F E B R U A R Y 2 0 1 8

Mount Diablo Astronomical Society

Diablo MoonWatch

GENERAL MEETING PROGRAM

TUESDAY, FEBRUARY 27, 2018 7:15 PM
DOORS OPEN 6:45 PM

Variable Star Observing with Science Results

Speaker: Bill Goff, AAVSO

Lindsay Wildlife Experience
1931 First Avenue
Walnut Creek CA
Follow Parking Instructions on Last Page

By Dick Flasck

This talk will discuss variable star types and observing techniques that have led to an understanding of the composition, structure and evolution of stars and how this knowledge has impacted our understanding of the universe. CCD observing and variable star photometry techniques using modest equipment accessible to amateur astronomers will be covered. Variable star data collection is one of the few fields available to amateurs to materially impact professional astronomy.



Mr. Goff had been a casual observer of the deep sky and an ATM enthusiast for a number of years. In the 1980s he met some AAVSO observers at Ford Observatory in Southern California. He immediately embraced visual variable star observing and learned a great deal about these interesting stars and the associated observing techniques. Later, as he attended AAVSO meetings he enjoyed the interesting dedicated people and sense of purpose that came from planned observing. AAVSO is a wonderful organization of people who love the many facets of observational astronomy.

Come to the February meeting and learn how to emulate these special stars and shine more brightly in our avocation!

WHAT'S UP? MEMBER TALK

What's Up?

RTMC

By Richard Ozer

RTMC, otherwise and previously known as the Riverside Telescope Makers' Conference, is turning 50 this year! The event has always involved a significant presence from Northern Californians and this year is no exception. Rich Ozer will give a What's Up to talk about the history of RTMC, and why this year will be a good one.

IN THIS ISSUE

February 27th Meeting Programs	1
President's Corner: Nucleosynthesis Revisited	2
Marvelous Moon: Copernicus	3
Photo Gallery: Is That the Real Color?	4-5
ECLIPSE! Super Blue Blood Moon Photo Bonanza	6
Update! New Year Fireworks in Andromeda Galaxy	7
Outreach / News & Nuggets: G Bruce Blair Awardee	8
MDAS Jacket Order Time!	9
Event Calendars for February and March 2018	10-11
Meetings & Mt Diablo Events 2018 CALENDAR	12
Club Contact Information	last pg

PRESIDENT'S CORNER

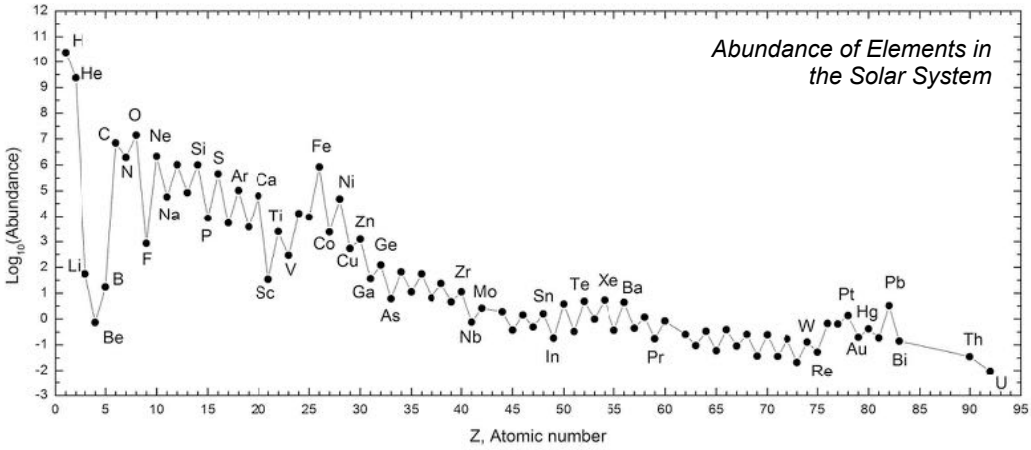
Nucleosynthesis Revisited (Part 1)

MDAS President: Steve Jacobs



A few years ago I gave a What's Up talk about nucleosynthesis. Nucleosynthesis is the formation of atoms heavier than Hydrogen or Helium.

There are several nucleosynthesis processes – Big Bang, stellar, explosive (i.e. supernovae), cosmic ray spallation, man-made, and neutron star mergers. All of these will be explained further.



