

CLEAR SKIES

a Champaign-Urbana Astronomical Society publication

May, 2019

Club News

A “CUAS thank you” goes out to Dr. Zach Putnam who gave us a wonderful talk on April 11 regarding the SASSI 2 Cubesat launch. Their launch was to occur on April 17 near 4pm but we haven’t found any press release to determine if the mission was successful. Dr. Putnam has been emailed but we have yet to hear back from him.

A cursory look at the **calendar** will reveal that club has many events coming up in May; some were just added. We hope you’ll consider volunteering for one or more of these events. In addition to our monthly open houses, we now have the following:

- ★ Saturday, May 11 is “Market at the Square” from 8-noon at Lincoln Square Mall. We have typically staffed a table and offered solar observing. We pick up the tent and tables from Loomis Physics Lab on the UI campus. We publicize the open house that evening, too.
- ★ Right after “Market,” we have been invited to participate in “Astronomy Day” at the Orpheum Children’s Science Museum in downtown Champaign. Education Coordinator Alex Dour has the same NISE kits the planetarium now owns and they are setting up eight stations in the main theater area. Each station will have detailed instructions. This will be much like our May 12 library function. If you’d like to help, you can sign up for a station here: <https://www.signupgenius.com/go/60b0c4fa8ac2fa4f49-astronomy>.
- ★ Sunday, May 12 is “Earth & Space Day” at the Champaign Public Library. We could use several volunteers to staff tables from noon to 2pm in the big activity room. We will be using the science kits given to the planetarium from NISE. A list of activities appears in this newsletter.
- ★ Thursday, May 16 will be the last episode of the “Big Bang Theory” and WCIA’s “CI Living” program will be broadcast live from the planetarium. CUAS will have a table in the lobby to be staffed from 3-3:45pm (set-up is at 2:30pm). Again we can use one of the NISE kits.
- ★ Though not a club event, on May 18, children’s author Alice McGinty will be signing her new book in the planetarium lobby. The new work is entitled “The Girl Who Named Pluto: The Story of Venetia Burney.” She will have the book for sale on site. (<https://www.amazon.com/Girl-Who-Named-Pluto-Venetia/dp/1524768316/>)

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- ★ Our good friend from Westville, Father Timothy Sauppe, is planning a star party for area residents at the Kennekuk County Park, northwest of Danville. He plans to have refreshments at the Environmental Education Center, plus a couple of talks and a video all on light pollution. And he’d like to have a telescope or two set-up outside the Center for viewing. The park can be found by taking I-72 towards Danville but take the route 150 exit, then take the next left on CR 1300E (Henning Road). The park entrance will be on your left. A park map can be found here: <http://www.vccd.org/wp-content/uploads/2018/09/KennekukParkMap.pdf>
- ★ Though it is in June, the big Dark Sky Celebration will be at the Middle Fork River Forest Preserve on June 1. Telescope and food truck set-up will be at 5pm. Remarks and the unveiling of the sign occur at 6pm at the Activity Center. Hands-on activities for the kids begin at 7pm with observing to follow at 9pm. The forest preserve staff is handling the kids activities but CUAS may have a table if we desire one. See the map on page #3 as to telescope set-up areas. Matt Kuntz, site superintendent, is suggesting the areas marked in red. The Activity Center is to the right. East of the Center will be some tallgrass prairie that they plan on mowing. If you set-up south of the pond, you may want to park west of the pond and not at the Activity Center. Matt says that globe lighting at the Activity Center parking lot will be replaced with fully-shielded LED fixtures by June 1. Many local legislators are being invited to this event.

Anyone who wants to do a 5-minute **AST 101 session** at one of the meetings, contact Erik Johnson. We still need people from June on. Recall the sessions are to introduce the world of astronomy to the novice.

The new **Girl Scouts** badges were discussed at the February meeting. It was thought that we could have a table at the open house sessions where scouts could check in.. A summary of what each should be doing under a real sky is as follows:

- ★ Explorer (K-3): Look at the Moon

(Continued on page 3)

President's Message

We had more clouds at the April Family Skywatch. On the bright side, Jim Wehmer, the CUAS vice president, tells us that 13 people came to the observatory before sunset to be trained on the new system he has set up with the dome telescope he dubbed "Ruby." I'm looking forward to familiarizing myself with the SkyCommander setting circles as well, and I hope we can use it at the Family Skywatch on May 11. Even if the skies are uncooperative that evening, we will be at the farmers market in Urbana in the morning.

