

ASTRONOMICAL CALENDAR, HIGHLIGHTS & CHALLENGES

**2012 SKIES
FOR
TRI CITIES, WASHINGTON**

**W119.280°, N46.280°
W 119° 16' 48", N 46° 16' 48"
(Richland, WA)**

Tom Page

Tri Cities Astronomy Club
<http://www.tricityastronomyclub.org/>

Number 24

January 2012

JANUARY

- Full (Wolf) Moon Mon 8th 23:30
- ▶ Last Quarter Mon 16th 01:08
- New Moon Tue 22nd 23:39
- ◀ First Quarter Mon 30th 20:10

-
- Mercury:** Low in the morning twilight, becomes difficult after mid-month.
- Venus:** In the SW in evening twilight, sets near 8 pm in the W.
- Mars:** Rises in the E after 10 PM and is high in the SW at dawn.
- Jupiter:** High in the SE after dark, transits high in the S near 6 PM and sets in the NW near midnight.
- Saturn:** Rises in the E after 1 AM and sets in the S at sunrise. The N side of the rings are visible in 2012, their tilt relative to the Earth will be $14^\circ \pm 1.5^\circ$ until Oct when they will begin to open to 19° by the end of the year.
- Uranus:** In the western evening sky in Pisces and sets in late evening. On the 28th, Uranus crosses over to the N side celestial equator and will remain there until 2052. From 1969 to 2011 Uranus was S of the celestial equator.
- Neptune:** Low in the early evening western sky.
-

5 Thu Earth at perihelion, 147,097,334 Kilometer (91,404,046 Miles) from the Sun. Latest sunrise 07:40 PST in the Tri Cities.

The end of the dark days of Winter.

22 Sun **(Extreme) Challenge No. 1.** See Old Crescent Moon 15hr before new in the eastern sky. Moonrise at 06:51. Sunrise at 07:31.

23 Mon **(Extreme) Challenge No. 2.** See Young Crescent Moon 18 hr after new in the western sky. Sunset at 16:48, Moonset at 17:47.

(Extreme) Challenge No. 3. See both events.

There is no dishonor in failure. 😊

27 Fri Apollo astronauts White, Grissom, and Chaffe die in cockpit fire on launch pad during test.

FEBRUARY

- Full (Snow) Moon Tue 7th 13:54
- ▶ Last Quarter Tue 14th 09:04
- New Moon Tue 21st 14:35
- ◀ First Quarter Wed 29th 17:21

Mercury: In superior conjunction on the 7th and difficult to see until the last 10 days of the month.

Venus: In western evening sky and well situated for us. The waxing crescent Moon passes 3° N of Venus on the 25th.

Mars: Is approaching opposition on Mar 3rd and is rising in mid-evening. It transits high in the S at 3 AM. At aphelion on the 15th.

Jupiter: High in SW after dark, sets in the NW near midnight. On the 26th, a waxing crescent Moon passes 4° N of Jupiter.

Saturn: Rises in the E after 11 PM and sets in the S at dawn.

Uranus: Low in the western evening sky, setting in mid-evening. The angle of the ecliptic favors northern hemisphere observers.

Neptune: Not visible.

2 Thu Candelmas. Celebrates the 40th day of Christmas and the presentation of the child Jesus. Now Groundhog Day. First quarter-cross days, half way between the winter solstice and spring equinox. Mid-winter in our calendar, the start of Spring in others.

2 Thu/ On Thursday Comet Garradd passes 0.6° S globular cluster and on Friday
3 Fri passes 0.5°W of M92. Forecasted to be near 6th mag in brightness.

Challenge No. 4. See Comet Garadd near M92.

20 Mon John Glenn piloted first US manned orbital spacecraft, Friendship 7, 50 years ago. Glenn was born in Cambridge Ohio in 1921.

