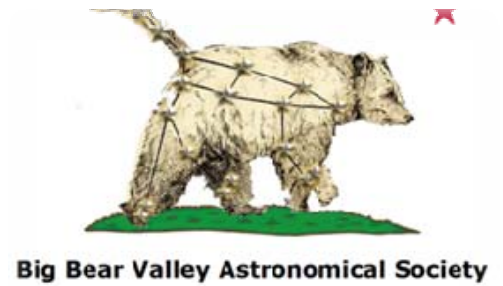


Big Bear Valley Astronomical Society



March 2018 Agenda and Minutes

- ✓ Welcome:
 - New members or 1st time visitors? **none**
 - **Members present: Claude, John, Vatch, Deanna, Wes, Stan, Byron, Randy, Dick, Matt, Jane, Tim, Bill**

- ✓ Announcements:
 - **Yerkes Observatory is closing down...**
 - <https://news.uchicago.edu/article/2018/03/07/uchicago-activities-yerkes-observatory-end-2018>
 - **Parker Solar Probe-** NASA's Parker Solar Probe will be the first-ever mission to "touch" the sun. The spacecraft, about the size of a small car, will travel directly into the sun's atmosphere about 4 million miles from our star's surface. Launch is slated for summer 2018.
 - <https://www.nasa.gov/content/goddard/parker-solar-probe>
 - **Free e-books from NASA... including "The Saturn System, through the eyes of Cassini"**
 - <https://www.nasa.gov/connect/ebooks/index.html>

- ✓ Treasurer/Membership Report: **32 paid members and \$708.50.**

- ✓ Librarian Report: **current inventory is now on the Club website. Contact Deanna for more info.**

- ✓ Comments, reports, discussions, reviews:
 - Virtual Lecture with – Dr Doug Rabin, NASA GSPF – “Photon Sieves”
 - **Interesting.... Good lecture**
 - BBVAS Star Party on Feb 17th.
 - **Claude/Teresa and Josh there...cloudy... packed up early**
 - Urban Assault Friday on Feb 23rd.
 - **Claude/Teresa showed the Moon to lots of visitors... captured a few donations.**
 - Mar 8 (today's) BBSO Tour... **canceled... no one signed up.**

- ✓ Activities
 - March 22nd, Virtual Lecture – Dr Jeff Kuhn, “Exolife Finder (ELF) and the PLANETS Foundation Colossus Project” ... <http://the-colossus.com/events.html> **74 meter!!**
 - Urban Assault Astronomy in the Village, Mar 23rd. **agreed**
 - BBVAS Star Party Mar 17th – HC? St Pat's Day! Look up Irish constellations?
 - **High Chaparral agreed.**
 - **(humor) <https://www.newyorker.com/magazine/2017/05/01/the-irish-constellation>**
 - Anyone working on the AL Lunar Project? **No new players**

- ✓ Chief observer report.
 - What's up this month? **Not much**
 - **March 20... Vernal Equinox at 16:15UTC...The time when the Sun reaches the point along the ecliptic where it crosses into the northern celestial hemisphere marking the start of spring in the Northern Hemisphere and autumn in the Southern Hemisphere.**

✓ Scheduling:

- Next beginner talk?
 - Jane proposed a short presentation on Clouds from an artistic point of view.

✓ General Discussion:

- BBVAS Scholarship Fund – To Be Awarded!
 - Motion made, seconded, 11 Ayes, 2 Nos, Motion passed
 - Details
 - \$1,000 Scholarship to be awarded in 2018
 - Winner to be selected by the Science Department chair at Big Bear High School
 - Source of funding:
 - \$500 donation from a club member
 - \$378 from the Donation Can
 - \$122 from the Club General Fund

