# 2012 July 17, 18, 19 (Tue, Wed, Thur)

| GMT | ARIES | VENUS -4.5 | | MARS +1.0 | | JUPITER -2.1 | | SATURN +0.7 | |
|---|---|---|---|---|---|---|---|---|---|
| | GHA | GHA | Dec | GHA | Dec | GHA | Dec | GHA | Dec |
| 17 Tuesday 00 | 295°13'.4 | 222°19'.5 | 17°51'.7 N | 108°26'.3 | 2°47'.4 S | 229°21'.5 | 20°48'.2 N | 92°52'.7 | 6°41'.3 S |
| 01 | 310°15'.8 | 237°20'.5 | 51'.9 | 123°27'.5 | 48'.0 | 244°23'.5 | 48'.3 | 107°55'.1 | 41'.4 |
| 02 | 325°18'.3 | 252°21'.4 | 52'.1 | 138°28'.7 | 48'.6 | 259°25'.4 | 48'.4 | 122°57'.5 | 41'.4 |
| 03 | 340°20'.7 | 267°22'.4 | 52'.3 | 153°29'.9 | 49'.1 | 274°27'.4 | 48'.5 | 137°59'.8 | 41'.5 |
| 04 | 355°23'.2 | 282°23'.3 | 52'.5 | 168°31'.1 | 49'.7 | 289°29'.3 | 48'.5 | 153°02'.2 | 41'.5 |
| 05 | 10°25'.7 | 297°24'.3 | 52'.7 | 183°32'.3 | 50'.3 | 304°31'.3 | 48'.6 | 168°04'.6 | 41'.6 |
| 06 | 25°28'.1 | 312°25'.2 | 52'.9 | 198°33'.5 | 50'.9 | 319°33'.2 | 48'.7 | 183°07'.0 | 41'.6 |
| 07 | 40°30'.6 | 327°26'.2 | 53'.1 | 213°34'.7 | 51'.5 | 334°35'.2 | 48'.8 | 198°09'.4 | 41'.6 |
| 08 | 55°33'.1 | 342°27'.1 | 53'.3 | 228°35'.8 | 52'.1 | 349°37'.1 | 48'.9 | 213°11'.8 | 41'.7 |
| 09 | 70°35'.5 | 357°28'.0 | 53'.5 | 243°37'.0 | 52'.7 | 4°39'.1 | 48'.9 | 228°14'.2 | 41'.7 |
| 10 | 85°38'.0 | 12°29'.0 | 53'.6 | 258°38'.2 | 53'.3 | 19°41'.0 | 49'.0 | 243°16'.5 | 41'.8 |
| 11 | 100°40'.5 | 27°29'.9 | 53'.8 | 273°39'.4 | 53'.9 | 34°43'.0 | 49'.1 | 258°18'.9 | 41'.8 |
| 12 | 115°42'.9 | 42°30'.8 | 17°54'.0 N | 288°40'.6 | 2°54'.5 S | 49°44'.9 | 20°49'.2 N | 273°21'.3 | 6°41'.9 S |
| 13 | 130°45'.4 | 57°31'.8 | 54'.2 | 303°41'.8 | 55'.1 | 64°46'.9 | 49'.2 | 288°23'.7 | 41'.9 |
| 14 | 145°47'.9 | 72°32'.7 | 54'.4 | 318°43'.0 | 55'.7 | 79°48'.8 | 49'.3 | 303°26'.1 | 41'.9 |
| 15 | 160°50'.3 | 87°33'.6 | 54'.6 | 333°44'.1 | 56'.3 | 94°50'.8 | 49'.4 | 318°28'.5 | 42'.0 |
| 16 | 175°52'.8 | 102°34'.5 | 54'.8 | 348°45'.3 | 56'.9 | 109°52'.8 | 49'.5 | 333°30'.8 | 42'.0 |
| 17 | 190°55'.2 | 117°35'.4 | 55'.0 | 3°46'.5 | 57'.5 | 124°54'.7 | 49'.6 | 348°33'.2 | 42'.1 |
| 18 | 205°57'.7 | 132°36'.4 | 55'.2 | 18°47'.7 | 58'.1 | 139°56'.7 | 49'.6 | 3°35'.6 | 42'.1 |
| 19 | 221°00'.2 | 147°37'.3 | 55'.4 | 33°48'.9 | 58'.7 | 154°58'.6 | 49'.7 | 18°38'.0 | 42'.2 |
| 20 | 236°02'.6 | 162°38'.2 | 55'.6 | 48°50'.1 | 59'.2 | 170°00'.6 | 49'.8 | 33°40'.4 | 42'.2 |
| 21 | 251°05'.1 | 177°39'.1 | 55'.8 | 63°51'.3 | 59'.8 | 185°02'.5 | 49'.9 | 48°42'.8 | 42'.2 |
| 22 | 266°07'.6 | 192°40'.0 | 56'.0 | 78°52'.4 | 3°00'.4 S | 200°04'.5 | 49'.9 | 63°45'.1 | 42'.3 |
| 23 | 281°10'.0 | 207°40'.9 | 56'.2 | 93°53'.6 | 01'.0 | 215°06'.4 | 50'.0 | 78°47'.5 | 42'.3 |
| 18 Wednesday 00 | 296°12'.5 | 222°41'.8 | 17°56'.4 N | 108°54'.8 | 3°01'.6 S | 230°08'.4 | 20°50'.1 N | 93°49'.9 | 6°42'.4 S |
| 01 | 311°15'.0 | 237°42'.7 | 56'.6 | 123°56'.0 | 02'.2 | 245°10'.3 | 50'.2 | 108°52'.3 | 42'.4 |
| 02 | 326°17'.4 | 252°43'.6 | 56'.8 | 138°57'.2 | 02'.8 | 260°12'.3 | 50'.3 | 123°54'.7 | 42'.5 |
| 03 | 341°19'.9 | 267°44'.5 | 57'.0 | 153°58'.4 | 03'.4 | 275°14'.3 | 50'.3 | 138°57'.0 | 42'.5 |
| 04 | 356°22'.4 | 282°45'.4 | 57'.2 | 168°59'.5 | 04'.0 | 290°16'.2 | 50'.4 | 153°59'.4 | 42'.6 |
| 05 | 11°24'.8 | 297°46'.3 | 57'.4 | 184°00'.7 | 04'.6 | 305°18'.2 | 50'.5 | 169°01'.8 | 42'.6 |
| 06 | 26°27'.3 | 312°47'.2 | 57'.6 | 199°01'.9 | 05'.2 | 320°20'.1 | 50'.6 | 184°04'.2 | 42'.6 |
| 07 | 41°29'.7 | 327°48'.1 | 57'.8 | 214°03'.1 | 05'.8 | 335°22'.1 | 50'.6 | 199°06'.6 | 42'.7 |
| 08 | 56°32'.2 | 342°49'.0 | 58'.0 | 229°04'.3 | 06'.4 | 350°24'.0 | 50'.7 | 214°09'.0 | 42'.7 |
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| 11 | 101°39'.6 | 27°51'.6 | 58'.6 | 274°07'.8 | 08'.2 | 35°29'.9 | 50'.9 | 259°16'.1 | 42'.9 |
| 12 | 116°42'.1 | 42°52'.5 | 17°58'.8 N | 289°09'.0 | 3°08'.8 S | 50°31'.9 | 20°51'.0 N | 274°18'.5 | 6°42'.9 S |
| 13 | 131°44'.5 | 57°53'.3 | 59'.0 | 304°10'.2 | 09'.4 | 65°33'.8 | 51'.1 | 289°20'.9 | 43'.0 |
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| 16 | 176°51'.9 | 102°56'.0 | 59'.6 | 349°13'.7 | 11'.2 | 110°39'.7 | 51'.3 | 334°28'.0 | 43'.1 |
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| 18 | 206°56'.8 | 132°57'.7 | 18°00'.0 N | 19°16'.1 | 12'.3 | 140°43'.6 | 51'.5 | 4°32'.8 | 43'.2 |
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| 22 | 267°06'.7 | 193°01'.1 | 00'.8 | 79°20'.8 | 14'.7 | 200°51'.4 | 51'.8 | 64°42'.3 | 43'.4 |
| 23 | 282°09'.2 | 208°02'.0 | 01'.0 | 94°22'.0 | 15'.3 | 215°53'.4 | 51'.9 | 79°44'.6 | 43'.4 |
| 19 Thursday 00 | 297°11'.6 | 223°02'.8 | 18°01'.2 N | 109°23'.1 | 3°15'.9 S | 230°55'.4 | 20°51'.9 N | 94°47'.0 | 6°43'.4 S |
| 01 | 312°14'.1 | 238°03'.7 | 01'.4 | 124°24'.3 | 16'.5 | 245°57'.3 | 52'.0 | 109°49'.4 | 43'.5 |
| 02 | 327°16'.6 | 253°04'.5 | 01'.6 | 139°25'.5 | 17'.1 | 260°59'.3 | 52'.1 | 124°51'.8 | 43'.5 |
| 03 | 342°19'.0 | 268°05'.4 | 01'.9 | 154°26'.7 | 17'.7 | 276°01'.2 | 52'.2 | 139°54'.2 | 43'.6 |
| 04 | 357°21'.5 | 283°06'.2 | 02'.1 | 169°27'.8 | 18'.3 | 291°03'.2 | 52'.2 | 154°56'.5 | 43'.6 |
| 05 | 12°24'.0 | 298°07'.0 | 02'.3 | 184°29'.0 | 18'.9 | 306°05'.1 | 52'.3 | 169°58'.9 | 43'.7 |
| 06 | 27°26'.4 | 313°07'.9 | 02'.5 | 199°30'.2 | 19'.5 | 321°07'.1 | 52'.4 | 185°01'.3 | 43'.7 |
| 07 | 42°28'.9 | 328°08'.7 | 02'.7 | 214°31'.4 | 20'.1 | 336°09'.1 | 52'.5 | 200°03'.7 | 43'.8 |
| 08 | 57°31'.3 | 343°09'.5 | 02'.9 | 229°32'.5 | 20'.7 | 351°11'.0 | 52'.5 | 215°06'.0 | 43'.8 |
| 09 | 72°33'.8 | 358°10'.4 | 03'.1 | 244°33'.7 | 21'.3 | 6°13'.0 | 52'.6 | 230°08'.4 | 43'.9 |
| 10 | 87°36'.3 | 13°11'.2 | 03'.3 | 259°34'.9 | 21'.9 | 21°14'.9 | 52'.7 | 245°10'.8 | 43'.9 |
| 11 | 102°38'.7 | 28°12'.0 | 03'.5 | 274°36'.1 | 22'.5 | 36°16'.9 | 52'.8 | 260°13'.2 | 43'.9 |
| 12 | 117°41'.2 | 43°12'.9 | 18°03'.7 N | 289°37'.2 | 3°23'.1 S | 51°18'.9 | 20°52'.8 N | 275°15'.6 | 6°44'.0 S |
| 13 | 132°43'.7 | 58°13'.7 | 03'.9 | 304°38'.4 | 23'.7 | 66°20'.8 | 52'.9 | 290°17'.9 | 44'.0 |
| 14 | 147°46'.1 | 73°14'.5 | 04'.1 | 319°39'.6 | 24'.3 | 81°22'.8 | 53'.0 | 305°20'.3 | 44'.1 |
| 15 | 162°48'.6 | 88°15'.3 | 04'.4 | 334°40'.8 | 24'.9 | 96°24'.7 | 53'.1 | 320°22'.7 | 44'.1 |
| 16 | 177°51'.1 | 103°16'.1 | 04'.6 | 349°41'.9 | 25'.5 | 111°26'.7 | 53'.1 | 335°25'.1 | 44'.2 |
| 17 | 192°53'.5 | 118°17'.0 | 04'.8 | 4°43'.1 | 26'.1 | 126°28'.7 | 53'.2 | 350°27'.4 | 44'.2 |
| 18 | 207°56'.0 | 133°17'.8 | 05'.0 | 19°44'.3 | 26'.7 | 141°30'.6 | 53'.3 | 5°29'.8 | 44'.3 |
| 19 | 222°58'.5 | 148°18'.6 | 05'.2 | 34°45'.4 | 27'.3 | 156°32'.6 | 53'.4 | 20°32'.2 | 44'.3 |
| 20 | 238°00'.9 | 163°19'.4 | 05'.4 | 49°46'.6 | 27'.9 | 171°34'.6 | 53'.4 | 35°34'.6 | 44'.4 |
| 21 | 253°03'.4 | 178°20'.2 | 05'.6 | 64°47'.8 | 28'.5 | 186°36'.5 | 53'.5 | 50°36'.9 | 44'.4 |
| 22 | 268°05'.8 | 193°21'.0 | 05'.8 | 79°49'.0 | 29'.1 | 201°38'.5 | 53'.6 | 65°39'.3 | 44'.5 |
| 23 | 283°08'.3 | 208°21'.8 | 06'.0 | 94°50'.1 | 29'.7 | 216°40'.4 | 53'.7 | 80°41'.7 | 44'.5 |
| | M.P. 04:11 | v 0'.9 | d 0'.2 | v 1'.2 | d 0'.6 | v 2'.0 | d 0'.1 | v 2'.4 | d 0'.0 |

