



March, 2021

April Meetings

The next **Membership Meeting** will be on Monday, April 19th from 8 PM via Zoom videoconference. Dennis Roscoe will give a presentation entitled: Galaxies.

He will be discussing the different types of galaxies and the latest hypotheses on how they were formed. Dennis will also spend time discussing our own Milky Way and the latest data from the Gaia space probe.

As always, the **Board Meeting** will be held right before the Membership Meeting, from 7 PM, and is

open to every MAS member who is interested in organizational and Observatory related issues.

The **Astrophotography Interest Group** will meet on Thursday (!), April 15th at 7 PM through Zoom videoconference. Dennis Roscoe will give a presentation and lead a discussion about his experiences with an Astrophotography Automation Software Voyager.

The **First Wednesday (How to) Meeting** will be held through Zoom videoconference on April 7th, from 7:30 PM. This is an informal meeting to discuss technical aspects of astronomy, however, any astronomy-related topic can be brought up. New members are especially encouraged to attend this meeting. It is a chance to receive tips on how to get started and/or get more involved in the Club's activities.

Invitations will be sent out prior to meetings.

The MAS Google Group is as active as ever. Learn about the astronomical news, follow equipment related discussions, or just check out the latest images taken by fellow Club members.



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Observatory Director Report

There is little new at the Observatory this month, but what I do have is good...

First, we had a week of clear weather that allowed members back on the hill to make use of the equipment once again. The Messier Night on 3/11/2021 was well attended and members were able to hunt down objects with an Unistellar eVscope, which was brought out for the evening. Next, I have been busy selling telescope items donated last summer. Sold were:

SBIG ST-7XME with a CFW-8A and an AO-7 Bundle \$250; Sky Watcher 120ED APO Pro Series Refractor \$910; Three Very Old Meade CCD Cameras \$60; an 8" Celestron on a basic fork mount, no GTO \$600; an Astronomik OIII CCD-Filter, 1.25" \$75. The total sales were \$1895 which will go into the Observatory New Equipment Fund.

Respectfully Submitted,
Paul Borchardt, Observatory Director

Treasurer's Report

\$10,989.01	<i>Starting Balance as of 02/08/2021</i>
	<u>Expenditures</u>
\$7.10	PayPal fees
\$161.29	WE Energies
\$178.39	TOTAL Expenditures
	<u>Revenue</u>
\$51.86	Private Donation
\$204.00	Membership dues
\$50.00	Key deposit
\$2.00	Grants
\$307.86	TOTAL Revenue
\$11,118.48	<i>Ending Balance as of 03/13/2021</i>

Respectfully Submitted,
Sue Timlin, Treasurer

Membership Report

Since the last Report we received 8 new membership applications. We welcome Prasanth Sukumar, Carol Lewandowski & Family, Matthew Ehresman, Samantha Kaufman & Family, Rick Schaber, Tom and Holly Kelly, Matthew Zakrzewski, and Antonio J Vargas & Family. The total number of active members is 174.

Respectfully Submitted,
Jeff Kraehnke, Committee Chair

Minutes

Due to the COVID-19 the Board Meeting was held via Zoom videoconference on March 15th. The meeting was called to order at 7:05PM by Tamas Kriska President.

Minutes, and Treasurer's Report electronically submitted ahead of the meeting were approved.

Observatory Director's Report electronically submitted ahead of the meeting was amended and approved. Amendment: A fuse in the Z-dome controller was replaced. The switch to the Quonset ceiling ventilation was taped. Mike Wagner is working on the LX 200 fork mount in the Tangney Observatory.

Membership Committee Report was submitted electronically ahead of the meeting. Membership applications of Katie Akermann & family, Prasanth Sukumar, Carol Lewandowski & family, Matthew Ehersman, and Samantha Kaufman & family were approved.

Old Business – Display box: Yet to be purchased. **Key request:** The Board approved the Observatory Committee's recommendation to grant a full key and a probationary keyholder status to William Gottemoller. If he is successful, will be put on keyholder rotation from July.

