



EVENT HORIZON

The SAN MATEO COUNTY ASTRONOMICAL SOCIETY

October – December • 2023 Issue

799th General Meeting: Oct. 6

800th General Meeting: Nov. 3

801st General Meeting: Dec. 1

OCTOBER 14, 2023
PARTIAL ECLIPSE OF THE SUN

8:05 a.m. to 10:42 a.m.
Maximum Eclipse at 9:19 a.m.
Plaza of the Sun
College of San Mateo

See page 3

Table of Contents

<i>Upcoming Events</i>	<i>3</i>
<i>Prez’s Corner.....</i>	<i>4</i>
<i>General Meeting, Friday: Oct. 6, 7pm & Presentation 8pm: Studying Exoplanets with JWST by Dr. Thomas Greene.....</i>	<i>5</i>
<i>General Meeting, Friday: Nov. 3, 7pm & Presentation 8pm: Vera C. Rubin Observatory and LSST Camera by Hannah Pollek</i>	<i>6</i>
<i>General Meeting, Friday: Dec. 1, 7pm & Presentation 8pm: Getting Started with Astronomical Spectroscopy By Carl Crum.....</i>	<i>7</i>
<i>Selected Celestial Objects of Interest.....</i>	<i>8</i>
<i>ALCon 2023 – Astronomical Gumbo</i>	<i>11</i>
<i>NASA Night Sky Notes: From Galileo to Clipper, Exploring Jupiter's Moons.....</i>	<i>13</i>
<i>Astronomical League October Activities</i>	<i>15</i>
<i>Directions to SMCAS Public Star Parties (Weather Permitting)</i>	<i>17</i>
<i>Directions to SMCAS Meetings at The College of San Mateo:</i>	<i>18</i>
<i>Become an SMCAS Member Today! Here’s what you get:.....</i>	<i>19</i>
<i>SMCAS Appliction.....</i>	<i>20</i>

Cover: The poster designed by Mohsen Janatpour for the partial eclipse viewing event at the College of San Mateo.

Upcoming Events

The Society and the City of San Carlos Parks Department host public Star Parties at Crestview Park, 1000 Crestview Drive, San Carlos. [Click here to see the schedule for the entire year.](#) See page 23 for directions and guidelines.

Friday, October 1: SMCAS Pizza Social and General Meeting, 7 p.m., College of San Mateo, ISC Room (#110) and a presentation by Dr. Thomas Greene called “The Vera C. Rubin Observatory and LSST Camera,” 8 p.m. in the Planetarium. See page 18 for directions to CSM.

Saturday, October 7: Star Party – At sunset (6:53 p.m.) – Crestview Park

Saturday, October 14: Eclipse Viewing Event – 8 a.m. – Plaza of the Sun at College of San Mateo. The Plaza of the Sun is the large round area between the Planetarium and the large parking lot. It begins at 8:05 a.m. Peaks at 9:19 am. and will end by 10:42 a.m. See page 18 for directions to CSM.

Friday, November 1: SMCAS Pizza Social and General Meeting, 7 p.m., College of San Mateo, ISC Room (#110) and a presentation by mechanical engineer Hannah Pollek called “Studying Exoplanets with The James Webb Space Telescope,” 8 p.m. in the Planetarium. See page 18 for directions to CSM.

Saturday, November 11: Star Party – At sunset (5:01 p.m.) – Crestview Park

Saturday, November 18: Star Party – At sunset (4:56 p.m.) – Crestview Park

Friday, December 1: SMCAS Pizza Social and General Meeting, 7 p.m., College of San Mateo, ISC Room (#110) and a presentation by Carl Crum Getting Started with Astronomical Spectroscopy, 8 p.m. in the Planetarium. Be sure to check your emails and the website for updates. See page 18 for directions to CSM.

Saturday, December 9: Star Party – At sunset (4:51 p.m.) – Crestview Park

Saturday, December 16: Star Party – At sunset (4:53 p.m.) – Crestview Park

Prez's Corner

Ok, which one of you made the celestial dragon mad? The dragon will take a big bite out of the sun on Oct. 14. I'm speaking of the annular eclipse, of course. The ancient Chinese had a myth that solar eclipses occur when a celestial dragon devours the sun. In the Chinese language, the term for eclipse was "shi" which also means "to eat". Annular eclipses of this type are sometimes called "ring of fire" eclipses because the moon is too far from Earth to fully block the Sun but creates a ring-like effect when it reaches annularity. We will get a partial eclipse here in the Bay Area, about 80% of the sun will be covered. SMCAS will be helping with a viewing event at CSM, so come on out for that Saturday morning event.

We are entering meteor shower season, Oct. 8 the Draconid meteor shower peaks. Oct. 22 the Orionid meteor shower peaks. Nov. 11 the Northern Taurid meteor shower peaks and Nov. 17 the Leonid meteor shower peaks. Dec. 14 the Geminid meteor shower, one of the largest of the year, peaks and finally Dec. 21 the Ursid meteor shower peaks. It going to be raining comet dust until next year!

SMCAS has a bunch of great speakers lined up through the end of the year for our first Friday of the month meetings at CSM. Dr Thomas Green talk about Exoplanets, Hannah Pollek on the LSST camera and club member Carl Crum on astronomical spectroscopy. I personally can wait for that one. Hope to see you there.

Hoping for clear skies,



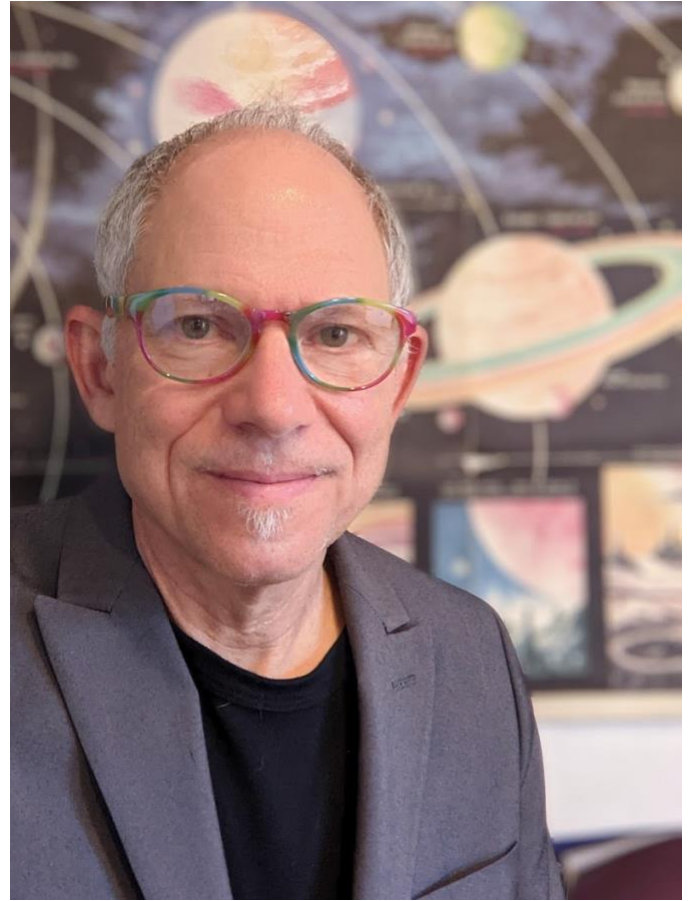
Michael Cooke
SMCAS President
tfbsaxman@hotmail.com

