  | 3°47   | 8°R 3  | 8°52   | 12°57  | 22°43  | S 14 |
| S 15 | 11 30 47 | 24°28'08  | 4°58   | 29°33  | 0°Y 2  | 11°30  | 24°24  | 9°10   | 14°42  | 29°12  | 3°48   | 8° 3   | 8°49   | 13° 4  | 22°46  | S 15 |
| M 16 | 11 34 43 | 25°27'58  | 18°41  | 0°X56  | 1°17   | 12°15  | 24°23  | 9°10   | 14°40  | 29°11  | 3°49   | 8° 1   | 8°46   | 13°10  | 22°48  | M 16 |
| T 17 | 11 38 40 | 26°27'46  | 3°Ω 3  | 2°20   | 2°32   | 13° 1  | 24°22  | 9°11   | 14°37  | 29°11  | 3°49   | 7°57   | 8°43   | 13°17  | 22°51  | T 17 |
| W 18 | 11 42 36 | 27°27'32  | 17°28  | 3°45   | 3°46   | 13°46  | 24°21  | 9°R 11 | 14°35  | 29°10  | 3°50   | 7°49   | 8°39   | 13°24  | 22°54  | W 18 |
| T 19 | 11 46 33 | 28°27'16  | 1°M52  | 5°12   | 5° 1   | 14°32  | 24°21  | 9°11   | 14°32  | 29°10  | 3°50   | 7°40   | 8°36   | 13°30  | 22°57  | T 19 |
| F 20 | 11 50 29 | 29°26'57  | 16°10  | 6°40   | 6°16   | 15°17  | 24°21  | 9°10   | 14°30  | 29° 9  | 3°51   | 7°29   | 8°33   | 13°37  | 22°59  | F 20 |
| S 21 | 11 54 26 | 0°Y26'36  | 0°Δ15  | 8° 9   | 7°30   | 16° 3  | 24°D21 | 9°10   | 14°27  | 29° 8  | 3°52   | 7°18   | 8°30   | 13°44  | 23° 2  | S 21 |
| S 22 | 11 58 22 | 1°26'13   | 14° 2  | 9°40   | 8°45   | 16°49  | 24°21  | 9°10   | 14°25  | 29° 8  | 3°52   | 7° 8   | 8°27   | 13°50  | 23° 5  | S 22 |
| M 23 | 12 2 19  | 2°25'49   | 27°28  | 11°12  | 10° 0  | 17°34  | 24°21  | 9°10   | 14°22  | 29° 7  | 3°53   | 7° 0   | 8°24   | 13°57  | 23° 8  | M 23 |
| T 24 | 12 6 16  | 3°25'22   | 10°M31 | 12°46  | 11°14  | 18°20  | 24°22  | 9° 9   | 14°20  | 29° 6  | 3°54   | 6°55   | 8°20   | 14° 4  | 23°11  | T 24 |
| W 25 | 12 10 12 | 4°24'54   | 2°Ω13  | 14°21  | 12°29  | 19° 6  | 24°23  | 9° 8   | 14°17  | 29° 6  | 3°55   | 6°51   | 8°17   | 14°10  | 23°14  | W 25 |
| T 26 | 12 14 9  | 5°24'24   | 5°X35  | 15°57  | 13°43  | 19°51  | 24°24  | 9° 8   | 14°15  | 29° 5  | 3°55   | 6°D51  | 8°14   | 14°17  | 23°18  | T 26 |
| F 27 | 12 18 5  | 6°23'52   | 17°41  | 17°34  | 14°58  | 20°37  | 24°25  | 9° 7   | 14°13  | 29° 4  | 3°56   | 6°51   | 8°11   | 14°24  | 23°21  | F 27 |
| S 28 | 12 22 2  | 7°23'19   | 29°36  | 19°13  | 16°12  | 21°23  | 24°26  | 9° 6   | 14°10  | 29° 3  | 3°57   | 6°52   | 8° 8   | 14°30  | 23°24  | S 28 |
| S 29 | 12 25 58 | 8°22'43   | 11°37  | 20°53  | 17°27  | 22° 9  | 24°28  | 9° 5   | 14° 8  | 29° 2  | 3°58   | 6°R52  | 8° 5   | 14°37  | 23°27  | S 29 |
| M 30 | 12 29 55 | 9°22'06   | 23°16  | 22°35  | 18°41  | 22°54  | 24°29  | 9° 4   | 14° 6  | 29° 2  | 3°59   | 6°51   | 8° 1   | 14°44  | 23°31  | M 30 |
| T 31 | 12 33 51 | 10°Y21'27 | 5°Δ11  | 24°X18 | 19°Y56 | 23°Δ40 | 24°531 | 9°X 3  | 14°M 3 | 29°M 1 | 4°II 0 | 6°II47 | 7°II58 | 14°350 | 23°R34 | T 31 |

Delta T = 110.83 sec

APRIL 2133

00:00 UT

| Day  | Sid.t    | ☉         | ☽      | ♀      | ♂      | ♂      | ♂      | ♂     | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | ♂      | Day  |
|------|----------|-----------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|------|
| W 1  | 12 37 48 | 11°Y20'47 | 17°Δ16 | 26°X 2 | 21°Y10 | 24°Δ26 | 24°533 | 9°R 1 | 14°R 1 | 29°R 0 | 4°II 0 | 6°R42  | 7°II55 | 14°357 | 23°R37 | W 1  |
| T 2  | 12 41 45 | 12°20'04  | 29°34  | 27°47  | 22°25  | 25°12  | 24°36  | 9°X 0 | 13°M59 | 28°M59 | 4° 1   | 6°II34 | 7°52   | 15° 4  | 23°41  | T 2  |
| F 3  | 12 45 41 | 13°19'20  | 12°X 9 | 29°34  | 23°39  | 25°57  | 24°38  | 8°59  | 13°57  | 28°58  | 4° 2   | 6°26   | 7°49   | 15°10  | 23°44  | F 3  |
| S 4  | 12 49 38 | 14°18'33  | 25° 0  | 1°Y23  | 24°53  | 26°43  | 24°41  | 8°57  | 13°54  | 28°57  | 4° 3   | 6°16   | 7°45   | 15°17  | 23°48  | S 4  |
| S 5  | 12 53 34 | 15°17'45  | 8°Y10  | 3°12   | 26° 8  | 27°29  | 24°44  | 8°55  | 13°52  | 28°56  | 4° 4   | 6° 7   | 7°42   | 15°24  | 23°51  | S 5  |
| M 6  | 12 57 31 | 16°16'55  | 21°36  | 5° 4   | 27°22  | 28°15  | 24°47  | 8°54  | 13°50  | 28°55  | 4° 5   | 5°59   | 7°39   | 15°30  | 23°55  | M 6  |
| T 7  | 13 1 27  | 17°16'02  | 5°B16  | 6°56   | 28°36  | 29° 1  | 24°50  | 8°52  | 13°48  | 28°53  | 4° 6   | 5°53   | 7°36   | 15°37  | 23°58  | T 7  |
| W 8  | 13 5 24  | 18°15'08  | 19° 7  | 8°50   | 29°51  | 29°47  | 24°53  | 8°50  | 13°46  | 28°52  | 4° 7   | 5°50   | 7°33   | 15°44  | 24° 2  | W 8  |
| T 9  | 13 9 20  | 19°14'11  | 3°II 6 | 10°45  | 1°X 5  | 0°X32  | 24°57  | 8°48  | 13°44  | 28°51  | 4° 8   | 5°D49  | 7°30   | 15°50  | 24° 5  | T 9  |
| F 10 | 13 13 17 | 20°13'13  | 17°11  | 12°42  | 2°19   | 1°18   | 25° 1  | 8°46  | 13°42  | 28°50  | 4° 9   | 5°49   | 7°26   | 15°57  | 24° 9  | F 10 |
| S 11 | 13 17 13 | 21°12'12  | 1°519  | 14°40  | 3°33   | 2° 4   | 25° 4  | 8°43  | 13°40  | 28°49  | 4°10   | 5°50   | 7°23   | 16° 4  | 24°13  | S 11 |
| S 12 | 13 21 10 | 22°11'08  | 15°28  | 16°40  | 4°47   | 2°50   | 25° 8  | 8°41  | 13°38  | 28°48  | 4°11   | 5°R51  | 7°20   | 16°10  | 24°17  | S 12 |
| M 13 | 13 25 7  | 23°10'03  | 29°37  | 18°41  | 6° 1   | 3°36   | 25°13  | 8°39  | 13°37  | 28°46  | 4°12   | 5°51   | 7°17   | 16°17  | 24°20  | M 13 |
| T 14 | 13 29 3  | 24° 8'55  | 13°Ω45 | 20°43  | 7°16   | 4°22   | 25°17  | 8°36  | 13°35  | 28°45  | 4°13   | 5°49   | 7°14   | 16°24  | 24°24  | T 14 |
| W 15 | 13 33 0  | 25° 7'45  | 27°49  | 22°46  | 8°30   | 5° 7   | 25°22  | 8°34  | 13°33  | 28°44  | 4°14   | 5°46   | 7°10   | 16°30  | 24°28  | W 15 |
| T 16 | 13 36 56 | 26° 6'32  | 11°M47 | 24°50  | 9°44   | 5°53   | 25°26  | 8°31  | 13°31  | 28°43  | 4°15   | 5°41   | 7° 7   | 16°37  | 24°32  | T 16 |
| F 17 | 13 40 53 | 27° 5'17  | 25°37  | 26°55  | 10°58  | 6°39   | 25°31  | 8°28  | 13°30  | 28°41  | 4°16   | 5°35   | 7° 4   | 16°44  | 24°36  | F 17 |
| S 18 | 13 44 49 | 28° 4'00  | 9°Δ15  | 29° 1  | 12°12  | 7°25   | 25°36  | 8°26  | 13°28  | 28°40  | 4°18   | 5°29   | 7° 1   | 16°50  | 24°40  | S 18 |
| S 19 | 13 48 46 | 29° 2'41  | 22°38  | 1°X 8  | 13°26  | 8°11   | 25°42  | 8°23  | 13°26  | 28°39  | 4°19   | 5°23   | 6°58   | 16°57  | 24°44  | S 19 |
| M 20 | 13 52 42 | 0°B 1'20  | 5°M45  | 3°15   | 14°40  | 8°57   | 25°47  | 8°20  | 13°25  | 28°37  | 4°20   | 5°19   | 6°55   | 17° 4  | 24°48  | M 20 |
| T 21 | 13 56 39 | 0°59'57   | 18°35  | 5°22   | 15°54  | 9°42   | 25°52  | 8°17  | 13°23  | 28°36  | 4°21   | 5°16   | 6°51   | 17°11  | 24°52  | T 21 |
| W 22 | 14 0 36  | 1°58'33   | 1°X 8  | 7°29   | 17° 7  | 10°28  | 25°58  | 8°14  | 13°22  | 28°34  | 4°22   | 5°D14  | 6°48   | 17°17  | 24°56  | W 22 |
| T 23 | 14 4 32  | 2°57'06   | 13°25  | 9°36   | 18°21  | 11°14  | 26° 4  | 8°10  | 13°20  | 28°33  | 4°23   | 5°15   | 6°45   | 17°24  | 25° 0  | T 23 |
| F 24 | 14 8 29  | 3°55'38   | 25°30  | 11°43  | 19°35  | 12° 0  | 26°10  | 8° 7  | 13°19  | 28°32  | 4°25   | 5°16   | 6°42   | 17°31  | 25° 4  | F 24 |
| S 25 | 14 12 25 | 4°54'09   | 7°326  | 13°48  | 20°49  | 12°46  | 26°16  | 8° 4  | 13°18  | 28°30  | 4°26   | 5°18   | 6°39   | 17°37  | 25° 8  | S 25 |
| S 26 | 14 16 22 | 5°52'37   | 19°17  | 15°52  | 22° 3  | 13°32  | 26°22  | 8° 1  | 13°16  | 28°29  | 4°27   | 5°19   | 6°36   | 17°44  | 25°12  | S 26 |
| M 27 | 14 20 18 | 6°51'04   | 1°Δ 9  | 17°55  | 23°16  | 14°17  | 26°29  | 7°57  | 13°15  | 28°27  | 4°28   | 5°20   | 6°32   | 17°51  | 25°16  | M 27 |
| T 28 | 14 24 15 | 7°49'30   | 13° 4  | 19°55  | 24°30  | 15° 3  | 26°35  | 7°54  | 13°14  | 28°26  | 4°29   | 5°R20  | 6°29   | 17°57  | 25°20  | T 28 |
| W 29 | 14 28 11 | 8°47'53   | 25°10  | 21°54  | 25°44  | 15°49  | 26°42  | 7°50  | 13°13  | 28°24  | 4°31   | 5°19   | 6°26   | 18° 4  | 25°24  | W 29 |
| T 30 | 14 32 8  | 9°B46'16  | 7°X30  | 23°B50 | 26°B58 | 16°X35 | 26°549 | 7°X46 | 13°M12 | 28°M23 | 4°II32 | 5°II17 | 6°II23 | 18°311 | 25°B28 | T 30 |