The club would like to thank Zach Putnam from the Department of Aerospace Engineering at the U of I for coming to give a talk about SASSI2. It's great to hear that students are helping build satellites to perform research. It appears the launch of the rocket on April 17 was successful. Since SASSI2 is only expected to be in orbit for 12 days, it should be reentering the atmosphere around the day I write this. Here's the video of the launch. <http://www.ustream.tv/recorded/121318148>

Lauren Pearce followed up that talk with an Astro 101 discussion of solar observing. I have only used the Coronado brand of solar telescope, so it was fascinating to get a comparison between their tilt-tuning hydrogen-alpha filters and the etalons used in Lunt telescopes. As an aside, we may want to put Astro 101 slides on the members' portion of the club website with the presenters' approval.

I have invited Tim Stone from the Twin Cities Amateur Astronomers to speak at our club meeting in May. Those of you who have attended our club "summits" or our eclipse trip to Camp Ondesonk may have met him and seen his amazing photographs taken at their club's observatory at Sugar Grove Nature Center. He plans to give a talk about amateur spectroscopy, and you can see some of his photos here. <http://tcaa.us/Astrophotos.aspx>

After Tim's presentation, Jim Wehmer has offered to show us details about stellar evolution for Astro 101. There are enough possible paths for stars that you need a flowchart to consider all the options, such as this example from the website for the Chandra X-ray Observatory. http://chandra.harvard.edu/graphics/xray_sources/stellar_fate_type1a_label.jpg The same star can't become a red dwarf, a neutron star, and a white dwarf. Each of those types of stars would be a worthy subject of discussion for Astro 101, and the Chandra website has some great educational materials to work from. Please consider sharing a little of what you've learned about astronomy with the club in the coming months.

Another naming campaign caught my attention this month. The astronomers who helped discover one of the largest worlds in the Solar System, a Kuiper belt object named 2007 OR10, are putting the name up to a public vote. This object is likely round and may be classified as a dwarf planet in the future, but it needs a name first. You can cast your vote for Vili, Holle, or Gonggong on this website. <https://2007or10.name/>

The other piece of news that excited me is from *Gaia*'s survey of a billion stars in the sky. Since the space telescope is measuring the precise distances to these objects, we have a better sense of how stars are clustered in our galaxy. This includes a number of streams of stars that appear to have been ripped away from globular clusters, implying that globular clusters may be the cores of galaxies that were assimilated into the Milky Way. When we see globular clusters, we could be seeing the leftover peach pits from a galactic snack.

I have no official news to share about the director position for Staerkel Planetarium. The board of trustees for Parkland College needs to approve the selection at their next meeting. The announcement should be included in a press release on May 15.

Clear skies!

Erik



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www.champaignparks.com





an adjacent yard shining into their windows. What can you do? Read this for starters: <http://dark-sky.org/our-work/lighting/lighting-for-citizens/my-neighbors-lighting>.

For our new members, note that we try to

- ★ Adventurer (grades 2-3): Attend a star party, take an observatory tour, look through telescope
- ★ Investigator (grades 4-5): Attend a star party, find any current planets

Programming note: WILL will air a three-part series on the Apollo 11 mission to the Moon on July 8, 9 and 10. There may be a sneak preview event at the planetarium during the last week of June, though details are sketchy as this issue goes to press.

The web site is: <http://cuas.org/about-page/new-observatory-construction/> You can donate today if you wish!! There is also a gofundme page for the observatory but, given the fees involved, this is for others to contribute. Club members should use our web page.

There's a new feature on club web site under "resources" called simply "for sale." You may find telescopes for sale here OR maybe you have some equipment you want to sell. You can see what's there directly by clicking here: <http://cuas.org/resources/for-sale>.

We should start thinking about our **4th of July parade float!** At the April meeting, there was talk of a 1/3 scale Eagle lunar module on the trailer. Maybe we can turn the Mars globe on the back panel (which was originally a solar eclipse) into the Moon. The theme for this year is "Flight in Space." Also, outgoing planetarium director and former CUAS president, Dave Leake has been tabbed to be the grand marshal of this year's parade.

Light Pollution update Dinosaur National Monument, near Jensen, Utah, is the latest addition to the Dark Sky Park list. They have 35 events this year dealing with dark skies. There are now over 100 Dark Sky Parks across the globe we talk to a number of people each year who have lights from

have volunteers in place for the "Family Skywatch" sessions (free public open houses). These occur on the Saturday closest to the first quarter Moon. During the New Moon weekend (the week before), we have a members-only night. We do not publicize these dates though members can bring guests. We do not pre-arrange volunteers for the members-only sessions. Jim Wehmer brought fliers to the March meeting that publicize our summer open houses. Feel free to take a few and post them at your work or anyplace that is appropriate (libraries? Grocery stores? Etc).