General Meeting, Friday: Oct. 6, 7pm & Presentation 8pm: Studying Exoplanets with JWST by Dr. Thomas Greene

Find out how the James Webb Space Telescope is being used to discover and characterize exoplanets in our galaxy. Dr. Thomas Greene, an astrophysicist in the Space Science and Astrobiology Division at NASA's Ames Research Center, is currently leading projects studying exoplanets and protostars with JWST and will discuss his observational studies of exoplanets and young stars. Dr. Greene is also a coinvestigator on the Near-Infrared Camera (NIRCam) and Mid-Infrared Instruments (MIRI) of JWST and serves on the JWST Users Committee. He develops astronomical technologies and instrumentation. He served as the director of the Ames Center for Exoplanet Studies, Project Scientist of the SOFIA mission and Chief of the Astrophysics Branch. Before joining NASA, he worked at the Lockheed Martin Advanced Technology Center on NASA astrophysics missions. Before that, Dr. Greene was on the faculty of the University of Hawaii where he was a support astronomer and later director of the NASA Infrared Telescope Facility. He received his Ph.D. in astronomy from the University of Arizona.

Launched December 2021, JWST is the most powerful and complex astronomical space observatory ever built. It is the premier astrophysics space observatory for NASA and the European Space Agency with an expected 20+ year mission lifetime. Its primary mirror, which has a slightly more

than 12-foot diameter, allows us to see some



Dr. Thomas Greene

of the very first luminous objects that formed in the universe shortly after the Big Bang. JWST will also study how galaxies are assembled and the birth of stars, planetary systems and the origins of life. JWST It will augment the Hubble Space Telescope, which primarily works at visible and ultraviolet light wavelengths. Many scientists will use JWST to make discoveries that we have not yet imagined! ◆

General Meeting, Friday: Nov. 3, 7pm & Presentation 8pm: Vera C. Rubin Observatory and LSST Camera by Hannah Pollek

Mechanical engineer Hannah Pollek will give an overview of the Vera C. Rubin Observatory with an emphasis on the construction of the Legacy Survey of Space and Time camera, the world's largest digital camera ever built for astronomy. The LSST camera, scheduled to start capturing images in early-mid 2025, will live atop the Vera C. Rubin Observatory's Simonyi Survey Telescope in Chile. Pollek will travel to Chile to help with the installation of the LSST camera.

She's been a part of the LSST project team at SLAC National Accelerator Laboratory for five years where she's responsible for assembling, mounting and testing the LSST camera. She will also talk about the science goals of the project during its 10-year survey,

the nationwide and international collaborations in building it and the challenges of handling the immense amounts of data that will be taken each night.

The LSST camera is roughly the size of a small car and weighs 3 tons. It features a five-foot wide front lens and a 3,200-megapixel sensor that will be cooled to -100 degrees Celsius to reduce noise. It'll be tasked with observing the night sky for a decade with the goal of providing a trove of data that scientists will study to try and understand some of the universe's biggest mysteries, including the nature of dark energy and dark matter.

Pollek first came to SLAC on the LSST project as an intern in 2018. Before that, she was a

team member and project lead at Aztec Baja SAE where she assisted in the design and manufacturing of the 2017-2018 race car. She received her bachelor's in mechanical engineering from San Diego State University in 2019. When she is not helping create the world's largest digital astronomical camera, she enjoys hanging out with her dog, playing volleyball and crocheting.

Rubin was a pioneering astronomer who did preliminary research on dark matter. For several decades her work was rejected by her colleges. It wasn't until 1993 that she received a

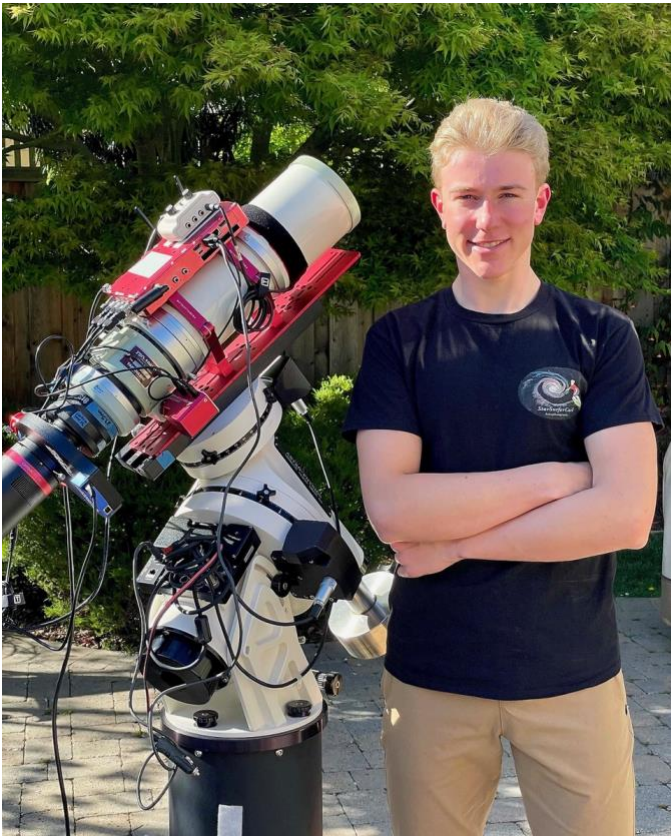
National Medal of Science for her dark matter research. ♦



Researchers at SLAC National Accelerator Lab with the LSST Camera, the world's largest digital camera ever built for astronomy. Hannah Pollek is second from the right.