-end-

The Evening Sky Map

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

Sky Calendar – March 2018

Get Sky Calendar on Twitter
<http://twitter.com/skymaps>

- 1 Moon near Regulus (evening sky) at 6h UT.
- 2 Full Moon at 0:51 UT.
- 4 Mercury 1.1° NW of Venus (13° from Sun, evening sky) at 6h UT. Mags. -1.2 and -3.9.
- 5 Moon near Spica (morning sky) at 2h UT.
- 7 Moon near Jupiter (morning sky) at 9h UT. Mag. -2.2.
- 8 Moon near Antares (morning sky) at 18h UT.
- 9 Last Quarter Moon at 11:22 UT.
- 10 Moon near Mars (84° from Sun, morning sky) at 1h UT. Mag. 0.7.
- 11 Moon near Saturn (72° from Sun, morning sky) at 2h UT. Mag. 0.5.
- 11 Moon at apogee (farthest from Earth) at 9h UT (distance 404,678 km; angular size 29.5').
- 15 Mercury at greatest elongation east (18° from Sun, evening sky) at 15h UT. Mag. -0.3.
- 17 New Moon at 13:13 UT. Start of lunation 1178.
- 18 Moon near Venus (17° from Sun, evening sky) at 22h UT. Mercury nearby. Mags. -3.9 and 0.3.
- 19 Mercury 3.8° from Venus (18° from Sun, evening sky) at 8h UT. Moon nearby. Mags. 0.5 and -3.9.
- 20 Vernal equinox at 16:15 UT. The time when the Sun reaches the point along the ecliptic where it crosses into the northern celestial hemisphere marking the start of spring in the Northern Hemisphere and autumn in the Southern Hemisphere.
- 22 Moon near the Pleiades at 6h UT (evening sky).
- 22 Moon near Aldebaran (evening sky) at 23h UT.
- 24 First Quarter Moon at 15:13 UT.
- 26 Moon at perigee (closest to Earth) at 18h UT (369,106 km; angular size 32.4').
- 27 Moon near Beehive cluster M44 (evening sky) at 1h UT.
- 28 Moon near Regulus (evening sky) at 15h UT.
- 31 Full Moon at 12:37 UT.

More sky events and links at <http://Skymaps.com/skycalendar/>

All times in Universal Time (UT). (USA Eastern Summer Time = UT - 4 hours.)



SAVE ON RECOMMENDED PRODUCTS • <http://Skymaps.com/store>

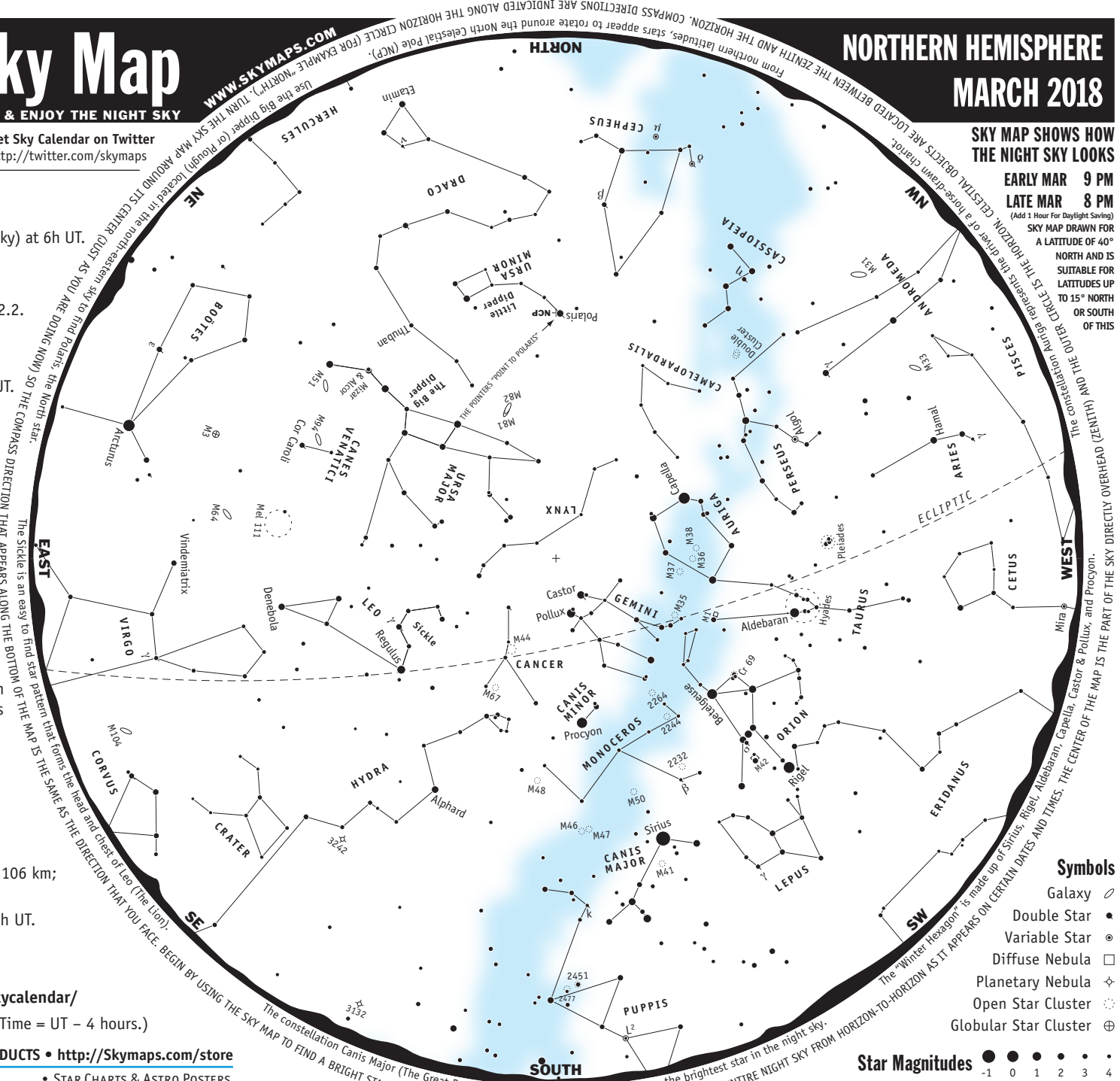
- STAR ATLASES & PLANISPHERES
 - STAR CHARTS & ASTRO POSTERS
 - BOOKS FOR SKY WATCHERS
 - TELESCOPES & BINOCULARS
- Help support the production and free distribution of The Evening Sky Map