Credits: NASA/JPL-Caltech Note that the Y-axis is logarithmic (i.e. a difference between 1 and 2 is power of 10, so the percent of hydrogen at 10.5 is about 10^4 more prevalent than Fe-Iron at 6.5 or 10,000 times) Source: Wikipedia Commons

Why bring up an old What's Up? Because something new has been added to the cosmic cookbook –namely the merger of two neutron stars.

In the first few minutes after the Big Bang, according to the theory, there would be about 75% hydrogen, about 25% helium, about 0.01% deuterium (hydrogen with an extra neutron) and helium-3 (helium with one less neutron), trace amounts (on the order of 10^{-10}) of lithium, and negligible heavier elements (all percentages by weight (mass)). These percentages pretty much represent the mass of the observable universe with a higher percent of some heavier elements.

The heavier stuff came from the other processes. As the chart above demonstrates, most of the elements in the Solar System are H- hydrogen and He – helium. Keeping in mind Chemistry 101, the number of protons determines the element. The number of neutrons determines if the isotope (isotopes are the same element but with a different number of neutrons) is radioactively stable.

The next well understood process of nucleosynthesis is the stellar process which accounts for most of the elements up to Fe – iron. This process in its simplest form combines (fuses) 4 Hydrogen atoms to one Helium atom and releases a lot of energy. All of this takes place in the core of a star. The same process occurs in a thermonuclear weapon. In fact the core of a main sequence star, including our own Sun, is a giant continuous hydrogen bomb converting H to He.

After most or all of the H is used up, "burned", then if the star is large enough, He is fused to C - carbon and O – oxygen and so on until Fe – iron. Then things get interesting. The fusion process which produces iron doesn't release energy; in fact it is endothermic (requires energy to proceed). This causes the core of a star to cool and gravity takes over. The resulting collapse of the star's core results in a supernova.

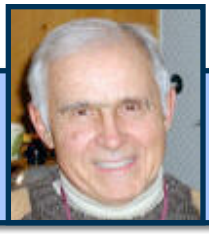
The supernova process produces elements heavier than iron in the few seconds after the core collapse. However, scientists didn't believe that the abundance of heavy elements could be accounted for by the supernova process.

Stay tuned for next month's installment (Part 2) for the exciting conclusion!