General Meeting, Friday: Dec. 1, 7pm & Presentation 8pm: Getting Started with Astronomical Spectroscopy By Carl Crum

Carl Crum, amateur astronomer, is an award winning astrophotographer who will give us an introduction to astronomical spectroscopy and why we should be interested in it. He'll bring his equipment so you can see and understand the setup and will conclude his lecture with a Q&A session. He'll share the software available to amateur astronomers to perform spectrographic analysis and will show examples of his research, giving you the information you need to get you started in astronomical spectroscopy.

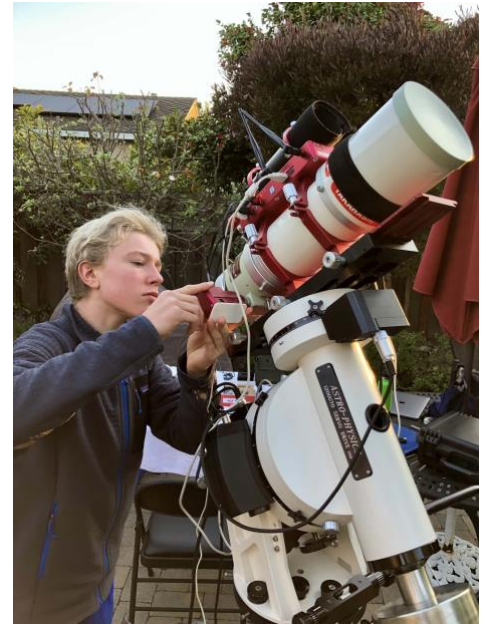


Carl Crum

Astro spectroscopy is the study of the electromagnetic spectrum of stars and other celestial objects through a spectroscope. Spectroscopy is one of the best tools we have for deciphering the chemical and

physical properties of the universe and is the backbone of modern astrophysical research. In fact, about 75% of all data collected by the James Webb Space Telescope is spectra!

Crum became interested in astronomy in middle school when he discovered his father's astronomy equipment, and has since developed



his astronomical interests and expertise, most recently diving head first into spectroscopy. He is currently a senior at Sacred Heart High School, where he has undertaken independent research projects in astronomical spectroscopy. More information about Crum's astronomical activities can be found at his excellent website: <https://starsurfercarl.com>.

When Crum isn't stargazing in his backyard, he enjoys photographing birds around his neighborhood and playing on his high school's water polo team. One of his favorite destinations is Lick Observatory on Mount Hamilton, where he peered through the Great Refractor at Albireo, the Whirlpool Galaxy and the Cat's Eye Nebula. ◆

Selected Celestial Objects of Interest

By Ken Lum

Quite a few of us in the SMCAS have taken to astrophotography over the past few years, mostly due to the spread of the remarkably easy-to-use Unistellar eVscope. In addition, there are also others using much larger telescopes and cameras capable of even better celestial imaging. The result is that some of us have collectively accumulated sizeable libraries of images of both well-known and not so well-known objects that are mostly locked up in our computers and have only been shared with everyone else in a limited way.

In an effort to better open up and share these images, I am going to start a column where some of my images are shared with the membership, perhaps starting with a couple at a time and give a brief narrative about what the objects are and what is astronomically happening with them. I hope you will find these images not only aesthetically pleasing but also interesting in understanding what is happening with them to make them appear the way they do.

With this opening entry, I hope to encourage others in the club with similar image collections to submit brief entries to the Event Horizon for the benefit of the membership. These images will also give a good idea of what the range of telescopes being used in the club are capable of doing when used for imaging. Clearly, images from

the eVscopes will not be as good as what is being produced from larger instruments. Nonetheless, one can only marvel at what even a 4 ½" telescope weighing a mere 20 lbs. can do nowadays.

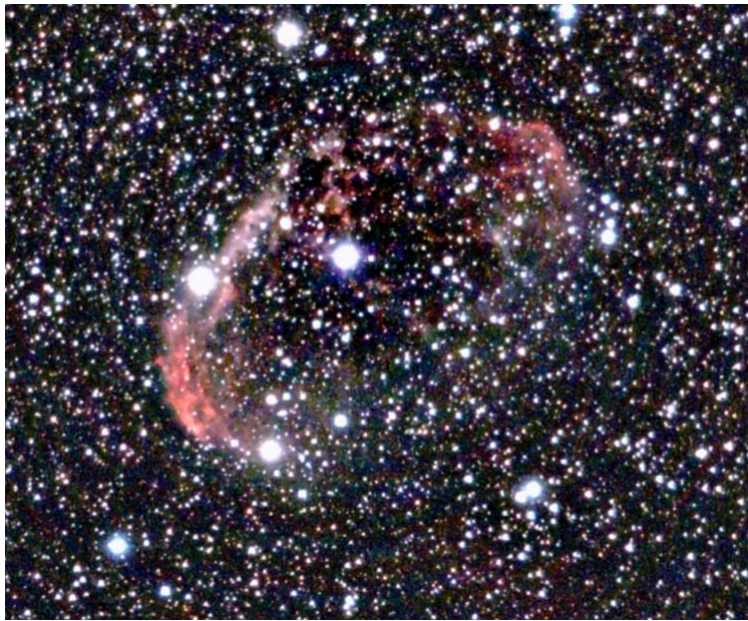
In the future, we hope to establish a feature in our website where images can be entered by their authors so the membership can easily access them and serve as a source of learning. By convention, each image will be listed with a title containing the following sequence of items:

1. Object's most commonly used catalogue number and any other commonly used title/type of object
2. Constellation of its location
3. Magnitude brightness
4. Distance
5. Comments
6. Instrument and camera used/Author of the image

We will try and list images of objects visible during the current season so readers can go out if they want to and try to observe them once reading about them. If you want to know more about the object, you can find other reference material about it online or in other reference sources or contact the author.