Treasurer's Report: from treasurer Jeff Kouzmanoff: will give a report at the May 9 meeting.

CUAS members can login to the member's side of the web site by using . . . name: user1, password: test. *This is for members – please don't share this with others.* Email Jeff Kouzmanoff at jtk@shout.net with input or edits.

If you have photos to contribute to CUAS, create an album on Flickr (or any other photo site) and send the link to Jeff Kouzmanoff. Send them to <https://kazpics.smugmug.com/upload/BJHwWd/cuasmars>. The photo page on our web site is at: <http://cuas.org/photos>.

If you're renewing **Sky & Telescope** magazine through the club, use this web site: www.skyandtelescope.com/clubspecial. The club rate is \$33 annually for 12 issues.

We are **exchanging monthly newsletters** with both the Twin City Amateur Astronomers (Bloomington-Normal) and the Rockford Astronomical Society. Back issues appear on our web site.

Join the **club listserv** and get viewing information in advance! This is a yahoo group that you have to join. See the web site

Looking Up This Month

We keep talking about Mars first as it's still in the evening sky . . . and we'll probably keep talking about it for a couple more months. The planet is getting closer to the horizon, but slowly. This month the set-time goes from 11:15pm CDT early in the month to just after 10:30pm late in the month. Not much difference. To accomplish this, Mars cruises along the ecliptic path from Taurus into Gemini. On the evening of May 7, Mars is situated between the "horn stars" of Taurus and a thin crescent Moon is to the lower left. On the 16th, it officially leaves Taurus and enters Gemini. If you can catch Mars in a dark sky, on the evening of the 19th, it is just above the rich star cluster, Messier 35. The planet creeps eastward, ending the month just below the star Mebsuta (ε Geminorum). Did you hear we found a few "Marsquakes" with the InSight lander's seismometer?

Mars get some company towards the end of the month as Mercury goes through superior conjunction on May 21 and heads to the evening sky. Mercury sets an hour after sunset on the last day of May and will be highest in the sky in mid-June. On May 30, Mercury makes a nice inverted triangle with Mars to the upper left and Capella to the upper right. Use binoculars in the twilight in the west-northwest. More on this planet next month.

Jupiter now appears in our evening sky in the southeast, rising at 11:15pm at the beginning of May (the same time Mars sets) to 9pm at the end. It rises about 40 minutes after Antares.

Opposition for Jupiter (when it rises at sunset) occurs early next month. The only issue with Jupiter will be its low altitude. When Jupiter is at its highest (about 2:30am), it is still only 27 degrees (just under three fists) high. Jupiter is in the constellation Ophiuchus. At magnitude -2.5, it will be the brightest star-like object in the area. A just-past-full Moon is to the right of Jupiter

Saturn trails Jupiter by just under two hours. At magnitude 0.37, it's substantially fainter than Jupiter but still pretty bright. I should be easy to pick out in eastern Sagittarius, to the left of the teapot asterism. It is highest in the sky dur-

ing the hours before sunrise. The tilt of the rings (as we see them anyway) is increasing.

Venus is tough to see just before sunrise. You need a low, unobstructed horizon, then look just north of east. Through May, Venus rises about an hour before sunrise. Like last month, each morning it seems to rise further to the north but it doesn't seem to change altitude. By the end of the month, a thin crescent Moon appears to the upper right of Venus.

The Earth crosses the path of Halley's Comet twice per year with one of those times being in early May. Any dust particles slowing in the atmosphere result in the Eta Aquarid Meteor Shower. The shower peaks on the morning of May 6, just two days after New Moon. The shower favors the southern hemisphere but, if you're out and it's clear (which has been rare as of late!), keep your eyes skyward.