| STARS | | |
|---|---|---|
| Name | SHA | Dec |
| Acamar | 315°19'.0 | 40°15'.0 S |
| Achernar | 335°27'.2 | 57°10'.0 S |
| Acrux | 173°10'.2 | 63°10'.5 S |
| Adhara | 255°13'.4 | 28°59'.4 S |
| Aldebaran | 290°50'.3 | 16°32'.0 N |
| Alioth | 166°21'.3 | 55°53'.7 N |
| Alkaid | 152°59'.4 | 49°15'.3 N |
| Alnair | 27°44'.1 | 46°53'.7 S |
| Alnilam | 275°47'.3 | 1°11'.7 S |
| Alphard | 217°57'.0 | 8°42'.9 S |
| Alphecca | 126°11'.3 | 26°40'.6 N |
| Alpheratz | 357°44'.0 | 29°09'.6 N |
| Altair | 62°08'.5 | 8°54'.3 N |
| Ankaa | 353°16'.2 | 42°13'.9 S |
| Antares | 112°26'.7 | 26°27'.6 S |
| Arcturus | 145°56'.2 | 19°07'.2 N |
| Atria | 107°28'.7 | 69°03'.1 S |
| Avior | 234°18'.9 | 59°33'.2 S |
| Bellatrix | 278°32'.9 | 6°21'.6 N |
| Betelgeuse | 271°02'.3 | 7°24'.5 N |
| Canopus | 263°56'.9 | 52°42'.1 S |
| Capella | 280°35'.7 | 46°00'.4 N |
| Deneb | 49°31'.4 | 45°19'.6 N |
| Denebola | 182°34'.4 | 14°30'.1 N |
| Diphda | 348°56'.4 | 17°54'.8 S |
| Dubhe | 193°52'.9 | 61°41'.1 N |
| Elnath | 278°13'.7 | 28°36'.9 N |
| Eltanin | 90°45'.9 | 51°29'.5 N |
| Enif | 33°47'.4 | 9°56'.1 N |
| Fomalhaut | 15°24'.4 | 29°33'.0 S |
| Gacrux | 172°01'.7 | 57°11'.3 S |
| Gienah | 175°53'.0 | 17°36'.8 S |
| Hadar | 148°48'.7 | 60°26'.3 S |
| Hamal | 328°01'.5 | 23°31'.2 N |
| Kaus Aust. | 83°44'.2 | 34°22'.6 S |
| Kochab | 137°19'.6 | 74°06'.5 N |
| Markab | 13°38'.7 | 15°16'.5 N |
| Menkar | 314°15'.8 | 4°08'.4 N |
| Menkent | 148°08'.2 | 36°26'.1 S |
| Miaplacidus | 221°40'.7 | 69°46'.4 S |
| Mirfak | 308°41'.4 | 49°54'.1 N |
| Nunki | 75°58'.7 | 26°16'.7 S |
| Peacock | 53°19'.6 | 56°41'.4 S |
| Polaris | 318°12'.4 | 89°18'.8 N |
| Pollux | 243°28'.9 | 27°59'.6 N |
| Procyon | 245°00'.7 | 5°11'.5 N |
| Rasalhague | 96°06'.7 | 12°33'.3 N |
| Regulus | 207°44'.4 | 11°54'.3 N |
| Rigel | 281°12'.9 | 8°11'.2 S |
| Rigil Kent | 139°52'.3 | 60°53'.4 S |
| Sabik | 102°13'.0 | 15°44'.3 S |
| Schedar | 349°41'.1 | 56°36'.2 N |
| Shaula | 96°22'.4 | 37°06'.7 S |
| Sirius | 258°34'.6 | 16°44'.1 S |
| Spica | 158°31'.9 | 11°13'.7 S |
| Suhail | 222°53'.3 | 43°29'.2 S |
| Vega | 80°39'.0 | 38°48'.0 N |
| Zuben'ubi | 137°06'.0 | 16°05'.7 S |