(continued on page 9)

Selected Celestial Objects of Interest (cont'd)



Object	NGC 6888 - Crescent Nebula
Constellation	Cygnus
Magnitude	7.4
Distance	5,000 ly
Comments	Wolf-Rayet star
Instrument/ Author	Unistellar eQuinox 2 Ken Lum

The **Crescent Nebula** is a bubble of gas emanating from a very massive, extremely hot star known as a **Wolf-Rayet (WR) star** seen here located near the center of the gas bubble. In this case, the star is catalogued as WR 136 estimated at 21 solar masses and burning its hydrogen fuel so rapidly that it has depleted nearly all of its hydrogen fuel in a mere 4.7 million years leaving only heavier elements to sustain thermonuclear fusion. Its surface temperature is estimated at 70,000°K (Our Sun's surface temperature is around 6,000° K.) There is evidence it may be a binary star system as well.

The nebula is due to the star having blown out a shell of gas between 120,000 and 240,000 years ago as a result of radiation pressure during its red-giant stage. This was accompanied by a fast stellar wind being blown out that is colliding with the shell thereby shaping it to what it looks like as we see it now. The shell is glowing from the

strong UV light also coming from WR 136. Due to its high mass, it is expected to explode as a supernova in a few hundred thousand years.

Good references on WR stars can be found in a couple of recent sources from:

Bryant, G. **The Allure of Wolf-Rayet Stars**, Sky and Telescope, Feb. 2023

Nested Dust Shells Around the Wolf-Rayet Binary WR 140 Observed with JWST

[Click here to watch this talk delivered by Dr. Thomas Madura of SJSU at an SJAA meeting in August shows how a WR star might generate the gas and dust cloud that surrounds many of these remarkable stars. It further reinforces what is written about in the above Bryant article.](#)

(continued on page 10)

Selected Celestial Objects of Interest (cont'd)



Object	NGC 7023 – Iris Nebula Reflection nebula
Constellation	Cepheus
Magnitude	6.8
Distance	1,300 ly
Comments	
Instrument/ Author	Unistellar eQuinox 2 Ken Lum

This object, most often known as the **Iris Nebula**, is a cloud of interstellar dust from which a young, hot star has formed and is illuminating the dust cloud as a reflection nebula whose dust particles are reflecting the star light allowing us to see the cloud. Interstellar dust is made up of heavy elements formed in stars that have ejected the ele-

ments into space by various mechanisms including flares, supernova explosions and jets. Often these elements combine via complex chemical reactions to form dust particles and various compounds including organic compounds some of which are found in tissues of living organisms here on Earth. Hence, Carl Sagan once said “We are made of star stuff”. ◆

ALCon 2023 – Astronomical Gumbo

By Steven M. Tilley



The 2023 Astronomical League Convention was held from July 26 to July 29 in Baton Rouge, Louisiana at the Historic Capitol House Hotel now known as the Hilton Baton Rouge Capitol Center. Our theme was “Astronomical Gumbo,” which represents the blend of diverse subfields and people within the vast field of astronomy. Gumbo is a dish that combines the culinary practices of Africans, Native Americans, French and Spanish, and is often used as a metaphor for the mix of cultures that exist in southern Louisiana.

ALCon 2023 kicked off with an opening reception at the historic Landolt Observatory on the main campus Louisiana State University. Housed on top of the physics and astronomy building called Nicholson Hall.

The attendees were given a presentation called “100 Years of LSU Astronomy: From a Lone Astronomer to Exoplanets, Black Holes and Cosmic Explosions!” by LSU Professor Dr. Rob Hynes before we had the opportunity to head upstairs for viewings through an 11.5-inch Alvan Clarke telescope.

A variety of presentations, lectures and panel discussions took place over the four-day event. Pranvera Hyseni’s talk was titled “From Vision to Reality: Building Kosovo’s Astronomical Legacy.” Chuck Allen spoke on “Astronomical Yardsticks” – the different yardsticks needed for the different subfields of astronomy. A “History of the Telescope” was given by Dr. James Dire. “Turn Left at Orion,” tag-team talk was given by Professor

(continued on page 12)

ALCon 2023 – Astronomical Gumbo (cont'd)

Dan M. Davis and Br. Guy Consolmagno. Debbie Moran's presentation was called "Light Pollution and Its Mitigation." Connor Matherne lectured on astrophotography. Greg Andrews, the planetarium manager at Sci-Port Discovery Center Shreveport discussed astronomical outreach. Dr. David Levy, author and comet hunter, spoke on "Poetry of the Night" and was presented with the 2023 Astronomical League Award.

The two National Young Astronomer Award winners, Katilyn Wang and León Garcia also gave presentations. In addition, they also tied for first place in the National Young Astronomer Award competition.

President Carroll Iorg led the AL president's panel called "The Astronomical League: Boldly Welcoming the Future." Vivian White, Br. Guy Consolmagno, David Eicher and Pranvera Hyseni were panelists for the "Being a Science Communicator" discussion. Pranvera Hyseni moderated the panel discussion on "Youth in Astronomy." Panelists were Ashini Modi, Katilyn Wang,

León Garcia, Dhruva Kalyani, and Anyalina Vertigan.

The AAVSO conducted a workshop "Showing Real-time Stellar Variability to the Public."

A group of lucky attendees went on a tour of Laser Interferometer gravitational-Wave Observatory outside the town of Livingston. One of two of such facilities that are now an increasing in number around the globe which were created for the detection of gravitational waves.

Attendees also listened to "Mr. Eclipse," also known as Fred Espenak, talk at the Louisiana Art & Science Museum, where we saw a show in the state of the art Irene Pennington Planetarium.

The Astronomical Gumbo/Jambalaya/BBQ was held at the Highland Road Park Observatory (MPC Code 747) where over 55 asteroids have been discovered by members of the Baton Rouge Astronomical Society.

The Astronomical League Annual Business Meeting was held, as well as the Annual Astronomical League Awards Banquet to honor all recipients of the AL awards. The key-note speaker was David Eicher, writer and editor-in-chief of Astronomy Magazine, whose lecture was titled "Galaxies."