Those up for more of a challenge should make an attempt to see the innermost dwarf planet, Ceres. As the chart shows, the dwarf planet/asteroid is heading westward above Scorpius and to the upper right of Jupiter. The bright star on the left in the chart is Eta Ophiuchi. Opposition occurs on May 28/29 but the object doesn't get any brighter than magnitude 7, so you'll need at least some binoculars. On the night of the 24th, Ceres splits between the stars Phi and Chi Ophiuchi. You might try looking a week before this to memorize the starfield, then watch the asteroid pass between the stars. -DCL



New Moon

May 4
June 3



1st Quarter

May 11
June 10



Full Moon

May 18
June 17

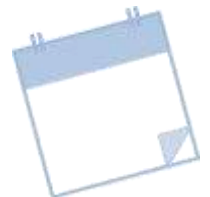


3rd Quarter

May 26
June 25

Looking Ahead

May 3	Kaler Science Lecture	7pm	Staerkel Planetarium
<i>Just added!</i> Dr. Charles Gammie (UIUC Astronomy) will talk about the recently released image of the black hole in M87. Charles is a team leader for the numerical modeling team. Admission is \$2 at the door.			
May 4	Members-only observing	8-?pm	Prairie Winds Observatory
May 9	CUAS Club Meeting	7-8:30pm	Staerkel Planetarium
Our guest will be Tim Stone from the Twin City Amateur Astronomers who will speak on spectroscopy at the telescope. AST 101 will feature Jim Wehmer on stellar evolution.			
May 11	Market at the Square	8am-noon	Lincoln Square Mall
May 11	"Astronomy Day"	2-4pm	Orpheum Children's Museum
See "club news" for details			
May 11	CUAS Family Skywatch	8-10pm	Prairie Winds Observatory
Let's hope for clear weather. Call 217-351-2567 if the weather threatens. We will need at least four volunteers to run the event.			
May 12	Earth & Space Event	noon-2pm	Champaign Public Library
See "club news" for details			
May 16	"CI Living" filming	4-5pm	Staerkel Planetarium
May 18	McGinty book signing	6-8pm	Staerkel Planetarium
May 24	Star Party	8-10pm	Kennekuk County Park
See "club news" for details			
June 1	Dark Sky Celebration	TBA	Middle Fork Forest Preserve
The Champaign County Forest Preserve District will officially christen the Middle Fork as Illinois' first dark sky park. There will be talks, activities for the kids, and (weather permitting) observing later on from the Activity Center. See "club news" for an agenda.			
June 8	CUAS Family Skywatch	8:30-11pm	Prairie Winds Observatory
June 13	CUAS Club Meeting	7-8:30pm	Staerkel Planetarium
Our own Mike Lockwood will speak on testing/improving a Newtonian telescope.			
June 15	Strawberry Jam	8-9pm	Meadowbrook Park
A few of our telescopes will highlight the evening. There is details here: https://www.urbanaparks.org/events/strawberry-jam-2019/			
July 6	CUAS Family Skywatch	9-11pm	Prairie Winds Observatory



www.cuas.org and look for “email listserv” link on the navigation bar on the left.

Observatory News

- ★ The mowing has begun! See the list below.
- ★ **Warning:** still be very careful when opening the Prairie Winds roof! When the roof was opened during the day on April 28, the rubber still would drag the drop wall inward. If you firmly hold the wall, it’s not a problem. The thought was to use a simple wooden plank (cut to the appropriate length) stood up against the south pier would be enough to hold the drop wall in place. This has been an annoying problem since we opened the building a year ago.
- ★ The Lumicon finder is now attached to the 16-inch Cassegrain. Thank you, Jim Wehmer!
- ★ Jim also conducted a training session at the April open house (despite the fact that actual open house was clouded out). We had 13 attend! Jim ran through the steps to get the Sky Commander working so you can use the 16-inch as a go-to telescope. During the same night we used the new power inverter to close the roll-off-roof and it worked great!
- ★ Also thanks to Jim Wehmer, we have the materials for a new shed for the riding mower. As this issue reaches your mailbox some preliminary construction has been done inside Prairie Winds to get some of the pieces assembled. We will have a work day soon to actually get the wall up. The shed will sit on the ground (i.e. no foundation). The UIUC-approved spot is immediately south of the existing shed, though we’ll leave a mower’s width of space. Jim has tie-downs to anchor the structure.
- ★ We still need to create an inventory of equipment and storage locations when the weather warms – which remote paddle goes with which telescope?
- ★ We still have the Meade Lightbridge 10-inch Dobsonian at the Prairie Winds site that can be assembled and used outside the observatory. The instrument is for sale for \$500 if anyone is interested.
- ★ The inside of the dome could use some scraping and painting this summer.