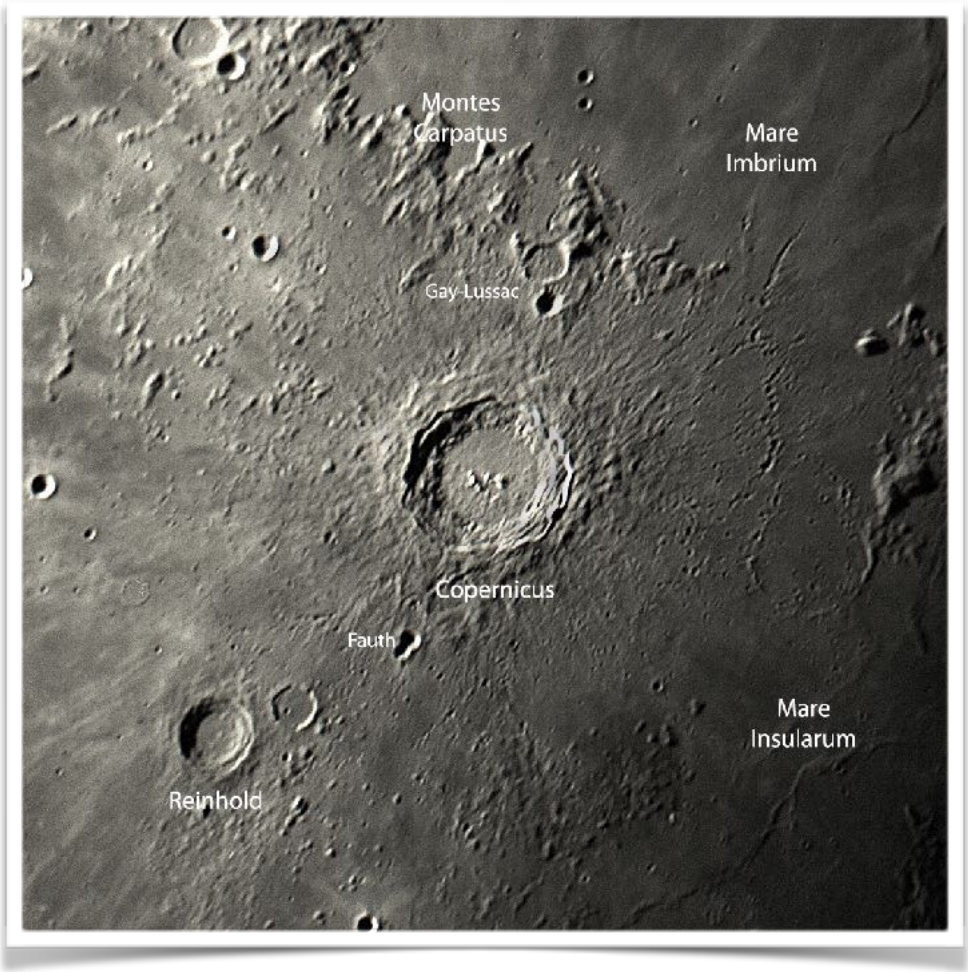
MARVELOUS MOON

Copernicus, Origin of Lunar Rays & History

by Jim Scala, MDAS member jscala2@comcast.net



Copernicus, possibly the most spectacular of all lunar craters, comes into view a few days after first quarter. That timing is excellent and allows viewing when the moon is high in the sky. As the origin of an extensive ray system that is easily observed with small telescopes, its rays can be traced across Maria Insularum and Imbrium, and as far away as Mare Nubium which doesn't appear on this image. Full Moon brightness is easily managed with filters. I have seen some observers use sunglasses.



Copernicus is about 56 miles across (about the distance from Walnut Creek to Sacramento), 2.4 miles deep with terraced walls and a flat floor. Its central peak, at about 3,300 feet, is a little shorter than Mt. Diablo. Since the outer walls are only a half mile above Insularum's surface it is clearly an impact crater. The difference in depth is striking near last quarter when its walls stand out, while its interior, including the central peak are in complete shadow.

LOOK EAST

Look east of the crater at the line of small craters and the deep rill nicely illustrating a group strike of small meteors and trace them upwards to the half mile high Montes Carpatus. Clearly the Gay Lussac crater and rill were formed after the mountains that appear geologically related to Copernicus.

LOOK SOUTH

Now turn your attention south and take notice of Reinhold and the sunken crater just to its north. It's a nice lesson in lunar history in which one crater has sunk into the Mare while the other appears freshly formed.

Notice also Fauth which consists of two craters raising a question of *was it two impacts?*

Now draw your view back and take another overview. We have only touched on a few high points of what's shown in this image. There are mountains, many small craters and the rills on the Mare. All of which can help us understand lunar history and the incredible meteoric activity of the early solar system. In addition it illustrates the Moon's protective effect..

I hope my image and this brief discussion will induce you to observe the Moon when past first quarter and is near full. ~

MDAS ASTROIMAGING

Is That the Real Color? (Images next page)

By Stuart Forman of the MDAS Imaging Special Interest Group

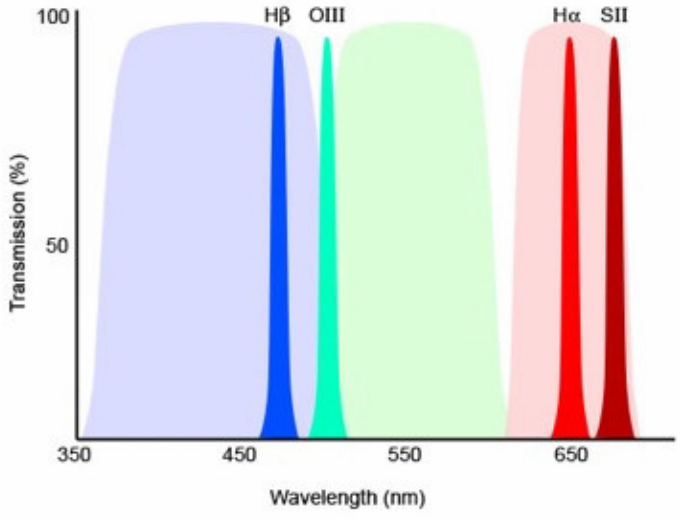
"Is that the real color?" *(**See images on the next page**)*

That's a question astrophotographers get all the time. What is "real color"? We have all looked in scopes at nebula and seen grey fuzzies, and if we are lucky enough to look in a fast scope with a large aperture in a dark sky you might see slight greens or reds.