Delta T = 110.89 sec

## ASTRODIENST EPHEMERIS for the year 2133

geocentric

MAY 2133

00:00 UT

| Day  | Sid.t    | ☉        | ☽      | ♀      | ♂     | ♂     | ♂     | ♂     | ♂      | ♂      | ♂    | ♂     | ♂    | ♂     | ♂     | Day  |
|------|----------|----------|--------|--------|-------|-------|-------|-------|--------|--------|------|-------|------|-------|-------|------|
| F 1  | 14 36 5  | 10♂44'36 | 20♂7 7 | 25♂43  | 28♂11 | 17♂21 | 26♂56 | 7°R43 | 13°R11 | 28°R21 | 4♂33 | 5°R14 | 6♂20 | 18♂17 | 25♂32 | F 1  |
| S 2  | 14 40 1  | 11°42'55 | 3♂5    | 27°33  | 29°25 | 18° 6 | 27° 3 | 7♂39  | 13♂10  | 28♂20  | 4°34 | 5♂10  | 6°16 | 18°24 | 25°37 | S 2  |
| S 3  | 14 43 58 | 12°41'12 | 16°25  | 29°21  | 0♂38  | 18°52 | 27°10 | 7°35  | 13° 9  | 28°18  | 4°36 | 5° 7  | 6°13 | 18°31 | 25°41 | S 3  |
| M 4  | 14 47 54 | 13°39'28 | 0♂8 7  | 1♂4    | 1°52  | 19°38 | 27°18 | 7°31  | 13° 8  | 28°17  | 4°37 | 5° 4  | 6°10 | 18°37 | 25°45 | M 4  |
| T 5  | 14 51 51 | 14°37'42 | 14° 7  | 2°45   | 3° 6  | 20°23 | 27°25 | 7°27  | 13° 7  | 28°15  | 4°38 | 5° 2  | 6° 7 | 18°44 | 25°49 | T 5  |
| W 6  | 14 55 47 | 15°35'55 | 28°22  | 4°21   | 4°19  | 21° 9 | 27°33 | 7°23  | 13° 6  | 28°13  | 4°39 | 5°D 1 | 6° 4 | 18°51 | 25°53 | W 6  |
| T 7  | 14 59 44 | 16°34'06 | 12♂48  | 5°54   | 5°33  | 21°55 | 27°41 | 7°19  | 13° 5  | 28°12  | 4°41 | 5° 1  | 6° 1 | 18°57 | 25°58 | T 7  |
| F 8  | 15 3 40  | 17°32'15 | 27°19  | 7°23   | 6°46  | 22°40 | 27°49 | 7°15  | 13° 5  | 28°10  | 4°42 | 5° 2  | 5°57 | 19° 4 | 26° 2 | F 8  |
| S 9  | 15 7 37  | 18°30'22 | 11♂50  | 8°48   | 7°59  | 23°26 | 27°57 | 7°11  | 13° 4  | 28° 9  | 4°43 | 5° 3  | 5°54 | 19°11 | 26° 6 | S 9  |
| S 10 | 15 11 34 | 19°28'27 | 26°16  | 10° 9  | 9°13  | 24°12 | 28° 5 | 7° 7  | 13° 3  | 28° 7  | 4°45 | 5° 4  | 5°51 | 19°17 | 26°10 | S 10 |
| M 11 | 15 15 30 | 20°26'30 | 10♂34  | 11°26  | 10°26 | 24°57 | 28°13 | 7° 3  | 13° 3  | 28° 6  | 4°46 | 5° 5  | 5°48 | 19°24 | 26°15 | M 11 |
| T 12 | 15 19 27 | 21°24'32 | 24°40  | 12°38  | 11°40 | 25°43 | 28°22 | 6°59  | 13° 2  | 28° 4  | 4°47 | 5°R 5 | 5°45 | 19°31 | 26°19 | T 12 |
| W 13 | 15 23 23 | 22°22'31 | 8♂34   | 13°47  | 12°53 | 26°28 | 28°30 | 6°55  | 13° 2  | 28° 2  | 4°49 | 5° 4  | 5°42 | 19°37 | 26°23 | W 13 |
| T 14 | 15 27 20 | 23°20'28 | 22°15  | 14°51  | 14° 6 | 27°14 | 28°39 | 6°50  | 13° 2  | 28° 1  | 4°50 | 5° 3  | 5°38 | 19°44 | 26°27 | T 14 |
| F 15 | 15 31 16 | 24°18'24 | 5♂41   | 15°50  | 15°19 | 27°59 | 28°48 | 6°46  | 13° 1  | 27°59  | 4°51 | 5° 2  | 5°35 | 19°51 | 26°32 | F 15 |
| S 16 | 15 35 13 | 25°16'18 | 18°54  | 16°46  | 16°33 | 28°45 | 28°57 | 6°42  | 13° 1  | 27°57  | 4°53 | 5° 1  | 5°32 | 19°58 | 26°36 | S 16 |
| S 17 | 15 39 9  | 26°14'10 | 1♂53   | 17°36  | 17°46 | 29°30 | 29° 6 | 6°37  | 13° 1  | 27°56  | 4°54 | 5° 0  | 5°29 | 20° 4 | 26°40 | S 17 |
| M 18 | 15 43 6  | 27°12'01 | 14°37  | 18°23  | 18°59 | 0♂16  | 29°15 | 6°33  | 13° 1  | 27°54  | 4°55 | 4°59  | 5°26 | 20°11 | 26°45 | M 18 |
| T 19 | 15 47 3  | 28° 9'50 | 27° 9  | 19° 4  | 20°12 | 1° 1  | 29°24 | 6°29  | 13° 1  | 27°53  | 4°57 | 4°58  | 5°22 | 20°18 | 26°49 | T 19 |
| W 20 | 15 50 59 | 29° 7'37 | 9♂29   | 19°41  | 21°25 | 1°46  | 29°33 | 6°24  | 13° 0  | 27°51  | 4°58 | 4°D58 | 5°19 | 20°24 | 26°53 | W 20 |
| T 21 | 15 54 56 | 0♂52     | 5°24   | 20°13  | 22°38 | 2°32  | 29°43 | 6°20  | 13°D 0 | 27°49  | 4°59 | 4°59  | 5°16 | 20°31 | 26°57 | T 21 |
| F 22 | 15 58 52 | 1° 3'09  | 3♂38   | 20°40  | 23°51 | 3°17  | 29°52 | 6°15  | 13° 0  | 27°48  | 5° 1 | 4°59  | 5°13 | 20°38 | 27° 2 | F 22 |
| S 23 | 16 2 49  | 2° 0'53  | 15°32  | 21° 3  | 25° 4 | 4° 2  | 0♂2   | 6°11  | 13° 1  | 27°46  | 5° 2 | 4°59  | 5°10 | 20°44 | 27° 6 | S 23 |
| S 24 | 16 6 45  | 2°58'36  | 27°23  | 21°20  | 26°17 | 4°47  | 0°12  | 6° 7  | 13° 1  | 27°44  | 5° 4 | 5° 0  | 5° 7 | 20°51 | 27°10 | S 24 |
| M 25 | 16 10 42 | 3°56'17  | 9♂15   | 21°33  | 27°30 | 5°33  | 0°21  | 6° 2  | 13° 1  | 27°43  | 5° 5 | 5° 0  | 5° 3 | 20°58 | 27°14 | M 25 |
| T 26 | 16 14 39 | 4°53'58  | 21°11  | 21°41  | 28°43 | 6°18  | 0°31  | 5°58  | 13° 1  | 27°41  | 5° 6 | 5°R 0 | 5° 0 | 21° 4 | 27°19 | T 26 |
| W 27 | 16 18 35 | 5°51'38  | 3♂15   | 21°R45 | 29°56 | 7° 3  | 0°41  | 5°53  | 13° 2  | 27°40  | 5° 8 | 5°D 0 | 4°57 | 21°11 | 27°23 | W 27 |
| T 28 | 16 22 32 | 6°49'16  | 15°33  | 21°43  | 1♂9   | 7°48  | 0°51  | 5°49  | 13° 2  | 27°38  | 5° 9 | 5° 0  | 4°54 | 21°18 | 27°27 | T 28 |
| F 29 | 16 26 28 | 7°46'54  | 28° 9  | 21°37  | 2°22  | 8°33  | 1° 2  | 5°44  | 13° 2  | 27°36  | 5°10 | 5° 0  | 4°51 | 21°24 | 27°32 | F 29 |
| S 30 | 16 30 25 | 8°44'30  | 11♂6   | 21°27  | 3°34  | 9°18  | 1°12  | 5°40  | 13° 3  | 27°35  | 5°12 | 5° 0  | 4°48 | 21°31 | 27°36 | S 30 |
| S 31 | 16 34 21 | 9♂42'06  | 24♂27  | 21♂13  | 4♂47  | 10♂3  | 1♂22  | 5♂35  | 13♂3   | 27♂33  | 5♂13 | 5♂1   | 4♂44 | 21♂38 | 27♂40 | S 31 |

Delta T = 110.93 sec

JUNE 2133

00:00 UT

| Day  | Sid.t    | ☉        | ☽     | ♀      | ♂     | ♂     | ♂    | ♂     | ♂     | ♂      | ♂    | ♂     | ♂    | ♂     | ♂     | Day  |
|------|----------|----------|-------|--------|-------|-------|------|-------|-------|--------|------|-------|------|-------|-------|------|
| M 1  | 16 38 18 | 10♂39'41 | 8♂14  | 20°R55 | 6♂0   | 10♂48 | 1♂33 | 5°R31 | 13♂4  | 27°R32 | 5♂14 | 5♂1   | 4♂41 | 21♂44 | 27♂48 | M 1  |
| T 2  | 16 42 14 | 11°37'15 | 22°24 | 20♂33  | 7°13  | 11°33 | 1°43 | 5♂26  | 13° 5 | 27♂30  | 5°16 | 5° 2  | 4°38 | 21°51 | 27°44 | T 2  |
| W 3  | 16 46 11 | 12°34'48 | 6♂56  | 20° 8  | 8°25  | 12°18 | 1°54 | 5°22  | 13° 5 | 27°28  | 5°17 | 5°R 2 | 4°35 | 21°58 | 27°53 | W 3  |
| T 4  | 16 50 8  | 13°32'20 | 21°43 | 19°41  | 9°38  | 13° 2 | 2° 5 | 5°18  | 13° 6 | 27°27  | 5°18 | 5° 1  | 4°32 | 22° 5 | 27°57 | T 4  |
| F 5  | 16 54 4  | 14°29'51 | 6♂38  | 19°11  | 10°50 | 13°47 | 2°15 | 5°13  | 13° 7 | 27°25  | 5°20 | 5° 1  | 4°28 | 22°11 | 28° 1 | F 5  |
| S 6  | 16 58 1  | 15°27'21 | 21°34 | 18°39  | 12° 3 | 14°32 | 2°26 | 5° 9  | 13° 8 | 27°24  | 5°21 | 5° 0  | 4°25 | 22°18 | 28° 5 | S 6  |
| S 7  | 17 1 57  | 16°24'50 | 6♂22  | 18° 6  | 13°15 | 15°17 | 2°37 | 5° 5  | 13° 9 | 27°22  | 5°22 | 4°58  | 4°22 | 22°25 | 28° 9 | S 7  |
| M 8  | 17 5 54  | 17°22'17 | 20°56 | 17°33  | 14°28 | 16° 1 | 2°48 | 5° 0  | 13° 9 | 27°21  | 5°24 | 4°57  | 4°19 | 22°31 | 28°13 | M 8  |
| T 9  | 17 9 50  | 18°19'44 | 5♂11  | 16°59  | 15°40 | 16°46 | 2°59 | 4°56  | 13°10 | 27°19  | 5°25 | 4°56  | 4°16 | 22°38 | 28°18 | T 9  |
| W 10 | 17 13 47 | 19°17'09 | 19° 6 | 16°26  | 16°53 | 17°30 | 3°11 | 4°52  | 13°12 | 27°18  | 5°26 | 4°D56 | 4°13 | 22°45 | 28°22 | W 10 |
| T 11 | 17 17 43 | 20°14'33 | 2♂40  | 15°55  | 18° 5 | 18°14 | 3°22 | 4°47  | 13°13 | 27°16  | 5°28 | 4°56  | 4° 9 | 22°51 | 28°26 | T 11 |
| F 12 | 17 21 40 | 21°11'55 | 15°53 | 15°24  | 19°17 | 18°59 | 3°33 | 4°43  | 13°14 | 27°15  | 5°29 | 4°57  | 4° 6 | 22°58 | 28°30 | F 12 |
| S 13 | 17 25 37 | 22° 9'17 | 28°49 | 14°56  | 20°30 | 19°43 | 3°45 | 4°39  | 13°15 | 27°13  | 5°30 | 4°58  | 4° 3 | 23° 5 | 28°34 | S 13 |
| S 14 | 17 29 33 | 23° 6'38 | 11♂28 | 14°30  | 21°42 | 20°27 | 3°56 | 4°35  | 13°16 | 27°12  | 5°32 | 5° 0  | 4° 0 | 23°11 | 28°38 | S 14 |
| M 15 | 17 33 30 | 24° 3'58 | 23°55 | 14° 8  | 22°54 | 21°12 | 4° 7 | 4°31  | 13°18 | 27°11  | 5°33 | 5° 1  | 3°57 | 23°18 | 28°42 | M 15 |
| T 16 | 17 37 26 | 25° 1'17 | 6♂17  | 13°49  | 24° 6 | 21°56 | 4°19 | 4°27  | 13°19 | 27° 9  | 5°34 | 5°R 1 | 3°54 | 23°25 | 28°46 | T 16 |
| W 17 | 17 41 23 | 25°58'35 | 18°17 | 13°33  | 25°18 | 22°40 | 4°31 | 4°23  | 13°20 | 27° 8  | 5°36 | 5° 1  | 3°50 | 23°32 | 28°50 | W 17 |
| T 18 | 17 45 19 | 26°55'53 | 0♂17  | 13°22  | 26°31 | 23°24 | 4°42 | 4°19  | 13°22 | 27° 6  | 5°37 | 4°59  | 3°47 | 23°38 | 28°54 | T 18 |
| F 19 | 17 49 16 | 27°53'10 | 12°11 | 13°15  | 27°43 | 24° 8 | 4°54 | 4°15  | 13°23 | 27° 5  | 5°38 | 4°56  | 3°44 | 23°45 | 28°58 | F 19 |
| S 20 | 17 53 12 | 28°50'27 | 24° 3 | 13°D12 | 28°55 | 24°52 | 5° 6 | 4°11  | 13°25 | 27° 4  | 5°39 | 4°53  | 3°41 | 23°52 | 29° 1 | S 20 |
| S 21 | 17 57 9  | 29°47'43 | 5♂54  | 13°14  | 0♂6   | 25°35 | 5°18 | 4° 7  | 13°26 | 27° 2  | 5°41 | 4°49  | 3°38 | 23°58 | 29° 5 | S 21 |
| M 22 | 18 1 6   | 0♂44'59  | 17°46 | 13°20  | 1°18  | 26°19 | 5°30 | 4° 4  | 13°28 | 27° 1  | 5°42 | 4°44  | 3°34 | 24° 5 | 29° 9 | M 22 |
| T 23 | 18 5 2   | 1°42'15  | 29°43 | 13°31  | 2°30  | 27° 3 | 5°42 | 4° 0  | 13°30 | 27° 0  | 5°43 | 4°41  | 3°31 | 24°12 | 29°13 | T 23 |
| W 24 | 18 8 59  | 2°39'30  | 11♂48 | 13°46  | 3°42  | 27°46 | 5°54 | 3°56  | 13°32 | 26°59  | 5°44 | 4°38  | 3°28 | 24°18 | 29°17 | W 24 |
| T 25 | 18 12 55 | 3°36'45  | 24° 4 | 14° 7  | 4°54  | 28°30 | 6° 6 | 3°53  | 13°33 | 26°57  | 5°46 | 4°36  | 3°25 | 24°25 | 29°20 | T 25 |
| F 26 | 18 16 52 | 4°34'00  | 6♂37  | 14°32  | 6° 5  | 29°14 | 6°18 | 3°49  | 13°35 | 26°56  | 5°47 | 4°D36 | 3°22 | 24°32 | 29°24 | F 26 |
| S 27 | 18 20 48 | 5°31'15  | 19°30 | 15° 1  | 7°17  | 29°57 | 6°30 | 3°46  | 13°37 | 26°55  | 5°48 | 4°37  | 3°19 | 24°38 | 29°28 | S 27 |
| S 28 | 18 24 45 | 6°28'29  | 2♂46  | 15°35  | 8°29  | 0♂40  | 6°43 | 3°42  | 13°39 | 26°54  | 5°49 | 4°38  | 3°15 | 24°45 | 29°32 | S 28 |
| M 29 | 18 28 41 | 7°25'44  | 16°28 | 16°14  | 9°40  | 1°24  | 6°55 | 3°39  | 13°41 | 26°53  | 5°51 | 4°39  | 3°12 | 24°52 | 29°35 | M 29 |
| T 30 | 18 32 38 | 8♂22'59  | 0♂37  | 16♂57  | 10♂52 | 2♂7   | 7♂7  | 3♂36  | 13♂43 | 26♂52  | 5♂52 | 4°R40 | 3♂9  | 24♂59 | 29♂39 | T 30 |

