

Big Bear Valley Astronomical Society



September 14, 2017 Agenda and Minutes

- ✓ Welcome:
 - New members or 1st time visitors? Pat and Lanny Hold
 - Members: Claude, Teresa, John, Deanna, Byron, Linda, Lydia, Randy, Tim, Tom, Dick, Mark, Vatch, Jane, Bill
- ✓ Announcements:
 - Available for sale: assorted sizes of t-shirts with club logo
 - The spacecraft Cassini will enter Saturn's atmosphere on 9/15/17 at 4:50am... and be gone.
- ✓ Treasurer/Membership Report: DUES are due, \$15 single and \$25 family.
 - Current Balance \$608.00
 - Randy prepared a club membership sheet... everyone needs to fill in and send to Randy with membership dues.
- ✓ Librarian Report : Deanna prepared an inventory sheet and will make it available on club website. If you want to borrow an item, just let Deanna know via email: deannapoulsen@mac.com
 - We also have an 8" telescope available to loan to club member.
- ✓ Comments, reports, discussions, reviews:
 - Solar Eclipse, August 21. BBVAS was set up in the parking lot near Swim Beach.
 - Est 300 folks attended from all over SoCal
 - We ran out of solar sun glasses, but everyone there shared
 - 4 telescopes showed the 70% occultation. (Wes, Steve, Randy, Bill)
 - Urban Assault Friday Aug 25th in the Village
 - 3 telescopes and a zillion visitors saw Saturn, Jupiter, and the Moon
 - BBVAS Star Party Aug 19 at HC
 - Not well attended due to the Eclipse travel etc.
 - BBSO Tours Aug 24 & Sept 7 (public & pilots simultaneously)
 - Despite the schedule conflict, everything went very well
 - Aug 26th – Civil Air Patrol Telescope Viewing
 - Thanks to Randy for showing about 100 CAP-ers what the night sky offers
 - August 13th- Tour of BBSO by about 35 3rd graders from Baldwin Lane Elementary
 - John gave lecture, Erika/Jeff showed demo of sunspotter, and Sergey/Bill guided the Dome tours.
- ✓ Activities
 - Virtual Lecture for September – Dr Tamitha Skov – Space Weather Woman!
 - Another SunDay? When/where?
 - In the Village, September 24, 11am to 1pm
 - Urban Assault Astronomy in the Village, Sept 29th. Confirmed
 - Anyone start the AL Lunar Project? Not yet, but here is the AL link:
 - <https://www.astroleague.org/observing.html>
 - BBVAS Star Party – Sept 16th. HC? Confirmed at High Chaparral... dusk setup

- ✓ Chief observer report.
 - What's up this month?
 - Randy handed out the Finder Path of Comet C/2017-01 (see attached)
 - Also see the attached "Evening Sky Map" for September 2017

- ✓ Scheduling:
 - October Virtual (but live) lecture – Teresa Bippert-Plymate "A Career in Astronomy"
 - A fall public Telescope Clinic?
 - October 14, 2017, Erwin Lake Park (on Hatchery road in Erwin Lake)
 - Teresa will produce the Flyer, Bill will contact the Chamber etc for PSA
 - Same format at the July event... if this is successful, then we'll have 2/year.
 - Next beginner talk?
 - Nothing suggested. However, if you have a "show and tell", please bring.
 - Probable November Virtual Lecture guest speaker: Philip Choi, Pomona College, AO expert
 - <http://physastro.pomona.edu/people/philip-choi/>

- ✓ Member reports on the Total Solar Eclipse of Aug 21!!
 - Wonderful and entertaining recap of the folks who went somewhere to see the Totality.
 - Teresa/Claude, Tim, Byron, Vatch, Mark (also saw Venus then as well)
 - Plans were discussed about visiting the 2024 total eclipse in Mexico et al
 - <https://www.timeanddate.com/eclipse/solar/2024-april-8>
 - Year 2045 will have total eclipse starting in NA in NoCal and heading southeast thru Florida... will happen on August 12, so will we be able to see the Perseids?

