



The Newsletter of the Kern Astronomical Society    No. 555    December 2021

**KAS DECEMBER MEETING (ANNUAL CHRISTMAS PARTY)  
WILL BE HELD ON DECEMBER 10<sup>th</sup>  
Round Table Pizza at 4200 Gosford Road  
**No Meeting on Friday December 3<sup>rd</sup>****

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**





## **KAS Annual Christmas Party**

We will be holding our annual Christmas Party on Friday, December 10th, at our regular meeting place at Round Table Pizza at 4200 Gosford Road. Bring a dessert to share. We will have a table set up for a “dessert bar”. Pizza and drinks can be ordered as usual. The party starts at 6:30 pm just like our regular meetings.

## **Upcoming Meetings**

December – Christmas Party

February - TBD

January - TBD

March – Omer Blaes

## **In Appreciation**

I want to express my sincere gratitude to Dr. Steve Collett for his donation of Astronomy and Science books to the Kern Astronomical Society. Dr.Collett was a long time member and past president for many years. Along with his organization skills he is a talented telescope maker building many of the club scopes that we are still using today. Those of us fortunate enough to have purchased his binocular mount will always have a special one of kind treasure. We will have the books available on Friday December 10th at our Dessert Potluck Christmas Gathering for all members! The books are free! Bring a dessert and join in on the fun!

Cheers!

Diane Franco



## Upcoming Star Parties

New moon star party on December 4<sup>th</sup> at Chuchupate. Check the KAS Facebook page or your e-mails for updates.

## Important Messages from the Board

**Membership:** We are now collecting annual membership fees for 2022. New members can join for our annual fee which will cover the remaining months of 2021 and year 2022. Annual membership is \$25. There is an application form at the end of the newsletter.

**Election of Club Officers:** Our annual election of club officers will be postponed until after the first of the year. So far, most of the current officers have been contacted and have confirmed that they will remain in their positions until a new election is held. However, we are in need of someone to fill the club secretary position. If interested, please e-mail Gregg Pytlak at [gpytlak@yahoo.com](mailto:gpytlak@yahoo.com). Here is a description of the duties:

### **Secretary Position Duties from the Club Bylaws:**

Section 4: The Secretary shall keep records, submit notices, and make reports to the members and Board of Directors, and perform such duties as are incidental to the office. The secretary must assist the treasurer in record keeping of the KAS membership list updated by administering sign in sheets at all meetings.



# Curious Minds in Tanzania

by: Walter Albrecht

**Eliatosha Maleko, a Standard 6 school teacher of English, geography, and science has a science club every Friday at the Ilboru Primary School in Arusha, Tanzania. Maleko plays the Eyes in the Skies podcast in Swahili to his students using his cell phone. Thanks to a donation of a rechargeable bluetooth speaker he is able to play the podcast for the entire club of approximately 60 students. He also has a laptop but the screen is difficult to see in a large class.**



**The students are learning about lenses and after listening to the podcast the students go outside and try to make lenses with pieces of glass and sticks. They want to make an instrument that will help them understand the universe. The students have a lot of questions about what they have learned. Maleko is a member of Astronomers Without Borders (AWB) and he posted his students' questions for other members to answer.**



**Here is a sample of their inquiries and my responses:**

**Dear Students from the Science Club, I trust that you are doing well. I am pleased to answer your great questions.**

**Clara Elirehema asked: Here in the world there are a variety of minerals that are very important in the production of various substances, do not experts see the importance of using solar gases such as Hydrogen gas which is more than 92 percent, Helium 83 percent that make up the sun?**

**Dear Clara Elirehema, There has been a lot of research in making cars that run on hydrogen. The problem is that making the hydrogen consumes more energy than it creates. Scientists are also working on creating nuclear fusion reactors that convert hydrogen to helium thus releasing huge amounts of energy. This is how the sun works. Tokamak Energy a company in Britain is working on making a fusion reactor. They have to create temperatures as high as 100 million degrees celsius for it to work. That is 7 times hotter than the center of the sun.**

**Emperor Abasi asked: What effect does solar wind have on living organisms or what effects if it reaches the earth?**

**Dear Emperor Abasi, The Earth's magnetic field protects us from solar wind. If the wind is strong it can cause auroras in the sky with bright colors you can see at night. But you need to be near the South Pole or North Pole.**

**Be thankful for our magnetic field because if the Earth had no magnetic field the solar wind would blow away our atmosphere making it difficult for life to exist. Mars lost its magnetic field long ago so its atmosphere is very thin.**