29 Wed Leap Day. Having added a day, 2012 is 366 days long.

MARCH

- Full (Worm) Moon Thu 8th 01:39
- ▶ Last Quarter Wed 14th 18:25
- New Moon Thu 22nd 07:37
- ◀ First Quarter Fri 30th 12:41

-
- Mercury:** Easily observed in evening twilight; but dims rapidly in the 2nd week reaching inferior conjunction on the 21st. On the 5th it is at greatest elongation E (18°), best evening view in 2012.
- Venus:** In western sky and lies 3° N of Jupiter from the 11th to the 15th. The waxing crescent Moon passes 1.8° S of the planet on the 26th and Venus reaches greatest elongation E (46°) on the 27th.
- Mars:** At opposition on the 3rd, with an apparent disk diameter 13.9", magnitude -1.2 and is 5.6 light minutes from Earth; its most distant opposition in the 30 yr period from 1996 to 2026. The northern Martian hemisphere summer solstice is on March 30th.
- Jupiter:** In the western evening sky setting in mid-evening.
- Saturn:** Rises in the E after 10 PM and transits about 3 AM in the S.
- Uranus:** Not visible.
- Neptune:** Reappears in the morning sky late in the month, favoring southern hemisphere observers.
-

- 5 Mon** **Challenge No. 5.** See Mercury at greatest elongation east (18°). Mercury sets at 19:29 on azimuth 276°.
- 11 Sun** **Daylight Savings Time** (though no time is saved) begins on the second Sunday in March. Spring your clocks ahead one hour. Officially, no clock hour 2 AM to 3AM. From now on to the first Sunday in November it is as if you were displaced one time zone to the east.
- 15 Thu** **Ides of March.** The buzzards (turkey vultures) return to Hinckley, OH. The resulting celebration has been going on for over 50 years.
- 19 Mon** **Spring (Vernal) Equinox** Spring arrives in Tri Cities at 22:15 (10:15 PM) PDT when the Sun crosses the equator into the northern hemisphere. Sun rises due E, sets due W. Marks mid-spring in some alternative calendars. Until 2007 the vernal equinox fell on the 20th or 21st Universal Time (7 hours earlier than PDT). It will now be on the 20th until the year 2044. After which it may occur on the 19th or 20th.
- 25 Sun** Moon 2.7°N of Jupiter in evening twilight with Venus nearby.
- 29 Thu** Lunar X near crater Werner visible 6 PM.
- 30 Fri** Lunar Straight Wall visible.

APRIL

- Full (Pink) Moon Fri 6th 12:19
- ▶ Last Quarter Fri 13th 03:50
- New Moon Sun 21st 00:18
- ◀ First Quarter Sun 29th 02:05

Mercury: Low in morning twilight and difficult to see.

Venus: In western evening sky. Attains greatest brightness, mag -4.7 at the end of the month as a waxing crescent 27% illuminated, 37" apparent disk diameter and 3.7 light minutes from Earth.

Mars: Dimming and being left behind by the Earth is high in the S transiting near 10 PM and sets near 4 AM. Retrograde motion ends on the 15th.

Jupiter: Low in W after sunset, sinks into the evening twilight late in the month.

Saturn: Visible most of the night. At opposition on the 15th at mag +0.2, 73 light minutes from the Earth. The N side of the rings tilted towards Earth at 13.7° and span 43".

Uranus: Not visible.

Neptune: In early morning sky the angle of the ecliptic favoring southern hemisphere observers.

2 Mon Venus 0.7°S of Pleiades.

3 Tue Venus 0.4°SE of Pleiades.

6 Fri Saturn, Spica, and the Moon visible all night in a near straight line.

20 Fri **Challenge No. 6.** See an old crescent Moon 18 hr before new in the eastern sky. Moonrise at 05:27. Sunrise at 06:01

21 Sat **Challenge No. 7.** See a young Crescent Moon 21 hr after new in the western sky. Sunset is 19:53, Moonset is 20:44.

Challenge No. 8. See both events.

22 Sun **Lyrid Meteor** shower peaks. ZHR variable, up to 90. Av=18. The radiant, on the Lyra-Hercules border (18h04m +32°), is in useful view after 10:30 PM and improves all evening. This year the Moon will be one day past new, so the sky will be dark. Lyrids are swift meteors (49 km/s), occasionally bright with about 20-25% leaving persistent trains. April can bring more sporadic fireballs (-3 magnitude or greater).