In color astroimaging, we image in red, green and blue. We balance color based upon best available white balance data and neutralize the background. Then we stretch images, and boost color saturation. It's not that easy, obviously, but the resulting color more or less represents the color of the actual object.

Unless it is narrowband. Narrowband imaging is an advanced type of imaging where instead of imaging with broad color filters (which can be 100 nm of bandwidth or more) and image with filters that only let in tiny bandwidths, such as 3 or 5 nm. We do this because it's relatively insensitive to light pollution and we can have interesting results.

Here is a graph that compares the spectrum of broadband vs narrowband filters.



The three most common filters that are used are hydrogen alpha, oxygen 3 and sulfur 2. As you can see, both Hydrogen alpha and Sulfur 2 lie deep within the red spectrum and Oxygen 3 lies somewhere between blue and green. There are other narrowband filters such as Hydrogen beta (pictured) but they are not commonly used by astrophotographers (you will find a lot of interesting ones in the Hubble archives if you feel ambitious and want to try to process some Hubble images).

So on first glance, it may not be any use to get two filters both in the red, but here is the rub: In narrowband, when we process, the colors are completely arbitrary. That makes it easy and hard at the same time. Easy, in that there is no "right" way, and hard, because there is literally an infinite combination of color that can be done.

Example Comparison (Images next page)

The top image on the next page is an example of a process where the Sulfur 2 is assigned to red, the Hydrogen alpha to green, and the Oxygen 3 to blue. Then the colors are tweaked in processing and you get a result more or less like that image. This process was taken by me in Pleasant Hill with my 140 mm refractor and QSI 683 (CCD camera). This is the classic "Hubble Palate".

The lower image on the next page is same target taken by Chris Ford with his 180 mm refractor and his SBIG 16803 chip. This is a completely different "palate." It is also a narrowband image, but instead, he used a more complicated formula:

- Red: 45% Ha, 55% S2
- Green: 15% Ha, 85% O3
- Blue: O3

And as you can see, he got a completely different result.

So as you can see in narrowband imaging, the sky's the limit! (Pun intended)

MDAS ASTROIMAGING

Is That the Real Color? (Images of Pacman Nebula: NGC 281)

Submitted by MDAS Imaging Special Interest Group





(See article on previous page)

NGC 281, a star-forming region, is located 9,200 light-years away in the direction of the constellation of Cassiopeia.

Top image Credit: Stuart Forman

- Red: S2
- Green: Ha
- Blue: O3

Lower image Credit: Chris Ford

- Red: 45% Ha, 55% S2
- Green: 15% Ha, 85% O3
- Blue: O3

How to join the Astro Imaging Group

Click on https://groups.io/g/mdasimaging, scroll to "Apply For Membership In This Group". For any questions, please email Stuart Forman at s24man@gmail.com

MDAS
ASTROIMAGING

Super Blue Blood Moon Bonanza (Crank up your display brightness!)

Submitted by MDAS Imaging Special Interest Group



Bob Minor: Moon plus the Beehive cluster: Nikon D300 200mm Nikon f4 - two exposures combined for dynamic range.



Tony Saraiva: using a c8 and a Nikon d810a.



Dan Vanderzanden: Taken with a 8 inch SCT and Canon 5dIII, 5 sec exposure



Donna Cook: "Moonset: looking like Jupiter"



Dan Berman: I took my DSLR and and a couple of telephoto lenses to Treasure Island. Between the skunk wandering around us threateningly and the raccoon grabbing my tripod (not kidding), I managed to snap this shot.