Delta T = 110.99 sec

ASTRODIENST EPHEMERIS for the year 2133  
geocentric

JULY 2133

00:00 UT

| Day  | Sid.t    | ☉                     | ☽                   | ♀                   | ♂                   | ♂                  | ♂                  | ♂                  | ♂                   | ♂                   | ♂                  | ♂                   | ♂                  | ♂                 | ♂                  | Day  |
|------|----------|-----------------------|---------------------|---------------------|---------------------|--------------------|--------------------|--------------------|---------------------|---------------------|--------------------|---------------------|--------------------|-------------------|--------------------|------|
| W 1  | 18 36 35 | 9 <sup>52</sup> 20'14 | 15 <sup>11</sup> 11 | 17 <sup>11</sup> 45 | 12 <sup>12</sup> 3  | 2 <sup>8</sup> 50  | 7 <sup>12</sup> 20 | 3 <sup>3</sup> R32 | 13 <sup>11</sup> 45 | 26 <sup>1</sup> R50 | 5 <sup>11</sup> 53 | 4 <sup>1</sup> R40  | 3 <sup>11</sup> 6  | 25 <sup>3</sup> 5 | 29 <sup>8</sup> 42 | W 1  |
| T 2  | 18 40 31 | 10 <sup>17</sup> 29   | 0 <sup>5</sup> 7    | 18 <sup>3</sup> 36  | 13 <sup>15</sup>    | 3 <sup>3</sup> 33  | 7 <sup>3</sup> 32  | 3 <sup>3</sup> 29  | 13 <sup>4</sup> 7   | 26 <sup>1</sup> M49 | 5 <sup>5</sup> 54  | 4 <sup>11</sup> 38  | 3 <sup>3</sup> 3   | 25 <sup>12</sup>  | 29 <sup>4</sup> 46 | T 2  |
| F 3  | 18 44 28 | 11 <sup>14</sup> 44   | 15 <sup>16</sup>    | 19 <sup>3</sup> 33  | 14 <sup>26</sup>    | 4 <sup>16</sup>    | 7 <sup>4</sup> 45  | 3 <sup>26</sup>    | 13 <sup>4</sup> 9   | 26 <sup>4</sup> 48  | 5 <sup>5</sup> 55  | 4 <sup>3</sup> 34   | 3 <sup>0</sup> 0   | 25 <sup>19</sup>  | 29 <sup>4</sup> 49 | F 3  |
| S 4  | 18 48 24 | 12 <sup>11</sup> 58   | 0 <sup>12</sup> 29  | 20 <sup>3</sup> 33  | 15 <sup>38</sup>    | 4 <sup>5</sup> 59  | 7 <sup>5</sup> 57  | 3 <sup>23</sup>    | 13 <sup>5</sup> 2   | 26 <sup>4</sup> 47  | 5 <sup>5</sup> 56  | 4 <sup>3</sup> 30   | 2 <sup>56</sup>    | 25 <sup>25</sup>  | 29 <sup>5</sup> 53 | S 4  |
| S 5  | 18 52 21 | 13 <sup>9</sup> 13    | 15 <sup>36</sup>    | 21 <sup>3</sup> 38  | 16 <sup>49</sup>    | 5 <sup>4</sup> 41  | 8 <sup>10</sup>    | 3 <sup>20</sup>    | 13 <sup>5</sup> 4   | 26 <sup>4</sup> 46  | 5 <sup>5</sup> 57  | 4 <sup>2</sup> 4    | 2 <sup>53</sup>    | 25 <sup>32</sup>  | 29 <sup>5</sup> 56 | S 5  |
| M 6  | 18 56 17 | 14 <sup>6</sup> 27    | 0 <sup>11</sup> 27  | 22 <sup>46</sup>    | 18 <sup>0</sup>     | 6 <sup>2</sup> 24  | 8 <sup>22</sup>    | 3 <sup>17</sup>    | 13 <sup>5</sup> 6   | 26 <sup>4</sup> 45  | 5 <sup>5</sup> 59  | 4 <sup>1</sup> 9    | 2 <sup>50</sup>    | 25 <sup>39</sup>  | 29 <sup>5</sup> 59 | M 6  |
| T 7  | 19 0 14  | 15 <sup>3</sup> 41    | 14 <sup>5</sup> 6   | 23 <sup>5</sup> 9   | 19 <sup>11</sup>    | 7 <sup>7</sup>     | 8 <sup>3</sup> 35  | 3 <sup>15</sup>    | 13 <sup>5</sup> 8   | 26 <sup>4</sup> 44  | 6 <sup>0</sup>     | 4 <sup>1</sup> 4    | 2 <sup>47</sup>    | 25 <sup>45</sup>  | 0 <sup>11</sup> 3  | T 7  |
| W 8  | 19 4 11  | 16 <sup>0</sup> 54    | 28 <sup>5</sup> 8   | 25 <sup>16</sup>    | 20 <sup>22</sup>    | 7 <sup>4</sup> 49  | 8 <sup>4</sup> 8   | 3 <sup>12</sup>    | 14 <sup>1</sup>     | 26 <sup>4</sup> 43  | 6 <sup>1</sup>     | 4 <sup>1</sup> 1    | 2 <sup>44</sup>    | 25 <sup>52</sup>  | 0 <sup>6</sup>     | W 8  |
| T 9  | 19 8 7   | 16 <sup>58</sup> 07   | 12 <sup>34</sup>    | 26 <sup>36</sup>    | 21 <sup>33</sup>    | 8 <sup>3</sup> 32  | 9 <sup>0</sup>     | 3 <sup>9</sup>     | 14 <sup>3</sup>     | 26 <sup>4</sup> 42  | 6 <sup>2</sup>     | 4 <sup>10</sup> D10 | 2 <sup>40</sup>    | 25 <sup>59</sup>  | 0 <sup>10</sup>    | T 9  |
| F 10 | 19 12 4  | 17 <sup>55</sup> 20   | 25 <sup>44</sup>    | 28 <sup>1</sup>     | 22 <sup>44</sup>    | 9 <sup>14</sup>    | 9 <sup>13</sup>    | 3 <sup>7</sup>     | 14 <sup>6</sup>     | 26 <sup>4</sup> 42  | 6 <sup>3</sup>     | 4 <sup>10</sup>     | 2 <sup>37</sup>    | 26 <sup>5</sup>   | 0 <sup>13</sup>    | F 10 |
| S 11 | 19 16 0  | 18 <sup>52</sup> 33   | 8 <sup>11</sup> 32  | 29 <sup>29</sup>    | 23 <sup>55</sup>    | 9 <sup>5</sup> 56  | 9 <sup>26</sup>    | 3 <sup>4</sup>     | 14 <sup>8</sup>     | 26 <sup>4</sup> 41  | 6 <sup>4</sup>     | 4 <sup>11</sup>     | 2 <sup>34</sup>    | 26 <sup>12</sup>  | 0 <sup>16</sup>    | S 11 |
| S 12 | 19 19 57 | 19 <sup>49</sup> 45   | 21 <sup>1</sup>     | 1 <sup>5</sup> 2    | 25 <sup>6</sup>     | 10 <sup>3</sup> 8  | 9 <sup>39</sup>    | 3 <sup>2</sup>     | 14 <sup>11</sup>    | 26 <sup>4</sup> 40  | 6 <sup>5</sup>     | 4 <sup>13</sup>     | 2 <sup>31</sup>    | 26 <sup>19</sup>  | 0 <sup>19</sup>    | S 12 |
| M 13 | 19 23 53 | 20 <sup>46</sup> 58   | 3 <sup>11</sup> 16  | 2 <sup>37</sup>     | 26 <sup>17</sup>    | 11 <sup>20</sup>   | 9 <sup>51</sup>    | 3 <sup>0</sup>     | 14 <sup>13</sup>    | 26 <sup>3</sup> 9   | 6 <sup>6</sup>     | 4 <sup>13</sup> R13 | 2 <sup>28</sup>    | 26 <sup>26</sup>  | 0 <sup>22</sup>    | M 13 |
| T 14 | 19 27 50 | 21 <sup>44</sup> 11   | 15 <sup>20</sup>    | 4 <sup>17</sup>     | 27 <sup>28</sup>    | 12 <sup>2</sup>    | 10 <sup>4</sup>    | 2 <sup>58</sup>    | 14 <sup>16</sup>    | 26 <sup>3</sup> 8   | 6 <sup>7</sup>     | 4 <sup>13</sup>     | 2 <sup>25</sup>    | 26 <sup>32</sup>  | 0 <sup>25</sup>    | T 14 |
| W 15 | 19 31 46 | 22 <sup>41</sup> 23   | 27 <sup>17</sup>    | 6 <sup>0</sup>      | 28 <sup>39</sup>    | 12 <sup>44</sup>   | 10 <sup>17</sup>   | 2 <sup>55</sup>    | 14 <sup>19</sup>    | 26 <sup>3</sup> 8   | 6 <sup>8</sup>     | 4 <sup>10</sup>     | 2 <sup>21</sup>    | 26 <sup>39</sup>  | 0 <sup>28</sup>    | W 15 |
| T 16 | 19 35 43 | 23 <sup>38</sup> 36   | 9 <sup>3</sup> 10   | 7 <sup>46</sup>     | 29 <sup>49</sup>    | 13 <sup>26</sup>   | 10 <sup>30</sup>   | 2 <sup>53</sup>    | 14 <sup>21</sup>    | 26 <sup>3</sup> 7   | 6 <sup>9</sup>     | 4 <sup>5</sup>      | 2 <sup>18</sup>    | 26 <sup>46</sup>  | 0 <sup>31</sup>    | T 16 |
| F 17 | 19 39 40 | 24 <sup>35</sup> 49   | 21 <sup>1</sup>     | 9 <sup>36</sup>     | 1 <sup>11</sup> 0   | 14 <sup>7</sup>    | 10 <sup>43</sup>   | 2 <sup>51</sup>    | 14 <sup>24</sup>    | 26 <sup>3</sup> 6   | 6 <sup>10</sup>    | 3 <sup>5</sup> 8    | 2 <sup>15</sup>    | 26 <sup>52</sup>  | 0 <sup>34</sup>    | F 17 |
| S 18 | 19 43 36 | 25 <sup>33</sup> 03   | 2 <sup>33</sup> 52  | 11 <sup>28</sup>    | 2 <sup>10</sup>     | 14 <sup>49</sup>   | 10 <sup>56</sup>   | 2 <sup>50</sup>    | 14 <sup>27</sup>    | 26 <sup>3</sup> 6   | 6 <sup>11</sup>    | 3 <sup>50</sup>     | 2 <sup>12</sup>    | 26 <sup>59</sup>  | 0 <sup>37</sup>    | S 18 |
| S 19 | 19 47 33 | 26 <sup>30</sup> 17   | 14 <sup>45</sup>    | 13 <sup>23</sup>    | 3 <sup>21</sup>     | 15 <sup>30</sup>   | 11 <sup>9</sup>    | 2 <sup>48</sup>    | 14 <sup>30</sup>    | 26 <sup>3</sup> 5   | 6 <sup>12</sup>    | 3 <sup>40</sup>     | 2 <sup>9</sup>     | 27 <sup>6</sup>   | 0 <sup>40</sup>    | S 19 |
| M 20 | 19 51 29 | 27 <sup>27</sup> 31   | 26 <sup>41</sup>    | 15 <sup>21</sup>    | 4 <sup>31</sup>     | 16 <sup>12</sup>   | 11 <sup>22</sup>   | 2 <sup>46</sup>    | 14 <sup>32</sup>    | 26 <sup>3</sup> 4   | 6 <sup>13</sup>    | 3 <sup>30</sup>     | 2 <sup>6</sup>     | 27 <sup>12</sup>  | 0 <sup>43</sup>    | M 20 |
| T 21 | 19 55 26 | 28 <sup>24</sup> 45   | 8 <sup>14</sup> 43  | 17 <sup>21</sup>    | 5 <sup>41</sup>     | 16 <sup>53</sup>   | 11 <sup>35</sup>   | 2 <sup>45</sup>    | 14 <sup>35</sup>    | 26 <sup>3</sup> 4   | 6 <sup>14</sup>    | 3 <sup>21</sup>     | 2 <sup>2</sup>     | 27 <sup>19</sup>  | 0 <sup>46</sup>    | T 21 |
| W 22 | 19 59 22 | 29 <sup>22</sup> 01   | 20 <sup>51</sup>    | 19 <sup>23</sup>    | 6 <sup>51</sup>     | 17 <sup>34</sup>   | 11 <sup>48</sup>   | 2 <sup>43</sup>    | 14 <sup>38</sup>    | 26 <sup>3</sup> 3   | 6 <sup>15</sup>    | 3 <sup>13</sup>     | 1 <sup>59</sup>    | 27 <sup>26</sup>  | 0 <sup>49</sup>    | W 22 |
| T 23 | 20 3 19  | 0 <sup>19</sup> 17    | 3 <sup>11</sup> 10  | 21 <sup>27</sup>    | 8 <sup>1</sup>      | 18 <sup>15</sup>   | 12 <sup>1</sup>    | 2 <sup>42</sup>    | 14 <sup>41</sup>    | 26 <sup>3</sup> 3   | 6 <sup>15</sup>    | 3 <sup>8</sup>      | 1 <sup>56</sup>    | 27 <sup>33</sup>  | 0 <sup>51</sup>    | T 23 |
| F 24 | 20 7 15  | 1 <sup>16</sup> 33    | 15 <sup>43</sup>    | 23 <sup>32</sup>    | 9 <sup>11</sup>     | 18 <sup>56</sup>   | 12 <sup>14</sup>   | 2 <sup>40</sup>    | 14 <sup>44</sup>    | 26 <sup>3</sup> 2   | 6 <sup>16</sup>    | 3 <sup>4</sup>      | 1 <sup>53</sup>    | 27 <sup>39</sup>  | 0 <sup>54</sup>    | F 24 |
| S 25 | 20 11 12 | 2 <sup>13</sup> 51    | 28 <sup>32</sup>    | 25 <sup>38</sup>    | 10 <sup>21</sup>    | 19 <sup>37</sup>   | 12 <sup>27</sup>   | 2 <sup>39</sup>    | 14 <sup>47</sup>    | 26 <sup>3</sup> 2   | 6 <sup>17</sup>    | 3 <sup>10</sup> D 3 | 1 <sup>50</sup>    | 27 <sup>46</sup>  | 0 <sup>56</sup>    | S 25 |
| S 26 | 20 15 9  | 3 <sup>11</sup> 09    | 11 <sup>8</sup> 42  | 27 <sup>44</sup>    | 11 <sup>31</sup>    | 20 <sup>17</sup>   | 12 <sup>40</sup>   | 2 <sup>38</sup>    | 14 <sup>50</sup>    | 26 <sup>3</sup> 1   | 6 <sup>18</sup>    | 3 <sup>3</sup>      | 1 <sup>46</sup>    | 27 <sup>53</sup>  | 0 <sup>59</sup>    | S 26 |
| M 27 | 20 19 5  | 4 <sup>8</sup> 28     | 25 <sup>17</sup>    | 29 <sup>52</sup>    | 12 <sup>41</sup>    | 20 <sup>58</sup>   | 12 <sup>54</sup>   | 2 <sup>37</sup>    | 14 <sup>53</sup>    | 26 <sup>3</sup> 1   | 6 <sup>19</sup>    | 3 <sup>4</sup>      | 1 <sup>43</sup>    | 27 <sup>59</sup>  | 1 <sup>1</sup>     | M 27 |
| T 28 | 20 23 2  | 5 <sup>5</sup> 49     | 9 <sup>11</sup> 17  | 1 <sup>15</sup> 59  | 13 <sup>51</sup>    | 21 <sup>38</sup>   | 13 <sup>7</sup>    | 2 <sup>36</sup>    | 14 <sup>56</sup>    | 26 <sup>3</sup> 1   | 6 <sup>20</sup>    | 3 <sup>1</sup> R 4  | 1 <sup>40</sup>    | 28 <sup>6</sup>   | 1 <sup>4</sup>     | T 28 |
| W 29 | 20 26 58 | 6 <sup>3</sup> 10     | 23 <sup>43</sup>    | 4 <sup>6</sup>      | 15 <sup>0</sup>     | 22 <sup>19</sup>   | 13 <sup>20</sup>   | 2 <sup>35</sup>    | 14 <sup>59</sup>    | 26 <sup>3</sup> 0   | 6 <sup>20</sup>    | 3 <sup>2</sup>      | 1 <sup>37</sup>    | 28 <sup>13</sup>  | 1 <sup>6</sup>     | W 29 |
| T 30 | 20 30 55 | 7 <sup>0</sup> 32     | 8 <sup>13</sup> 33  | 6 <sup>13</sup>     | 16 <sup>10</sup>    | 22 <sup>59</sup>   | 13 <sup>33</sup>   | 2 <sup>34</sup>    | 15 <sup>2</sup>     | 26 <sup>3</sup> 0   | 6 <sup>21</sup>    | 2 <sup>58</sup>     | 1 <sup>34</sup>    | 28 <sup>19</sup>  | 1 <sup>9</sup>     | T 30 |
| F 31 | 20 34 51 | 7 <sup>15</sup> 55    | 23 <sup>40</sup>    | 8 <sup>19</sup>     | 17 <sup>11</sup> 20 | 23 <sup>8</sup> 39 | 13 <sup>46</sup>   | 2 <sup>34</sup>    | 15 <sup>11</sup> 6  | 26 <sup>1</sup> M30 | 6 <sup>11</sup> 22 | 2 <sup>11</sup> 52  | 1 <sup>11</sup> 31 | 28 <sup>26</sup>  | 1 <sup>11</sup> 11 | F 31 |