New Business – Public Night: We are considering holding, and taking preparations for Public Nights in the months of September and October. No presentations, only telescope viewing is planned.

Collimator: Costume made 3D printed collimators for SCT are available to buy for \$23/piece per an advertisement on Cloudy Night. The Observatory Committee will explore this possibility and will make suggestion.

Announcement – The next meeting will be on Monday, April 19th, 2021 via Zoom.

Program – Video viewing of Michio Kaku's presentation entitled: The Universe in a Nutshell.



The meeting was adjourned at 9:33 PM.

Respectfully Submitted,
Agnes Keszler, Secretary

Messier Half Marathon

Thanks to member Matt Ryno for bringing out his eVscope Thursday night for the attempted Messier marathon. A decent size group gathered on the green grass. You can look up the details of this newer invention. The scope has a built-in compass that kind of knows where it is. It then takes a picture and plate-solves exactly where it is. You can then ask it to goto any object. It slews to it, re-platesolves and lines it up perfectly. The next part is even better. It starts taking images and shows you an accumulated stack as you watch. It sounds like they are up to 4 s exposures each, depending on the settings. It very quickly shows color in nebulae and even galaxies.



"It was a fun night and good to see and hear a lot of you as a fun socially distant type of way to observe. It was unfortunate those clouds came in early at 10, but we got a few bonus targets in then like NGC 2158, 6015, 6503, Owl Cluster, etc. The good news is that the clouds lifted later as I drove home down Calhoun, so I found a dark spot and brought the scope out again to make it to at least a half marathon, capturing 59 Messier objects in one night!

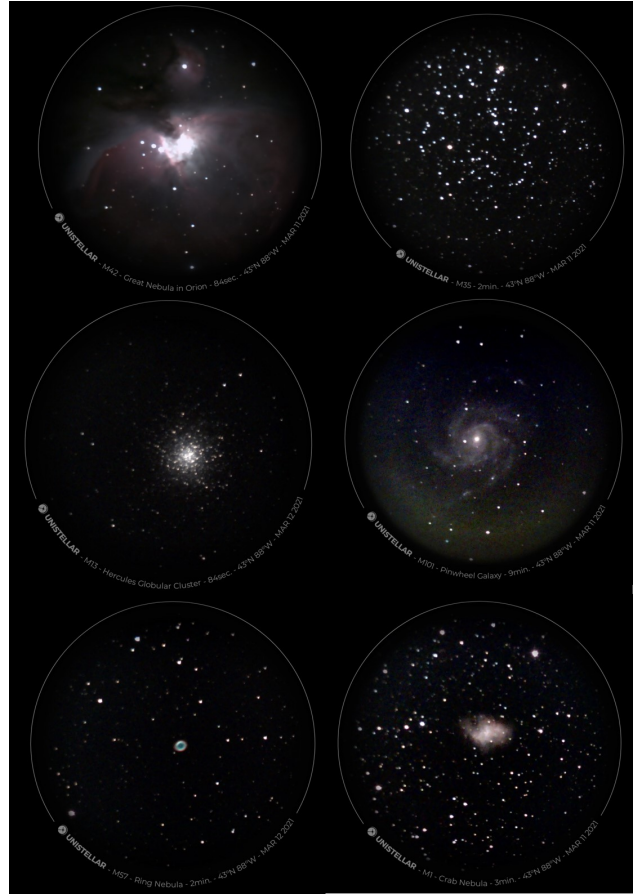
You all had a lot of great questions that I wish I had answers to off the top of my head, so thanks for posting some of those details for everyone.

I recall telling someone it had a "sony IX or something" sensor in it, so there you go ;-) I will have to bring this on a notecard I can just reference, heh.

I haven't had a ton of time to collect and share the images yet - but I uploaded them last night to Unistellar/SETI, so they looked decent. I'll gather and share all of the snaps we took over the week-end here as a follow-up.