**Peter Elieta asked: What are the benefits of meteors in the lives of humans or other living things? How big are meteors? And why do the burning particles not fall to the ground as the mineral contains what minerals? Why do meteor showers occur in December each year and not other months? What is the secret in that month?**

**Dear Peter Eliata, People long ago used the iron in meteorites to make weapons and tools. Nowadays people smelt iron ore to make iron and steel. A meteorite can be anywhere between the size of a grain of sand to one meter in diameter. Anything larger is considered to be an asteroid. Larger meteors will land on the ground but they can be**



**hard to find. A desert is a good place to look. The tiny particles will not fall to the ground right away but they can be attracted to rain drops and reach the ground that way. Actually there are meteor showers all year long. Here is a link to find out about the meteor showers.**

**<https://www.amsmeteors.org/meteor-showers/meteor-shower-calendar/>**

**Thank you for your excellent questions. I wish you all the best in the future.**

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**Walter Albrecht**

**Bakersfield**  
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**Maleko is an Astronomy Ambassador for the Mount Meru Astronomical Observatory. Mount Meru (14,968 feet) is about an hour from Arusha. It is dwarfed by its famous neighbor Mount Kilimanjaro. Students and teachers visit the observatory for a chance to experience the wonders of the universe.**

**The Mount Meru Astronomical Observatory can be traced back to the summer of 2010 when Sue and Chuck Ruehle traveled from Wisconsin to Tanzania bringing along three 50mm Galileoscopes. They donated the scopes to local secondary schools in the foothills of Mount Meru. The schools received the telescopes, eyepieces, and additional gear. They instructed the teachers on how to use the equipment, held star parties for the community, and shared their passion for amateur astronomy. Sue and Chuck got together with AWB to get support for the Telescopes to Tanzania project. In 2013 Chuck met filmmaker Kai Staats who helped in the design and construction of an observatory in the foothills of Mount Meru. After Chuck died in 2016**





**Kai took over the project. In 2019 AWB and generous supporters completed a roll off roof observatory with a 1969 12" Cave-Cassegrain telescope lovingly restored by members of the Racine, Wisconsin Astronomy Club. Today the observatory works with local teachers like Eliatosha Maleko to be astronomy ambassadors who share their love of astronomy with their students and communities.**



**Fun trivia fact: The movie Hatari! (1962) starring John Wayne was filmed in Arusha and the Arusha National Park. I hear that you can see Mount Meru in some of the shots.**

**By Walter Albrecht**

**Links of interest:**

**Video of Maleko's class asking questions:**

**[https://mmao.space/wp-content/uploads/2021/07/WhatsApp-Video-2021-07-09-at-15.58.13.mp4?\\_=1](https://mmao.space/wp-content/uploads/2021/07/WhatsApp-Video-2021-07-09-at-15.58.13.mp4?_=1)**

**Telescopes to Tanzania Facebook:**

**<https://www.facebook.com/groups/telescopestotanzania/>**

**Mount Meru Astronomical Observatory:**

**<https://mmao.space>**

**Astronomers Without Borders:**

**<https://my.astronomerswithoutborders.org/home>**



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

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

- 1 Moon near Spica at 4h UT (45° from Sun, morning sky).
- 3 Moon near Mars at 2h UT (18° from Sun, morning sky). Mag. 1.6.
- 4 New Moon at 7:43 UT. Start of lunation 1224.
- 4 Moon at perigee (closest to Earth) at 10:12 UT (distance 356,794 km; angular size 33.5'). 2.5 hours after New Moon.
- 6 Moon at southernmost declination (-26.33°) at 3h UT.
- 7 Moon near Venus at 2h UT (evening sky). Mag. -4.7.
- 7 Venus at its brightest at 16h UT. Mag. -4.7.
- 8 Moon near Saturn at 4h UT (evening sky). Mag. 0.7.
- 9 Moon near Jupiter at 10h UT (evening sky). Mag. -2.2.
- 11 First Quarter Moon at 1:36 UT.
- 14 Geminid Meteor Shower peaks in a broad maximum centred at 7h UT. Produces bright, medium-speed meteors at its peak (up to 80 meteors/hour). Most reliable annual meteor shower. Easy to observe (radiant on sky map). Best after midnight. Some interference from moonlight.
- 16 Moon near the Pleiades at 23h UT (evening sky).
- 17 Moon near Aldebaran at 17h UT (evening sky).
- 18 Moon at apogee (farthest from Earth) at 2h UT (distance 406,320 km; angular size 29.4').
- 19 Full Moon at 4:37 UT.
- 21 December solstice at 15:57 UT. The time when the Sun reaches the point farthest south of the celestial equator marking the start of winter in the Northern Hemisphere and summer in the Southern Hemisphere.
- 22 Moon near Beehive cluster M44 at 13h UT (morning sky).
- 24 Moon near Regulus at 9h UT (morning sky).
- 27 Last Quarter Moon at 2:25 UT.
- 27 Mars 4.5° N of Antares at 20h UT (26° from Sun, morning sky). Mags. 1.6 and 1.0. The red planet pairs up with its red "rival".
- 28 Moon near Spica at 13h UT (morning sky).
- 29 Mercury 4.2° S of Venus at 6h UT (17° from Sun, evening sky). Mags. -0.7 and -4.4.