Delta T = 111.04 sec

AUGUST 2133

00:00 UT

| Day  | Sid.t    | ☉        | ☽     | ♂     | ♀     | ♂     | ♂     | ♂     | ♂     | ♂      | ♂    | ♂     | ♂     | ♂     | ♂    | Day  |
|------|----------|----------|-------|-------|-------|-------|-------|-------|-------|--------|------|-------|-------|-------|------|------|
| S 1  | 20 38 48 | 8♂55'19  | 8♂56  | 10♂24 | 18♂29 | 24♂19 | 14♂ 0 | 2°R33 | 15♂ 9 | 26°R29 | 6♂23 | 2°R44 | 1♂27  | 28♂33 | 1♂13 | S 1  |
| S 2  | 20 42 44 | 9°52'44  | 24°10 | 12°28 | 19°38 | 24°59 | 14°13 | 2♂33  | 15°12 | 26♂29  | 6°23 | 2♂34  | 1°24  | 28°40 | 1°15 | S 2  |
| M 3  | 20 46 41 | 10°50'09 | 9♂11  | 14°32 | 20°48 | 25°38 | 14°26 | 2°32  | 15°15 | 26°29  | 6°24 | 2°24  | 1°21  | 28°46 | 1°17 | M 3  |
| T 4  | 20 50 38 | 11°47'35 | 23°50 | 16°34 | 21°57 | 26°18 | 14°39 | 2°32  | 15°19 | 26°29  | 6°25 | 2°16  | 1°18  | 28°53 | 1°20 | T 4  |
| W 5  | 20 54 34 | 12°45'01 | 8♂ 1  | 18°34 | 23° 6 | 26°57 | 14°52 | 2°32  | 15°22 | 26°29  | 6°25 | 2° 9  | 1°15  | 29° 0 | 1°22 | W 5  |
| T 6  | 20 58 31 | 13°42'28 | 21°42 | 20°33 | 24°15 | 27°36 | 15° 6 | 2°D32 | 15°25 | 26°29  | 6°26 | 2° 5  | 1°12  | 29° 6 | 1°23 | T 6  |
| F 7  | 21 2 27  | 14°39'56 | 4♂55  | 22°31 | 25°24 | 28°15 | 15°19 | 2°32  | 15°29 | 26°29  | 6°27 | 2° 4  | 1° 8  | 29°13 | 1°25 | F 7  |
| S 8  | 21 6 24  | 15°37'25 | 17°43 | 24°27 | 26°32 | 28°54 | 15°32 | 2°32  | 15°32 | 26°D29 | 6°27 | 2°D 3 | 1° 5  | 29°20 | 1°27 | S 8  |
| S 9  | 21 10 20 | 16°34'54 | 0♂ 9  | 26°22 | 27°41 | 29°33 | 15°45 | 2°32  | 15°35 | 26°29  | 6°28 | 2°R 3 | 1° 2  | 29°26 | 1°29 | S 9  |
| M10  | 21 14 17 | 17°32'24 | 12°20 | 28°15 | 28°49 | 0♂12  | 15°58 | 2°33  | 15°39 | 26°29  | 6°28 | 2° 3  | 0°59  | 29°33 | 1°31 | M10  |
| T 11 | 21 18 13 | 18°29'55 | 24°19 | 0♂ 7  | 29°58 | 0°50  | 16°12 | 2°33  | 15°42 | 26°29  | 6°29 | 2° 1  | 0°56  | 29°40 | 1°32 | T 11 |
| W12  | 21 22 10 | 19°27'27 | 6♂12  | 1°57  | 1♂ 6  | 1°29  | 16°25 | 2°34  | 15°46 | 26°29  | 6°29 | 1°57  | 0°52  | 29°47 | 1°34 | W12  |
| T 13 | 21 26 7  | 20°24'59 | 18° 2 | 3°46  | 2°14  | 2° 7  | 16°38 | 2°34  | 15°49 | 26°29  | 6°30 | 1°50  | 0°49  | 29°53 | 1°36 | T 13 |
| F 14 | 21 30 3  | 21°22'33 | 29°53 | 5°33  | 3°22  | 2°45  | 16°51 | 2°35  | 15°53 | 26°29  | 6°30 | 1°40  | 0°46  | 29°59 | 1°37 | F 14 |
| S 15 | 21 34 0  | 22°20'08 | 11♂46 | 7°18  | 4°30  | 3°23  | 17° 4 | 2°36  | 15°56 | 26°30  | 6°31 | 1°28  | 0°43  | 0♂ 7  | 1°39 | S 15 |
| S 16 | 21 37 56 | 23°17'43 | 23°44 | 9° 2  | 5°38  | 4° 0  | 17°18 | 2°37  | 16° 0 | 26°30  | 6°31 | 1°15  | 0°40  | 0°13  | 1°40 | S 16 |
| M17  | 21 41 53 | 24°15'20 | 5♂47  | 10°45 | 6°46  | 4°38  | 17°31 | 2°38  | 16° 3 | 26°30  | 6°32 | 1° 1  | 0°37  | 0°20  | 1°41 | M17  |
| T 18 | 21 45 49 | 25°12'58 | 17°58 | 12°26 | 7°54  | 5°15  | 17°44 | 2°39  | 16° 7 | 26°30  | 6°32 | 0°48  | 0°33  | 0°27  | 1°43 | T 18 |
| W19  | 21 49 46 | 26°10'38 | 0♂16  | 14° 5 | 9° 1  | 5°52  | 17°57 | 2°40  | 16°10 | 26°31  | 6°32 | 0°37  | 0°30  | 0°34  | 1°44 | W19  |
| T 20 | 21 53 42 | 27° 8'19 | 12°44 | 15°43 | 10° 8 | 6°29  | 18°10 | 2°41  | 16°14 | 26°31  | 6°33 | 0°29  | 0°27  | 0°40  | 1°45 | T 20 |
| F 21 | 21 57 39 | 28° 6'01 | 25°23 | 17°20 | 11°16 | 7° 6  | 18°23 | 2°43  | 16°18 | 26°31  | 6°33 | 0°24  | 0°24  | 0°47  | 1°46 | F 21 |
| S 22 | 22 1 36  | 29° 3'45 | 8♂16  | 18°55 | 12°23 | 7°43  | 18°36 | 2°44  | 16°21 | 26°32  | 6°33 | 0°21  | 0°21  | 0°54  | 1°47 | S 22 |
| S 23 | 22 5 32  | 0♂ 1'31  | 21°26 | 20°29 | 13°29 | 8°20  | 18°49 | 2°46  | 16°25 | 26°32  | 6°34 | 0°20  | 0°17  | 1° 0  | 1°48 | S 23 |
| M24  | 22 9 29  | 0°59'19  | 4♂55  | 22° 1 | 14°36 | 8°56  | 19° 3 | 2°47  | 16°29 | 26°33  | 6°34 | 0°20  | 0°14  | 1° 7  | 1°49 | M24  |
| T 25 | 22 13 25 | 1°57'08  | 18°46 | 23°32 | 15°43 | 9°32  | 19°16 | 2°49  | 16°32 | 26°33  | 6°34 | 0°19  | 0°11  | 1° 14 | 1°50 | T 25 |
| W26  | 22 17 22 | 2°54'59  | 2♂59  | 25° 2 | 16°49 | 10° 8 | 19°29 | 2°51  | 16°36 | 26°34  | 6°34 | 0°17  | 0° 8  | 1°20  | 1°51 | W26  |
| T 27 | 22 21 18 | 3°52'51  | 17°34 | 26°30 | 17°56 | 10°44 | 19°42 | 2°53  | 16°40 | 26°35  | 6°35 | 0°13  | 0° 5  | 1°27  | 1°51 | T 27 |
| F 28 | 22 25 15 | 4°50'46  | 2♂27  | 27°56 | 19° 2 | 11°19 | 19°55 | 2°55  | 16°43 | 26°35  | 6°35 | 0° 5  | 0° 2  | 1°34  | 1°52 | F 28 |
| S 29 | 22 29 11 | 5°48'42  | 17°30 | 29°21 | 20° 8 | 11°55 | 20° 8 | 2°57  | 16°47 | 26°36  | 6°35 | 29♂56 | 29♂58 | 1°41  | 1°52 | S 29 |
| S 30 | 22 33 8  | 6°46'39  | 2♂35  | 0♂45  | 21°14 | 12°30 | 20°20 | 2°59  | 16°51 | 26°37  | 6°35 | 29°45 | 29°55 | 1°47  | 1°53 | S 30 |
| M31  | 22 37 5  | 7♂44'38  | 17♂31 | 2♂ 7  | 22♂19 | 13♂ 5 | 20♂33 | 3♂ 2  | 16♂55 | 26♂37  | 6♂35 | 29♂34 | 29♂52 | 1♂54  | 1♂53 | M31  |