NORTHERN HEMISPHERE MARCH 2018

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY MAR 9 PM
 LATE MAR 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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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 CIRCLE REPRESENTS THE DIRECTION OF A HORSE-DRAWN CHARIOT.

The constellation Canis Major (The Great Dog) is dominated by Sirius, the Dog Star, the brightest star in the night sky.

The Sickle is an easy to find star pattern that forms the head and chest of Leo (The Lion). THE CENTER OF THE MAP IS THE SAME AS THE DIRECTION THAT YOU FACE. BEGIN BY USING THE SKY MAP TO FIND A BRIGHT STAR PATTERN IN THE SKY.

Use the Big Dipper (or Plough) to find the north-eastern sky to find planets, the North Star. THE CENTER OF THE MAP IS THE SAME AS THE DIRECTION THAT YOU ARE FACING. BEGIN BY USING THE SKY MAP PROPERLY, TURN THE SKY MAP AROUND IN THE DIRECTION THAT YOU ARE FACING.

WWW.SKYMAPS.COM

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 MARCH 2018 CELESTIAL OBJECTS Sky maps.com

Easily Seen with the Naked Eye

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.
Sirius	CMa	•	The brightest star in the sky. Also known as the "Dog Star". Dist=8.6 ly.
Procyon	CMi	•	Greek name meaning "before the dog" - rises before Sirius (northern latitudes). Dist=11.4 ly.
δ Cephei	Cep	♁	Cepheid prototype. Mag varies between 3.5 & 4.4 over 5.366 days. Mag 6 companion.
Castor	Gem	•	Multiple star system with 6 components. 3 stars visible in telescope. Dist=52 ly.
Pollux	Gem	•	With Castor, the twin sons of Leda in classical mythology. Dist=34 ly.
Regulus	Leo	•	Brightest star in Leo. A blue-white star with at least 1 companion. Dist=77 ly.
Rigel	Ori	•	The brightest star in Orion. Blue supergiant star with mag 7 companion. Dist=770 ly.
Betelgeuse	Ori	•	One of the largest red supergiant stars known. Diameter=300 times that of Sun. Dist=430 ly.
Algol	Per	☉	Famous eclipsing binary star. Magnitude varies between 2.1 & 3.4 over 2.867 days.
Pleiades	Tau	☉	The Seven Sisters. Spectacular cluster. Many more stars visible in binoculars. Dist=399 ly.
Hyades	Tau	☉	Large V-shaped star cluster. Binoculars reveal many more stars. Dist=152 ly.
Aldebaran	Tau	•	Brightest star in Taurus. It is not associated with the Hyades star cluster. Dist=66.7 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=2.5 million ly.
M38	Aur	☉	Stars appear arranged in "pi" or cross shape. Dist=4,300 ly.
M36	Aur	☉	About half size of M38. Located in rich Milky Way star field. Dist=4,100 ly.
M37	Aur	☉	Very fine star cluster. Discovered by Messier in 1764. Dist=4,400 ly.
M44	Cnc	☉	Praesepe or Beehive Cluster. Visible to the naked eye. Dist=590±20 ly.