So how many Messier objects did we get to? On my ride home the clouds that rolled in lifted about 45 minutes to midnight, so I increased our Messier till Midnight count.

Then being the nerd I am, knowing we needed a few more, I kept going until the battery on the eVscope finally died around 2 am or so.



March 11 into March 12 final counts: Messier 'till Midnight count - 32 Messier Objects; Messier after Midnight count - 28 Messier Objects to 2 am (1 of them was just a cloud, so -1). That equals 59 Messier objects total. Half Marathon achieved!"

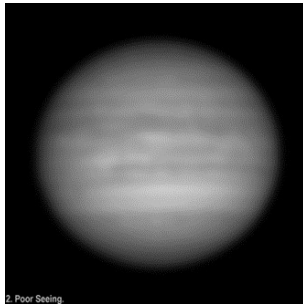


Matt promises to bring it out again with a nice tablet that's easy for many to view safely.

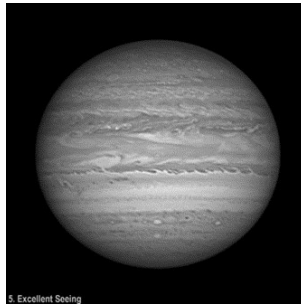
Seeing the Problems in Planetary Imaging with Film (Part III)

When you look up at the stars at night, they twinkle in their typical twinkly way. But it is this twinkling that distorts their images like an object at the bottom of a pool when the surface is disturbed. This is called scintillation and is the major limitation to seeing small details in the planets. While Jupiter & Saturn will look sharp at low magnifications that are typically used to view them, at high magnification needed for high resolution planetary imaging, the disks dance, flutter and blur in a seemingly random way. While typical snapshots in daylight with film use exposures that are a small fraction of a second, exposures of the relatively dim planets can be a large fraction of a second or more. The longer the exposure, the more opportunity there is for the image to be hopelessly blurred. In addition, this blurring is worst for the details on the small planets. It is not as much a problem for the much larger objects that deep sky imagers photograph.

This, in a nutshell, is the problem that must be overcome to get sharp planetary images. The long exposures required by low sensitivity film allow the turbulence of the atmosphere to blur the fine details on the planets. This turbulence is called seeing and is demonstrated by the images below.



Poor seeing



Excellent seeing

To highlight how far planetary imaging has come, I now want to show you some past images of planets using film. They pretty much speak for themselves and represent the state of the art at the time.

First a story. Just before the MAS remodeled the Quonset hut (meeting room) the Z dome was also remodeled. New floor, paint job and a massive reduction in the MAS print library which included disposing of the collection of Sky & Telescope magazines (from the 1940's!) that were filling up the "control room". As I was pulling them out of their binders to send to recycling, it was interesting to see the progression of amateur astronomy and how imaging was going. I noticed that while

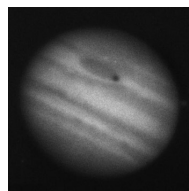
there were many pretty good images of deep sky objects, there were almost no planetary pictures and what I did see did not show much detail but for the most obvious features. Certainly not as much as you could see, however briefly, through the eyepiece.

One cover did catch my eye. It was from the early 1960s and showed a picture of the planet Jupiter using no less than the largest telescope in the world at the time, the venerable Hale 200" (5 meter) telescope at Mt Palomar using the state-of-the-art film and techniques during a time of good conditions resulting in what I can only assume was one of the best photographs of Jupiter ever taken. Why else would Sky & Telescope magazine put it on the cover if it were not an example of cutting-edge imaging?

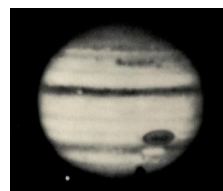
So how would I describe this example of mid-20th century astronomical technology? I have used this term to describe an image taken under the worst possible conditions: a fuzzy tennis ball. I couldn't believe that this 6" fuzzy tennis ball with two fuzzy horizontal stripes was Jupiter. It showed absolutely no other features or even the Great Red Spot. I couldn't help but break out laughing. But I also knew the limitations the astronomers at the Palomar Observatory were working under.