The observatory address is 926 County Road 700E or latitude: 40.014947, longitude: -88.331347

The infamous mow list returns: Remember to call or email the next person on the list as soon as you mow! This will give the next person a week or two to plan when they can go out and mow. IF you can’t mow during your time in the line-up, switch with the next person. Thank you for your work! IF you would like to be on the mow list, please let Dave Leake know. The entire lot takes 2-3 hours and mowers are in the shed on-site. There is an expectation that keyholders also help with up-keep. We still have a few shed-only keys if you want to stay on (or join) the mow list at the site but do not want to pay the

keyholder fee. See Dave Leake for details. *Note . . . Use the Toro mower for the gullies. Be alert to the new habitat being planted on the north & east sides of the observatory and north of the storage shed. Mow on the inside of the planted side*

- | | | |
|---------------------|---------------------|--------------------|
| 1. Mike Rosenberger | 5. Guy Hampel | 9. Ken Chapman |
| 2. Dave Leake | 6. Willard Brinegar | 10. John Stone |
| 3. Erik Johnson | 7. Larret Wright | 11. Duane Crider |
| 4. Audrey Ishii | 8. Dave Thompson | 12. John Bruckhart |



MEMBERSHIP FORM

Enroll me as a new member!
 Membership renewal
 Change in address/email address only

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone #: _____

Email: _____

Make all checks payable to: *“Champaign-Urbana Astronomical Society”* Membership includes membership in the Astronomical League.

Circle all that apply:

Basic membership	\$20
Observatory key fee	\$30
Tax deductible donation	\$ _____
Total enclosed:	\$ _____

Detach and mail to:

CUAS Treasurer
 c/o Staerke Planetarium/Parkland College
 2400 West Bradley Avenue
 Champaign, IL 61821

* You can join/renew using a credit card online at www.cuas.org.

Here are some brief descriptions of the kits provided by the National Institute for STEM Education (NISE). These will be available at the Champaign Public Library for May 12:



1. Expanding Universe
 - Need four people (don't let go of bands!)
 - Use gray & black circles to determine how far they move
2. Filtered Light
 - Draw two small circles on white paper with blue & pink markers
 - Look at circles with blue and red filters
 - Look at space images – look at what is enhanced
 - Draw something on either white or black paper and look with filters (use pencils on black paper, not markers)
3. Hide & Seek Moon
 - 3 pairs of kid's binoculars
 - Need to photocopy Moon sheets (for kids to draw on) – ten animals
 - Animals hidden on Moon scarf (can see through – need solid background)
 - Hang Moon poster 6-8 feet away from table.
4. Land Cover – NEED VIDEO
 - Fill pitcher with water & add blue dye (if desired), stir to mix
 - Place the plastic plant at the top of one side of the small paint tray, and loop the small red net around the edges of the plastic plant.
 - Add a small handful of pebbles (approximately ½ cup) into the side of the tray with the plant. Add another small handful of pebbles into the other side of the paint tray.
 - Place the prepared small paint tray on top of a microfiber cloth and the larger cafeteria-style tray to prevent water spills. You may also want to have paper towels or a sponge on hand
 - This activity requires a reset. Use the sponge to soak up the water from each side of the tray. You can squeeze the water back into the pitcher. You can also use the sponge to move the pebbles back up to the top of the tray. Try to keep an even amount of pebbles on either side of the tray as different visitor groups use the activity. The physical toolkit also comes with two complete sets of materials for the small tray-pebble-plant setup. You can have multiple groups working at one time, or alternate between the trays to minimize reset time.
 - Use “map your backyard land cover”
5. Observe the Sun – NEED DAYLIGHT
 - Solarscope requires assembly – user's guide with instrument
 - Focus by rotating the mirror (silver)
 - Base and spotter sits on base

6. Pocket Solar System

- 1-meter long strips of paper
- Stickers
- Instructions on where to put other stickers by folding paper in half
- Markers to draw space probes in (e.g. Juno at Jupiter)

7. Rising Sea

- Place plastic cover over basin & use marker to trace around outside edge of island landform
- Add water to basin until it comes to up to first mark. Trace again where water meets land.
- Keep adding water and tracing until you have a topographic map.

8. Space Guess Quest

- Best with partners – each player has board and one space object card (don't show to partner). This is mystery object.
- Take turns asking yes/no questions to figure what partner's mystery object is
- Start with category (e.g. nebula). Inside/outside solar system? Round or other shape? Colors? Surface features? Details on spacecraft?

9. Static Electricity

- Make an electroscope – 1) curl one end of wire 2) make small hook on other end 3) cut two small rectangles foil 2" by ½" 4) punch hole at top of each rectangle 5) slide both foil pieces on hook end of wire, 6) put foil into plastic bottle and hold by folding sponge around wire (like a taco)
- Cut sponge into 8 sections. Precut 8-inch lengths of Copper wire
- Rub foam tray on wool felt then wave tray next to wire on top (don't touch wire). Look at foil inside. Try other combinations.