## ASTRODIENST EPHEMERIS for the year 2133

geocentric

SEPTEMBER 2133

00:00 UT

| Day  | Sid.t    | ☉                     | ☽                  | ♀                   | ♂                   | ♂                  | ♂                  | ♂                 | ♂                  | ♂                   | ♂                  | ♂                   | ♂                  | ♂                 | ♂                  | Day  |
|------|----------|-----------------------|--------------------|---------------------|---------------------|--------------------|--------------------|-------------------|--------------------|---------------------|--------------------|---------------------|--------------------|-------------------|--------------------|------|
| T 1  | 22 41 1  | 8 <sup>h</sup> 42'39  | 2 <sup>h</sup> 9   | 3 <sup>h</sup> 27   | 23 <sup>h</sup> 25  | 13 <sup>h</sup> 39 | 20 <sup>h</sup> 46 | 3 <sup>h</sup> 4  | 16 <sup>h</sup> 58 | 26 <sup>h</sup> 38  | 6 <sup>h</sup> 35  | 29 <sup>h</sup> 24  | 29 <sup>h</sup> 49 | 2 <sup>h</sup> 1  | 1 <sup>h</sup> 54  | T 1  |
| W 2  | 22 44 58 | 9 <sup>h</sup> 40'41  | 16 <sup>h</sup> 22 | 4 <sup>h</sup> 46   | 24 <sup>h</sup> 30  | 14 <sup>h</sup> 14 | 20 <sup>h</sup> 59 | 3 <sup>h</sup> 6  | 17 <sup>h</sup> 2  | 26 <sup>h</sup> 39  | 6 <sup>h</sup> 36  | 29 <sup>h</sup> 16  | 29 <sup>h</sup> 46 | 2 <sup>h</sup> 7  | 1 <sup>h</sup> 54  | W 2  |
| T 3  | 22 48 54 | 10 <sup>h</sup> 38'44 | 0 <sup>h</sup> 7   | 6 <sup>h</sup> 3    | 25 <sup>h</sup> 36  | 14 <sup>h</sup> 48 | 21 <sup>h</sup> 12 | 3 <sup>h</sup> 9  | 17 <sup>h</sup> 6  | 26 <sup>h</sup> 40  | 6 <sup>h</sup> 36  | 29 <sup>h</sup> 11  | 29 <sup>h</sup> 43 | 2 <sup>h</sup> 14 | 1 <sup>h</sup> 54  | T 3  |
| F 4  | 22 52 51 | 11 <sup>h</sup> 36'49 | 13 <sup>h</sup> 24 | 7 <sup>h</sup> 19   | 26 <sup>h</sup> 40  | 15 <sup>h</sup> 22 | 21 <sup>h</sup> 25 | 3 <sup>h</sup> 12 | 17 <sup>h</sup> 10 | 26 <sup>h</sup> 41  | 6 <sup>h</sup> 36  | 29 <sup>h</sup> 8   | 29 <sup>h</sup> 39 | 2 <sup>h</sup> 21 | 1 <sup>h</sup> 55  | F 4  |
| S 5  | 22 56 47 | 12 <sup>h</sup> 34'56 | 26 <sup>h</sup> 15 | 8 <sup>h</sup> 33   | 27 <sup>h</sup> 45  | 15 <sup>h</sup> 56 | 21 <sup>h</sup> 37 | 3 <sup>h</sup> 15 | 17 <sup>h</sup> 13 | 26 <sup>h</sup> 41  | 6 <sup>h</sup> 36  | 29 <sup>h</sup> D 8 | 29 <sup>h</sup> 36 | 2 <sup>h</sup> 28 | 1 <sup>h</sup> 55  | S 5  |
| S 6  | 23 0 44  | 13 <sup>h</sup> 33'03 | 8 <sup>h</sup> 43  | 9 <sup>h</sup> 45   | 28 <sup>h</sup> 50  | 16 <sup>h</sup> 29 | 21 <sup>h</sup> 50 | 3 <sup>h</sup> 17 | 17 <sup>h</sup> 17 | 26 <sup>h</sup> 42  | 6 <sup>h</sup> R36 | 29 <sup>h</sup> R 8 | 29 <sup>h</sup> 33 | 2 <sup>h</sup> 34 | 1 <sup>h</sup> 55  | S 6  |
| M 7  | 23 4 40  | 14 <sup>h</sup> 31'13 | 20 <sup>h</sup> 54 | 10 <sup>h</sup> 54  | 29 <sup>h</sup> 54  | 17 <sup>h</sup> 3  | 22 <sup>h</sup> 3  | 3 <sup>h</sup> 20 | 17 <sup>h</sup> 21 | 26 <sup>h</sup> 43  | 6 <sup>h</sup> 36  | 29 <sup>h</sup> 8   | 29 <sup>h</sup> 30 | 2 <sup>h</sup> 41 | 1 <sup>h</sup> R55 | M 7  |
| T 8  | 23 8 37  | 15 <sup>h</sup> 29'23 | 2 <sup>h</sup> 54  | 12 <sup>h</sup> 2   | 0 <sup>h</sup> 58   | 17 <sup>h</sup> 36 | 22 <sup>h</sup> 15 | 3 <sup>h</sup> 23 | 17 <sup>h</sup> 25 | 26 <sup>h</sup> 44  | 6 <sup>h</sup> 36  | 29 <sup>h</sup> 6   | 29 <sup>h</sup> 27 | 2 <sup>h</sup> 48 | 1 <sup>h</sup> 55  | T 8  |
| W 9  | 23 12 34 | 16 <sup>h</sup> 27'35 | 14 <sup>h</sup> 46 | 13 <sup>h</sup> 8   | 2 <sup>h</sup> 2    | 18 <sup>h</sup> 8  | 22 <sup>h</sup> 28 | 3 <sup>h</sup> 27 | 17 <sup>h</sup> 28 | 26 <sup>h</sup> 45  | 6 <sup>h</sup> 36  | 29 <sup>h</sup> 3   | 29 <sup>h</sup> 23 | 2 <sup>h</sup> 54 | 1 <sup>h</sup> 55  | W 9  |
| T 10 | 23 16 30 | 17 <sup>h</sup> 25'49 | 26 <sup>h</sup> 37 | 14 <sup>h</sup> 12  | 3 <sup>h</sup> 6    | 18 <sup>h</sup> 41 | 22 <sup>h</sup> 41 | 3 <sup>h</sup> 30 | 17 <sup>h</sup> 32 | 26 <sup>h</sup> 46  | 6 <sup>h</sup> 36  | 28 <sup>h</sup> 57  | 29 <sup>h</sup> 20 | 3 <sup>h</sup> 1  | 1 <sup>h</sup> 55  | T 10 |
| F 11 | 23 20 27 | 18 <sup>h</sup> 24'04 | 8 <sup>h</sup> 29  | 15 <sup>h</sup> 13  | 4 <sup>h</sup> 10   | 19 <sup>h</sup> 13 | 22 <sup>h</sup> 53 | 3 <sup>h</sup> 33 | 17 <sup>h</sup> 36 | 26 <sup>h</sup> 47  | 6 <sup>h</sup> 35  | 28 <sup>h</sup> 48  | 29 <sup>h</sup> 17 | 3 <sup>h</sup> 8  | 1 <sup>h</sup> 54  | F 11 |
| S 12 | 23 24 23 | 19 <sup>h</sup> 22'21 | 20 <sup>h</sup> 26 | 16 <sup>h</sup> 11  | 5 <sup>h</sup> 13   | 19 <sup>h</sup> 45 | 23 <sup>h</sup> 6  | 3 <sup>h</sup> 36 | 17 <sup>h</sup> 40 | 26 <sup>h</sup> 48  | 6 <sup>h</sup> 35  | 28 <sup>h</sup> 38  | 29 <sup>h</sup> 14 | 3 <sup>h</sup> 14 | 1 <sup>h</sup> 54  | S 12 |
| S 13 | 23 28 20 | 20 <sup>h</sup> 20'39 | 2 <sup>h</sup> 30  | 17 <sup>h</sup> 7   | 6 <sup>h</sup> 16   | 20 <sup>h</sup> 17 | 23 <sup>h</sup> 18 | 3 <sup>h</sup> 40 | 17 <sup>h</sup> 44 | 26 <sup>h</sup> 50  | 6 <sup>h</sup> 35  | 28 <sup>h</sup> 26  | 29 <sup>h</sup> 11 | 3 <sup>h</sup> 21 | 1 <sup>h</sup> 54  | S 13 |
| M14  | 23 32 16 | 21 <sup>h</sup> 18'59 | 14 <sup>h</sup> 44 | 18 <sup>h</sup> 0   | 7 <sup>h</sup> 18   | 20 <sup>h</sup> 49 | 23 <sup>h</sup> 30 | 3 <sup>h</sup> 43 | 17 <sup>h</sup> 47 | 26 <sup>h</sup> 51  | 6 <sup>h</sup> 35  | 28 <sup>h</sup> 13  | 29 <sup>h</sup> 8  | 3 <sup>h</sup> 28 | 1 <sup>h</sup> 53  | M14  |
| T 15 | 23 36 13 | 22 <sup>h</sup> 17'20 | 27 <sup>h</sup> 7  | 18 <sup>h</sup> 50  | 8 <sup>h</sup> 21   | 21 <sup>h</sup> 20 | 23 <sup>h</sup> 43 | 3 <sup>h</sup> 47 | 17 <sup>h</sup> 51 | 26 <sup>h</sup> 52  | 6 <sup>h</sup> 35  | 28 <sup>h</sup> 2   | 29 <sup>h</sup> 4  | 3 <sup>h</sup> 35 | 1 <sup>h</sup> 53  | T 15 |
| W16  | 23 40 9  | 23 <sup>h</sup> 15'44 | 9 <sup>h</sup> 41  | 19 <sup>h</sup> 37  | 9 <sup>h</sup> 23   | 21 <sup>h</sup> 51 | 23 <sup>h</sup> 55 | 3 <sup>h</sup> 51 | 17 <sup>h</sup> 55 | 26 <sup>h</sup> 53  | 6 <sup>h</sup> 35  | 27 <sup>h</sup> 52  | 29 <sup>h</sup> 1  | 3 <sup>h</sup> 41 | 1 <sup>h</sup> 52  | W16  |
| T 17 | 23 44 6  | 24 <sup>h</sup> 14'09 | 22 <sup>h</sup> 24 | 20 <sup>h</sup> 20  | 10 <sup>h</sup> 25  | 22 <sup>h</sup> 22 | 24 <sup>h</sup> 7  | 3 <sup>h</sup> 54 | 17 <sup>h</sup> 59 | 26 <sup>h</sup> 54  | 6 <sup>h</sup> 34  | 27 <sup>h</sup> 44  | 28 <sup>h</sup> 58 | 3 <sup>h</sup> 48 | 1 <sup>h</sup> 51  | T 17 |
| F 18 | 23 48 2  | 25 <sup>h</sup> 12'37 | 5 <sup>h</sup> 19  | 21 <sup>h</sup> 0   | 11 <sup>h</sup> 27  | 22 <sup>h</sup> 52 | 24 <sup>h</sup> 20 | 3 <sup>h</sup> 58 | 18 <sup>h</sup> 2  | 26 <sup>h</sup> 56  | 6 <sup>h</sup> 34  | 27 <sup>h</sup> 40  | 28 <sup>h</sup> 55 | 3 <sup>h</sup> 55 | 1 <sup>h</sup> 51  | F 18 |
| S 19 | 23 51 59 | 26 <sup>h</sup> 11'07 | 18 <sup>h</sup> 26 | 21 <sup>h</sup> 35  | 12 <sup>h</sup> 28  | 23 <sup>h</sup> 22 | 24 <sup>h</sup> 32 | 4 <sup>h</sup> 2  | 18 <sup>h</sup> 6  | 26 <sup>h</sup> 57  | 6 <sup>h</sup> 34  | 27 <sup>h</sup> 37  | 28 <sup>h</sup> 52 | 4 <sup>h</sup> 1  | 1 <sup>h</sup> 50  | S 19 |
| S 20 | 23 55 56 | 27 <sup>h</sup> 9'38  | 1 <sup>h</sup> 45  | 22 <sup>h</sup> 6   | 13 <sup>h</sup> 29  | 23 <sup>h</sup> 52 | 24 <sup>h</sup> 44 | 4 <sup>h</sup> 6  | 18 <sup>h</sup> 10 | 26 <sup>h</sup> 58  | 6 <sup>h</sup> 34  | 27 <sup>h</sup> D37 | 28 <sup>h</sup> 49 | 4 <sup>h</sup> 8  | 1 <sup>h</sup> 49  | S 20 |
| M21  | 23 59 52 | 28 <sup>h</sup> 8'12  | 15 <sup>h</sup> 18 | 22 <sup>h</sup> 32  | 14 <sup>h</sup> 30  | 24 <sup>h</sup> 21 | 24 <sup>h</sup> 56 | 4 <sup>h</sup> 10 | 18 <sup>h</sup> 14 | 27 <sup>h</sup> 0   | 6 <sup>h</sup> 33  | 27 <sup>h</sup> 38  | 28 <sup>h</sup> 45 | 4 <sup>h</sup> 15 | 1 <sup>h</sup> 48  | M21  |
| T 22 | 0 3 49   | 29 <sup>h</sup> 6'49  | 29 <sup>h</sup> 6  | 22 <sup>h</sup> 53  | 15 <sup>h</sup> 30  | 24 <sup>h</sup> 50 | 25 <sup>h</sup> 8  | 4 <sup>h</sup> 15 | 18 <sup>h</sup> 17 | 27 <sup>h</sup> 1   | 6 <sup>h</sup> 33  | 27 <sup>h</sup> R38 | 28 <sup>h</sup> 42 | 4 <sup>h</sup> 22 | 1 <sup>h</sup> 47  | T 22 |
| W23  | 0 7 45   | 0 <sup>h</sup> 5'27   | 13 <sup>h</sup> 31 | 23 <sup>h</sup> 9   | 16 <sup>h</sup> 30  | 25 <sup>h</sup> 19 | 25 <sup>h</sup> 20 | 4 <sup>h</sup> 19 | 18 <sup>h</sup> 21 | 27 <sup>h</sup> 2   | 6 <sup>h</sup> 33  | 27 <sup>h</sup> 37  | 28 <sup>h</sup> 39 | 4 <sup>h</sup> 28 | 1 <sup>h</sup> 46  | W23  |
| T 24 | 0 11 42  | 1 <sup>h</sup> 4'08   | 27 <sup>h</sup> 30 | 23 <sup>h</sup> 19  | 17 <sup>h</sup> 30  | 25 <sup>h</sup> 48 | 25 <sup>h</sup> 32 | 4 <sup>h</sup> 23 | 18 <sup>h</sup> 25 | 27 <sup>h</sup> 4   | 6 <sup>h</sup> 32  | 27 <sup>h</sup> 35  | 28 <sup>h</sup> 36 | 4 <sup>h</sup> 35 | 1 <sup>h</sup> 45  | T 24 |
| F 25 | 0 15 38  | 2 <sup>h</sup> 2'51   | 12 <sup>h</sup> 2  | 23 <sup>h</sup> R22 | 18 <sup>h</sup> 29  | 26 <sup>h</sup> 16 | 25 <sup>h</sup> 43 | 4 <sup>h</sup> 28 | 18 <sup>h</sup> 29 | 27 <sup>h</sup> 5   | 6 <sup>h</sup> 32  | 27 <sup>h</sup> 30  | 28 <sup>h</sup> 33 | 4 <sup>h</sup> 42 | 1 <sup>h</sup> 44  | F 25 |
| S 26 | 0 19 35  | 3 <sup>h</sup> 1'36   | 26 <sup>h</sup> 42 | 23 <sup>h</sup> 19  | 19 <sup>h</sup> 28  | 26 <sup>h</sup> 44 | 25 <sup>h</sup> 55 | 4 <sup>h</sup> 32 | 18 <sup>h</sup> 32 | 27 <sup>h</sup> 7   | 6 <sup>h</sup> 31  | 27 <sup>h</sup> 23  | 28 <sup>h</sup> 29 | 4 <sup>h</sup> 48 | 1 <sup>h</sup> 43  | S 26 |
| S 27 | 0 23 31  | 4 <sup>h</sup> 0'23   | 11 <sup>h</sup> 24 | 23 <sup>h</sup> 10  | 20 <sup>h</sup> 27  | 27 <sup>h</sup> 11 | 26 <sup>h</sup> 7  | 4 <sup>h</sup> 37 | 18 <sup>h</sup> 36 | 27 <sup>h</sup> 8   | 6 <sup>h</sup> 31  | 27 <sup>h</sup> 15  | 28 <sup>h</sup> 26 | 4 <sup>h</sup> 55 | 1 <sup>h</sup> 42  | S 27 |
| M28  | 0 27 28  | 4 <sup>h</sup> 59'12  | 26 <sup>h</sup> 0  | 22 <sup>h</sup> 53  | 21 <sup>h</sup> 25  | 27 <sup>h</sup> 38 | 26 <sup>h</sup> 19 | 4 <sup>h</sup> 41 | 18 <sup>h</sup> 40 | 27 <sup>h</sup> 10  | 6 <sup>h</sup> 31  | 27 <sup>h</sup> 6   | 28 <sup>h</sup> 23 | 5 <sup>h</sup> 2  | 1 <sup>h</sup> 40  | M28  |
| T 29 | 0 31 25  | 5 <sup>h</sup> 58'03  | 10 <sup>h</sup> 23 | 22 <sup>h</sup> 28  | 22 <sup>h</sup> 23  | 28 <sup>h</sup> 5  | 26 <sup>h</sup> 30 | 4 <sup>h</sup> 46 | 18 <sup>h</sup> 43 | 27 <sup>h</sup> 11  | 6 <sup>h</sup> 30  | 26 <sup>h</sup> 58  | 28 <sup>h</sup> 20 | 5 <sup>h</sup> 9  | 1 <sup>h</sup> 39  | T 29 |
| W30  | 0 35 21  | 6 <sup>h</sup> 56'57  | 24 <sup>h</sup> 27 | 21 <sup>h</sup> 57  | 23 <sup>h</sup> M20 | 28 <sup>h</sup> 31 | 26 <sup>h</sup> 42 | 4 <sup>h</sup> 51 | 18 <sup>h</sup> 47 | 27 <sup>h</sup> M13 | 6 <sup>h</sup> 30  | 26 <sup>h</sup> 53  | 28 <sup>h</sup> 17 | 5 <sup>h</sup> 15 | 1 <sup>h</sup> 38  | W30  |