This why I am so excited about the digital imaging of planets as the results are nothing short of magic compared to images like that. And it's as easy as imaging can be once you get some practice. The MAS has all the equipment including the telescope, camera and even a laptop, though I recommend you bring your own with software already installed.

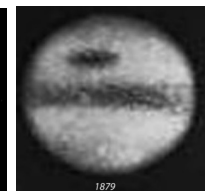
In the images below, note the large size and oblong shape of the Great Red Spot (GRS). It is about half the size now and rounder. Also note that while you can see the major belts and spots, there is no fine detail (though the Lick image is pretty good) because it has been blurred by the turbulence in the atmosphere during the exposures. The middle image looks a lot like that image on the cover of Sky & Telescope so long ago.



36" Lick scope in 1890



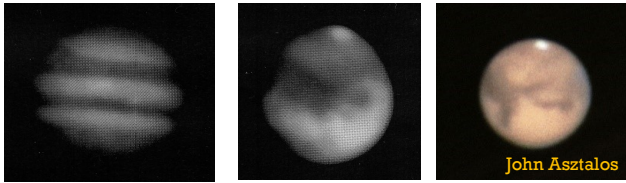
200" Hale scope in 1952



State of the art in 1879!

To be continued on page 5

The images below are from the 1980s using a 10" telescope and are among the best amateur images of Jupiter & Mars at the time.



As you can tell, these images leave much to be desired. While they were good at the time, they did not show as much detail as you could see by looking through the telescope due to the blurring of the atmosphere. What to do? One thing to do is put your telescope above the blurring effects of the atmosphere, think Hubble Space Telescope. An-

other way is to use something called adaptive optics, where your telescope mirror is literally flexed in such a way to counteract the atmospheric blurring. Unfortunately, you need powerful lasers, fast computers, a specially designed thin mirror with hundreds of specially designed actuators on the back of the mirror, etc., etc., etc.... Only large professional observatories have the resources to do this.

So, it seems like the amateur astronomer is left to take all the blurry planet pictures they want. But a revolution is coming that will change everything and beat the shifting atmosphere at its own game!

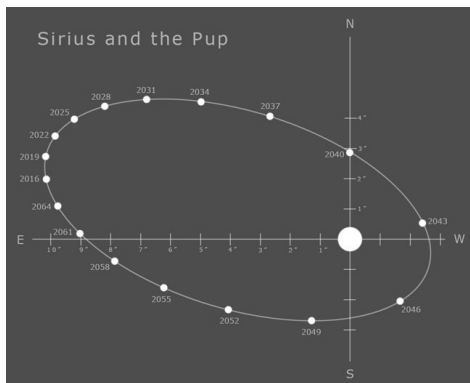
Lee Keith

Final part will appear in the April issue

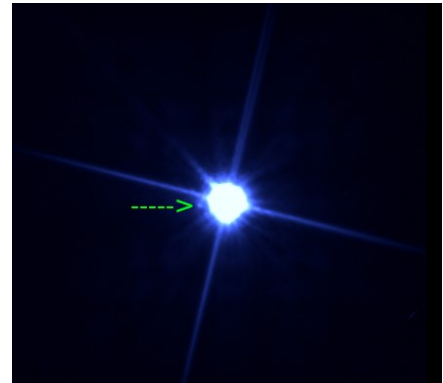
Member's Story: Imaging Sirius B

I've ~~wasted~~ spent as much time on our brightest star Sirius and its companion as on the elusive moons of Mars. Where Deimos is 500,000x dimmer than its parent Mars, and about 72 arcseconds away, Sirius B is only 10,000x dimmer but a slim 11 arcseconds away.

It is believed that Sirius B was originally larger, blew up as a red giant, and is now a white dwarf. In 2023, they will be a maximal 11 arcseconds apart, but they are essentially that right now: A is about 2 sun diameters wide, and B is only the size of the Earth.