The 2024 ALCon will be a hybrid event based in Kansas City, between July 17 and July 20, 2024. ♦

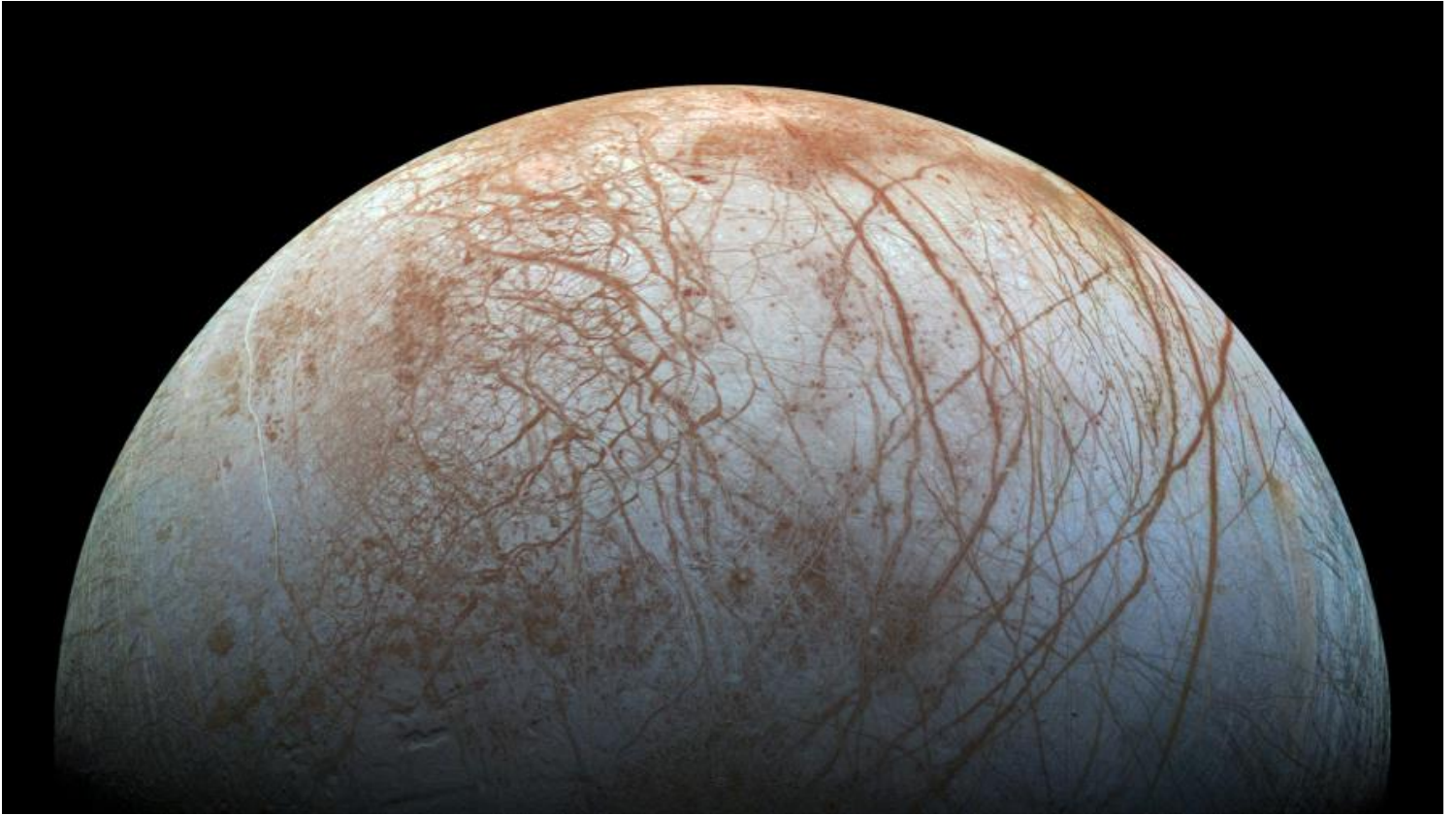




NASA Night Sky Notes

From Galileo to Clipper, Exploring Jupiter's Moons

By Vivian White



*“...We, too, are made of wonders, of great
and ordinary loves, of small invisible worlds,
of a need to call out through the dark.”*

From *In Praise of Mystery: A Poem for Europa* by Ada Limon

As autumn begins, if you're up late, you may notice a bright point of light rising in the east. Look a bit closer, with a pair of binoculars, and you'll notice it's not a star at all. While stars look point-like no matter how big your backyard telescope, this light appears as a circle under closer examination. Even more curious, you will likely see a line of smaller dots on one or both sides. Congratulations! You've rediscovered the king of the planets - majestic Jupiter - and its four largest moons.

Galileo famously chronicled the four moving dots near Jupiter and surmised that they were orbiting the distant world. While Jupiter has well over 80 discovered moons as of September 2023, these brightest four are called the “Galilean Moons” - Io, Europa, Ganymede, and Callisto. (Great mnemonics exist to remember these in order of distance from Jupiter, such as “I Eat Green Caterpillars”) You can follow these like Galileo did, using stargazing apps or the

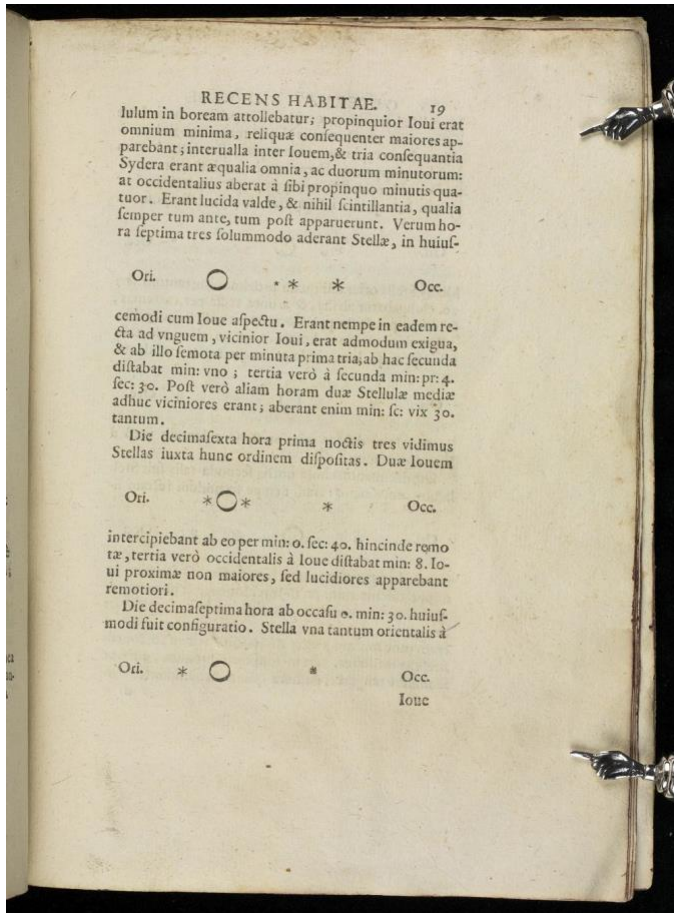
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NASA Night Sky Notes

From Galileo to Clipper, Exploring Jupiter's Moon (cont'd)

handy image below. A favorite beginning observing challenge is to [track the movement of the Galilean Moons](#) over the



Galileo's drawings of Jupiter and its Medicean Stars from Sidereus Nuncius. Image courtesy of the History of Science Collections, University of Oklahoma Libraries.

course of many nights. Even within a few hours, you will notice them moving in relation to Jupiter, just as Galileo did.