Delta T = 111.14 sec

OCTOBER 2133

00:00 UT

| Day  | Sid.t   | ☉                     | ☾                    | ♀                   | ♂                   | ♂                    | ♂                   | ♂                 | ♂                  | ♂                   | ♂                   | ♂                   | ♂                   | ♂                  | ♂                   | Day  |
|------|---------|-----------------------|----------------------|---------------------|---------------------|----------------------|---------------------|-------------------|--------------------|---------------------|---------------------|---------------------|---------------------|--------------------|---------------------|------|
| T 1  | 0 39 18 | 7 <sup>h</sup> 55'52  | 8 <sup>h</sup> M 7   | 21 <sup>h</sup> R17 | 24 <sup>h</sup> M17 | 28 <sup>h</sup> II57 | 26 <sup>h</sup> Q53 | 4 <sup>h</sup> 55 | 18 <sup>h</sup> 51 | 27 <sup>h</sup> M14 | 6 <sup>h</sup> R29  | 26 <sup>h</sup> R49 | 28 <sup>h</sup> 14  | 5 <sup>h</sup> 22  | 1 <sup>h</sup> R36  | T 1  |
| F 2  | 0 43 14 | 8 <sup>h</sup> 54'49  | 21 <sup>h</sup> 23   | 20 <sup>h</sup> 31  | 25 <sup>h</sup> 14  | 29 <sup>h</sup> 23   | 27 <sup>h</sup> 4   | 5 <sup>h</sup> 0  | 18 <sup>h</sup> 54 | 27 <sup>h</sup> 16  | 6 <sup>h</sup> II29 | 26 <sup>h</sup> D47 | 28 <sup>h</sup> 10  | 5 <sup>h</sup> 29  | 1 <sup>h</sup> II35 | F 2  |
| S 3  | 0 47 11 | 9 <sup>h</sup> 53'48  | 4 <sup>h</sup> 15    | 19 <sup>h</sup> 38  | 26 <sup>h</sup> 10  | 29 <sup>h</sup> 48   | 27 <sup>h</sup> 16  | 5 <sup>h</sup> 5  | 18 <sup>h</sup> 58 | 27 <sup>h</sup> 18  | 6 <sup>h</sup> 28   | 26 <sup>h</sup> D47 | 28 <sup>h</sup> 7   | 5 <sup>h</sup> 35  | 1 <sup>h</sup> 33   | S 3  |
| S 4  | 0 51 7  | 10 <sup>h</sup> 52'48 | 16 <sup>h</sup> 45   | 18 <sup>h</sup> 39  | 27 <sup>h</sup> 5   | 0 <sup>h</sup> 313   | 27 <sup>h</sup> 27  | 5 <sup>h</sup> 10 | 19 <sup>h</sup> 1  | 27 <sup>h</sup> 19  | 6 <sup>h</sup> 27   | 26 <sup>h</sup> 48  | 28 <sup>h</sup> 4   | 5 <sup>h</sup> 42  | 1 <sup>h</sup> 31   | S 4  |
| M 5  | 0 55 4  | 11 <sup>h</sup> 51'51 | 28 <sup>h</sup> 59   | 17 <sup>h</sup> 36  | 28 <sup>h</sup> 0   | 0 <sup>h</sup> 37    | 27 <sup>h</sup> 38  | 5 <sup>h</sup> 15 | 19 <sup>h</sup> 5  | 27 <sup>h</sup> 21  | 6 <sup>h</sup> 27   | 26 <sup>h</sup> 50  | 28 <sup>h</sup> 1   | 5 <sup>h</sup> 49  | 1 <sup>h</sup> 30   | M 5  |
| T 6  | 0 59 0  | 12 <sup>h</sup> 50'55 | 11 <sup>h</sup> 3    | 0 <sup>h</sup> 16   | 28 <sup>h</sup> 55  | 1 <sup>h</sup> 1     | 27 <sup>h</sup> 49  | 5 <sup>h</sup> 21 | 19 <sup>h</sup> 8  | 27 <sup>h</sup> 23  | 6 <sup>h</sup> 26   | 26 <sup>h</sup> R50 | 27 <sup>h</sup> 58  | 5 <sup>h</sup> 56  | 1 <sup>h</sup> 28   | T 6  |
| W 7  | 1 2 57  | 13 <sup>h</sup> 50'01 | 22 <sup>h</sup> 54   | 15 <sup>h</sup> 19  | 29 <sup>h</sup> 49  | 1 <sup>h</sup> 24    | 28 <sup>h</sup> 0   | 5 <sup>h</sup> 26 | 19 <sup>h</sup> 12 | 27 <sup>h</sup> 24  | 6 <sup>h</sup> 26   | 26 <sup>h</sup> 50  | 27 <sup>h</sup> 55  | 6 <sup>h</sup> 2   | 1 <sup>h</sup> 26   | W 7  |
| T 8  | 1 6 54  | 14 <sup>h</sup> 49'09 | 4 <sup>h</sup> 46    | 14 <sup>h</sup> 10  | 0 <sup>h</sup> 42   | 1 <sup>h</sup> 47    | 28 <sup>h</sup> 11  | 5 <sup>h</sup> 31 | 19 <sup>h</sup> 16 | 27 <sup>h</sup> 26  | 6 <sup>h</sup> 25   | 26 <sup>h</sup> 48  | 27 <sup>h</sup> 51  | 6 <sup>h</sup> 9   | 1 <sup>h</sup> 24   | T 8  |
| F 9  | 1 10 50 | 15 <sup>h</sup> 48'18 | 16 <sup>h</sup> 40   | 13 <sup>h</sup> 2   | 1 <sup>h</sup> 35   | 2 <sup>h</sup> 10    | 28 <sup>h</sup> 22  | 5 <sup>h</sup> 36 | 19 <sup>h</sup> 19 | 27 <sup>h</sup> 28  | 6 <sup>h</sup> 24   | 26 <sup>h</sup> 44  | 27 <sup>h</sup> 48  | 6 <sup>h</sup> 16  | 1 <sup>h</sup> 22   | F 9  |
| S 10 | 1 14 47 | 16 <sup>h</sup> 47'29 | 28 <sup>h</sup> 41   | 11 <sup>h</sup> 57  | 2 <sup>h</sup> 27   | 2 <sup>h</sup> 32    | 28 <sup>h</sup> 32  | 5 <sup>h</sup> 42 | 19 <sup>h</sup> 22 | 27 <sup>h</sup> 30  | 6 <sup>h</sup> 24   | 26 <sup>h</sup> 38  | 27 <sup>h</sup> 45  | 6 <sup>h</sup> 22  | 1 <sup>h</sup> 20   | S 10 |
| S 11 | 1 18 43 | 17 <sup>h</sup> 46'42 | 10 <sup>h</sup> 51   | 10 <sup>h</sup> 58  | 3 <sup>h</sup> 18   | 2 <sup>h</sup> 54    | 28 <sup>h</sup> 43  | 5 <sup>h</sup> 47 | 19 <sup>h</sup> 26 | 27 <sup>h</sup> 32  | 6 <sup>h</sup> 23   | 26 <sup>h</sup> 32  | 27 <sup>h</sup> 42  | 6 <sup>h</sup> 29  | 1 <sup>h</sup> 18   | S 11 |
| M12  | 1 22 40 | 18 <sup>h</sup> 45'57 | 23 <sup>h</sup> 13   | 10 <sup>h</sup> 6   | 4 <sup>h</sup> 9    | 3 <sup>h</sup> 15    | 28 <sup>h</sup> 54  | 5 <sup>h</sup> 53 | 19 <sup>h</sup> 29 | 27 <sup>h</sup> 33  | 6 <sup>h</sup> 22   | 26 <sup>h</sup> 25  | 27 <sup>h</sup> 39  | 6 <sup>h</sup> 36  | 1 <sup>h</sup> 16   | M12  |
| T 13 | 1 26 36 | 19 <sup>h</sup> 45'14 | 5 <sup>h</sup> 49    | 9 <sup>h</sup> 22   | 4 <sup>h</sup> 59   | 3 <sup>h</sup> 36    | 29 <sup>h</sup> 4   | 5 <sup>h</sup> 58 | 19 <sup>h</sup> 33 | 27 <sup>h</sup> 35  | 6 <sup>h</sup> 22   | 26 <sup>h</sup> 18  | 27 <sup>h</sup> 35  | 6 <sup>h</sup> 42  | 1 <sup>h</sup> 14   | T 13 |
| W14  | 1 30 33 | 20 <sup>h</sup> 44'33 | 18 <sup>h</sup> 40   | 8 <sup>h</sup> 48   | 5 <sup>h</sup> 49   | 3 <sup>h</sup> 56    | 29 <sup>h</sup> 14  | 6 <sup>h</sup> 4  | 19 <sup>h</sup> 36 | 27 <sup>h</sup> 37  | 6 <sup>h</sup> 21   | 26 <sup>h</sup> 13  | 27 <sup>h</sup> 32  | 6 <sup>h</sup> 49  | 1 <sup>h</sup> 12   | W14  |