29 Sun Lunar straight wall visible.

MAY

- Full (Flower) Moon Sat 5th 20:35
- ▶ Last Quarter Sat 12th 14:47
- New Moon Sun 20th 16:47
- ◀ First Quarter Mon 28th 13:47

-
- Mercury:** Difficult to see in the morning twilight and lost by mid-month.
- Venus:** In the WNW in the evening sky and descending daily towards the Sun. It vanishes in the Sun's glare by month end as it approaches its historic last transit of this century.
- Mars** Continues to move away and dim It is high in the S at sunset and sets in the W near 3AM.
- Jupiter:** Not visible. In conjunction with the Sun on the 13th.
- Saturn:** A few weeks beyond opposition is visible most of the night, rising at dusk in the SE, transiting in the S about 11 PM and setting in the W before dawn.
- Uranus:** In morning eastern sky.
- Neptune:** In morning eastern sky.
-

1 Tue **May Day** or Beltane, the 2nd cross-quarter day of the year, half way between the equinox and the solstice. Start of summer on some alternative calendars, mid-spring in ours.

4 Fri **Venus** reaches its greatest declination N (27.82° N) of the year, in its 8 year cycle, as well as in several centuries. It will be the year 2239 before it is that far N again. **(Extremely) Easy Challenge No. 9. See Venus at greatest elongation N.**

5 Sat Largest full Moon of 2012. Closest perigee, 357,000 km (221,829 miles). Large ocean tides expected.

Eta Aquarid Meteors. Active Apr 19-May 28. ZHR 60 varying between ~40 to 85. Very fast (66 km/s), bright meteors, frequently leaving persistent trains (40-60). Associated with Comet 1P Halley. The radiant, the "Y"-shaped water jar asterism of Aquarius does not rise to a useful altitude in the E until about 03:30 am, coincident with astronomical twilight. The full Moon creates about the worst viewing conditions for the peak.

19 Sat Farthest lunar apogee of 2012, 401,167 km (249,273 miles).

20 Sun Annular eclipse of the Sun. Most of Oregon and all of Washington State will see a partial eclipse in the late afternoon. The closest place for us to see the complete eclipse includes the area around Medford, OR, Klamath, Redding, Eureka, and Red Bluff California. The instant of greatest eclipse occurs at 16hr 52m 47s PDT (4:52:47 PM). The annular phase is then at its maximum duration of 5 minutes and 46 seconds. So, if you want travel ...

JUNE

- Full (Honey) Moon Mon 4th 04:12
 - ▶ Last Quarter Mon 11th 03:41
 - New Moon Tue 19th 08:02
 - ◀ First Quarter Tue 26th 20:30
-

- Mercury:** Reappears in evening twilight by mid month.
- Venus:** Low in NE morning twilight after mid-month. Venus transits the Sun on June 5th. We will see it as the Sun sets.
- Mars:** Continues to move away and dim, it is in the SW at sunset and setting in the W near 1AM.
- Jupiter:** Not visible, in conjunction with the Sun on the 13th.
- Saturn:** A few weeks past opposition and retrograding is visible from dusk until it sets in the W near 2 AM.
- Uranus:** In eastern morning sky.
- Neptune:** In eastern morning sky.
-

During the 6000 year period from 2000 BC to 4000 AD, 81 transits of Venus occur. Transits of Venus occur in pairs, 8 years apart separated alternately by 105.5 and 121.5 years, resulting in a pattern reoccurring every 243 years. Since the invention of the telescope in 1609 there have been 7 transits. Johannes Kepler predicted the 1631 Venus transit, but died in 1630. The first to see a telescopic transit of Venus were Jeremiah Horrocks and William Crabtree in 1639 in England. Edmund Halley (1656-1742) urged observations of transits of Venus from widely spaced locations on Earth be used to determine the size of the Earth's orbit. But of course, never saw a transit. The next transit occurs on Dec 11, 2117. We'll see this transit in progress as the Sun sets. During the transit Venus will have an apparent diameter of 58" and will be 2.40 light minutes distant.

5 Tue **Challenge No. 10.** Observe the transit of Venus across the Sun. Use appropriate filters and eye protection at all time when viewing the Sun.

14 Thu **Earliest sunrise** 05:05 PDT in the Tri Cities.

20 Tue **Summer Solstice falls for the first time fall on the 20th.** Longest day of the year with 15 hr 48 m of daylight, in Tri Cities. Summer begins in the Tri Cities at 16:07 PDT, when the Sun reaches its farthest point N of the equator. Mid summer in some alternative calendars. Until 1975 the solstice fell on June 21st or 22nd (Universal Time). Now it will fall on June 21st and begins falling sometimes on the 20th.