| | SHA | Mer.Pass. |
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| Venus | 286°29'.3 | 09:09 |
| Mars | 172°42'.3 | 16:43 |
| Jupiter | 293°55'.9 | 08:38 |
| Saturn | 157°37'.4 | 17:42 |

| SUN | | MOON | | | | |
|---|---|---|---|---|---|---|
| GHA | Dec | GHA | v | Dec | d | HP |
| 178°27'.7 | 21°09'.6 N | 205°30'.3 | 10'.8 | 21°12'.7 N | 2'.4 | 54'.9 |
| 193°27'.7 | 09'.1 | 220°00'.1 | 10'.8 | 10'.3 | 2'.6 | |
| 208°27'.6 | 08'.7 | 234°29'.9 | 10'.7 | 07'.7 | 2'.6 | |
| 223°27'.6 | 08'.3 | 248°59'.6 | 10'.8 | 05'.1 | 2'.8 | |
| 238°27'.5 | 07'.9 | 263°29'.4 | 10'.8 | 02'.3 | 2'.9 | 55'.0 |
| 253°27'.5 | 07'.4 | 277°59'.2 | 10'.7 | 20°59'.4 N | 3'.0 | |
| 268°27'.4 | 07'.0 | 292°28'.9 | 10'.8 | 56'.4 | 3'.1 | |
| 283°27'.4 | 06'.6 | 306°58'.7 | 10'.8 | 53'.3 | 3'.2 | |
| 298°27'.3 | 06'.1 | 321°28'.5 | 10'.7 | 50'.1 | 3'.3 | |
| 313°27'.3 | 05'.7 | 335°58'.2 | 10'.8 | 46'.8 | 3'.4 | |
| 328°27'.2 | 05'.3 | 350°28'.0 | 10'.8 | 43'.4 | 3'.5 | 55'.1 |
| 343°27'.2 | 04'.8 | 4°57'.8 | 10'.7 | 39'.9 | 3'.6 | |
| 358°27'.1 | 21°04'.4 N | 19°27'.5 | 10'.8 | 20°36'.3 N | 3'.7 | 55'.1 |
| 13°27'.1 | 04'.0 | 33°57'.3 | 10'.8 | 32'.6 | 3'.9 | |
| 28°27'.0 | 03'.5 | 48°27'.1 | 10'.8 | 28'.7 | 3'.9 | |
| 43°27'.0 | 03'.1 | 62°56'.9 | 10'.8 | 24'.8 | 4'.0 | 55'.2 |
| 58°26'.9 | 02'.7 | 77°26'.7 | 10'.8 | 20'.8 | 4'.2 | |
| 73°26'.9 | 02'.2 | 91°56'.5 | 10'.8 | 16'.6 | 4'.2 | |
| 88°26'.8 | 01'.8 | 106°26'.3 | 10'.8 | 12'.4 | 4'.4 | |
| 103°26'.8 | 01'.3 | 120°56'.1 | 10'.8 | 08'.0 | 4'.4 | |
| 118°26'.7 | 00'.9 | 135°25'.9 | 10'.8 | 03'.6 | 4'.6 | |
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| 148°26'.6 | 00'.0 | 164°25'.5 | 10'.9 | 54'.4 | 4'.8 | |
| 163°26'.6 | 20°59'.6 N | 178°55'.4 | 10'.8 | 49'.6 | 4'.8 | |
| 178°26'.5 | 20°59'.1 N | 193°25'.2 | 10'.9 | 19°44'.8 N | 5'.0 | 55'.3 |
| 193°26'.5 | 58'.7 | 207°55'.1 | 10'.8 | 39'.8 | 5'.0 | |
| 208°26'.4 | 58'.3 | 222°24'.9 | 10'.9 | 34'.8 | 5'.2 | 55'.4 |
| 223°26'.4 | 57'.8 | 236°54'.8 | 10'.9 | 29'.6 | 5'.3 | |
| 238°26'.4 | 57'.4 | 251°24'.7 | 10'.9 | 24'.3 | 5'.3 | |
| 253°26'.3 | 56'.9 | 265°54'.6 | 10'.9 | 19'.0 | 5'.5 | |
| 268°26'.3 | 56'.5 | 280°24'.5 | 11'.0 | 13'.5 | 5'.6 | |
| 283°26'.2 | 56'.0 | 294°54'.5 | 10'.9 | 07'.9 | 5'.6 | 55'.5 |
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| 343°26'.0 | 54'.2 | 352°54'.3 | 11'.0 | 44'.7 | 6'.0 | |
| 358°26'.0 | 20°53'.8 N | 7°24'.3 | 11'.0 | 18°38'.7 N | 6'.2 | 55'.6 |
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| 28°25'.9 | 52'.9 | 36°24'.3 | 11'.1 | 26'.3 | 6'.4 | |
| 43°25'.9 | 52'.4 | 50°54'.4 | 11'.0 | 19'.9 | 6'.4 | |
| 58°25'.8 | 52'.0 | 65°24'.4 | 11'.1 | 13'.5 | 6'.6 | |
| 73°25'.8 | 51'.5 | 79°54'.5 | 11'.1 | 06'.9 | 6'.6 | 55'.7 |
| 88°25'.7 | 51'.1 | 94°24'.6 | 11'.1 | 00'.3 | 6'.7 | |
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| 133°25'.6 | 49'.7 | 137°54'.9 | 11'.2 | 39'.9 | 7'.0 | |
| 148°25'.6 | 49'.3 | 152°25'.1 | 11'.2 | 32'.9 | 7'.1 | 55'.8 |
| 163°25'.5 | 48'.8 | 166°55'.3 | 11'.2 | 25'.8 | 7'.2 | |
| 178°25'.5 | 20°48'.3 N | 181°25'.5 | 11'.2 | 17°18'.6 N | 7'.3 | 55'.8 |
| 193°25'.4 | 47'.9 | 195°55'.7 | 11'.2 | 11'.3 | 7'.4 | |
| 208°25'.4 | 47'.4 | 210°25'.9 | 11'.2 | 03'.9 | 7'.4 | |
| 223°25'.3 | 47'.0 | 224°56'.1 | 11'.3 | 16°56'.5 N | 7'.6 | 55'.9 |
| 238°25'.3 | 46'.5 | 239°26'.4 | 11'.3 | 48'.9 | 7'.6 | |
| 253°25'.3 | 46'.1 | 253°56'.7 | 11'.3 | 41'.3 | 7'.7 | |
| 268°25'.2 | 45'.6 | 268°27'.0 | 11'.3 | 33'.6 | 7'.8 | |
| 283°25'.2 | 45'.1 | 282°57'.3 | 11'.4 | 25'.8 | 7'.9 | |
| 298°25'.1 | 44'.7 | 297°27'.7 | 11'.3 | 17'.9 | 8'.0 | 56'.0 |
| 313°25'.1 | 44'.2 | 311°58'.0 | 11'.4 | 09'.9 | 8'.1 | |
| 328°25'.1 | 43'.8 | 326°28'.4 | 11'.4 | 01'.8 | 8'.2 | |
| 343°25'.0 | 43'.3 | 340°58'.8 | 11'.4 | 15°53'.6 N | 8'.2 | |
| 358°25'.0 | 20°42'.8 N | 355°29'.2 | 11'.5 | 15°45'.4 N | 8'.3 | 56'.1 |
| 13°25'.0 | 42'.4 | 9°59'.7 | 11'.4 | 37'.1 | 8'.4 | |
| 28°24'.9 | 41'.9 | 24°30'.1 | 11'.5 | 28'.7 | 8'.5 | |
| 43°24'.9 | 41'.4 | 39°00'.6 | 11'.5 | 20'.2 | 8'.6 | |
| 58°24'.8 | 41'.0 | 53°31'.1 | 11'.5 | 11'.6 | 8'.6 | |
| 73°24'.8 | 40'.5 | 68°01'.6 | 11'.6 | 03'.0 | 8'.8 | 56'.2 |
| 88°24'.8 | 40'.0 | 82°32'.2 | 11'.5 | 14°54'.2 N | 8'.8 | |
| 103°24'.7 | 39'.6 | 97°02'.7 | 11'.6 | 45'.4 | 8'.9 | |
| 118°24'.7 | 39'.1 | 111°33'.3 | 11'.6 | 36'.5 | 9'.0 | |
| 133°24'.6 | 38'.6 | 126°03'.9 | 11'.6 | 27'.5 | 9'.0 | |
| 148°24'.6 | 38'.2 | 140°34'.5 | 11'.7 | 18'.5 | 9'.1 | 56'.3 |
| 163°24'.6 | 37'.7 | 155°05'.2 | 11'.6 | 09'.4 | 9'.2 | |
| SD 15'.7 | d 0'.4 | SD | 15'.0 | 15'.1 | 15'.3 | |