| T 15 | 1 34 29 | 21 <sup>h</sup> 43'53 | 1 <sup>h</sup> 44    | 8 <sup>h</sup> 24   | 6 <sup>h</sup> 37   | 4 <sup>h</sup> 15    | 29 <sup>h</sup> 25  | 6 <sup>h</sup> 10 | 19 <sup>h</sup> 39 | 27 <sup>h</sup> 39  | 6 <sup>h</sup> 20   | 26 <sup>h</sup> 9   | 27 <sup>h</sup> 29  | 6 <sup>h</sup> 56  | 1 <sup>h</sup> 10   | T 15 |
| F 16 | 1 38 26 | 22 <sup>h</sup> 43'16 | 15 <sup>h</sup> 1    | 8 <sup>h</sup> 11   | 7 <sup>h</sup> 25   | 4 <sup>h</sup> 35    | 29 <sup>h</sup> 35  | 6 <sup>h</sup> 15 | 19 <sup>h</sup> 43 | 27 <sup>h</sup> 41  | 6 <sup>h</sup> 19   | 26 <sup>h</sup> 6   | 27 <sup>h</sup> 26  | 7 <sup>h</sup> 3   | 1 <sup>h</sup> 7    | F 16 |
| S 17 | 1 42 23 | 23 <sup>h</sup> 42'41 | 28 <sup>h</sup> 30   | 8 <sup>h</sup> D10  | 8 <sup>h</sup> 12   | 4 <sup>h</sup> 53    | 29 <sup>h</sup> 45  | 6 <sup>h</sup> 21 | 19 <sup>h</sup> 46 | 27 <sup>h</sup> 43  | 6 <sup>h</sup> 19   | 26 <sup>h</sup> D 6 | 27 <sup>h</sup> 23  | 7 <sup>h</sup> 9   | 1 <sup>h</sup> 5    | S 17 |
| S 18 | 1 46 19 | 24 <sup>h</sup> 42'09 | 12 <sup>h</sup> II10 | 8 <sup>h</sup> 19   | 8 <sup>h</sup> 58   | 5 <sup>h</sup> 11    | 29 <sup>h</sup> 55  | 6 <sup>h</sup> 27 | 19 <sup>h</sup> 49 | 27 <sup>h</sup> 45  | 6 <sup>h</sup> 18   | 26 <sup>h</sup> 7   | 27 <sup>h</sup> 20  | 7 <sup>h</sup> 16  | 1 <sup>h</sup> 3    | S 18 |
| M19  | 1 50 16 | 25 <sup>h</sup> 41'38 | 26 <sup>h</sup> 0    | 8 <sup>h</sup> 38   | 9 <sup>h</sup> 44   | 5 <sup>h</sup> 29    | 0 <sup>h</sup> 5    | 6 <sup>h</sup> 33 | 19 <sup>h</sup> 53 | 27 <sup>h</sup> 47  | 6 <sup>h</sup> 17   | 26 <sup>h</sup> 8   | 27 <sup>h</sup> 16  | 7 <sup>h</sup> 23  | 1 <sup>h</sup> 0    | M19  |
| T 20 | 1 54 12 | 26 <sup>h</sup> 41'10 | 9 <sup>h</sup> 38    | 9 <sup>h</sup> 8    | 10 <sup>h</sup> 28  | 5 <sup>h</sup> 46    | 0 <sup>h</sup> 15   | 6 <sup>h</sup> 39 | 19 <sup>h</sup> 56 | 27 <sup>h</sup> 49  | 6 <sup>h</sup> 16   | 26 <sup>h</sup> 10  | 27 <sup>h</sup> 13  | 7 <sup>h</sup> 29  | 0 <sup>h</sup> 58   | T 20 |
| W21  | 1 58 9  | 27 <sup>h</sup> 40'44 | 24 <sup>h</sup> 3    | 9 <sup>h</sup> 47   | 11 <sup>h</sup> 11  | 6 <sup>h</sup> 2     | 0 <sup>h</sup> 24   | 6 <sup>h</sup> 45 | 19 <sup>h</sup> 59 | 27 <sup>h</sup> 51  | 6 <sup>h</sup> 15   | 26 <sup>h</sup> R11 | 27 <sup>h</sup> 10  | 7 <sup>h</sup> 36  | 0 <sup>h</sup> 55   | W21  |
| T 22 | 2 2 5   | 28 <sup>h</sup> 40'21 | 8 <sup>h</sup> Q14   | 10 <sup>h</sup> 34  | 11 <sup>h</sup> 54  | 6 <sup>h</sup> 18    | 0 <sup>h</sup> 34   | 6 <sup>h</sup> 51 | 20 <sup>h</sup> 2  | 27 <sup>h</sup> 53  | 6 <sup>h</sup> 14   | 26 <sup>h</sup> 10  | 27 <sup>h</sup> 7   | 7 <sup>h</sup> 43  | 0 <sup>h</sup> 53   | T 22 |
| F 23 | 2 6 2   | 29 <sup>h</sup> 40'00 | 22 <sup>h</sup> 30   | 11 <sup>h</sup> 29  | 12 <sup>h</sup> 35  | 6 <sup>h</sup> 33    | 0 <sup>h</sup> 43   | 6 <sup>h</sup> 57 | 20 <sup>h</sup> 5  | 27 <sup>h</sup> 55  | 6 <sup>h</sup> 14   | 26 <sup>h</sup> 9   | 27 <sup>h</sup> 4   | 7 <sup>h</sup> 50  | 0 <sup>h</sup> 50   | F 23 |
| S 24 | 2 9 58  | 0 <sup>h</sup> M39'41 | 6 <sup>h</sup> 546   | 12 <sup>h</sup> 31  | 13 <sup>h</sup> 15  | 6 <sup>h</sup> 48    | 0 <sup>h</sup> 53   | 7 <sup>h</sup> 3  | 20 <sup>h</sup> 8  | 27 <sup>h</sup> 57  | 6 <sup>h</sup> 13   | 26 <sup>h</sup> 6   | 27 <sup>h</sup> 0   | 7 <sup>h</sup> 56  | 0 <sup>h</sup> 47   | S 24 |
| S 25 | 2 13 55 | 1 <sup>h</sup> 39'24  | 21 <sup>h</sup> 0    | 13 <sup>h</sup> 40  | 13 <sup>h</sup> 55  | 7 <sup>h</sup> 2     | 1 <sup>h</sup> 2    | 7 <sup>h</sup> 9  | 20 <sup>h</sup> 12 | 27 <sup>h</sup> 59  | 6 <sup>h</sup> 12   | 26 <sup>h</sup> 3   | 26 <sup>h</sup> 57  | 8 <sup>h</sup> 3   | 0 <sup>h</sup> 45   | S 25 |
| M26  | 2 17 52 | 2 <sup>h</sup> 39'09  | 5 <sup>h</sup> Q 8   | 14 <sup>h</sup> 53  | 14 <sup>h</sup> 33  | 7 <sup>h</sup> 15    | 1 <sup>h</sup> 11   | 7 <sup>h</sup> 16 | 20 <sup>h</sup> 15 | 28 <sup>h</sup> 1   | 6 <sup>h</sup> 11   | 25 <sup>h</sup> 59  | 26 <sup>h</sup> 54  | 8 <sup>h</sup> 10  | 0 <sup>h</sup> 42   | M26  |
| T 27 | 2 21 48 | 3 <sup>h</sup> 38'56  | 19 <sup>h</sup> 5    | 16 <sup>h</sup> 11  | 15 <sup>h</sup> 9   | 7 <sup>h</sup> 28    | 1 <sup>h</sup> 20   | 7 <sup>h</sup> 22 | 20 <sup>h</sup> 18 | 28 <sup>h</sup> 3   | 6 <sup>h</sup> 10   | 25 <sup>h</sup> 56  | 26 <sup>h</sup> 51  | 8 <sup>h</sup> 16  | 0 <sup>h</sup> 39   | T 27 |
| W28  | 2 25 45 | 4 <sup>h</sup> 38'46  | 2 <sup>h</sup> M47   | 17 <sup>h</sup> 33  | 15 <sup>h</sup> 45  | 7 <sup>h</sup> 39    | 1 <sup>h</sup> 29   | 7 <sup>h</sup> 28 | 20 <sup>h</sup> 21 | 28 <sup>h</sup> 5   | 6 <sup>h</sup> 9    | 25 <sup>h</sup> 54  | 26 <sup>h</sup> 48  | 8 <sup>h</sup> 23  | 0 <sup>h</sup> 36   | W28  |
| T 29 | 2 29 41 | 5 <sup>h</sup> 38'37  | 16 <sup>h</sup> 12   | 18 <sup>h</sup> 59  | 16 <sup>h</sup> 19  | 7 <sup>h</sup> 51    | 1 <sup>h</sup> 38   | 7 <sup>h</sup> 35 | 20 <sup>h</sup> 24 | 28 <sup>h</sup> 7   | 6 <sup>h</sup> 8    | 25 <sup>h</sup> 52  | 26 <sup>h</sup> 45  | 8 <sup>h</sup> 30  | 0 <sup>h</sup> 34   | T 29 |
| F 30 | 2 33 38 | 6 <sup>h</sup> 38'31  | 29 <sup>h</sup> 18   | 20 <sup>h</sup> 27  | 16 <sup>h</sup> 52  | 8 <sup>h</sup> 1     | 1 <sup>h</sup> 47   | 7 <sup>h</sup> 41 | 20 <sup>h</sup> 26 | 28 <sup>h</sup> 9   | 6 <sup>h</sup> 7    | 25 <sup>h</sup> D52 | 26 <sup>h</sup> 41  | 8 <sup>h</sup> 37  | 0 <sup>h</sup> 31   | F 30 |
| S 31 | 2 37 34 | 7 <sup>h</sup> M38'26 | 12 <sup>h</sup> Q 5  | 21 <sup>h</sup> Q57 | 17 <sup>h</sup> Q24 | 8 <sup>h</sup> Q11   | 1 <sup>h</sup> 55   | 7 <sup>h</sup> 47 | 20 <sup>h</sup> 29 | 28 <sup>h</sup> M12 | 6 <sup>h</sup> II 6 | 25 <sup>h</sup> Q53 | 26 <sup>h</sup> Q38 | 8 <sup>h</sup> Q43 | 0 <sup>h</sup> II28 | S 31 |