27 Wed Lunar Straight Wall visible.

28 Thu **Latest Sun set**, at 20:54 PDT (8:54 PM).

JULY

- Full (Thunder) Moon Tue 3rd 11:52
- ▶ Last Quarter Tue 10th 18:48
- New Moon Wed 18th 21:24
- ◀ First Quarter Thu 26th 01:56

-
- Mercury:** Very low in the WNW evening twilight and no longer visible by mid-month. At greatest elongation E (26°) on the 1st and at aphelion on the 12th. The angle of the ecliptic favors southern hemisphere observers.
- Venus:** In the E morning sky. During 1st half of the month Venus and Jupiter lie less than 7° apart with Aldebaran and the Hyades in the background. Venus reaches greatest illuminated extent (27% of the waxing crescent) on the 12th, with a brightness of -4.7 mag, 37" apparent diameter and 3.7 light-minutes from Earth.
- Mars:** Low in the SW at dusk and sets in the W near midnight. It crosses to the S side of the celestial equator on the 5th.
- Jupiter:** Low in the E morning twilight. On the 15th, the waxing crescent Moon passes 0.5° N of Jupiter.
- Saturn:** In the SW at dusk and sets in the W near 1 AM. The angle of the ecliptic favors southern hemisphere observers.
- Uranus:** Rises near midnight in Cetus.
- Neptune:** Rises in late evening.
-

- 2 Mon** Mid point of the year occurs at 1:00 PM PDT.
- 4 Wed** Earth at aphelion (farthest from the Sun) at 11 PM 152,092,400 km (94,505,836 miles).
- 6 Fri** Sir Isaac Newton published *Principia* 325 years ago.
- 14 Sat** Venus-Jupiter-Aldebaran-Crescent Moon-Pleiades grouped in the morning twilight.
- 26 Thu** Lunar Straight Wall visible.

AUGUST

- Full (Sturgeon) Moon Wed 1st 20:27
 - ▶ Last Quarter Thu 9th 11:55
 - New Moon Fri 17th 08:54
 - ◀ First Quarter Fri 24th 06:51
- Full (Blue/Grain) Moon Fri 31st 06:58

-
- Mercury:** Reappears in dawn sky by the 2nd week of the month. Reaches greatest elongation W (19°) on the 16th with the Moon nearby.
- Venus:** In the E morning sky and reaches greatest elongation W (46°) on the 15th. On the 13th, the waning crescent moon occults Venus in the daylight at 2 PM.
- Mars:** Very low in the SW and sets at 10 PM.
- Jupiter:** Rises by 1 AM in the ENE and sets in SE by sunrise.
- Saturn:** Low in the SW at dusk and sets ~10 PM.
- Uranus:** Rises in late evening.
- Neptune:** Visible all night. At opposition on the 24th 11° S of celestial equator, mag +7.8, apparent disk diameter of 2.3", and 4 light-hours from Earth.
-

- 1 Wed Lammas**, the 3rd quarter cross-day of the year, half way between the Summer Solstice and the Autumnal Equinox. Beginning of Fall in some alternative calendars, mid summer in ours.
- 12 Sun Perseid Meteors.** at maximum after midnight on the 12th. The radiant, a few degrees NE of double star cluster in Perseus reaches useable elevation after 10:00 PM and improves after that. The waning crescent Moon rising at midnight is more likely to be a nuisance than a deterrent.
- Active from July 17 to August 24.
 - Peak variable: ZHR 100.
 - Swift atmospheric velocity 60 km/sec (~37 miles/sec) because head on to earth's orbit.
 - Beginning height 110-160 km.
 - Average magnitude 2.27. Brighter meteors often end in flares or bursts.
 - Some fire balls, about 1/3 leave trains up to 2 degrees wide, lasting to 100 sec.
 - Typically yellow, fewer white, brighter ones are green, orange, or red.
 - Derived from comet Swift-Tuttle, period now receding.
 - Historical record dates from 36 AD in China and 714 AD in Europe.
- 13 Mon** Double shadow transit on Jupiter, 03:38.
- 14 Tue** Venus at theoretical dichotomy, half illuminated when viewed from Earth 3 AM PDT.
- 20 Sun** Middle of the best time to observe the night skies. Leslie Peltier made the 2,000,000th American Association of Variable Star Observations observation 50 years ago. Peltier himself contributed over 132,000 AAVSO observations. Another Ohio boy made good.