| Lat | Twilight Nautical | Twilight Civil | Sunrise | Moonrise 17 | Moonrise 18 | Moonrise 19 |
|---|---|---|---|---|---|---|
| N 72° | - | - | - | - | - | 01:14 |
| N 70° | - | - | - | 23:50 | - | 02:12 |
| 68° | - | - | 00:37 | - | 01:02 | 02:45 |
| 66° | - | - | 01:50 | 00:18 | 01:39 | 03:10 |
| 64° | - | - | 02:25 | 00:51 | 02:05 | 03:29 |
| 62° | - | 01:12 | 02:51 | 01:15 | 02:25 | 03:44 |
| 60° | - | 01:56 | 03:10 | 01:34 | 02:41 | 03:57 |
| N 58° | - | 02:24 | 03:26 | 01:50 | 02:55 | 04:08 |
| 56° | 01:06 | 02:45 | 03:40 | 02:03 | 03:07 | 04:18 |
| 54° | 01:46 | 03:03 | 03:52 | 02:15 | 03:17 | 04:26 |
| 52° | 02:12 | 03:17 | 04:02 | 02:25 | 03:27 | 04:34 |
| 50° | 02:33 | 03:30 | 04:11 | 02:34 | 03:35 | 04:40 |
| 45° | 03:09 | 03:55 | 04:31 | 02:54 | 03:52 | 04:55 |
| N 40° | 03:35 | 04:15 | 04:46 | 03:09 | 04:06 | 05:07 |
| 35° | 03:56 | 04:31 | 05:00 | 03:23 | 04:19 | 05:17 |
| 30° | 04:12 | 04:44 | 05:11 | 03:34 | 04:29 | 05:26 |
| 20° | 04:38 | 05:06 | 05:30 | 03:54 | 04:47 | 05:41 |
| N 10° | 04:58 | 05:25 | 05:47 | 04:11 | 05:03 | 05:54 |
| 0° | 05:15 | 05:41 | 06:03 | 04:27 | 05:17 | 06:07 |
| S 10° | 05:30 | 05:56 | 06:18 | 04:43 | 05:32 | 06:19 |
| 20° | 05:44 | 06:11 | 06:34 | 05:01 | 05:48 | 06:33 |
| 30° | 05:58 | 06:27 | 06:53 | 05:20 | 06:06 | 06:48 |
| 35° | 06:05 | 06:36 | 07:04 | 05:32 | 06:16 | 06:56 |
| 40° | 06:13 | 06:47 | 07:16 | 05:45 | 06:28 | 07:06 |
| 45° | 06:22 | 06:58 | 07:31 | 06:01 | 06:42 | 07:18 |
| S 50° | 06:31 | 07:12 | 07:49 | 06:20 | 06:59 | 07:32 |
| 52° | 06:36 | 07:18 | 07:57 | 06:29 | 07:07 | 07:38 |
| 54° | 06:40 | 07:25 | 08:06 | 06:39 | 07:16 | 07:46 |
| 56° | 06:45 | 07:32 | 08:17 | 06:51 | 07:26 | 07:54 |
| 58° | 06:51 | 07:41 | 08:29 | 07:04 | 07:37 | 08:03 |
| S 60° | 06:56 | 07:50 | 08:43 | 07:19 | 07:50 | 08:13 |
| S 62° | 07:03 | 08:01 | 08:59 | 07:38 | 08:06 | 08:25 |

| Lat | Sunset | Twilight Civil | Twilight Nautical | Moonset 17 | Moonset 18 | Moonset 19 |
|---|---|---|---|---|---|---|
| N 72° | - | - | - | - | 22:48 | 22:02 |
| N 70° | - | - | - | 22:27 | 21:49 | 21:34 |
| 68° | 23:23 | - | - | 21:14 | 21:14 | 21:13 |
| 66° | 22:19 | - | - | 20:37 | 20:49 | 20:56 |
| 64° | 21:45 | - | - | 20:11 | 20:30 | 20:42 |
| 62° | 21:20 | 22:56 | - | 19:50 | 20:14 | 20:30 |
| 60° | 21:01 | 22:14 | - | 19:34 | 20:00 | 20:20 |
| N 58° | 20:45 | 21:47 | - | 19:19 | 19:49 | 20:12 |
| 56° | 20:31 | 21:26 | 23:02 | 19:07 | 19:39 | 20:04 |
| 54° | 20:20 | 21:08 | 22:24 | 18:57 | 19:30 | 19:57 |
| 52° | 20:10 | 20:54 | 21:58 | 18:47 | 19:22 | 19:51 |
| 50° | 20:00 | 20:42 | 21:39 | 18:39 | 19:14 | 19:45 |
| 45° | 19:41 | 20:17 | 21:02 | 18:21 | 18:59 | 19:33 |
| N 40° | 19:26 | 19:57 | 20:37 | 18:06 | 18:46 | 19:23 |
| 35° | 19:13 | 19:41 | 20:16 | 17:53 | 18:35 | 19:14 |
| 30° | 19:01 | 19:28 | 20:00 | 17:42 | 18:26 | 19:06 |
| 20° | 18:42 | 19:06 | 19:34 | 17:23 | 18:09 | 18:53 |
| N 10° | 18:25 | 18:48 | 19:14 | 17:07 | 17:55 | 18:41 |
| 0° | 18:10 | 18:32 | 18:58 | 16:52 | 17:41 | 18:30 |
| S 10° | 17:55 | 18:17 | 18:43 | 16:36 | 17:28 | 18:19 |
| 20° | 17:38 | 18:02 | 18:29 | 16:19 | 17:13 | 18:07 |
| 30° | 17:20 | 17:45 | 18:15 | 16:00 | 16:56 | 17:54 |
| 35° | 17:09 | 17:36 | 18:07 | 15:49 | 16:46 | 17:46 |
| 40° | 16:57 | 17:26 | 18:00 | 15:36 | 16:35 | 17:37 |
| 45° | 16:42 | 17:15 | 17:51 | 15:21 | 16:22 | 17:26 |
| S 50° | 16:24 | 17:01 | 17:42 | 15:02 | 16:05 | 17:13 |
| 52° | 16:16 | 16:55 | 17:37 | 14:53 | 15:58 | 17:07 |
| 54° | 16:07 | 16:48 | 17:33 | 14:43 | 15:49 | 17:00 |
| 56° | 15:56 | 16:41 | 17:28 | 14:32 | 15:40 | 16:53 |
| 58° | 15:44 | 16:32 | 17:23 | 14:19 | 15:29 | 16:44 |
| S 60° | 15:30 | 16:23 | 17:17 | 14:04 | 15:16 | 16:34 |
| S 62° | 15:14 | 16:12 | 17:10 | 13:46 | 15:01 | 16:23 |

| Day | SUN Eqn. of Time 00h | SUN Eqn. of Time 12h | SUN Mer. Pass. | MOON Mer. Pass. Upper | MOON Mer. Pass. Lower | MOON Age/ Vis |
|---|---|---|---|---|---|---|
| 17 | 6 09 | 6 11 | 12:06 | 10:39 | 23:04 | 28d 3% |
| 18 | 6 14 | 6 16 | 12:06 | 11:29 | 23:54 | 29d 1% |
| 19 | 6 18 | 6 20 | 12:06 | 12:19 | 24:43 | 0d 0% |