- ✓ General Discussion:

Calendar summary:

Sept thru Oct	Comet C/2017 01 (see attached flight path)
Sept 16	Star party, High Chaparral site, starts at dusk
Sept 22	Autumnal Equinox: Fall begins, sun goes south of equator
Sept 24	SUNday in the Village, 11am -1pm, bring solar filters and scopes
Sept 28	Virtual Lecture at BBSO... Dr. Tamitha Skov, Space Weather Woman
Sept 29	Urban Assault in the Village, starts at Dusk
Oct 12	Next club meeting at Dennys
Oct 14	Public Telescope Clinic, Erwin Lake park on Hatchery
Oct 26	Virtual Lecture (actually this will be live), Teresa's professional career

The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

Sky Calendar – September 2017

- 1 **Venus 1.2° SSW of Beehive cluster** (morning sky) at 13h UT. Mag. -4.0.
- 6 **Full Moon** at 7:04 UT.
- 10 **Mercury 0.6° S of Regulus** (18° from Sun, morning sky) at 12h UT. Mags. 0.2 and 1.3.
- 11 **Moon near the Pleiades** (morning sky) at 20h UT.
- 12 **Jupiter 3.1° NNE of Spica** (35° from Sun, evening sky) at 1h UT. Mags. -1.7 and 1.0.
- 12 **Mercury at greatest elongation west** (18° from Sun, morning sky) at 10h UT. Mag. 0.6.
- 12 **Moon near Aldebaran** (100° from Sun, morning sky) at 12h UT. Occultation visible from Hawaii & western USA.
- 13 **Last Quarter Moon** at 6:26 UT.
- 13 **Moon at perigee** (closest to Earth) at 16:11 UT (369,800 km; angular size 32.3').
- 16 **Moon near Beehive cluster** (morning sky) at 15h UT.
- 16 **Mercury 0.06° NNE of Mars** (17° from Sun, morning sky) at 19h UT. Mags. -0.7 and 1.8.
- 18 **Moon, Venus and Regulus** within 2.4° circle (25° from Sun, morning sky) at 5h UT. Mags. -3.9 and 1.3. Occultation of Venus visible from Indian Ocean.
- 18 **Moon, Mercury and Mars** within 1.8° circle (17° from Sun, morning sky) at 21h UT. Mags. -0.9 and 1.8.
- 20 **Venus 0.5° NNE of Regulus** (27° from Sun, morning sky) at 2h UT. Mag. -3.9.
- 20 **New Moon** at 5:30 UT. Start of lunation 1172.
- 22 **Moon near Jupiter** (evening sky) at 10h UT. Mag. -1.7.
- 22 **September equinox** at 20:02 UT. The time when the Sun reaches the point along the ecliptic where it crosses into the southern celestial hemisphere marking the start of autumn in the Northern Hemisphere and spring in the Southern Hemisphere.
- 27 **Moon near Saturn** (evening sky) at 1h UT. Mag. 0.5.
- 27 **Moon at apogee** (farthest from Earth) at 7h UT (distance 404,348 km; angular size 29.6').
- 28 **First Quarter Moon** at 2:54 UT.

More sky events and links at <http://Skymaps.com/skycalendar/>
All times in Universal Time (UT). (USA Eastern Summer Time = UT - 4 hours.)



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WWW.SKYMAPS.COM

The bright stars of Cassiopeia form a well defined 'W' shape that is easy to recognize. The ancient constellation of Aquarius represents a young man pouring water from a jar into the mouth of a large fish, Piscis Austrinus.

The Milky Way stretches across the sky. Ancient poets identified it as the "road of the gods".