SEPTEMBER

- ▶ Last Quarter Sat 8th 06:15
- New Moon Sat 15th 19:11
- ◐ First Quarter Sat 22nd 12:41
- Full (Harvest) Moon Sat 29th 20:19

-
- Mercury:** Not observable this month, in superior conjunction on the 10th.
- Venus:** Now in the E morning sky well positioned for northern observers and still receding from earth after the June transit. Venus reaches 1 au from Earth on the 23rd. On the 12th, the waxing crescent Moon is nearby Venus.
- Mars:** Mars low in the SW dusk and sets by 9 PM.
- Jupiter:** Rises in the ENE near 10 PM and transits high in the S at sunrise.
- Saturn:** Vanishes in the SW evening twilight by mid month.
- Uranus:** Visible all night. At opposition on the 29th in Pisces, mag +5.7, apparent disk diameter of 3.7", and 2.6 light-years from Earth.
- Neptune:** Just past opposition and is visible most of the evening.
-

7 Fri Moon within 3° of Jupiter in late evening and overnight.

8 Sat Spot Jupiter unaided after Sunrise 3° to upper right of the Moon.

Challenge No. 11. See Jupiter unaided just after Sunrise.

22 Sat **Autumnal Equinox**, Fall starts in the Tri Cities at 07:47 AM when the Sun crosses the equator into the southern hemisphere. Mid-fall in some alternative calendars.

The Moon is <5° SSW of Mars at the time of the Autumnal Equinox.

23 Sun Lunar Straight Wall visible.

OCTOBER

- ▶ Last Quarter Mon 8th 00:33
- New Moon Mon 15th 05:02
- ◐ First Quarter Sun 21st 20:32
- Full (Hunter's) Moon Mon 29th 12:49

-
- Mercury:** Observed with difficulty buried in the evening twilight at month's end.
- Venus:** In E morning sky. It passes 0.1° S of Regulus on the 3rd and the waxing crescent Moon passes 6° S of Venus on the 12th.
- Mars:** Low in W evening sky. Sets in early evening. The angle of the ecliptic favors southern hemisphere observers.
- Jupiter:** Rises near 9 PM in ENE, transits high in the S near 4 AM.
- Saturn:** Not visible, in conjunction with the Sun on the 25th.
- Uranus:** Just past opposition and visible most of the night.
- Neptune:** Well placed in the evening sky.
-

- 2 Tue** Venus $\sim 0.15^\circ$ SW of Regulus, magnitudes -4.1 and 1.4 respectively. Closest appulse (apparent closest approach of one body to another) of a planet and 1st magnitude star this year at 22:00 PDT. With careful visual observation, with averted vision, you may see "rays" (diffraction spikes) of the two appear to touch.

(Modest) Challenge No. 12

See Venus and Regulus at their closest approach. Look for touching rays.

- 14 Sun** Old Crescent Moon 21 hr before new before Sunrise. Moonrise 06:19, Sunrise 06:36.

- 23 Tue** Lunar Straight Wall visible.

- 31 Wed Hallowe'en, (eve of All Saints Day)** 4th quarter-cross day, half way between the autumnal equinox and the winter solstice. Beginning of Winter in some alternative calendars and mid Fall in ours.

The Vatican absolved Galileo of all heresy charges 20 years ago.

NOVEMBER

- ▶ Last Quarter Tue 6th 16:36
- New Moon Tue 13th 14:08
- ◀ First Quarter Tue 20th 06:31
- Full (Beaver) Moon Wed 28th 06:46

-
- Mercury:** Very low in the SW at dusk, sets in the SW after 6 PM. Reappears in the dawn sky for northern hemisphere observers late in the month.
- Venus:** In the SE morning sky. Moon passes 5°S of Venus on the 11th. Venus passes 4°N of Spica on the 16th.
- Mars:** Low in the SW evening sky is moving rapidly eastward. It reaches maximum S declination of the year on the 17th -24°33'.
- Jupiter** Rises in the NE in mid-evening, transits high in the S and sets in the NW after sunrise.
- Saturn:** Reappears low in dawn twilight at mid-month. The angle of the ecliptic favors northern hemisphere observers. Rings are now getting more open to us.
- Uranus:** Well placed in evening sky.
- Neptune:** Well placed in early evening sky.
-