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

All times in Universal Time (UT). (USA Eastern Standard Time = UT - 5 hours.)



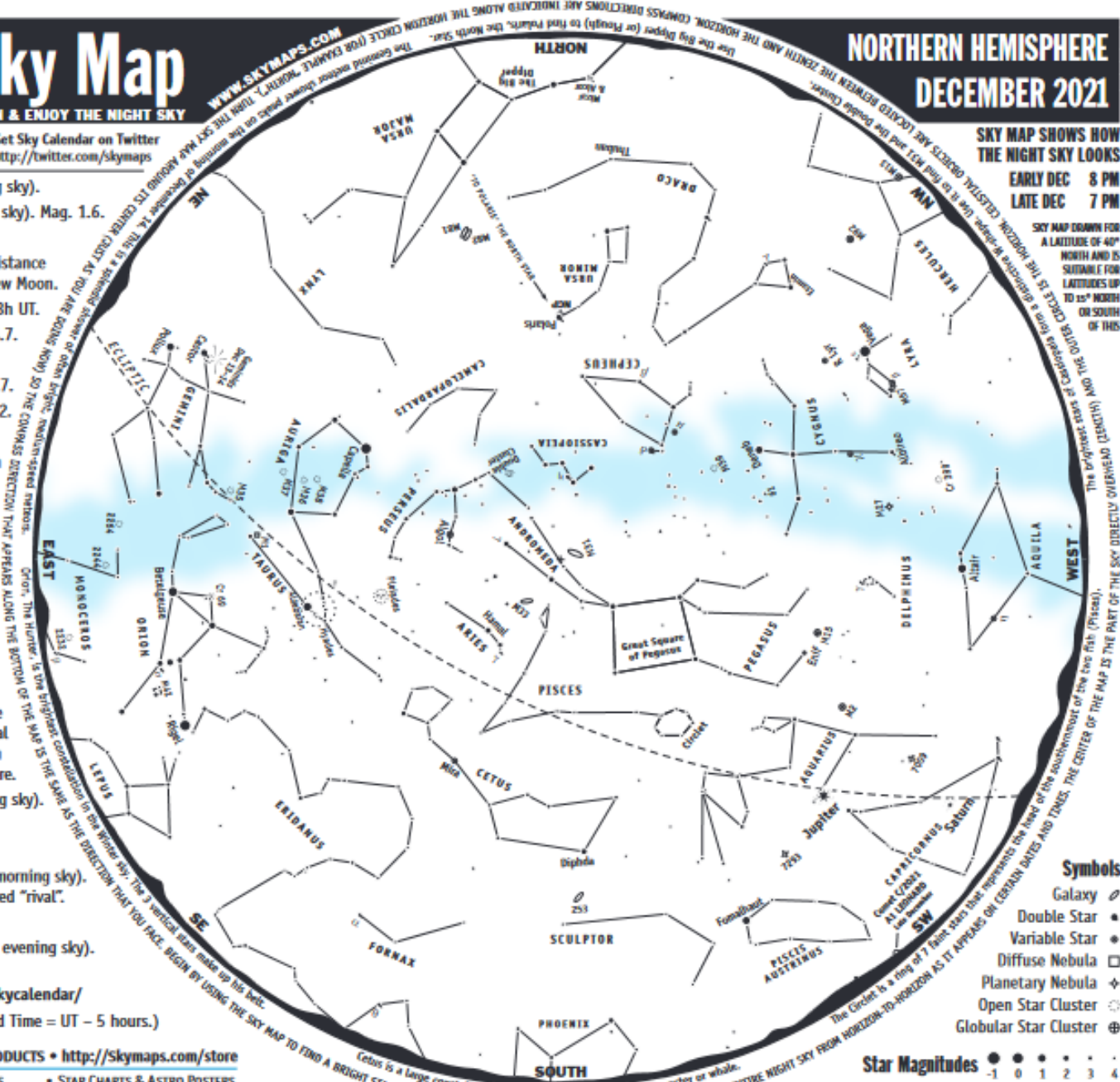
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- STAR ATLASES & PLANISPHERES
  - STAR CHARTS & ASTRO POSTERS
  - BOOKS FOR SKY WATCHERS
  - TELESCOPES & BINOCULARS
- All sales support the production and free distribution of The Evening Sky Map.








### SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

|           |      |
|-----------|------|
| EARLY DEC | 8 PM |
| LATE DEC  | 7 PM |

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 
- Globular Star Cluster 

Star Magnitudes ● ● ● ● ● ●

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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  
DECEMBER 2021

# CELESTIAL OBJECTS



### 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.       |
| α 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.         |
| 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.                      |
| Vega       | Lyr | • The 5th brightest star in the sky. A blue-white star. Dist=25.0 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.           |
| Fomalhaut  | Psa | • Brightest star in Piscis Austrinus. In Arabic the "fish's mouth". Dist=25 ly.               |
| 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=65 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.           |
| 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.          |
| 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.                          |
| μ Cephei       | Cop   | ● | Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.                |
| Mira           | Cet   | ● | Famous long period variable star. Mag varies between 3.0 & 10.1 over 332 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.           |
| M35            | Gem   | ○ | Fine open cluster located near foot of the twin Castor. Dist=2,800 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.         |
| R Lyrae        | R Lyr | ● | Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.                      |
| Cr 69          | Ori   | ○ | Lambda Orionis Cluster. Dist=1,630 ly.   |
| M42            | Ori   | □ | The Great Orion Nebula. Spectacular bright nebula. Best in telescopes. Dist=1,300 light years. |
| 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.              |
| 253            | Scl   | ♂ | Fine, large, cigar-shaped galaxy. Requires dark sky. Member of Sculptor Group.                 |
| 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=0.8".                |
| 7000          | 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".             |
| γ 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 Eridani     | Eri | • | Striking blue-white double star. Mags 3.2 & 4.3. Visible in a small telescope. Sep=8.2".       |
| 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.                              |
| α Orionis     | Ori | • | Superb multiple star. 2 mag 7 stars one side, mag 9 star on other. Struve 761 triple in field. |
| M1            | Tau | □ | Crab Nebula. Remnant from supernova which was visible in 1054. Dist=6,500 ly.                  |
| M33           | Tri | ♦ | Fine face-on spiral galaxy. Requires a large aperture telescope. Dist=2.3 million 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.   |
| M27           | Vul | ♦ | Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.             |



## 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 1/2" f/13 Maksukov-Cassegrain, 4" f/15 Unitron Refractor
- 8" Solar Filter
- Assorted eyepieces

### KAS Club Officers and Support Staff

|                                |                |  |
|--------------------------------|----------------|--|
| President:                     | Gregg Pytlak   | <a href="mailto:gpytlak@yahoo.com">gpytlak@yahoo.com</a>                 |
| Vice President:                | Diane Franco   | <a href="mailto:dianef02@yahoo.com">dianef02@yahoo.com</a>               |
| Treasurer                      | Pam Miller     | <a href="mailto:dgmpsm2@yahoo.com">dgmpsm2@yahoo.com</a>                 |
| Secretary                      |                |  |
| Star Party / Event Coordinator | Darren Bly     | <a href="mailto:dcbly@bak.rr.com">dcbly@bak.rr.com</a>                   |
| Educational Committee Chair    |                |  |
| Educational Youth Ambassador   |                |  |
| Newsletter Editor              | Timothy Stoner | <a href="mailto:desert_enduro@hotmail.com">desert_enduro@hotmail.com</a> |
| Webmaster                      | Ivan Aburto    | <a href="mailto:ivanaburto88@gmail.com">ivanaburto88@gmail.com</a>       |



# Kern Astronomical Society

## Membership New/Renewal 2022

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

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

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

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

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

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

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

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

Yearly Membership \$25

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

You can also mail this 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": \_\_\_\_\_