Fast forward 414 years, and NASA will be sending a robotic mission to investigate the surface of one of these distant worlds. The

[Europa Clipper Mission](#) is launching to the cold, icy moon in 2024, to begin orbiting in 2030. With its salty oceans covered by ice, Europa was chosen as an excellent location to continue the search for life outside of Earth. Clipper will be the largest spacecraft ever sent to another planet, designed to withstand Jupiter's punishing radiation. Once it arrives at Jupiter in 2030, NASA plans to do about 50 flybys of Europa, mapping almost the entire surface of this watery world.

What was once only dreamed of in the small telescope of Galileo, or in great works of fiction, NASA is turning our wildest imagination into reality. One of the celebrated quotes from the classic 2010: Odyssey Two warns, "All these worlds are yours, except Europa. Attempt no landing there." Science fiction fans can feel relieved knowing that writer Arthur C. Clarke gave his blessing for the Europa Clipper mission.

Join the Europa Message in a Bottle Campaign to send your name with the spacecraft, hear the rest of the poem by the US Poet Laureate, and learn more about the wonders of space travel with the Clipper Mission:

<https://europa.nasa.gov/participate>

Watch a wonderful Clipper webinar with Dr. Cynthia Phillips, planetary geologist with the mission:

<https://www.youtube.com/live/RnnLJBLRB CA?feature=shared&t=269> ♦

Astronomical League October Activities

In the early morning on October 10, try this challenge:

View to the east on October 10 90 minutes before sunrise

Crescent moon meets Venus and Regulus

On the morning of October 10, the crescent moon, glowing full with earthshine, floats left of brilliant Venus. Look 90 minutes before sunrise.

Between them, shines Leo's brightest star, Regulus.

Two mornings earlier a thicker crescent moon was near M44, the Beehive star cluster.

The meeting of the crescent moon and Venus also occurs on the mornings of November 9 when the moon nearly covers Venus, and of December 9.

ASTRONOMICAL LEAGUE Double Star Activity

Gamma Andromedae

A-B separation: 9.7 sec
 A magnitude: 2.3
 B magnitude: 5.0
 Position Angle: 63°
 A & B colors:
 orange, blue

Other Suns: Gamma Andromedae

How to find Gamma Andromedae on an October evening

Face northeast. Find the Great Square and the curve of stars extending to the lower left. This is Andromeda. Gamma is the third star on the string and is as bright as the major stars of the Big Dipper. From the "W" of Cassiopeia, Gamma lies to the lower right.

Suggested magnification: 40x
 Suggested aperture: >2 inches

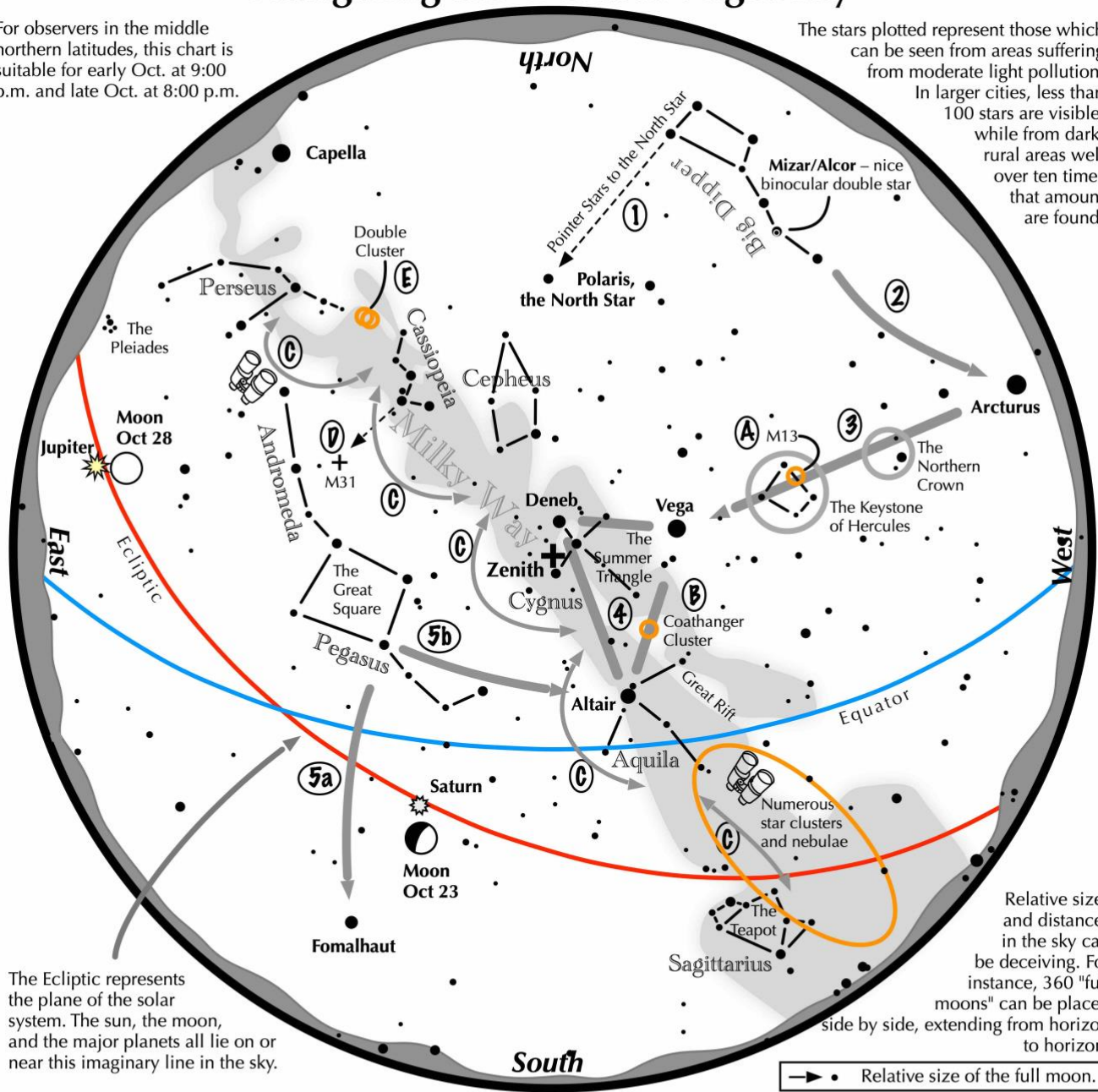
1° field of view

Astronomical League October Activities (cont'd)