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# 2012 July 20, 21, 22 (Fri, Sat, Sun)

| GMT | ARIES | VENUS -4.5 | | MARS +1.0 | | JUPITER -2.1 | | SATURN +0.7 | |
|---|---|---|---|---|---|---|---|---|---|
| | GHA | GHA | Dec | GHA | Dec | GHA | Dec | GHA | Dec |
| 20 Friday 00 | 298°10'.8 | 223°22'.6 | 18°06'.3 N | 109°51'.3 | 3°30'.3 S | 231°42'.4 | 20°53'.7 N | 95°44'.1 | 6°44'.5 S |
| 01 | 313°13'.2 | 238°23'.4 | 06'.5 | 124°52'.5 | 30'.9 | 246°44'.4 | 53'.8 | 110°46'.4 | 44'.6 |
| 02 | 328°15'.7 | 253°24'.2 | 06'.7 | 139°53'.6 | 31'.5 | 261°46'.3 | 53'.9 | 125°48'.8 | 44'.6 |
| 03 | 343°18'.2 | 268°25'.0 | 06'.9 | 154°54'.8 | 32'.1 | 276°48'.3 | 54'.0 | 140°51'.2 | 44'.7 |
| 04 | 358°20'.6 | 283°25'.8 | 07'.1 | 169°56'.0 | 32'.6 | 291°50'.3 | 54'.0 | 155°53'.6 | 44'.7 |
| 05 | 13°23'.1 | 298°26'.6 | 07'.3 | 184°57'.2 | 33'.2 | 306°52'.2 | 54'.1 | 170°55'.9 | 44'.8 |
| 06 | 28°25'.6 | 313°27'.4 | 07'.5 | 199°58'.3 | 33'.8 | 321°54'.2 | 54'.2 | 185°58'.3 | 44'.8 |
| 07 | 43°28'.0 | 328°28'.1 | 07'.8 | 214°59'.5 | 34'.4 | 336°56'.1 | 54'.3 | 201°00'.7 | 44'.9 |
| 08 | 58°30'.5 | 343°28'.9 | 08'.0 | 230°00'.7 | 35'.0 | 351°58'.1 | 54'.3 | 216°03'.1 | 44'.9 |
| 09 | 73°33'.0 | 358°29'.7 | 08'.2 | 245°01'.8 | 35'.6 | 7°00'.1 | 54'.4 | 231°05'.4 | 45'.0 |
| 10 | 88°35'.4 | 13°30'.5 | 08'.4 | 260°03'.0 | 36'.2 | 22°02'.0 | 54'.5 | 246°07'.8 | 45'.0 |
| 11 | 103°37'.9 | 28°31'.3 | 08'.6 | 275°04'.2 | 36'.8 | 37°04'.0 | 54'.6 | 261°10'.2 | 45'.1 |
| 12 | 118°40'.3 | 43°32'.0 | 18°08'.8 N | 290°05'.3 | 3°37'.4 S | 52°06'.0 | 20°54'.6 N | 276°12'.5 | 6°45'.1 S |
| 13 | 133°42'.8 | 58°32'.8 | 09'.0 | 305°06'.5 | 38'.0 | 67°07'.9 | 54'.7 | 291°14'.9 | 45'.2 |
| 14 | 148°45'.3 | 73°33'.6 | 09'.3 | 320°07'.7 | 38'.6 | 82°09'.9 | 54'.8 | 306°17'.3 | 45'.2 |
| 15 | 163°47'.7 | 88°34'.4 | 09'.5 | 335°08'.8 | 39'.2 | 97°11'.9 | 54'.9 | 321°19'.7 | 45'.3 |
| 16 | 178°50'.2 | 103°35'.1 | 09'.7 | 350°10'.0 | 39'.8 | 112°13'.8 | 54'.9 | 336°22'.0 | 45'.3 |
| 17 | 193°52'.7 | 118°35'.9 | 09'.9 | 5°11'.2 | 40'.4 | 127°15'.8 | 55'.0 | 351°24'.4 | 45'.3 |
| 18 | 208°55'.1 | 133°36'.7 | 10'.1 | 20°12'.3 | 41'.0 | 142°17'.7 | 55'.1 | 6°26'.8 | 45'.4 |
| 19 | 223°57'.6 | 148°37'.4 | 10'.3 | 35°13'.5 | 41'.6 | 157°19'.7 | 55'.2 | 21°29'.2 | 45'.4 |
| 20 | 239°00'.1 | 163°38'.2 | 10'.6 | 50°14'.7 | 42'.2 | 172°21'.7 | 55'.2 | 36°31'.5 | 45'.5 |
| 21 | 254°02'.5 | 178°38'.9 | 10'.8 | 65°15'.8 | 42'.8 | 187°23'.6 | 55'.3 | 51°33'.9 | 45'.5 |
| 22 | 269°05'.0 | 193°39'.7 | 11'.0 | 80°17'.0 | 43'.4 | 202°25'.6 | 55'.4 | 66°36'.3 | 45'.6 |
| 23 | 284°07'.4 | 208°40'.4 | 11'.2 | 95°18'.2 | 44'.0 | 217°27'.6 | 55'.5 | 81°38'.6 | 45'.6 |
| 21 Saturday 00 | 299°09'.9 | 223°41'.2 | 18°11'.4 N | 110°19'.3 | 3°44'.6 S | 232°29'.5 | 20°55'.5 N | 96°41'.0 | 6°45'.7 S |
| 01 | 314°12'.4 | 238°41'.9 | 11'.6 | 125°20'.5 | 45'.2 | 247°31'.5 | 55'.6 | 111°43'.4 | 45'.7 |
| 02 | 329°14'.8 | 253°42'.7 | 11'.9 | 140°21'.6 | 45'.8 | 262°33'.5 | 55'.7 | 126°45'.8 | 45'.8 |
| 03 | 344°17'.3 | 268°43'.4 | 12'.1 | 155°22'.8 | 46'.4 | 277°35'.4 | 55'.8 | 141°48'.1 | 45'.8 |
| 04 | 359°19'.8 | 283°44'.2 | 12'.3 | 170°24'.0 | 47'.0 | 292°37'.4 | 55'.8 | 156°50'.5 | 45'.9 |
| 05 | 14°22'.2 | 298°44'.9 | 12'.5 | 185°25'.1 | 47'.6 | 307°39'.4 | 55'.9 | 171°52'.9 | 45'.9 |
| 06 | 29°24'.7 | 313°45'.7 | 12'.7 | 200°26'.3 | 48'.2 | 322°41'.3 | 56'.0 | 186°55'.2 | 46'.0 |
| 07 | 44°27'.2 | 328°46'.4 | 13'.0 | 215°27'.5 | 48'.8 | 337°43'.3 | 56'.0 | 201°57'.6 | 46'.0 |
| 08 | 59°29'.6 | 343°47'.1 | 13'.2 | 230°28'.6 | 49'.4 | 352°45'.3 | 56'.1 | 217°00'.0 | 46'.1 |
| 09 | 74°32'.1 | 358°47'.9 | 13'.4 | 245°29'.8 | 50'.0 | 7°47'.2 | 56'.2 | 232°02'.3 | 46'.1 |
| 10 | 89°34'.6 | 13°48'.6 | 13'.6 | 260°31'.0 | 50'.6 | 22°49'.2 | 56'.3 | 247°04'.7 | 46'.2 |
| 11 | 104°37'.0 | 28°49'.3 | 13'.8 | 275°32'.1 | 51'.2 | 37°51'.2 | 56'.3 | 262°07'.1 | 46'.2 |
| 12 | 119°39'.5 | 43°50'.1 | 18°14'.1 N | 290°33'.3 | 3°51'.8 S | 52°53'.1 | 20°56'.4 N | 277°09'.4 | 6°46'.3 S |
| 13 | 134°41'.9 | 58°50'.8 | 14'.3 | 305°34'.4 | 52'.4 | 67°55'.1 | 56'.5 | 292°11'.8 | 46'.3 |
| 14 | 149°44'.4 | 73°51'.5 | 14'.5 | 320°35'.6 | 53'.0 | 82°57'.1 | 56'.6 | 307°14'.2 | 46'.4 |
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| 16 | 179°49'.3 | 103°52'.9 | 14'.9 | 350°37'.9 | 54'.2 | 113°01'.0 | 56'.7 | 337°18'.9 | 46'.5 |
| 17 | 194°51'.8 | 118°53'.7 | 15'.2 | 5°39'.1 | 54'.8 | 128°03'.0 | 56'.8 | 352°21'.3 | 46'.5 |
| 18 | 209°54'.3 | 133°54'.4 | 15'.4 | 20°40'.2 | 55'.4 | 143°04'.9 | 56'.8 | 7°23'.7 | 46'.6 |
| 19 | 224°56'.7 | 148°55'.1 | 15'.6 | 35°41'.4 | 56'.0 | 158°06'.9 | 56'.9 | 22°26'.0 | 46'.6 |
| 20 | 239°59'.2 | 163°55'.8 | 15'.8 | 50°42'.6 | 56'.6 | 173°08'.9 | 57'.0 | 37°28'.4 | 46'.7 |
| 21 | 255°01'.7 | 178°56'.5 | 16'.0 | 65°43'.7 | 57'.2 | 188°10'.9 | 57'.1 | 52°30'.8 | 46'.7 |
| 22 | 270°04'.1 | 193°57'.2 | 16'.3 | 80°44'.9 | 57'.8 | 203°12'.8 | 57'.1 | 67°33'.1 | 46'.8 |
| 23 | 285°06'.6 | 208°57'.9 | 16'.5 | 95°46'.0 | 58'.4 | 218°14'.8 | 57'.2 | 82°35'.5 | 46'.8 |
| 22 Sunday 00 | 300°09'.1 | 223°58'.6 | 18°16'.7 N | 110°47'.2 | 3°59'.0 S | 233°16'.8 | 20°57'.3 N | 97°37'.9 | 6°46'.9 S |
| 01 | 315°11'.5 | 238°59'.3 | 16'.9 | 125°48'.3 | 59'.6 | 248°18'.7 | 57'.4 | 112°40'.2 | 46'.9 |
| 02 | 330°14'.0 | 254°00'.0 | 17'.2 | 140°49'.5 | 4°00'.2 S | 263°20'.7 | 57'.4 | 127°42'.6 | 47'.0 |
| 03 | 345°16'.4 | 269°00'.7 | 17'.4 | 155°50'.7 | 00'.8 | 278°22'.7 | 57'.5 | 142°45'.0 | 47'.0 |
| 04 | 0°18'.9 | 284°01'.4 | 17'.6 | 170°51'.8 | 01'.4 | 293°24'.6 | 57'.6 | 157°47'.3 | 47'.0 |
| 05 | 15°21'.4 | 299°02'.1 | 17'.8 | 185°53'.0 | 02'.0 | 308°26'.6 | 57'.6 | 172°49'.7 | 47'.1 |
| 06 | 30°23'.8 | 314°02'.8 | 18'.1 | 200°54'.1 | 02'.6 | 323°28'.6 | 57'.7 | 187°52'.1 | 47'.1 |
| 07 | 45°26'.3 | 329°03'.5 | 18'.3 | 215°55'.3 | 03'.2 | 338°30'.6 | 57'.8 | 202°54'.4 | 47'.2 |
| 08 | 60°28'.8 | 344°04'.2 | 18'.5 | 230°56'.4 | 03'.8 | 353°32'.5 | 57'.9 | 217°56'.8 | 47'.2 |
| 09 | 75°31'.2 | 359°04'.9 | 18'.7 | 245°57'.6 | 04'.4 | 8°34'.5 | 57'.9 | 232°59'.2 | 47'.3 |
| 10 | 90°33'.7 | 14°05'.6 | 18'.9 | 260°58'.8 | 05'.0 | 23°36'.5 | 58'.0 | 248°01'.5 | 47'.3 |
| 11 | 105°36'.2 | 29°06'.3 | 19'.2 | 275°59'.9 | 05'.6 | 38°38'.4 | 58'.1 | 263°03'.9 | 47'.4 |
| 12 | 120°38'.6 | 44°06'.9 | 18°19'.4 N | 291°01'.1 | 4°06'.2 S | 53°40'.4 | 20°58'.1 N | 278°06'.3 | 6°47'.4 S |
| 13 | 135°41'.1 | 59°07'.6 | 19'.6 | 306°02'.2 | 06'.8 | 68°42'.4 | 58'.2 | 293°08'.6 | 47'.5 |
| 14 | 150°43'.5 | 74°08'.3 | 19'.8 | 321°03'.4 | 07'.4 | 83°44'.3 | 58'.3 | 308°11'.0 | 47'.5 |
| 15 | 165°46'.0 | 89°09'.0 | 20'.1 | 336°04'.5 | 08'.0 | 98°46'.3 | 58'.4 | 323°13'.4 | 47'.6 |
| 16 | 180°48'.5 | 104°09'.7 | 20'.3 | 351°05'.7 | 08'.6 | 113°48'.3 | 58'.4 | 338°15'.7 | 47'.6 |
| 17 | 195°50'.9 | 119°10'.3 | 20'.5 | 6°06'.8 | 09'.2 | 128°50'.3 | 58'.5 | 353°18'.1 | 47'.7 |
| 18 | 210°53'.4 | 134°11'.0 | 20'.7 | 21°08'.0 | 09'.8 | 143°52'.2 | 58'.6 | 8°20'.5 | 47'.7 |
| 19 | 225°55'.9 | 149°11'.7 | 21'.0 | 36°09'.1 | 10'.4 | 158°54'.2 | 58'.6 | 23°22'.8 | 47'.8 |
| 20 | 240°58'.3 | 164°12'.3 | 21'.2 | 51°10'.3 | 11'.0 | 173°56'.2 | 58'.7 | 38°25'.2 | 47'.8 |
| 21 | 256°00'.8 | 179°13'.0 | 21'.4 | 66°11'.4 | 11'.6 | 188°58'.2 | 58'.8 | 53°27'.5 | 47'.9 |
| 22 | 271°03'.3 | 194°13'.7 | 21'.6 | 81°12'.6 | 12'.2 | 204°00'.1 | 58'.9 | 68°29'.9 | 47'.9 |
| 23 | 286°05'.7 | 209°14'.3 | 21'.9 | 96°13'.8 | 12'.8 | 219°02'.1 | 58'.9 | 83°32'.3 | 48'.0 |
| | M.P. 03:59 | v 0'.7 | d 0'.2 | v 1'.2 | d 0'.6 | v 2'.0 | d 0'.1 | v 2'.4 | d 0'.0 |