AMATEUR ASTRONOMY RESEARCH

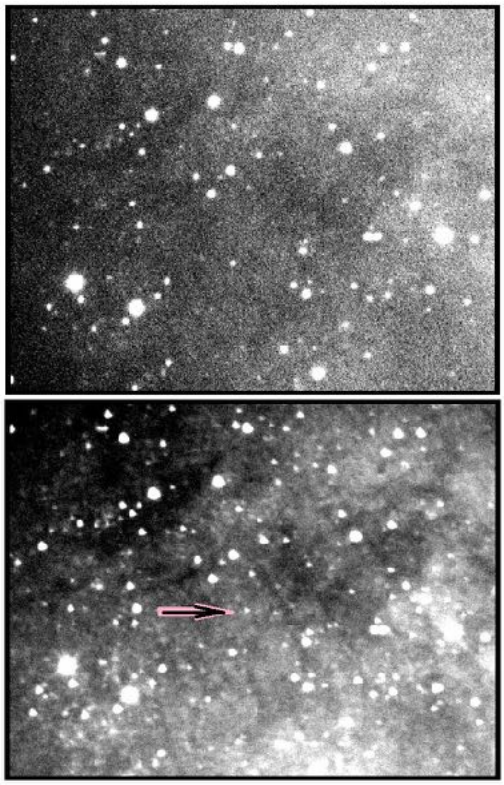
New Year Fireworks in Andromeda Galaxy!

By MDAS member Lew Cook

This article may seem familiar. This is the successful continuation of Lew Cook's research, initially discussed on page 5 of the March 2016 issue of our Diablo Moonwatch newsletter: http://www.mdas.net/newsletter/documents/MDASnews1603.pdf

The New Year opened with fireworks in the Andromeda galaxy (M31). A nova erupted over 2 million light years away. A nova is a star that undergoes a nuclear fusion episode on its SURFACE! These are close binary stars where one star revolves around the other in 3 to 36 hours or so. One is an ordinary star, similar to our sun. The other star is about the size of the earth but with a mass of the sun. Called a white dwarf, it is the burnt-out, but still white-hot, remains of the core of its parent star.

The white dwarf "steals" the stellar wind from its partner and actually causes more matter to be transferred to it. It does this by being so close to its "dance partner." A dance with a Dracula!



Images of the same region in the Andromeda galaxy taken on successive nights (top - 12/30/2017 and bottom - 12/31/2017) showing that the Recurrent Nova (M31N 2008-12a shown by arrow) erupted on New Year's Eve!

Why did we expect the nova to show up? Because once astronomers realized the nova was recurring practically every year, they have looked for it to erupt. Then Prof. Martin Henze of San Diego State University got an idea: why not ask all astronomers with medium to large sized telescopes who were comfortable measuring faint variable stars to look for it, too? He contacted the leaders of groups of professional and amateur astronomers to ask for help. That's when I became involved.

This year's outburst occurred a little later this year than was expected (but not as late as the 2016 eruption). The 2016 eruption, predicted for mid-September, didn't occur until December 13, 2016. The 2017 eruption was discovered by my friend David Boyd, in England, on December 31, 2017, New Year's eve. Just like in 2016, the moon was bright and nearly full.

How do we know this happened on New Year's Eve and not, say, a week or even a day before? Because there were many astronomers looking for it, waiting for it to erupt.

I used a remotely controlled telescope in New Mexico on Dec 30th to produce the upper image (no nova!). The next night, I captured the image of the nova with my own telescope (lower image).

The nova got as bright as 18th magnitude. Remember, the faintest stars you can see with your naked eyes are about 6th magnitude, so what we are excited about would have to be 63,000 times brighter for us to just barely see it with our naked eyes! The nova is shown here at its brightest on the first night in this, a composite of all my acceptable images. The next night the nova had started declining rapidly, as it usually does.

Why is this distant star so interesting?

Recurrent novae (RN) do occur in our Milky Way galaxy, but only ten are currently known and their outbursts are less frequent. The outbursts are believed to be related to the amount of gas falling onto the white dwarf. Eventually, it accumulates until the pressure and temperature climb. Then a nova outburst occurs. Eventually more and more matter accumulates until a critical point is reached. Then the star blasts apart, resulting in a supernova. When? That's the question!

We think this RN in M31 is closer to blasting itself apart than any other known RN in the local group of galaxies. There are 10 known RN in the Milky Way, one in the Large Magellanic Cloud and eighteen in M31. ~

MDAS COMMUNITY OUTREACH

Join Our Outreach Team!

To join the Outreach Team, contact Paul Reid and Ken DeSilva at outreachinfo@mdas.net

Community Outreach is ramping up! Join the fun of sharing the universe with your telescopes, time and expertise.