- 1 Thu** Moon 1.5°S of Jupiter visible after moonrise.
- 4 Sun** Daylight Savings ends. As predicted, no time was saved. Officially the hour 1 AM to 2 AM is repeated.
- 17 Sat** **Leonid meteors.** Active 6 to 23 Nov. ZHR 15? Extremely fast meteors, 71 km/s, often bright, 50-70% leave persistent trains. The radiant, in Leo's head near the sickle rises about 11 PM. The waxing crescent Moon is no problem, setting before the radiant is properly in view. Associated with comet 55P/Temple-Tuttle.
- 20 Tue** Lunar X near crater Werner visible 8 PM.
- 21 Wed** Lunar Straight Wall visible.

DECEMBER

- ▶ Last Quarter Thu 6th 07:31
- New Moon Thu 13th 00:42
- ◐ First Quarter Thu 19th 21:19
- Full (Long Nights) Moon Fri 28th 02:21

-
- Mercury:** Best morning apparition of the year for northern hemisphere observers during 1st week of Dec. Greatest elongation W (21°) on the 4th.
- Venus:** In eastern morning sky. At year-end, reaches maximum S declination of the year, -22°21'.
- Mars:** Very low in SW at dusk and sets in SW after 6 PM.
- Jupiter:** At opposition on the 3rd near Hyades, mag -2.9, 48" equatorial diameter, 21° N of celestial equator, 34 light minutes from the Earth.
- Saturn:** Well placed in the dawn sky.
- Uranus:** Well placed in early evening sky, sets after midnight.
- Neptune:** In W early evening sky in Aquarius.
-

3 Mon Mercury, Venus and Saturn form an even 15° long line in the morning twilight.

7 Thu **Earliest sunset** at 16:11 (4:11 PM) PST in the Tri Cities.

The beginning of the dark days of winter.

13 Thu **Geminid Meteors** ZHR 120, slightly variable. One of the best showers presently visible from Earth. Bright, medium speed meteors (35 km/sec), with few persistent trains. The radiant, above the head of Castor in Gemini (the twins) is available almost all night, rising in early evening. A reliable shower. The new Moon on this evening assures a dark sky. Associated with an Apollo asteroid 3200 Phaeton.

21 Fri **Winter solstice.** Shortest day of the year. Winter arrives in the Tri Cities at 03:12 PDT. Mid-winter in some alternative calendars. The Sun appearing to travel along the ecliptic reaches its farthest point south of the celestial equator. Tri Cities get 8 hr and 36 minutes of daylight. Sun rises at 7:37 AM and sets at 4:13 PM PST.

2012 CHALLENGES

Sun Jan 21 (Extreme) Challenge No. 1.

See Old Crescent Moon 15hr before new. i.e., 08: 39 in the eastern sky.

Mon Jan 22 (Extreme) Challenge No. 2.

See Young Crescent Moon 18 hr after new, i.e, 17:39 in the western sky.

(Extreme) Challenge No. 3.

See events No. 1 and No. 2.

Thu and Fri Challenge No. 4.

Feb 2 and 3 Spot Comet Garradd near M92.

Mon Mar 5 Challenge No. 5.

See Mercury at greatest elongation east (18°), Mercury sets at 19:29 on azimuth 276° .

Fri Apr 20 Challenge No. 6.

See an old crescent Moon 18 hr before new in the eastern sky. Moonrise at 05:27. Sunrise at 06:01.

Sat Apr 21 Challenge No. 7.

See a young Crescent Moon 21 hr after new in the western sky. Sunset is 19:53, Moonset is 20:44.

Challenge No. 8.

See events No. 6 and No. 7.

Fri May 4 (Extremely) Easy Challenge No. 9.

See Venus at greatest elongation N.

Tue Jun 5 Challenge No. 10.

Observe the transit of Venus across the Sun.
Use appropriate filters or other eye protection at all times when viewing at or near the sun. External ingress at 15:06 Sun altitude 56° , Internal Ingress at 15:23 Sun alt 53° , Greatest Transit at 18:26, Sun Alt 23° . Transit ends at Sunset.

Sat Sept 8 (Easy) Challenge No. 11.

See Jupiter unaided just after Sunrise.

Sun Oct 14 (Modest) Challenge No. 12.

See Venus and Regulus at their closest approach. Look for touching rays.