| STARS | | |
|---|---|---|
| Name | SHA | Dec |
| Acamar | 315°18'.9 | 40°15'.0 S |
| Achernar | 335°27'.2 | 57°10'.0 S |
| Acrux | 173°10'.3 | 63°10'.5 S |
| Adhara | 255°13'.4 | 28°59'.4 S |
| Aldebaran | 290°50'.3 | 16°32'.0 N |
| Alioth | 166°21'.4 | 55°53'.7 N |
| Alkaid | 152°59'.4 | 49°15'.3 N |
| Alnair | 27°44'.1 | 46°53'.7 S |
| Alnilam | 275°47'.3 | 1°11'.7 S |
| Alphard | 217°57'.0 | 8°42'.9 S |
| Alphecca | 126°11'.4 | 26°40'.6 N |
| Alpheratz | 357°44'.0 | 29°09'.6 N |
| Altair | 62°08'.5 | 8°54'.3 N |
| Ankaa | 353°16'.1 | 42°13'.9 S |
| Antares | 112°26'.8 | 26°27'.6 S |
| Arcturus | 145°56'.2 | 19°07'.2 N |
| Atria | 107°28'.7 | 69°03'.1 S |
| Avior | 234°18'.9 | 59°33'.1 S |
| Bellatrix | 278°32'.9 | 6°21'.6 N |
| Betelgeuse | 271°02'.2 | 7°24'.5 N |
| Canopus | 263°56'.9 | 52°42'.1 S |
| Capella | 280°35'.7 | 46°00'.4 N |
| Deneb | 49°31'.4 | 45°19'.7 N |
| Denebola | 182°34'.4 | 14°30'.1 N |
| Diphda | 348°56'.4 | 17°54'.8 S |
| Dubhe | 193°52'.9 | 61°41'.1 N |
| Elnath | 278°13'.7 | 28°36'.9 N |
| Eltanin | 90°45'.9 | 51°29'.5 N |
| Enif | 33°47'.4 | 9°56'.2 N |
| Fomalhaut | 15°24'.4 | 29°33'.0 S |
| Gacrux | 172°01'.8 | 57°11'.3 S |
| Gienah | 175°53'.1 | 17°36'.8 S |
| Hadar | 148°48'.7 | 60°26'.3 S |
| Hamal | 328°01'.5 | 23°31'.3 N |
| Kaus Aust. | 83°44'.2 | 34°22'.6 S |
| Kochab | 137°19'.7 | 74°06'.5 N |
| Markab | 13°38'.7 | 15°16'.5 N |
| Menkar | 314°15'.8 | 4°08'.4 N |
| Menkent | 148°08'.2 | 36°26'.1 S |
| Miaplacidus | 221°40'.7 | 69°46'.4 S |
| Mirfak | 308°41'.4 | 49°54'.1 N |
| Nunki | 75°58'.7 | 26°16'.7 S |
| Peacock | 53°19'.6 | 56°41'.4 S |
| Polaris | 318°11'.0 | 89°18'.8 N |
| Pollux | 243°28'.8 | 27°59'.6 N |
| Procyon | 245°00'.7 | 5°11'.5 N |
| Rasalhague | 96°06'.7 | 12°33'.3 N |
| Regulus | 207°44'.4 | 11°54'.3 N |
| Rigel | 281°12'.9 | 8°11'.2 S |
| Rigil Kent | 139°52'.3 | 60°53'.4 S |
| Sabik | 102°13'.0 | 15°44'.3 S |
| Schedar | 349°41'.0 | 56°36'.2 N |
| Shaula | 96°22'.4 | 37°06'.7 S |
| Sirius | 258°34'.6 | 16°44'.1 S |
| Spica | 158°31'.9 | 11°13'.7 S |
| Suhail | 222°53'.3 | 43°29'.2 S |
| Vega | 80°39'.0 | 38°48'.0 N |
| Zuben'ubi | 137°06'.0 | 16°05'.7 S |