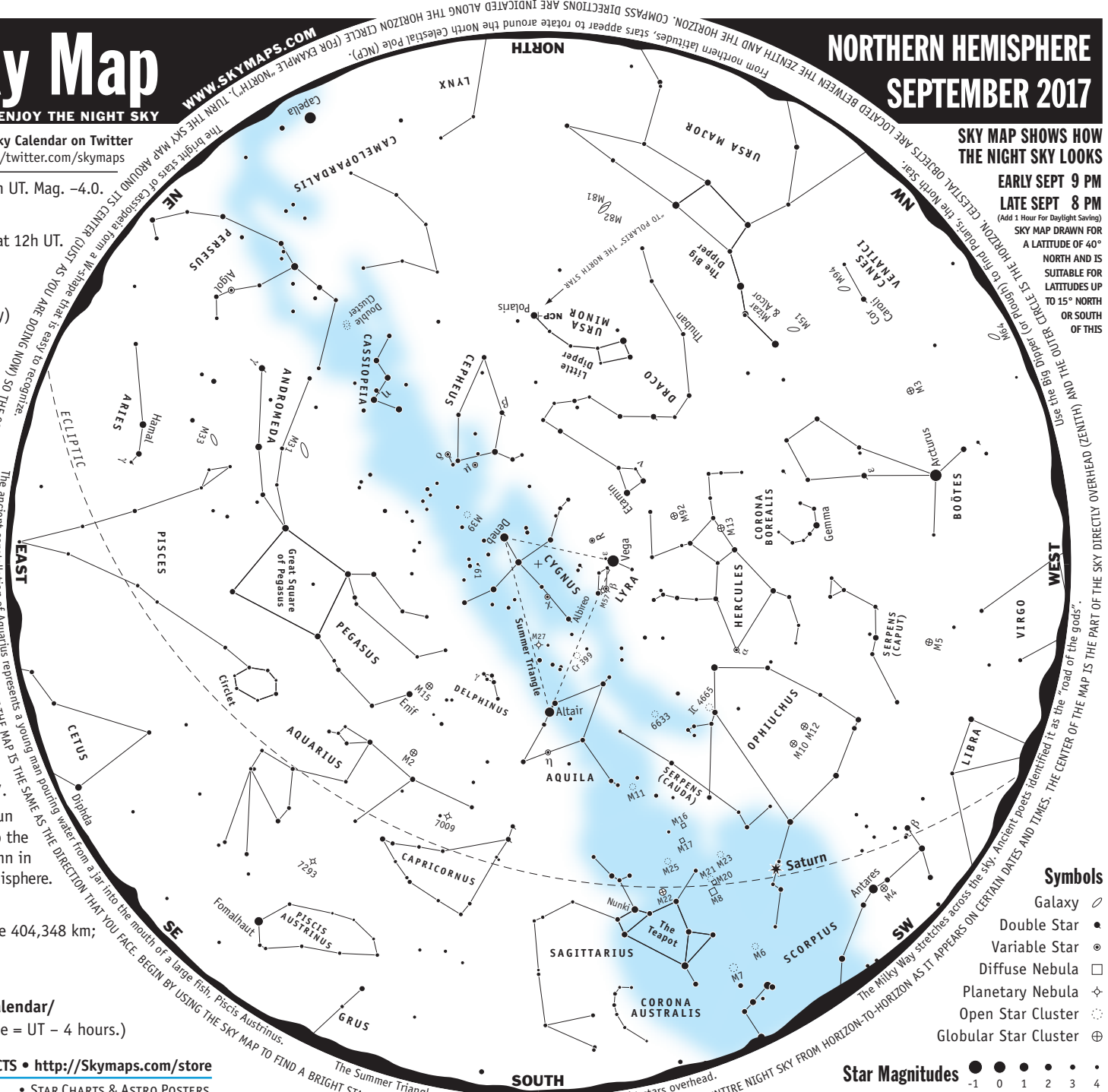
The Summer Triangle - Vega, Altair, and Deneb - three bright stars overhead.

INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NIGHT SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES. THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH) AND THE OUTER CIRCLES (OR POINTS) TO FIND POINTS, THE NORTH STAR, THE NORTH STAR, THE NORTH STAR, THE NORTH STAR.

NORTHERN HEMISPHERE SEPTEMBER 2017

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY SEPT 9 PM
LATE SEPT 8 PM
(Add 1 Hour For Daylight Saving)
SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS



- ### Symbols
- Galaxy ☾
 - Double Star ●●
 - Variable Star ⊙
 - Diffuse Nebula □
 - Planetary Nebula ☆
 - Open Star Cluster ○
 - Global Star Cluster ⊕

Star Magnitudes -1 0 1 2 3 4

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About the Celestial Objects

Listed on this page are several of the brighter, more interesting celestial objects visible in the evening sky this month (refer to the monthly sky map). The objects are grouped into three categories. Those that can be easily seen with the naked eye (that is, without optical aid), those easily seen with binoculars, and those requiring a telescope to be appreciated. **Note, all of the objects (except single stars) will appear more impressive when viewed through a telescope or very large binoculars.** They are grouped in this way to highlight objects that can be seen using the optical equipment that may be available to the star gazer.

