



**KAS Open Meeting**

**First Friday of  
Every Month**

March 6, 2020 @  
Round Table Pizza,  
4200 Gosford Road,  
Suite 101, Bakersfield, CA

Dinner & Social 6:30 pm  
Meeting/Program 7:30 pm

Round Table Pizza: You are now able to order online or through the phone prior to arriving to the monthly meeting, by doing so you will receive customer rewards.

<http://www.roundtablepizza.com/rtp/>

[661-397-1111](tel:661-397-1111)

**New Members / Membership Renewal**

- You can join / renew at our monthly meetings with cash, check, or credit card
- You can join / renew by mail using the form at the bottom of the newsletter

**Time to Renew Membership for 2020**

Join us on Facebook: <https://www.facebook.com/groups/syzygy/>

Visit our Web Page at <https://www.kernastro.org>

Contact us at [kernastronomicalsociety@gmail.com](mailto:kernastronomicalsociety@gmail.com)



**Reach for the Stars**



# This Month's Events

## MARCH 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6 	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

- Mar 6<sup>th</sup> – Monthly Meeting at Round Table Pizza
- Mar 14<sup>th</sup> – Last Quarter Moon Star Party at Chuchupate
- Mar 21<sup>st</sup> & Mar 22<sup>nd</sup> Wind Wolves Spring Nature Festival
- Mar 21<sup>st</sup> – New Moon Star Party at Chuchupate
- Mar 24<sup>th</sup> – Board Meeting at Doubletree

## Upcoming Programs – 2020

- March 6<sup>th</sup> – Angela Dorsey – Atomic Clock
- April 3<sup>rd</sup> – Omer Blaes – TBD
- May 1<sup>st</sup> – Tim Stoner – The Analemma
- June 5<sup>th</sup> – Rod Guice – TBD
- **July – No Meeting**
- August 7<sup>th</sup> – Mark Morrison – Sofia
- September 4<sup>th</sup> – Dark Sky Festival

## March Speaker

Dr. Angie Dorsey is an aerospace engineer working at NASA's Jet Propulsion Laboratory in Pasadena, California. She received her BS in Aerospace Engineering from the University of Alabama and a Ph.D. in Aerospace Engineering Sciences from the University of Colorado Boulder. She works in the area of high precision, space borne GPS receivers for use in scientific applications. She has been working on various space flight projects at JPL for 20 years.

## Kern Astronomical Society Public Outreach

Kern Astronomical Society (KAS) will host seven public "Star Parties" where we allow the public to look through our telescopes. These events start at 7:00 pm and run to about 10:00 pm. Here are the "weather permitting" dates and locations for 2020.

**River Walk Park:** April 4<sup>th</sup>, June 7<sup>th</sup>, and September 26<sup>th</sup> (near the main entrance)

**Barnes & Noble:** May 2<sup>nd</sup>, August 29<sup>th</sup>, and October 24<sup>th</sup> (near the entrance)

**Panorama Park:** July 25<sup>th</sup> (corner of Linden St. and Panorama Dr.)

# WIND WOLVES PRESERVE 7th ANNUAL SPRING NATURE FESTIVAL

**Saturday March 21 and Sunday March 22**

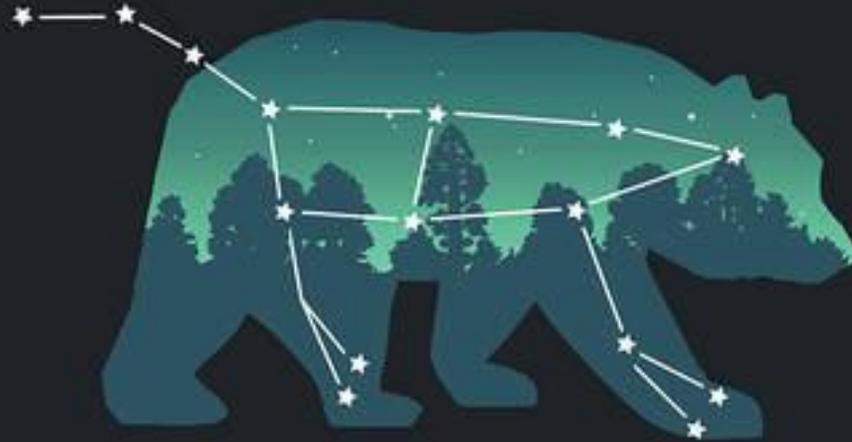
The Spring Nature Festival is Wind Wolves Preserve's biggest event of the year!

KAS will be there on both Saturday and Sunday to set up telescopes for solar viewing and a table with other information about Astronomy and our Club. All members are invited to come out and help. Plan to arrive at 9 AM to help set up. Look for more information and a sign-up sheet at our next monthly meeting on March 1.