M3	CVn	☉	Easy to find in binoculars. Might be glimpsed with the naked eye.
M41	CMa	☉	First recorded observation by Aristotle in 325 BC as "cloudy spot". Dist=2,300 ly.
Mel 111	Com	☉	Coma Berenices. 80 mag 5-6 stars in 5 deg. Dist=288 ly. Age=400 million years.
M35	Gem	☉	Fine open cluster located near foot of the twin Castor. Dist=2,800 ly.
M48	Hya	☉	12+ stars in 7x binoculars. Triangular asterism near centre. Dist=1,990 ly.
γ Leporis	Lep	•	Visible with binoculars. Gold & white stars. Mags 3.6 & 6.2. Dist=30 ly. Sep=96.3".
2232	Mon	☉	A large scattered star cluster of 20 stars. Dist=1,300 ly.
2244	Mon	☉	Surrounded by the rather faint Rosette Nebula. Dist=5,540 ly.
M50	Mon	☉	Visible with binoculars. Telescope reveals individual stars. Dist=3,000 ly.
Cr 69	Ori	☉	Lambda Orionis Cluster. Dist=1,630 ly.
M42	Ori	☉	The Great Orion Nebula. Spectacular bright nebula. Best in telescope. Dist=1,300 light years.
Double Cluster	Per	☉	Double Cluster in Perseus. NGC 869 & 884. Excellent in binoculars. Dist=7,300 ly.
M47	Pup	☉	Bright star cluster. 15+ stars in 7x binoculars. Dist=1,500 ly.
M46	Pup	☉	Dist=5,400 ly. Contains planetary NGC 2438 (Mag 11, d=65") - not associated.
Mizar & Alcor	UMa	•	Good eyesight or binoculars reveals 2 stars. Not a binary. Mizar has a mag 4 companion.

Telescopic Objects

γ Andromedae	And	•	Attractive double star. Bright orange star with mag 5 blue companion. Sep=9.8".
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.
M67	Cnc	☉	Contains 500+ stars mag 10 & fainter. One of the oldest clusters. Dist=2,350 ly.
M94	CVn	☉	Compact nearly face-on spiral galaxy. Dist=15 million ly.
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".
M64	Com	☉	Black-Eye Galaxy. Discovered by J.E. Bode in 1775 - "a small, nebulous star".
3242	Hya	♃	Ghost of Jupiter. Bright blue disk. Mag 11 central star. Dist=2,600 ly.
γ Leonis	Leo	•	Superb pair of golden-yellow giant stars. Mags 2.2 & 3.5. Orbit=600 years. Sep=4.4".
β Monocerotis	Mon	•	Triple star. Mags 4.6, 5.0 & 5.4. Requires telescope to view arc-shape. Sep=7.3".
2264	Mon	☉	Christmas Tree Cluster. Associated with the Cone Nebula. Dist=2,450 ly.
σ Orionis	Ori	•	Superb multiple star. 2 mag 7 stars one side, mag 9 star on other. Struve 761 triple in field.
k Puppis	Pup	•	Telescope easily shows two blue-white stars of almost equal brightness. Sep=9.9".
M1	Tau	☉	Crab Nebula. Remnant from supernova which was visible in 1054. Dist=6,500 ly.
M81	UMa	☉	Beautiful spiral galaxy visible with binoculars. Easy to see in a telescope.
M82	UMa	☉	Close to M81 but much fainter and smaller.
γ Virginis	Vir	•	Superb pair of mag 3.5 yellow-white stars. Orbit=169 years. At their closest in 2005.