Navigating the October Night Sky

For observers in the middle northern latitudes, this chart is suitable for early Oct. at 9:00 p.m. and late Oct. at 8:00 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

Navigating the October night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the early October evening sky.
- 3 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 Nearly overhead lie the summer triangle stars of Vega, Altair, and Deneb.
- 5 High in the east are the four moderately bright stars of the Great Square. Its two southern stars point west to Altair. Its two western stars point south to Fomalhaut.

Binocular Highlights

A: On the western side of the Keystone glows the Great Hercules Cluster, a ball of 500,000 stars. **B:** 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger. **C:** Sweep along the Milky Way for an astounding number of fuzzy star clusters and nebulae amid many faint glows and dark bays, including the Great Rift. **D:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **E:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster.



Directions to SMCAS Public Star Parties (Weather Permitting)

From Hwy 101 or El Camino: Take Brittan Avenue in San Carlos, west (toward the hills). Follow Brittan 2.3 miles (from El Camino) to Crestview Drive. Turn right on Crestview. In half-a-block, you will see a small, blue-posted sign with an arrow, indicating the entry road into Crestview Park. It lies between houses with addresses 998 and 1000 Crestview Drive.

From Highway 280: Take Edgewood Road exit. Go east (toward the Bay) about 0.8 miles. Turn left at Crestview Drive. Go 0.5-mile uphill to where Crestview meets Brittan. Again, drive the half-block, to the small blue sign on the right, and the entry road on the left.

From Hastings and Club Drives: From Belmont, take Carlmont Drive to Hastings Drive. Follow Hastings about 1.5 miles, first uphill, then down, to San Carlos where it becomes Witheridge Road, then ends a block later at Club Drive. Turn right and climb Club Drive to Crestview Drive. Turn left and continue some 2 miles, first up, then down past Leslie Drive, to the small blue

Crestview Park sign on the left. Turn right into the Crestview Park entry road.

From San Carlos, take San Carlos Avenue to Club Drive, and climb to the 5-way intersection. Take the half-right to continue on Club Drive past Witheridge Road to Crestview Drive. Proceed as above to Crestview Park.

Crestview Park - San Carlos

*Come on out, and bring the kids,
for a mind-blowing look at the Universe!*

Bring your binoculars, telescopes, star guides, and lounge chairs for some informal star gazing at Crestview Park.

Dress warmly and wear a hat. Only visitors with telescopes should drive in. Others should park on the street and walk in or arrive before dark so that car headlights don't affect the observers' dark adaptation. Bring small flashlights only, covered with red cellophane or red balloon.

These measures avoid safety issues of maneuvering in the dark, as well as ruining the night vision of the viewers.

Please don't touch a telescope without permission. And parents, please don't let children run around in the dark.

Note: If bringing a telescope and arriving after dark, please enter the Park with your headlamps and white interior lights off. **If you aren't bringing a telescope, whether before or after dark, please park along Crestview Drive, and walk in.**

Crestview Park is residential, adjacent to homes and backyards. Before inviting potentially noisy groups, please call Ed Pieret at (650) 595-3691 for advice and advisories. **Call Ed also to check the weather and 'sky clock' and to see whether the Star Party is still scheduled.**

Crestview Star Party schedule is here:

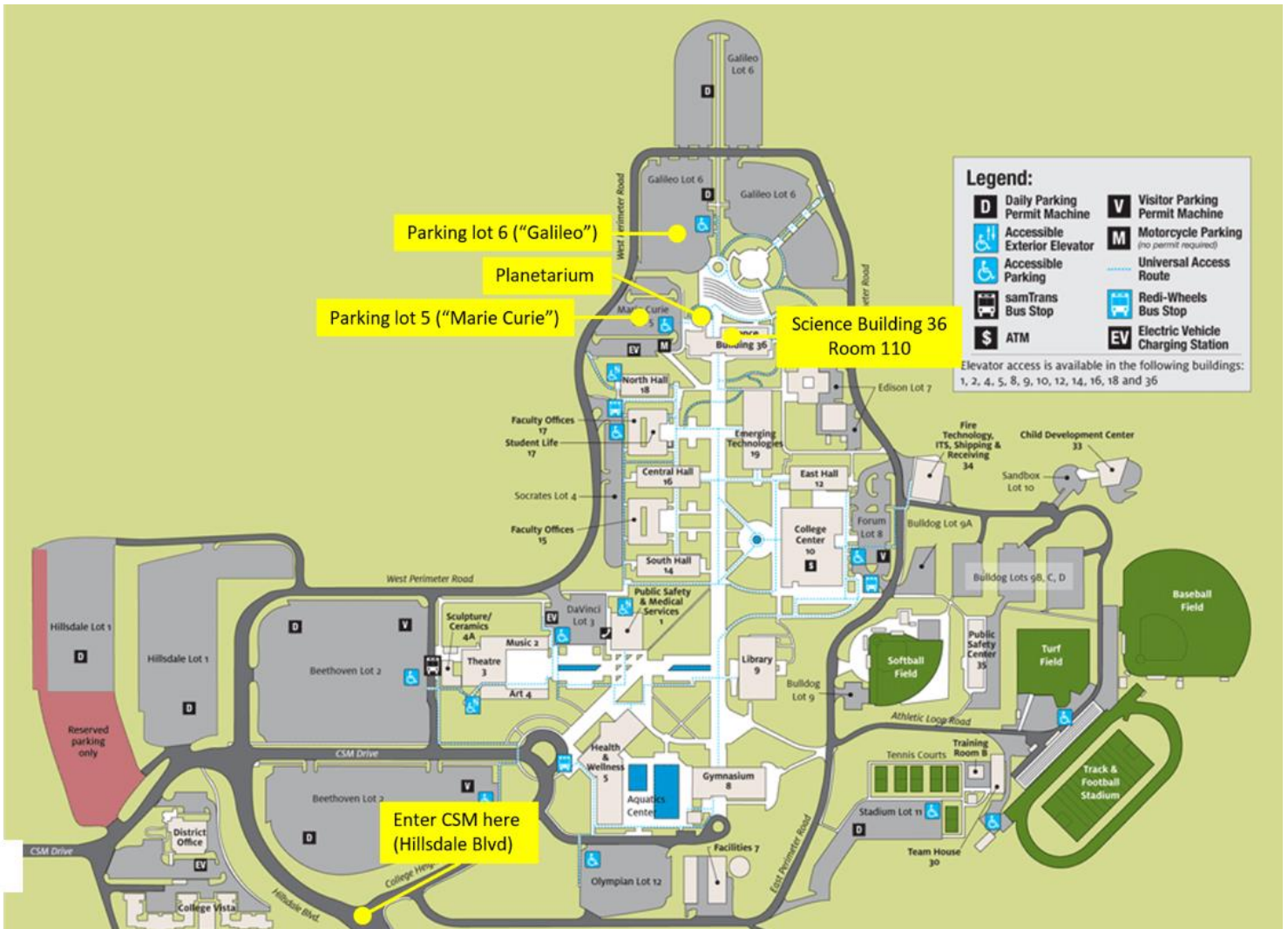
<http://www.smcasastro.com/crestview-park.html>