The Festival features exhibits, hikes, native animals, and so much more. No registration is required for any activities. The nature festival is absolutely free! Will there be food? Yes! There will be a limited number of local food vendors. But you may want to just bring your own picnic lunch!



SEQUOIA AND KINGS CANYON  
NATIONAL PARKS



DARK SKY FESTIVAL  
WHERE THE STARS ALIGN

2020 DARK SKY FESTIVAL  
September 11, 12, & 13

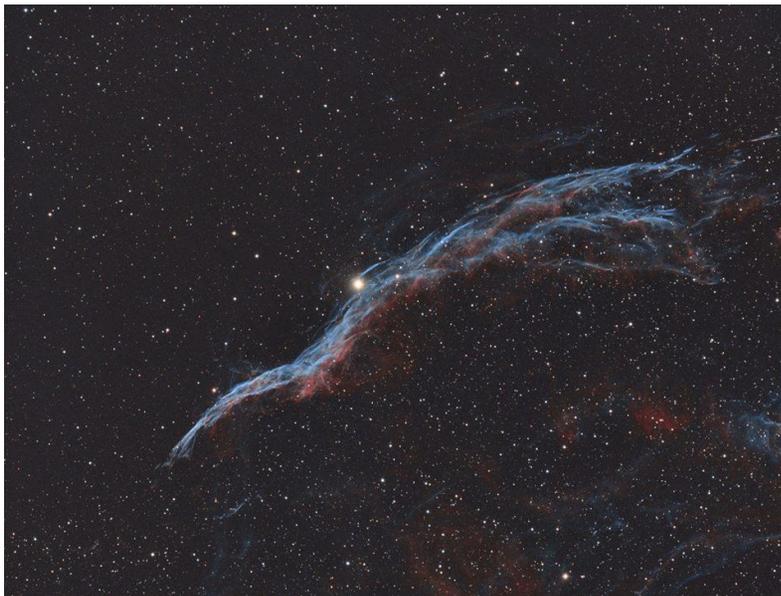
# KAS Astrophotography



Horsehead Nebula (Barnard 33) by: Kyle Druey



Orion Nebula (M42) with Trapezium by: Timothy Stoner



Witch's Broom (NGC 6960) by: Thien Ngo



Milky Way with Dark Horse Nebula by: Timothy Stoner



Dewars Chew Nebula (NGC 2371) by: Kyle Druey



Eagle Nebula (M16) by: Thien Ngo



Dumbbell Nebula (M27) by: Timothy Stoner



February Snow Moon by: Timothy Stoner

# The Evening Sky Map

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

**NORTHERN HEMISPHERE**  
**MARCH 2020**

## Sky Calendar - March 2020

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

- 1 Moon near the Pleiades (evening sky) at 22h UT.
- 2 Moon near Aldebaran (evening sky) at 15h UT.
- 2 First Quarter Moon at 19:57 UT.
- 6 Moon near Beehive cluster M44 (evening sky) at 23h UT.
- 8 Moon near Regulus (evening sky) at 11h UT.
- 9 Full Moon at 17:47 UT.
- 10 Moon at perigee (closest to Earth) at 6:24 UT (distance 357,122 km; angular size 33.5').
- 12 Moon near Spica (morning sky) at 1h UT.
- 15 Moon near Antares (morning sky) at 6h UT.
- 16 Last Quarter Moon at 9:35 UT.
- 18 Moon, Mars and Jupiter within a circle of diameter 1.6° (morning sky) at 10h UT. Mags. 0.9 and -2.1.
- 19 Moon near Saturn (59° from Sun, morning sky) at 1h UT. Mag. 0.7.
- 20 Vernal equinox at 3:54 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.
- 20 Mars 0.7° S of Jupiter (67° from Sun, morning sky) at 11h UT. Mags. 0.9 and -2.1.
- 21 Moon near Mercury (28° from Sun, morning sky) at 21h UT. Mag. 0.3.
- 24 Mercury at greatest elongation west (28° from Sun, morning sky) at 2h UT. Mag. 0.3.
- 24 New Moon at 9:28 UT. Start of lunation 1203.
- 24 Moon at apogee (farthest from Earth) at 15h UT (distance 406,692 km; angular size 29.4').
- 24 Venus at greatest elongation east (46° from Sun, evening sky) at 22h UT. Mag. -4.4.
- 28 Moon near Venus (evening sky) at 16h UT. Mag. -4.4.
- 29 Moon near the Pleiades (evening sky) at 4h UT.
- 29 Moon near Aldebaran (evening sky) at 22h UT.
- 31 Mars 0.9° SE of Saturn (morning sky) at 18h UT. Mags. 0.8 and 0.7.