It's not all telescopes! At a recent Science, Technology, Engineering and Math (STEM) Fair at Pleasant Hill Elementary, while other members were outside with scopes, Ken Coates (pictured here) kindled student dreams of humans on Mars.



To join the Outreach Team, contact Paul Reid and Ken DeSilva at outreachinfo@mdas.net

FOR MDAS MEMBERS

News and Nuggets

G. Bruce Blair Awardee: Wally Pacholka

By Jon Wilson

Western Amateur Astronomers (WAA) had its mid-winter meeting on January 20th at Griffith Observatory. At the meeting, the board nominated **Wally Pacholka** as the G. Bruce Blair Medal winner for 2018 for "Pioneering work in Landscape Astrophotography of National Parks." Wally has made a tremendous contribution to landscape photography with the night sky as a backdrop. Wally's photo and biography is here: http://www.waastro.org/. The award will be given at the Riverside Telescope Makers Conference (RTMC) this year, which is also the 50th anniversary of RTMC, May 24-28, 2018. http://rtmcastronomyexpo.org/



Wally's remarkable images can be seen and enjoyed at AstroPics.com

Call for Volunteers: Chabot Space and Science Center

RSVP for Volunteer Orientation: Saturday, February 17, 2018, 10:00am to 2:00pm

Do you want to Inspire young astronomers and future scientists by assisting students in our astronomy education programs? A brand new exhibit designed by The Exploratorium will be opening this spring at Chabot Space and Science Center in Oakland. We will be in need of volunteers during the daytime to assist visitors with daytime observatory deck experiences. Wednesday – Sunday volunteers are Chabot Space & Science Center ambassadors who work with students and the general public to enhance their experience. Volunteers interested in these roles must be outgoing, have an interest in working with various age groups, and enjoy speaking and interacting with children. Orientation and training is provided. We ask our volunteers to work 8 hours per month and for at least one year. For more information on our volunteer program and to RSVP and register for orientation, visit *http://www.chabotspace.org/adult-volunteers.htm* or email the Volunteer Department volunteers@chabotspace.org

WEAR YOUR CLUB COLORS

Time to Order Your Personalized MDAS Jacket!

ANNUAL ORDER

We place our MDAS jacket order once a year, so NOW is your chance to reserve your very own personalized MDAS jacket.



The order will be placed on March 15th, so reserve yours right away.

Order online here:
http://www.mdas.net/mdas_store.html#MDAS_Jacket

- **We need a minimum order of four jackets.**
- **Orders are only placed once a year.**

Jackets will be available for pickup at the April (or May) general meeting.

Your jacket is embroidered on the back with our club name, includes an MDAS patch sewn on the front, and your first name embroidered on the front. The cost of the jacket is $55.00.

WHAT'S YOUR SIZE?

Be sure to tell us the **size** you want (S, M, L, XL, XXL) and the **first name** you want embroidered on the jacket.

NOTE: The sizes are in Men's and run a bit large, so order accordingly.

In these two photos, Marni is wearing a size Small.

Order online here:
http://www.mdas.net/mdas_store.html#MDAS_Jacket

OR

You can **mail a check for $55 made payable "Mount Diablo Astronomical Society"** to this address:

Mount Diablo
Astronomical Society
P.O. Box 4889
Walnut Creek, CA
94596



For questions, email mdasberendsen@gmail.com or call Marni Berendsen at 925-930-7431.

WEAR YOUR MDAS COLORS TO ALL OUR EVENTS!

WEAR YOUR CLUB NAME BADGE

Need an extra MDAS Name Badge?

If you'd like a second (or replacement) MDAS Name Badge - or name badges for family members in your same household, order them online here (Scroll down to "Additional Badge Request"):

http://www.mdas.net/mdas_store.html

Orders are placed monthly.

Each badge is $7.00. Badge orders placed by the last day of the month will be ready for pickup at the following month's meeting.