Directions to SMCAS Meetings at The College of San Mateo:

Directions to the CSM Planetarium for Meetings:

After exiting Hwy 92 at Hillsdale Blvd, climb the hill towards CSM, passing two traffic lights to the stop sign at the top of Hillsdale Blvd. Continue straight onto West Perimeter Road and follow it until you reach Lot 5, "Marie Curie", or Lot 6, "Galileo." Science (ISC) Bldg. (36) and the Planetarium lie straight ahead. Enter Bldg. 36 either through the door facing the lot or walk around the dome to the courtyard entrance. We meet in ISC room, #110 for pizza and soft drinks one hour prior to the talk in the Planetarium (Pictured below.)





San Mateo County Astronomical Society Membership Application

SMCAS@live.com; P.O. Box 974, Station A, San Mateo CA 94403; (650) 678-2762

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Become an SMCAS Member Today! Here's what you get:

- **Members Community**

Friendly advice and guidance from experienced recreational astronomers; access to SMCAS group emails, which provide general orientation information, announcements of astronomy events, file access and exchange.

- **SMCAS Events**

General meetings are held the first Friday of most months, at 7pm in the Integrated Science Center (ISC) Room and Planetarium in the Science Center (Bldg. 36) at the College of San Mateo (CSM), 1700 W. Hillsdale Blvd., San Mateo. Meetings include lectures and presentations on space science, an activity session, and refreshments (usually pizza).

We also offer stargazing two Saturdays a month, weather permitting. Visitors and those without telescopes are welcome; members are glad to share! SMCAS also has sponsored dark-sky campouts at Fremont Peak State Park, field trips to SLAC, KIPAC and Lick Observatory, plus **member-only events, including Star-B-Ques and quarterly potlucks.**

- **Subscriptions (free with your membership)**

The Event Horizon, SMCAS' newsletter, with SMCAS and member information, viewing tips and articles.

The Reflector, published quarterly by the Astronomical League, a national alliance of astronomy groups like SMCAS.

- **Significant Discounts on Equipment and Publications**

Discounts on purchases at Bay Area astronomical equipment retailer Orion Telescope Center, on sky calendars and ephemerides, and on such periodicals as *Sky & Telescope* and *Astronomy*.

- **Access to Loaner Equipment**

Use of SMCAS loaner telescopes and other astronomy equipment.

- **Sharing your Appreciation of Astronomy and Space Science with the General Public.**

Your SMCAS membership helps bring astronomy to interested lay people, especially students and children

Annual Dues: (SMCAS is a tax-exempt non-profit 501(c)(3). Dues may be tax deductible; consult your tax advisor):

\$30 Regular Family Membership; \$15 Student Membership

Every membership includes all members of your immediate family, (including your kids).

To join you can:

Send application (see reverse side), with payment, to: SMCAS, P.O. Box 974, Station A, San Mateo CA 94403.

- Bring the completed application and payment to a meeting or event and give it to any SMCAS officer.
- Go online at <http://www.smcasastro.com>, click on the Membership tab and pay via PayPal.

Membership Application on next page



San Mateo County Astronomical Society Membership Application

rev 02272020

SMCAS@live.com; P.O. Box 974, Station A, San Mateo CA 94403; (650) 678-2762

Date: _____ Please check one: New Member or Renewal

\$30 Regular Family Membership; \$15 Student Membership

All members, please indicate areas of interest below. New members, please complete entire form. Renewing members, please provide your name and any information that has changed in the last year.

We will list your name, address, email address, and phone number(s) in our membership roster unless you have checked the box preceding that information. The membership roster is distributed to active members only.

Each member's name and mailing address must be provided to the Astronomical League (AL), SMCAS' umbrella organization. If you don't want AL to have your phone number and email address, indicate below.

Name(s) _____ Email Address _____

Address _____

City & Zip Code _____

Phone Number(s): _____ Do not provide my phone number(s) to the AL.

Don't provide my email address to the AL. (Checking this means you can ONLY get **The Reflector** by regular mail)

Please check one: send **The Reflector** by mail, or by email.

Areas of Interest:

SMCAS encourages member involvement. We invite you to provide additional information about your interests, skills, occupation and prior experience. Please identify SMCAS projects and functions that you might like to help facilitate.

Please indicate which of the following activities might be of interest to you:

___ Star Parties - Do you own a telescope you can bring: Yes () No ()

___ General Meetings - Finding (or being) a Speaker. Official greeter. Set up or take down ISC or refreshments.

___ Family Science Day & Astronomy Festival (Usually at CSM the first Saturday in October).

___ Social Events - Equinoctial and Summer Solstice potlucks, Summer Star-B-Que, Holiday Potluck.

___ SMCAS Membership and Promotional Drives

___ Communications – 'Event Horizon' Newsletter, Website(s), Facebook page, group email, Publicity posting.

___ Educational Programs – School, museum and library star parties, Bay Area Astro teacher assistants.

Other/Comments: _____