| | SHA | Mer.Pass. |
|---|---|---|
| Venus | 284°31'.3 | 09:05 |
| Mars | 171°09'.4 | 16:37 |
| Jupiter | 293°19'.6 | 08:29 |
| Saturn | 157°31'.1 | 17:30 |

| SUN | | | | MOON | | | | |
|---|---|---|---|---|---|---|---|---|
| GHA | Dec | GHA | v | Dec | d | HP |
| 178°24'.5 | 20°37'.2 N | 169°35'.8 | 11'.7 | 14°00'.2 N | 9'.3 | 56'.3 |
| 193°24'.5 | 36'.7 | 184°06'.5 | 11'.7 | 13°50'.9 N | 9'.4 | |
| 208°24'.5 | 36'.3 | 198°37'.2 | 11'.7 | 41'.5 | 9'.4 | |
| 223°24'.4 | 35'.8 | 213°07'.9 | 11'.8 | 32'.1 | 9'.5 | 56'.4 |
| 238°24'.4 | 35'.3 | 227°38'.7 | 11'.7 | 22'.6 | 9'.5 | |
| 253°24'.4 | 34'.8 | 242°09'.4 | 11'.8 | 13'.1 | 9'.7 | |
| 268°24'.3 | 34'.4 | 256°40'.2 | 11'.8 | 03'.4 | 9'.7 | |
| 283°24'.3 | 33'.9 | 271°11'.0 | 11'.8 | 12°53'.7 N | 9'.8 | 56'.5 |
| 298°24'.3 | 33'.4 | 285°41'.8 | 11'.8 | 43'.9 | 9'.8 | |
| 313°24'.2 | 32'.9 | 300°12'.6 | 11'.8 | 34'.1 | 10'.0 | |
| 328°24'.2 | 32'.5 | 314°43'.4 | 11'.9 | 24'.1 | 9'.9 | |
| 343°24'.2 | 32'.0 | 329°14'.3 | 11'.9 | 14'.2 | 10'.1 | |
| 358°24'.1 | 20°31'.5 N | 343°45'.2 | 11'.9 | 12°04'.1 N | 10'.1 | 56'.6 |
| 13°24'.1 | 31'.0 | 358°16'.1 | 11'.9 | 11°54'.0 N | 10'.2 | |
| 28°24'.1 | 30'.6 | 12°47'.0 | 11'.9 | 43'.8 | 10'.3 | |
| 43°24'.0 | 30'.1 | 27°17'.9 | 12'.0 | 33'.5 | 10'.3 | |
| 58°24'.0 | 29'.6 | 41°48'.9 | 11'.9 | 23'.2 | 10'.4 | |
| 73°24'.0 | 29'.1 | 56°19'.8 | 12'.0 | 12'.8 | 10'.4 | 56'.7 |
| 88°23'.9 | 28'.6 | 70°50'.8 | 12'.0 | 02'.4 | 10'.5 | |
| 103°23'.9 | 28'.1 | 85°21'.8 | 12'.0 | 10°51'.9 N | 10'.6 | |
| 118°23'.9 | 27'.7 | 99°52'.8 | 12'.0 | 41'.3 | 10'.6 | |
| 133°23'.8 | 27'.2 | 114°23'.8 | 12'.1 | 30'.7 | 10'.7 | |
| 148°23'.8 | 26'.7 | 128°54'.9 | 12'.0 | 20'.0 | 10'.7 | 56'.8 |
| 163°23'.8 | 26'.2 | 143°25'.9 | 12'.1 | 09'.3 | 10'.8 | |
| 178°23'.8 | 20°25'.7 N | 157°57'.0 | 12'.1 | 9°58'.5 N | 10'.8 | 56'.8 |
| 193°23'.7 | 25'.2 | 172°28'.1 | 12'.1 | 47'.7 | 10'.9 | |
| 208°23'.7 | 24'.8 | 186°59'.2 | 12'.1 | 36'.8 | 11'.0 | 56'.9 |
| 223°23'.7 | 24'.3 | 201°30'.3 | 12'.1 | 25'.8 | 11'.0 | |
| 238°23'.6 | 23'.8 | 216°01'.4 | 12'.1 | 14'.8 | 11'.1 | |
| 253°23'.6 | 23'.3 | 230°32'.5 | 12'.1 | 03'.7 | 11'.1 | |
| 268°23'.6 | 22'.8 | 245°03'.6 | 12'.2 | 8°52'.6 N | 11'.2 | |
| 283°23'.5 | 22'.3 | 259°34'.8 | 12'.2 | 41'.4 | 11'.2 | 57'.0 |
| 298°23'.5 | 21'.8 | 274°06'.0 | 12'.1 | 30'.2 | 11'.3 | |
| 313°23'.5 | 21'.3 | 288°37'.1 | 12'.2 | 18'.9 | 11'.3 | |
| 328°23'.5 | 20'.8 | 303°08'.3 | 12'.2 | 07'.6 | 11'.3 | |
| 343°23'.4 | 20'.3 | 317°39'.5 | 12'.2 | 7°56'.3 N | 11'.4 | |
| 358°23'.4 | 20°19'.9 N | 332°10'.7 | 12'.2 | 7°44'.9 N | 11'.5 | 57'.1 |
| 13°23'.4 | 19'.4 | 346°41'.9 | 12'.2 | 33'.4 | 11'.5 | |
| 28°23'.4 | 18'.9 | 1°13'.1 | 12'.2 | 21'.9 | 11'.5 | |
| 43°23'.3 | 18'.4 | 15°44'.3 | 12'.2 | 10'.4 | 11'.6 | |
| 58°23'.3 | 17'.9 | 30°15'.5 | 12'.2 | 6°58'.8 N | 11'.6 | |
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| 88°23'.3 | 16'.9 | 59°18'.0 | 12'.2 | 35'.5 | 11'.7 | |
| 103°23'.2 | 16'.4 | 73°49'.2 | 12'.2 | 23'.8 | 11'.7 | |
| 118°23'.2 | 15'.9 | 88°20'.4 | 12'.3 | 12'.1 | 11'.8 | |
| 133°23'.2 | 15'.4 | 102°51'.7 | 12'.2 | 00'.3 | 11'.8 | |
| 148°23'.2 | 14'.9 | 117°22'.9 | 12'.3 | 5°48'.5 N | 11'.9 | 57'.3 |
| 163°23'.1 | 14'.4 | 131°54'.2 | 12'.2 | 36'.6 | 11'.9 | |
| 178°23'.1 | 20°13'.9 N | 146°25'.4 | 12'.2 | 5°24'.7 N | 11'.9 | 57'.3 |
| 193°23'.1 | 13'.4 | 160°56'.6 | 12'.3 | 12'.8 | 12'.0 | |
| 208°23'.1 | 12'.9 | 175°27'.9 | 12'.2 | 00'.8 | 12'.0 | 57'.4 |
| 223°23'.0 | 12'.4 | 189°59'.1 | 12'.3 | 4°48'.8 N | 12'.0 | |
| 238°23'.0 | 11'.9 | 204°30'.4 | 12'.2 | 36'.8 | 12'.0 | |
| 253°23'.0 | 11'.4 | 219°01'.6 | 12'.2 | 24'.8 | 12'.1 | |
| 268°23'.0 | 10'.9 | 233°32'.8 | 12'.3 | 12'.7 | 12'.1 | |
| 283°22'.9 | 10'.4 | 248°04'.1 | 12'.2 | 00'.6 | 12'.1 | 57'.5 |
| 298°22'.9 | 09'.9 | 262°35'.3 | 12'.2 | 3°48'.5 N | 12'.2 | |
| 313°22'.9 | 09'.4 | 277°06'.5 | 12'.2 | 36'.3 | 12'.2 | |
| 328°22'.9 | 08'.9 | 291°37'.7 | 12'.3 | 24'.1 | 12'.2 | |
| 343°22'.9 | 08'.4 | 306°09'.0 | 12'.2 | 11'.9 | 12'.2 | |
| 358°22'.8 | 20°07'.9 N | 320°40'.2 | 12'.2 | 2°59'.7 N | 12'.3 | 57'.6 |
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| 28°22'.8 | 06'.8 | 349°42'.5 | 12'.2 | 35'.1 | 12'.3 | |
| 43°22'.8 | 06'.3 | 4°13'.7 | 12'.2 | 22'.8 | 12'.3 | |
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| 73°22'.7 | 05'.3 | 33°16'.1 | 12'.1 | 1°58'.2 N | 12'.4 | 57'.7 |
| 88°22'.7 | 04'.8 | 47°47'.2 | 12'.1 | 45'.8 | 12'.3 | |
| 103°22'.7 | 04'.3 | 62°18'.3 | 12'.2 | 33'.5 | 12'.4 | |
| 118°22'.7 | 03'.8 | 76°49'.5 | 12'.1 | 21'.1 | 12'.4 | |
| 133°22'.7 | 03'.3 | 91°20'.6 | 12'.1 | 08'.7 | 12'.4 | |
| 148°22'.6 | 02'.8 | 105°51'.7 | 12'.0 | 0°56'.3 N | 12'.4 | |
| 163°22'.6 | 02'.2 | 120°22'.7 | 12'.1 | 43'.9 | 12'.5 | 57'.8 |
| SD 15'.7 | d 0'.5 | SD | 15'.4 | 15'.5 | 15'.7 | |