Questions? mdasberendsen@gmail.com

EVENT CALENDAR

FEBRUARY 2018

Detailed Event Information: https://nightsky.jpl.nasa.gov/event-list.cfm?Club_ID=51

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28 5:25 PM Sunset	29	30	31	01	02	03 6:00 PM Observatory
04 5:33 PM Sunset	05 6:30 PM Diablo View Middle	06	07	08 6:00 PM Hidden Valley STEM Fair	09	10 5:00 PM Society Observing
11 5:41 PM Sunset	12 7:30 PM MDAS Board Meeting	13 5:30 PM Garin Family Science	14	15	16	17 5:00 PM Society Observing
18 5:48 PM Sunset	19 7:00 PM MDAS Imaging Meeting	20	21 5:30 PM Loma Vista STEAM Night 6:00 PM Country Club Astronomy	22 6:00 PM Westwood Elementary STEM	23	24
25 5:56 PM Sunset	26	27 7:15 PM GenMtg: Variable stars	28	01	02	03

OUTREACH EVENTS

NEXT COMMUNITY OUTREACH EVENT

Monday, February 5th, Diablo View Astronomy Night

HOW TO sign up to help at school and community outreach events (events in RED on the calendar):

- Log into the Night Sky Network.
- Select: My Profile > My RSVPs
- Upcoming outreach events will be listed.
- Select Update next to events where you can help.



EVENT CALENDAR

MARCH 2018

Detailed Event Information: https://nightsky.jpl.nasa.gov/event-list.cfm?Club_ID=51

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25 5:56 PM Sunset	26	27	28	01 6:00 PM Adams Middle Science	02	03
04 6:03 PM Sunset	05	06	07 6:30 PM Gregory Gardens Star Part	08	09	10 6:00 PM Observatory
11 6:10 PM Sunset	12 7:30 PM MDAS Board Meeting	13	14	15	16	17 5:00 PM Society Observing
18 7:16 PM Sunset	19 7:00 PM MDAS Imaging Meeting	20	21	22	23	24 5:30 PM Public Astronomy: Stars
25 7:23 PM Sunset	26	27 7:15 PM GenMtg:Spacefaring	28	29	30	31

UPCOMING SKY EVENTS

For more upcoming sky events,
http:/www.seasky.org/astronomy/astronomy-calendar-current.html

February: NO FULL MOON! Two full moons occur in each of January and March this year, leaving February without.

March 20 - March Equinox. The March equinox occurs at 8:15 am PDT. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world.

March 2 and 31 - Full Moons, Blue Moon. Since the 31st has the second full moon in the same month, it is sometimes referred to as a blue moon. **This year is particularly unique in that January and March both contain two full moons while February has no full moon.**



Image Credit: J. Scala

CLUB EVENTS

2018 MDAS CLUB EVENT DATES

(Includes pre-scheduled events only: does not include outreach events - see pages 10 & 11)

For Detailed Event Information, refer to our club's Events calendar on the Night Sky Network: https://nightsky.jpl.nasa.gov/event-list.cfm?Club_ID=51

General Meetings

Lindsay Wildlife Experience
7:15 pm

GENERAL	Board
2018-01-23	2018-01-08
2018-02-27	2018-02-12
2018-03-27	2018-03-12
2018-04-24	2018-04-09
2018-05-22	2018-05-07
2018-06-26	2018-06-11
2018-07-24	2018-07-09
2018-08-28	2018-08-13
2018-09-25	2018-09-10
2018-10-23	2018-10-08
2018-11-20	2018-11-05
No December Meetings	

Board Meetings 7:30 pm
Sports Basement

Public Astronomy Nights

Mount Diablo Lower Summit Lot

Event Date	Sunset Time	Moon Phase
2018-03-24	7:25 PM	First Quarter
2018-04-14	7:44 PM	Waning Crescent
2018-05-19	8:16 PM	Waxing Crescent
2018-06-16	8:33 PM	Waxing Crescent
2018-07-28	8:21 PM	Waning Gibbous
2018-08-11	8:05 PM	New Moon
2018-09-29	6:54 PM	Waning Gibbous
2018-10-13	6:34 PM	Waxing Crescent
2019-03-09	6:11 PM	Waxing Crescent