Tips for Observing the Night Sky

When observing the night sky, and in particular deep-sky objects such as star clusters, nebulae, and galaxies, it's always best to observe from a dark location. Avoid direct light from street lights and other sources. If possible observe from a dark location away from the light pollution that surrounds many of today's large cities.

You will see more stars after your eyes adapt to the darkness—usually about 10 to 20 minutes after you go outside. Also, if you need to use a torch to view the sky map, cover the light bulb with red cellophane. This will preserve your dark vision.

Finally, even though the Moon is one of the most stunning objects to view through a telescope, its light is so bright that it brightens the sky and makes many of the fainter objects very difficult to see. So try to observe the evening sky on moonless nights around either New Moon or Last Quarter.

Astronomical Glossary

Conjunction – An alignment of two celestial bodies such that they present the least angular separation as viewed from Earth.

Constellation – A defined area of the sky containing a star pattern.

Diffuse Nebula – A cloud of gas illuminated by nearby stars.

Double Star – Two stars that appear close to each other in the sky; either linked by gravity so that they orbit each other (binary star) or lying at different distances from Earth (optical double). Apparent separation of stars is given in seconds of arc (").

Ecliptic – The path of the Sun's center on the celestial sphere as seen from Earth.

Elongation – The angular separation of two celestial bodies. For Mercury and Venus the greatest elongation occurs when they are at their most angular distance from the Sun as viewed from Earth.

Galaxy – A mass of up to several billion stars held together by gravity.

Globular Star Cluster – A ball-shaped group of several thousand old stars.

Light Year (ly) – The distance a beam of light travels at 300,000 km/sec in one year.

Magnitude – The brightness of a celestial object as it appears in the sky.

Open Star Cluster – A group of tens or hundreds of relatively young stars.

Opposition – When a celestial body is opposite the Sun in the sky.

Planetary Nebula – The remnants of a shell of gas blown off by a star.

Universal Time (UT) – A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.

Variable Star – A star that changes brightness over a period of time.

NORTHERN HEMISPHERE SEPTEMBER 2017 CELESTIAL OBJECTS Sky maps.com

Easily Seen with the Naked Eye

Altair	Aql	• Brightest star in Aquila. Name means "the flying eagle". Dist=16.7 ly.
Capella	Aur	• The 6th brightest star. Appears yellowish in color. Spectroscopic binary. Dist=42 ly.
Arcturus	Boo	• Orange, giant K star. Name means "bear watcher". Dist=36.7 ly.
δ Cephei	Cep	• Cepheid prototype. Mag varies between 3.5 & 4.4 over 5.366 days. Mag 6 companion.
Deneb	Cyg	• Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
α Herculis	Her	• Semi-regular variable. Magnitude varies between 3.1 & 3.9 over 90 days. Mag 5.4 companion.
Vega	Lyr	• The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
Algol	Per	• Famous eclipsing binary star. Magnitude varies between 2.1 & 3.4 over 2.867 days.
Fomalhaut	PsA	• Brightest star in Piscis Austrinus. In Arabic the "fish's mouth". Dist=25 ly.
Antares	Sco	• Red, supergiant star. Name means "rival of Mars". Dist=135.9 ly.
Polaris	UMi	• The North Pole Star. A telescope reveals an unrelated mag 8 companion star. Dist=433 ly.