10. Stomp Rockets

- Build stomp rocket . . 1) roll one sheet of paper tightly around tube & tape closed. 2) remove paper from tube, 3) fold over one end & tape closed. 4) add science payload with stickers (what project are you studying?) 5) add fins and decorate.
- Slide rocket onto tubing at end of stomper bottle. Aim at poster with target, below satellite but above weather balloon.

11. Temperature Mapping

- Place hand on thermal sheet for 5 seconds. Remove hand, see colors.
- Use IR thermometer to measure temps of handprint. What do colors represent?
- Use thermometer to measure temps of white and black tiles under lamp (need electricity). Do same with paver and soil. Which has higher temperature?

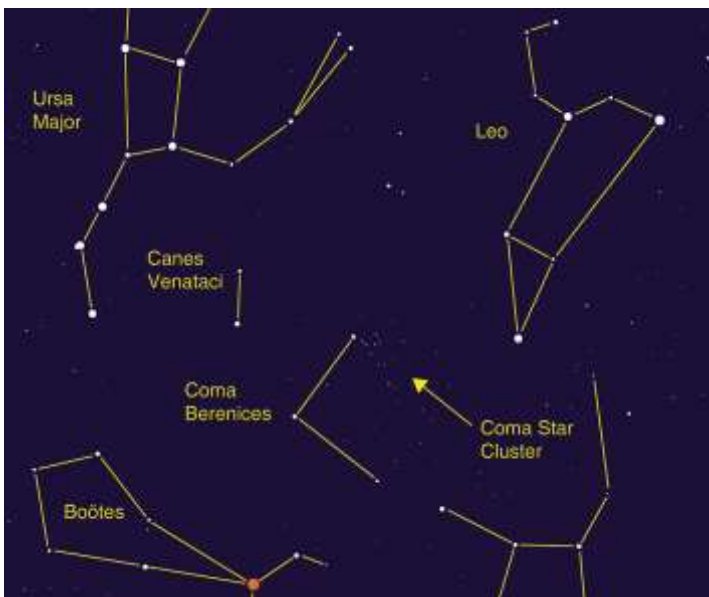


Watching the Late Spring Skies

By David Prosper

Late spring brings warmer nights, making it more comfortable to observe a good showing of the **Eta Aquarids** meteor shower. Skywatchers can also look for the delicate **Coma Star Cluster**, and spot the **Moon** on the anniversary of **Apollo 10's** "test run" prior to the Moon landing in 1969.

The **Eta Aquarids** meteor shower should make a good showing this year, peaking the morning of May 6. This meteor shower has an unusual "soft peak," meaning that many meteors can be spotted several days before and after the 6th; many may find it convenient to schedule meteor watching for the weekend, a night or two before the peak. You may be able to spot a couple dozen meteors an hour from areas with clear dark skies. Meteors can appear in any part of the sky and you don't need any special equipment to view them; just find an area away from lights, lie down on a comfy lawn chair or blanket, relax, and patiently look up. These brief bright streaks are caused by Earth moving through the stream of fine dust particles left by the passage of Comet Halley. While we have to wait another 43 years for the famous comet grace our skies once more, we are



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events,

treated to this beautiful cosmic postcard every year.

While you're up meteor watching, try to find a delightful naked eye star cluster: the **Coma Star Cluster** (aka Melotte 111) in the small constellation of Coma Berenices. It can be spotted after sunset in the east and for almost the entire night during the month of May. Look for it inside the area of the sky roughly framed between the constellations of Leo, Boötes, and Ursa Major. The cluster's sparkly mem-



bers are also known as "Berenice's Hair" in honor of Egyptian Queen Berenices II's sacrifice of her lovely tresses. Binoculars will bring out even more stars in this large young cluster.

May marks the 50th anniversary of the Lunar Module's test run by the **Apollo 10** mission! On May 22, 1969, NASA astronauts Thomas Safford and Eugene Cernan piloted the Lunar Module - nicknamed "Snoopy" - on a test descent towards the lunar surface. Undocking from "Charlie Brown" - the Command Module, piloted by John Young - they descended to 47,400 feet above the surface of the Moon before returning safely to the orbiting Command Module. Their success paved the way for the first humans to land on the Moon later that year with Apollo 11. Look for the Moon on the morning of May 22, before or after dawn, and contemplate what it must have felt like to hover mere miles above the lunar surface. You'll also see the