Society Observing

Mount Diablo Lower Summit Lot

Event Date	Sunset Time	Moon Phase
2018-01-13	5:11 PM	Waning Crescent
2018-01-20	5:20 PM	Waxing Crescent
2018-02-10	5:43 PM	Waning Crescent
2018-02-17	5:51 PM	Waxing Crescent
2018-03-17	7:19 PM	New Moon
2018-04-07	7:38 PM	Waning Gibbous
2018-05-12	8:10 PM	Waning Crescent
2018-06-09	8:31 PM	Waning Crescent
2018-07-14	8:31 PM	Waxing Crescent
2018-08-04	8:15 PM	Last Quarter
2018-09-08	7:27 PM	Waning Crescent
2018-10-06	6:44 PM	Waning Crescent
2018-11-03	6:07 PM	Waning Crescent
2018-11-10	5:00 PM	Waxing Crescent
2018-12-01	4:50 PM	Waning Crescent
2018-12-08	4:50 PM	Waxing Crescent
2019-01-05	5:05 PM	Waning Crescent
2019-01-26	5:26 PM	Waning Gibbous
2019-02-02	5:34 PM	Waning Crescent
2019-02-23	5:57 PM	Waning Gibbous
2019-03-02	6:04 PM	Waning Crescent

Observatory Maintenance

Mount Diablo Observatory

Event Date	Sunset Time	Moon Phase
2018-01-06	5:05 PM	Waning Gibbous
2018-02-03	5:35 PM	Waning Gibbous
2018-03-10	6:11 PM	Waning Crescent
2018-04-21	7:51 PM	Waxing Crescent
2018-05-26	8:21 PM	Waxing Gibbous
2018-06-30	8:35 PM	Waning Gibbous
2018-07-07	8:34 PM	Waning Crescent
2018-08-18	7:57 PM	First Quarter
2018-09-01	7:37 PM	Waning Gibbous
2018-10-27	6:14 PM	Waning Gibbous
2018-11-17	4:56 PM	Waxing Gibbous
2018-12-29	4:59 PM	Last Quarter
2019-01-12	5:11 PM	Waxing Crescent
2019-02-09	5:42 PM	Waxing Crescent
2019-03-30	7:30 PM	Waning Crescent

To add all events to your iOS Calendar, Log into Night Sky Network, select "Events" then click on "Show Upcoming Events" on the right side box. Above the "Find Astronomy Events" box, select "Download Events to iCal" and follow the prompts.

Mount Diablo Astronomical Society
Diablo MoonWatch
FEBRUARY 2018

CLUB CONTACT INFORMATION

BOARD AND COMMITTEE MEMBERS

See who all these folks are: http://www.mdas.net/clubboard/clubboard.htm

President
Steve Jacobs -llasjacobs@gmail.com

Vice President
Leary Wong - kinglear3@aol.com

Secretary
Moon - moonglow611@gmail.com

Treasurer
Jamshed Gandi
gandijamshed@gmail.com

Board Member;
Whats Up Coordinator
Kent Richardson -
kayarind@sbcglobal.net

Board Member
Paul Reid -
p4real@comcast.net

Board Member;
AANC Rep; Observing Chair
Richard Ozer - rozer@pacbell.net

Outreach Coordinators
Paul Reid & Ken DeSilva
outreachinfo@mdas.net

New Member Steward
Nick Tsakoyias -
claytonjandl@aol.com

Astroimaging Group Co-Chairs
Stu Forman s24man@gmail.com
Chris Ford cford81@comcast.net

Meeting Programs
Dick Flasck - rflasck@aol.com

Meeting Refreshments
Ron & Laura Daniel -
daniel.laura945@gmail.com

Publicity
Mark Stafforini -
mstafforini@yahoo.com

Webmaster
June Stephens -
webmaster@mdas.net

Yosemite Coordinator
René Gandolfi -
rene.gandolfi@sbcglobal.net

Mt Diablo Observatory;
WAA President
Jon Wilson -
jwilson8721@sbcglobal.net

Newsletter Editor;
Membership Coordinator
Marni Berendsen -
mdasberendsen@gmail.com

Mailing address:
MDAS
P.O. Box 4889
Walnut Creek, CA 94596-3754

Website:
www.mdas.net

General Meetings:
Fourth Tuesday every month, except on the third Tuesday in November. *No Meeting in December.*
Refreshments and conversations at 6:45 pm; Meeting begins at 7:15

Where:
Lindsay Wildlife Experience
1931 First Avenue
Walnut Creek, CA 94597
http://lindsaywildlife.org/



Parking Instructions for Meeting

Lindsay Wildlife Experience is located in a residential area. There are no parking meters.
Please park only in the Lindsay parking lot on the east side of Lindsay, the Friends Church lot across the street (except Sunday mornings) or on Buena Vista Avenue. Please do not park on First Avenue in front of our neighbors' homes — you will get a parking ticket.