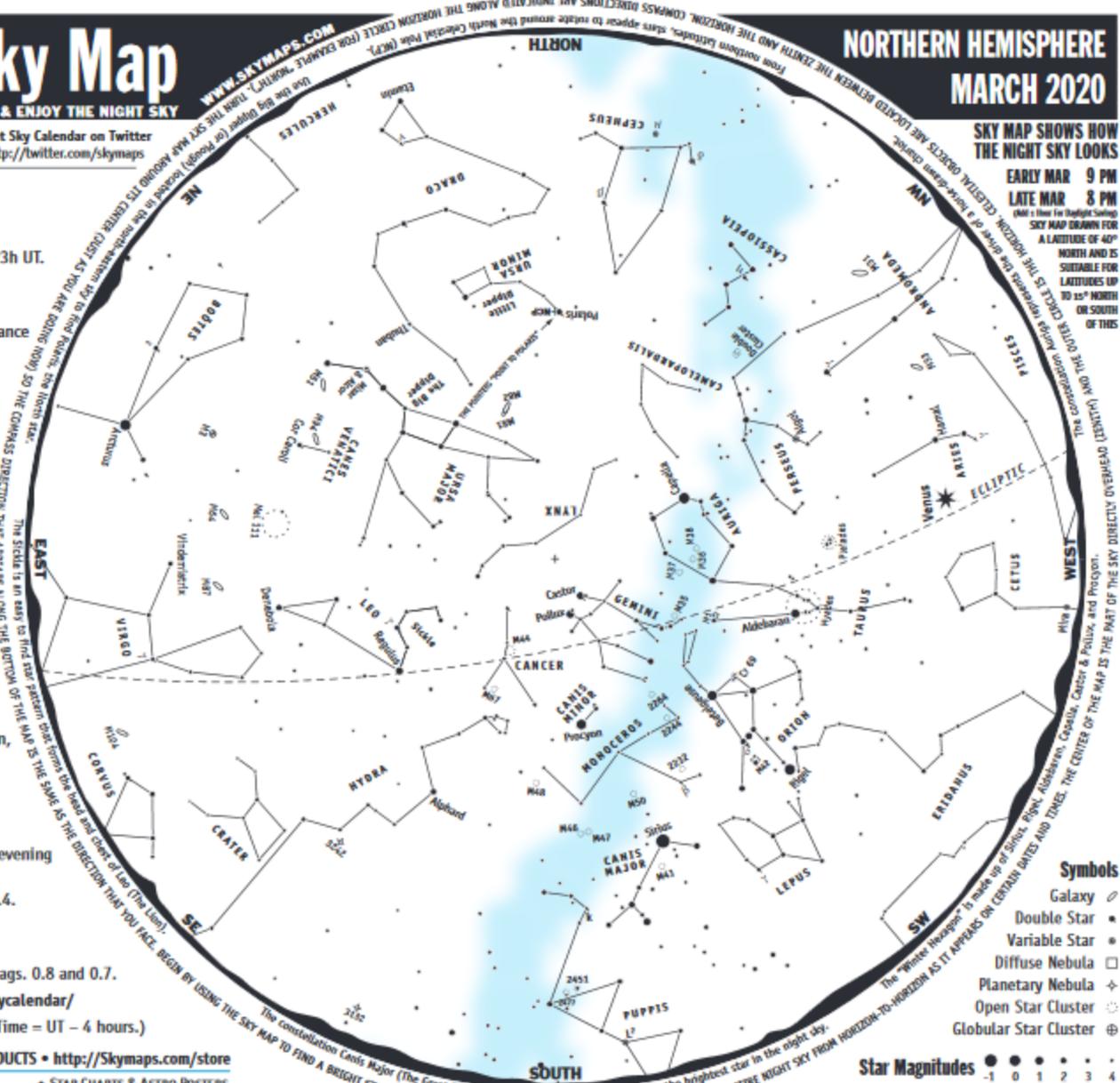
More sky events and links at <http://Skymaps.com/skycalendar/>

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



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

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



**SKY MAP SHOWS HOW THE NIGHT SKY LOOKS**

**EARLY MAR 9 PM**  
**LATE MAR 8 PM**  
(Mars is three full daylight savings hours ahead of the Sun)  
SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 25° NORTH OR SOUTH OF THIS

### Symbols

- Galaxy
- Double Star
- Variable Star
- Diffuse Nebula
- Planetary Nebula
- Open Star Cluster
- Globular 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  
MARCH 2020

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".
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.
ο 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.
M87	Vir	• Supergiant galaxy with supermassive black hole at its core. Dist=53.5 million ly.
γ Virginis	Vir	• Superb pair of mag 3.5 yellow-white stars. Orbit=169 years. At their closest in 2005.

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# Popular Spring Objects

by Walter Albrecht

Spring is coming fast and club members are cleaning their telescopes and watching the weather reports for clear nights. Today we will talk about three objects that are popular with club members when they go up to the mountains to observe.