| Lat | Twilight Nautical | Twilight Civil | Sunrise | Moonrise 20 | Moonrise 21 | Moonrise 22 |
|---|---|---|---|---|---|---|
| N 72° | - | - | - | 03:42 | 05:46 | 07:43 |
| N 70° | - | - | - | 04:09 | 06:00 | 07:48 |
| 68° | - | - | 01:09 | 04:29 | 06:11 | 07:53 |
| 66° | - | - | 02:03 | 04:44 | 06:20 | 07:56 |
| 64° | - | - | 02:35 | 04:57 | 06:28 | 07:59 |
| 62° | - | 01:28 | 02:58 | 05:08 | 06:35 | 08:02 |
| 60° | - | 02:06 | 03:17 | 05:17 | 06:40 | 08:04 |
| N 58° | - | 02:32 | 03:32 | 05:25 | 06:45 | 08:07 |
| 56° | 01:20 | 02:52 | 03:45 | 05:32 | 06:50 | 08:08 |
| 54° | 01:55 | 03:08 | 03:56 | 05:39 | 06:54 | 08:10 |
| 52° | 02:19 | 03:22 | 04:06 | 05:44 | 06:57 | 08:12 |
| 50° | 02:38 | 03:34 | 04:15 | 05:49 | 07:01 | 08:13 |
| 45° | 03:13 | 03:59 | 04:34 | 06:00 | 07:08 | 08:16 |
| N 40° | 03:38 | 04:18 | 04:49 | 06:09 | 07:13 | 08:18 |
| 35° | 03:58 | 04:33 | 05:02 | 06:17 | 07:18 | 08:20 |
| 30° | 04:14 | 04:46 | 05:13 | 06:24 | 07:23 | 08:22 |
| 20° | 04:39 | 05:08 | 05:32 | 06:36 | 07:31 | 08:26 |
| N 10° | 04:59 | 05:25 | 05:48 | 06:46 | 07:37 | 08:28 |
| 0° | 05:15 | 05:41 | 06:03 | 06:56 | 07:44 | 08:31 |
| S 10° | 05:30 | 05:55 | 06:18 | 07:05 | 07:50 | 08:34 |
| 20° | 05:43 | 06:10 | 06:34 | 07:15 | 07:57 | 08:37 |
| 30° | 05:57 | 06:26 | 06:52 | 07:27 | 08:04 | 08:40 |
| 35° | 06:04 | 06:35 | 07:02 | 07:34 | 08:08 | 08:42 |
| 40° | 06:12 | 06:45 | 07:14 | 07:41 | 08:13 | 08:44 |
| 45° | 06:20 | 06:56 | 07:28 | 07:50 | 08:19 | 08:47 |
| S 50° | 06:29 | 07:09 | 07:45 | 08:00 | 08:26 | 08:49 |
| 52° | 06:33 | 07:15 | 07:53 | 08:05 | 08:29 | 08:51 |
| 54° | 06:37 | 07:21 | 08:02 | 08:11 | 08:32 | 08:52 |
| 56° | 06:42 | 07:29 | 08:12 | 08:17 | 08:36 | 08:54 |
| 58° | 06:47 | 07:37 | 08:24 | 08:23 | 08:40 | 08:56 |
| S 60° | 06:52 | 07:46 | 08:37 | 08:31 | 08:45 | 08:58 |
| S 62° | 06:59 | 07:56 | 08:53 | 08:39 | 08:50 | 09:00 |

| Lat | Sunset | Twilight Civil | Twilight Nautical | Moonset 20 | Moonset 21 | Moonset 22 |
|---|---|---|---|---|---|---|
| N 72° | - | - | - | 21:39 | 21:22 | 21:07 |
| N 70° | - | - | - | 21:23 | 21:14 | 21:06 |
| 68° | 22:57 | - | - | 21:10 | 21:07 | 21:05 |
| 66° | 22:07 | - | - | 21:00 | 21:02 | 21:04 |
| 64° | 21:36 | - | - | 20:51 | 20:57 | 21:03 |
| 62° | 21:13 | 22:41 | - | 20:43 | 20:53 | 21:02 |
| 60° | 20:55 | 22:05 | - | 20:36 | 20:49 | 21:02 |
| N 58° | 20:40 | 21:39 | - | 20:30 | 20:46 | 21:01 |
| 56° | 20:27 | 21:20 | 22:49 | 20:25 | 20:43 | 21:00 |
| 54° | 20:16 | 21:03 | 22:15 | 20:20 | 20:41 | 21:00 |
| 52° | 20:06 | 20:50 | 21:52 | 20:16 | 20:38 | 21:00 |
| 50° | 19:57 | 20:38 | 21:33 | 20:12 | 20:36 | 20:59 |
| 45° | 19:39 | 20:14 | 20:59 | 20:03 | 20:31 | 20:58 |
| N 40° | 19:24 | 19:55 | 20:34 | 19:56 | 20:27 | 20:58 |
| 35° | 19:11 | 19:39 | 20:14 | 19:50 | 20:24 | 20:57 |
| 30° | 19:00 | 19:26 | 19:58 | 19:45 | 20:21 | 20:57 |
| 20° | 18:41 | 19:05 | 19:33 | 19:35 | 20:16 | 20:56 |
| N 10° | 18:25 | 18:48 | 19:14 | 19:27 | 20:11 | 20:55 |
| 0° | 18:10 | 18:32 | 18:58 | 19:19 | 20:06 | 20:54 |
| S 10° | 17:55 | 18:17 | 18:43 | 19:11 | 20:02 | 20:53 |
| 20° | 17:39 | 18:03 | 18:30 | 19:02 | 19:57 | 20:52 |
| 30° | 17:21 | 17:47 | 18:16 | 18:52 | 19:51 | 20:51 |
| 35° | 17:11 | 17:38 | 18:09 | 18:46 | 19:48 | 20:50 |
| 40° | 16:59 | 17:29 | 18:02 | 18:40 | 19:44 | 20:50 |
| 45° | 16:45 | 17:17 | 17:54 | 18:32 | 19:40 | 20:49 |
| S 50° | 16:28 | 17:04 | 17:45 | 18:23 | 19:35 | 20:48 |
| 52° | 16:20 | 16:58 | 17:40 | 18:19 | 19:32 | 20:47 |
| 54° | 16:11 | 16:52 | 17:36 | 18:14 | 19:30 | 20:47 |
| 56° | 16:01 | 16:45 | 17:32 | 18:09 | 19:27 | 20:46 |
| 58° | 15:49 | 16:37 | 17:27 | 18:03 | 19:24 | 20:46 |
| S 60° | 15:36 | 16:28 | 17:21 | 17:56 | 19:20 | 20:45 |
| S 62° | 15:20 | 16:17 | 17:15 | 17:49 | 19:16 | 20:44 |

| Day | SUN Eqn. of Time 00h | SUN Eqn. of Time 12h | SUN Mer. Pass. | MOON Mer. Pass. Upper | MOON Mer. Pass. Lower | MOON Age/ Vis |
|---|---|---|---|---|---|---|
| 20 | 6 22 | 6 23 | 12:06 | 13:07 | 00:43 | 1d 2% |
| 21 | 6 25 | 6 26 | 12:06 | 13:55 | 01:31 | 2d 6% |
| 22 | 6 28 | 6 29 | 12:06 | 14:43 | 02:19 | 3d 12% |

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