# ASTRODIENST EPHEMERIS for the year 2133

## geocentric

NOVEMBER 2133

00:00 UT

| Day  | Sid.t   | ☉        | ☽     | ♀     | ♂      | ♂     | ♂    | ♂     | ♂     | ♂     | ♂    | ♂      | ♂     | ♂     | ♂     | Day  |
|------|---------|----------|-------|-------|--------|-------|------|-------|-------|-------|------|--------|-------|-------|-------|------|
| S 1  | 2 41 31 | 8♉38'23  | 24♊34 | 23♋29 | 17♌54  | 8♍20  | 2♎4  | 7♏54  | 20♐32 | 28♑14 | 6♒5  | 25♓54  | 26♈35 | 8♉50  | 0°R25 | S 1  |
| M 2  | 2 45 27 | 9°38'22  | 6♈48  | 25°3  | 18°22  | 8°29  | 2°12 | 8°0   | 20°35 | 28°16 | 6♉4  | 25°55  | 26°32 | 8°57  | 0♈22  | M 2  |
| T 3  | 2 49 24 | 10°38'22 | 18°50 | 26°38 | 18°49  | 8°36  | 2°20 | 8°7   | 20°38 | 28°18 | 6°3  | 25°57  | 26°29 | 9°4   | 0°19  | T 3  |
| W 4  | 2 53 21 | 11°38'24 | 0♉46  | 28°14 | 19°14  | 8°43  | 2°29 | 8°14  | 20°40 | 28°20 | 6°2  | 25°58  | 26°26 | 9°10  | 0°16  | W 4  |
| T 5  | 2 57 17 | 12°38'28 | 12°38 | 29°51 | 19°38  | 8°49  | 2°37 | 8°20  | 20°43 | 28°22 | 6°1  | 25°R58 | 26°22 | 9°17  | 0°13  | T 5  |
| F 6  | 3 1 14  | 13°38'33 | 24°32 | 1♉28  | 19°59  | 8°55  | 2°44 | 8°27  | 20°46 | 28°25 | 6°0  | 25°58  | 26°19 | 9°24  | 0°10  | F 6  |
| S 7  | 3 5 10  | 14°38'39 | 6♈33  | 3°5   | 20°19  | 8°59  | 2°52 | 8°34  | 20°48 | 28°27 | 5°59 | 25°57  | 26°16 | 9°30  | 0°7   | S 7  |
| S 8  | 3 9 7   | 15°38'47 | 18°45 | 4°43  | 20°37  | 9°3   | 3°0  | 8°40  | 20°51 | 28°29 | 5°58 | 25°56  | 26°13 | 9°37  | 0°4   | S 8  |
| M 9  | 3 13 3  | 16°38'57 | 1°Y11 | 6°21  | 20°52  | 9°6   | 3°7  | 8°47  | 20°53 | 28°31 | 5°57 | 25°54  | 26°10 | 9°44  | 0°1   | M 9  |
| T 10 | 3 17 0  | 17°39'08 | 13°55 | 7°59  | 21°6   | 9°8   | 3°14 | 8°54  | 20°56 | 28°33 | 5°56 | 25°53  | 26°6  | 9°51  | 29°57 | T 10 |
| W 11 | 3 20 56 | 18°39'21 | 26°58 | 9°37  | 21°18  | 9°9   | 3°21 | 9°1   | 20°58 | 28°36 | 5°55 | 25°52  | 26°3  | 9°57  | 29°54 | W 11 |
| T 12 | 3 24 53 | 19°39'36 | 10♋20 | 11°15 | 21°27  | 9°R10 | 3°28 | 9°7   | 21°1  | 28°38 | 5°54 | 25°52  | 26°0  | 10°4  | 29°51 | T 12 |
| F 13 | 3 28 49 | 20°39'52 | 24°1  | 12°52 | 21°34  | 9°9   | 3°35 | 9°14  | 21°3  | 28°40 | 5°53 | 25°D51 | 25°57 | 10°11 | 29°48 | F 13 |
| S 14 | 3 32 46 | 21°40'10 | 7♉57  | 14°30 | 21°39  | 9°8   | 3°42 | 9°21  | 21°5  | 28°42 | 5°52 | 25°51  | 25°54 | 10°17 | 29°45 | S 14 |
| S 15 | 3 36 43 | 22°40'30 | 22°5  | 16°7  | 21°42  | 9°6   | 3°49 | 9°28  | 21°8  | 28°45 | 5°51 | 25°52  | 25°51 | 10°24 | 29°42 | S 15 |
| M 16 | 3 40 39 | 23°40'52 | 6♋22  | 17°44 | 21°R42 | 9°3   | 3°55 | 9°35  | 21°10 | 28°47 | 5°49 | 25°52  | 25°47 | 10°31 | 29°38 | M 16 |
| T 17 | 3 44 36 | 24°41'15 | 20°42 | 19°21 | 21°40  | 8°59  | 4°1  | 9°42  | 21°12 | 28°49 | 5°48 | 25°52  | 25°44 | 10°38 | 29°35 | T 17 |
| W 18 | 3 48 32 | 25°41'41 | 5♊2   | 20°57 | 21°35  | 8°55  | 4°7  | 9°49  | 21°14 | 28°51 | 5°47 | 25°R52 | 25°41 | 10°44 | 29°32 | W 18 |
| T 19 | 3 52 29 | 26°42'08 | 19°18 | 22°34 | 21°28  | 8°49  | 4°13 | 9°56  | 21°16 | 28°54 | 5°46 | 25°52  | 25°38 | 10°51 | 29°29 | T 19 |
| F 20 | 3 56 25 | 27°42'37 | 3♎28  | 24°10 | 21°19  | 8°43  | 4°19 | 10°3  | 21°18 | 28°56 | 5°45 | 25°D52 | 25°35 | 10°58 | 29°25 | F 20 |
| S 21 | 4 0 22  | 28°43'08 | 17°29 | 25°46 | 21°7   | 8°36  | 4°25 | 10°10 | 21°20 | 28°58 | 5°44 | 25°52  | 25°32 | 11°4  | 29°22 | S 21 |
| S 22 | 4 4 19  | 29°43'41 | 1♋21  | 27°21 | 20°52  | 8°27  | 4°30 | 10°17 | 21°22 | 29°0  | 5°43 | 25°53  | 25°28 | 11°11 | 29°19 | S 22 |
| M 23 | 4 8 15  | 0♉44'15  | 15°1  | 28°56 | 20°36  | 8°18  | 4°36 | 10°24 | 21°24 | 29°3  | 5°42 | 25°53  | 25°25 | 11°18 | 29°16 | M 23 |
| T 24 | 4 12 12 | 1°44'51  | 28°29 | 0♊32  | 20°16  | 8°8   | 4°41 | 10°31 | 21°26 | 29°5  | 5°40 | 25°54  | 25°22 | 11°25 | 29°12 | T 24 |
| W 25 | 4 16 8  | 2°45'29  | 11♉45 | 2°7   | 19°55  | 7°57  | 4°46 | 10°38 | 21°28 | 29°7  | 5°39 | 25°54  | 25°19 | 11°31 | 29°9  | W 25 |
| T 26 | 4 20 5  | 3°46'08  | 24°47 | 3°41  | 19°32  | 7°46  | 4°51 | 10°45 | 21°30 | 29°9  | 5°38 | 25°R54 | 25°16 | 11°38 | 29°6  | T 26 |
| F 27 | 4 24 1  | 4°46'49  | 7♊36  | 5°16  | 19°6   | 7°33  | 4°55 | 10°52 | 21°31 | 29°12 | 5°37 | 25°54  | 25°12 | 11°45 | 29°3  | F 27 |
| S 28 | 4 27 58 | 5°47'32  | 20°11 | 6°50  | 18°39  | 7°20  | 5°0  | 10°59 | 21°33 | 29°14 | 5°36 | 25°53  | 25°9  | 11°51 | 28°59 | S 28 |
| S 29 | 4 31 54 | 6°48'15  | 2♈33  | 8°25  | 18°9   | 7°6   | 5°4  | 11°6  | 21°35 | 29°16 | 5°35 | 25°52  | 25°6  | 11°58 | 28°56 | S 29 |
| M 30 | 4 35 51 | 7°49'00  | 14♈43 | 9♊59  | 17♊38  | 6♋51  | 5♎8  | 11♊13 | 21♎36 | 29♉18 | 5♊34 | 25♓50  | 25♈3  | 12♉5  | 28♈53 | M 30 |

Delta T = 111.24 sec

DECEMBER 2133

00:00 UT

| Day  | Sid.t   | ☉        | ☽     | ♀     | ♂      | ♂     | ♂     | ♂     | ♂      | ♂     | ♂     | ♂      | ♂     | ♂     | ♂      | Day  |
|------|---------|----------|-------|-------|--------|-------|-------|-------|--------|-------|-------|--------|-------|-------|--------|------|
| T 1  | 4 39 48 | 8♊49'46  | 26♈44 | 11♊33 | 17°R 6 | 6°R35 | 5♎12  | 11♊20 | 21♎38  | 29♉21 | 5°R33 | 25°R48 | 25♈0  | 12♉12 | 28°R50 | T 1  |
| W 2  | 4 43 44 | 9°50'33  | 8♉39  | 13°7  | 16♊32  | 6♋19  | 5°16  | 11°27 | 21°39  | 29°23 | 5♊31  | 25♓46  | 24°57 | 12°18 | 28♈47  | W 2  |
| T 3  | 4 47 41 | 10°51'20 | 20°31 | 14°41 | 15°57  | 6°2   | 5°20  | 11°35 | 21°40  | 29°25 | 5°30  | 25°45  | 24°53 | 12°25 | 28°43  | T 3  |
| F 4  | 4 51 37 | 11°52'09 | 2♈23  | 16°15 | 15°22  | 5°44  | 5°23  | 11°42 | 21°42  | 29°27 | 5°29  | 25°44  | 24°50 | 12°32 | 28°40  | F 4  |
| S 5  | 4 55 34 | 12°52'59 | 14°22 | 17°49 | 14°46  | 5°25  | 5°27  | 11°49 | 21°43  | 29°29 | 5°28  | 25°D43 | 24°47 | 12°39 | 28°37  | S 5  |
| S 6  | 4 59 30 | 13°53'49 | 26°30 | 19°22 | 14°9   | 5°6   | 5°30  | 11°56 | 21°44  | 29°32 | 5°27  | 25°44  | 24°44 | 12°45 | 28°34  | S 6  |
| M 7  | 5 3 27  | 14°54'41 | 8°Y54 | 20°56 | 13°33  | 4°46  | 5°32  | 12°3  | 21°45  | 29°34 | 5°26  | 25°45  | 24°41 | 12°52 | 28°31  | M 7  |
| T 8  | 5 7 23  | 15°55'33 | 21°38 | 22°30 | 12°57  | 4°26  | 5°35  | 12°10 | 21°47  | 29°36 | 5°25  | 25°47  | 24°38 | 12°59 | 28°28  | T 8  |
| W 9  | 5 11 20 | 16°56'26 | 4♈44  | 24°4  | 12°21  | 4°5   | 5°38  | 12°17 | 21°48  | 29°38 | 5°24  | 25°48  | 24°34 | 13°5  | 28°25  | W 9  |
| T 10 | 5 15 17 | 17°57'19 | 18°14 | 25°37 | 11°46  | 3°44  | 5°40  | 12°24 | 21°49  | 29°40 | 5°22  | 25°49  | 24°31 | 13°12 | 28°22  | T 10 |
| F 11 | 5 19 13 | 18°58'14 | 2♉9   | 27°11 | 11°11  | 3°22  | 5°42  | 12°31 | 21°50  | 29°43 | 5°21  | 25°R49 | 24°28 | 13°19 | 28°19  | F 11 |
| S 12 | 5 23 10 | 19°59'10 | 16°27 | 28°45 | 10°38  | 3°0   | 5°44  | 12°38 | 21°50  | 29°45 | 5°20  | 25°48  | 24°25 | 13°26 | 28°16  | S 12 |
| S 13 | 5 27 6  | 21°0'06  | 1♋2   | 0♈18  | 10°7   | 2°38  | 5°46  | 12°45 | 21°51  | 29°47 | 5°19  | 25°46  | 24°22 | 13°32 | 28°13  | S 13 |
| M 14 | 5 31 3  | 22°1'03  | 15°49 | 1°52  | 9°36   | 2°15  | 5°48  | 12°53 | 21°52  | 29°49 | 5°18  | 25°42  | 24°18 | 13°39 | 28°10  | M 14 |
| T 15 | 5 34 59 | 23°2'02  | 0♊38  | 3°26  | 9°8    | 1°52  | 5°49  | 13°0  | 21°53  | 29°51 | 5°17  | 25°38  | 24°15 | 13°46 | 28°7   | T 15 |
| W 16 | 5 38 56 | 24°3'01  | 15°23 | 4°59  | 8°42   | 1°29  | 5°50  | 13°7  | 21°53  | 29°53 | 5°16  | 25°34  | 24°12 | 13°52 | 28°4   | W 16 |
| T 17 | 5 42 53 | 25°4'02  | 29°57 | 6°33  | 8°17   | 1°5   | 5°51  | 13°14 | 21°54  | 29°55 | 5°15  | 25°31  | 24°9  | 13°59 | 28°1   | T 17 |
| F 18 | 5 46 49 | 26°5'03  | 14♎15 | 8°6   | 7°55   | 0°42  | 5°52  | 13°21 | 21°55  | 29°57 | 5°14  | 25°29  | 24°6  | 14°6  | 27°59  | F 18 |
| S 19 | 5 50 46 | 27°6'05  | 28°15 | 9°40  | 7°35   | 0°18  | 5°53  | 13°28 | 21°55  | 29°59 | 5°13  | 25°D28 | 24°3  | 14°13 | 27°56  | S 19 |
| S 20 | 5 54 42 | 28°7'08  | 11♋56 | 11°13 | 7°18   | 29♉55 | 5°53  | 13°35 | 21°56  | 0♊1   | 5°12  | 25°29  | 23°59 | 14°19 | 27°53  | S 20 |
| M 21 | 5 58 39 | 29°8'12  | 25°19 | 12°46 | 7°3    | 29°31 | 5°53  | 13°41 | 21°56  | 0°3   | 5°11  | 25°31  | 23°56 | 14°26 | 27°50  | M 21 |
| T 22 | 6 2 35  | 0♈9'17   | 8♉26  | 14°19 | 6°50   | 29°8  | 5°R53 | 13°48 | 21°56  | 0°6   | 5°10  | 25°32  | 23°53 | 14°33 | 27°48  | T 22 |
| W 23 | 6 6 32  | 1°10'23  | 21°19 | 15°51 | 6°40   | 28°44 | 5°53  | 13°55 | 21°57  | 0°8   | 5°9   | 25°R33 | 23°50 | 14°40 | 27°45  | W 23 |
| T 24 | 6 10 28 | 2°11'30  | 3♊59  | 17°23 | 6°33   | 28°21 | 5°53  | 14°2  | 21°57  | 0°10  | 5°8   | 25°33  | 23°47 | 14°46 | 27°43  | T 24 |
| F 25 | 6 14 25 | 3°12'37  | 16°28 | 18°54 | 6°27   | 27°58 | 5°52  | 14°9  | 21°57  | 0°11  | 5°7   | 25°31  | 23°44 | 14°53 | 27°40  | F 25 |
| S 26 | 6 18 22 | 4°13'45  | 28°48 | 20°24 | 6°25   | 27°35 | 5°52  | 14°16 | 21°57  | 0°13  | 5°6   | 25°27  | 23°40 | 15°0  | 27°38  | S 26 |
| S 27 | 6 22 18 | 5°14'53  | 10♈59 | 21°54 | 6°D25  | 27°13 | 5°51  | 14°23 | 21°R57 | 0°15  | 5°5   | 25°21  | 23°37 | 15°6  | 27°35  | S 27 |
| M 28 | 6 26 15 | 6°16'02  | 23°3  | 23°22 | 6°27   | 26°51 | 5°50  | 14°30 | 21°57  | 0°17  | 5°4   | 25°13  | 23°34 | 15°13 | 27°33  | M 28 |
| T 29 | 6 30 11 | 7°17'11  | 5♉0   | 24°49 | 6°31   | 26°30 | 5°48  | 14°36 | 21°57  | 0°19  | 5°3   | 25°5   | 23°31 | 15°20 | 27°31  | T 29 |
| W 30 | 6 34 8  | 8°18'20  | 16°53 | 26°14 | 6°38   | 26°8  | 5°47  | 14°43 | 21°57  | 0°21  | 5°2   | 24°56  | 23°28 | 15°27 | 27°28  | W 30 |
| T 31 | 6 38 4  | 9♈19'29  | 28♉44 | 27♈37 | 6♊48   | 25♉48 | 5♎45  | 14♊50 | 21♎57  | 0♊23  | 5♊1   | 24♓48  | 23♈24 | 15♉33 | 27♈26  | T 31 |

Delta T = 111.29 sec