M13 is a popular object at almost any star party and it is not hard to see why. It is a bright globular cluster easily found between the bright stars Zeta and Eta Herculis in the constellation Hercules. In a pair of binoculars it appears as a fuzzy patch of light. A six inch telescope may allow one to see some individual stars. Large telescopes will reveal a multitude of stars like sugar crystals sprinkled on to black velvet.

The Sombrero Galaxy is found in the constellation Virgo although many people prefer to look above the constellation Corvus to find it. This edge on galaxy is known for the large dust lane that runs through it thus giving the appearance of a sombrero. The dust lane may be glimpsed in a six inch telescope but larger apertures will make it more obvious.



Epsilon Lyrae is also known as the double double in the constellation Lyra. At first glance this will appear as a double star but upon closer examination each star is also a double. The stars may be easily observed in a six inch telescope. A good test for your telescope is to see if you can see the smaller pairs as well.



# KAS Sky Patrol Program

by Walter Albrecht



The KAS Sky Patrol is a program that will provide many activities to introduce KAS members to the exciting world of amateur astronomy. In order to complete the program you will need a copy of the sky patrol workbook. Workbooks will be available at our monthly meetings. There are two levels in the KAS Sky Patrol program. Level one has activities that can be completed in the city or suburbs. Level two activities will probably need to be completed in a dark sky location. Members are eligible to receive pins for completing the requisite number of activities in each level.

The KAS Sky Patrol can be completed by any KAS club member. Just complete at least 5 activities from level one and you will receive a pin. Complete at least 5 observations from level two and you can receive a second pin.

Many tasks are inspired by the Sky Puppies Observing Club from the Astronomical League. Should a child under the age of 11 wish to tackle the Sky Puppies Observing Club they will need to go online to the Astronomical League website for further information. The Astronomical League will issue a pin if you complete their Sky Puppies program. Remember that all KAS members are also members of the Astronomical League. Please see a KAS board member for further information.

Please note that the KAS Sky Patrol is a great family project and parents are encouraged to help their children complete the various tasks. Some of the projects can be developed into science fair or STEM fair projects.

For more information on the Astronomical League: <https://www.astroleague.org/>

## Kern Astronomical Society InfoShare

Since 1956, the Kern Astronomical Society has promoted community awareness of current events in astronomy, and provides a forum for sharing of knowledge and experiences among amateur astronomers. Annual membership is \$25.00 which also provides membership in the Amateur Astronomical League, access to their newsletter (Reflector Magazine), and participation in observational programs.

### Star Parties and Outreach

The Kern Astronomical Society typically has two Club Star Parties each month depending on the weather. Our Club Parties are held on Saturdays nearest the New Moon. We also host Public Star Parties at various locations around town during April - October. These parties are held on Saturdays nearest the first quarter Moon. In addition, we also host Lunar, Solar, and Planetary viewing for Public Schools. Requests may be directed to our Star Party Coordinator.

### Club Equipment

The Kern Astronomical Society has telescopes and accessories (listed below) available for loan to Club Members in good standing. Members are encouraged to borrow the different types of telescopes in stock (especially if you are considering purchasing one). Trying out different sizes and types of telescopes can help you make an informed decision about purchases. If you have a Club telescope in your possession, you will be expected to participate in at least one public star party.

- 6" f/6, 8" f/6, 10" f/5.6, 13" f/4.5 Dobsonian telescopes, Parks Jovian 90, 3 ½" f/13 Maksukov-Cassegrain, 4" f/15 Unitron Refractor
- 8" Solar Filter
- Assorted eyepieces

### KAS Board Members

President:	Gregg Pytlak	ggpytlak@yahoo.com
Vice President:	Diane Franco	dianef02@yahoo.com
Treasurer:	Mary Hanel	hanel1125@att.net
Secretary:	Angel Gil	angel.gil3021@email.bakersfieldcollege.edu
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Star Party Coordinator:	Darren Bly	dcbly@bak.rr.com
Educational Committee Chair	Walter Albrecht	melchior1472@gmail.com
Educational Youth Ambassador	Claire Im	claire2133@gmail.com
Newsletter Editor	Timothy Stoner	desert_enduro@hotmail.com

# Kern Astronomical Society

Membership New/Renewal    March 2020/2021

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Family Members: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Email:\* \_\_\_\_\_

My check# \_\_\_\_\_ for (or cash) the amount of \$ \_\_\_\_\_ is enclosed.

(Check box)

Yearly Membership        \$25    March 2020 – March 2021

Make checks payable to: KAS (or) Kern Astronomical Society

You can also mail form and check to:

**KAS**  
**5501 Stockdale Hwy #10241**  
**Bakersfield, CA 93389**

\*\* Please provide the email address where you wish to receive the KAS newsletter (if different than above)

“SYZYGY”: \_\_\_\_\_