Easily Seen with Binoculars

M31	And	○ The Andromeda Galaxy. Most distant object visible to naked eye. Dist=2.93 million ly.
M2	Aqr	• Resembles a fuzzy star in binoculars.
η Aquilae	Aql	• Bright Cepheid variable. Mag varies between 3.6 & 4.5 over 7.166 days. Dist=1,200 ly.
M3	CVn	• Easy to find in binoculars. Might be glimpsed with the naked eye.
μ Cephei	Cep	• Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.
χ Cygni	Cyg	• Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
M39	Cyg	• May be visible to the naked eye under good conditions. Dist=900 ly.
ν Draconis	Dra	• Wide pair of white stars. One of the finest binocular pairs in the sky. Dist=100 ly.
M13	Her	• Best globular in northern skies. Discovered by Halley in 1714. Dist=23,000 ly.
M92	Her	• Fainter and smaller than M13. Use a telescope to resolve its stars.
ε Lyrae	Lyr	• Famous Double Double. Binoculars show a double star. High power reveals each a double.
η Lyrae	Lyr	• Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
M10	Oph	• 3 degrees from the fainter M12. Both may be glimpsed in binoculars. Dist=14,000 ly.
IC 4665	Oph	• Large, scattered open cluster. Visible with binoculars.
6633	Oph	• Scattered open cluster. Visible with binoculars.
M15	Peg	• Only globular known to contain a planetary nebula (Mag 14, d=1"). Dist=30,000 ly.
Double Cluster	Per	• Double Cluster in Perseus. NGC 869 & 884. Excellent in binoculars. Dist=7,300 ly.
M8	Sgr	□ Lagoon Nebula. Bright nebula bisected by a dark lane. Dist=5,200 ly.
M25	Sgr	• Bright cluster located about 6 deg N of "teapot's" lid. Dist=1,900 ly.
M22	Sgr	• A spectacular globular star cluster. Telescope will show stars. Dist=10,000 ly.
M6	Sco	• Butterfly Cluster. 30+ stars in 7x binoculars. Dist=1,960 ly.
M7	Sco	• Superb open cluster. Visible to the naked eye. Age=260 million years. Dist=780 ly.
Mizar & Alcor	UMa	• Good eyesight or binoculars reveals 2 stars. Not a binary. Mizar has a mag 4 companion.
Cr 399	Vul	• Coathanger asterism or "Brocchi's Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

Telescopic Objects

γ Andromedae	And	• Attractive double star. Bright orange star with mag 5 blue companion. Sep=9.8".
7009	Aqr	✦ Saturn Nebula. Requires 8-inch telescope to see Saturn-like appendages.
7293	Aqr	✦ Helix Nebula. Spans nearly 1/4 deg. Requires dark sky. Dist=300 ly.
γ Arietis	Ari	• Impressive looking double blue-white star. Visible in a small telescope. Sep=7.8".
ε Boötis	Boo	• Red giant star (mag 2.5) with a blue-green mag 4.9 companion. Sep=2.8". Difficult to split.
M51	CVn	○ Whirlpool Galaxy. First recognised to have spiral structure. Dist=25 million ly.
η Cassiopeiae	Cas	• Yellow star mag 3.4 & orange star mag 7.5. Dist=19 ly. Orbit=480 years. Sep=12".
Albireo	Cyg	• Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4".
61 Cygni	Cyg	• Attractive double star. Mags 5.2 & 6.1 orange dwarfs. Dist=11.4 ly. Sep=28.4".
γ Delphini	Del	• Appear yellow & white. Mags 4.3 & 5.2. Dist=100 ly. Struve 2725 double in same field.
β Lyrae	Lyr	• Eclipsing binary. Mag varies between 3.3 & 4.3 over 12.940 days. Fainter mag 7.2 blue star.
M57	Lyr	✦ Ring Nebula. Magnificent object. Smoke-ring shape. Dist=4,100 ly.
M20	Sgr	□ Trifid Nebula. A telescope shows 3 dust lanes trisecting nebula. Dist=5,200 ly.
M17	Sgr	□ Omega Nebula. Contains the star cluster NGC 6618. Dist=4,900 ly.
M11	Sct	• Wild Duck Cluster. Resembles a globular through binoculars. V-shaped. Dist=5,600 ly.
M16	Ser	□ Eagle Nebula. Requires a telescope of large aperture. Dist=8,150 ly.
M33	Tri	○ Fine face-on spiral galaxy. Requires a large aperture telescope. Dist=2.3 million ly.
M27	Vul	✦ Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.