So the difficulty visually and photographically is that the brightest star in the night sky starts to spread out from atmospheric seeing and overtakes its little companion. A Sky and Telescope article from about a year ago stated that the author DID see it visually



with something like an 18inch scope, high magnification and a very clear night. Well, we have access to 2 out of 3 of those, but several hours of my life have not been able to see Sirius B (the pup).

So on a Saturday's member's night we slapped a planetary camera on the A-scope and took a few 0.6 second images. And we found it! You could see it on the live image, and then stacking a few showed it nicely, to the left where it should be given some camera tilt could NOT see it visually, even with high magnification and sticking it off the side of the field. Perhaps on a clearer night (seeing was reported as 3/5) and with our 18inch scopes it could be seen. It only takes a few seconds to point a scope at it and say "nope". Or the host could put a quick camera on there and try to capture it.

Like going on a safari- everyone knows what a lion looks like, but finding one in the wild and photographing it is kind of fun.

Russ Blankenburg

Member's Story

Imaging a Supernova

I am pleased to report that Saturday, March 6th morning I came across my first supernova of the year. And there is more, a lot more! SN2021biz, which is located in galaxy NGC4227, is not only my first supernova discovery of this year, but it is the first supernova that I have ever found in a secondary galaxy. What's a secondary galaxy? My definition of a secondary galaxy is any galaxy that happens to exist on the same frame as the galaxy that I had purposefully targeted. Secondary galaxies are common. I would guess that at least one third of the 537 galaxies that I routinely target have one or more secondary galaxies appearing in the same frame. Most of them are small and far

away. Galaxy NGC4227 measures 1.5 x 0.9 arc minutes and is 269 million light years distant. And that makes SN2021biz the most distant supernova I have ever come across.

This time last year, I wasn't even looking for supernovae in secondary galaxies. Because they were small and distant, and my refractor only measures 5 inches in diameter, I wrongly thought it wasn't worth the effort. But, by chance a MAS member posted that a super bright supernova had been discovered in a tiny galaxy. And that galaxy did not appear on my official target list. As it turns out, one of my target galaxy images contained the galaxy with the supernova and because my routine was/is to zoom in on the target galaxy while doing the

"blinking", I had missed it. To me, missing a super bright supernova in such a tiny galaxy was unacceptable. I had to do something about it.

The attached picture is an actual screenshot showing most of the information available to me at the time I'm doing the "blinking". The large "fit" CCDStack image, upper left, is zoomed in to 200%. It shows the supernova in the secondary galaxy

NGC4227. But, the actual galaxy targeted for this image, NGC4203, is located off screen. At the bottom left is a black rectangle with some circles in it. The black rectangle represents the entire picture frame of the current target galaxy. The circles show the position

Object	Cons	Type	Mag.	Size(m)	PA	Mly	RA (hms)	DEC (dms)
NGC4203	Com	EGAL	10.7	3.4/1.4	10	49	12:15:05.2	+33:11:52.0
NGC4227	Cvn	GAL	13.7	1.5/0.9	70	---	12:16:33.7	+33:31:16
NGC4229	Cvn	GAL	14.2	1.1/0.8	3	---	12:16:39.6	+33:33:38

Metadata for SN2021biz:
 2021biz (= ATLAS21dfz) (= ZTF21aagcn1), TNS discovered 2021/03/29 5:43 by ATLAS Found in NGC 4227 at R.A. = 12h16m34s.755, Decl. = +33° 31' 35".51 Located 12".8 east and 16".5 north of the center of NGC 4227 (Gianluca Masi image) (Odd Trondal image) (Jean-Claude Merlin image) (Odd Trondal image) (Michael Antoin image) (Jean-Claude Merlin image) Mag 16.8:3/3 (15.3:2/11), Type Ia (zhost=0.021513) (Claudio Bal con spectrum) (Reference: ZTF observations)
 P1=NGC4203_L21-03-06_061535t_120x2Ec

and size of all galaxies which appear in the same frame. The target galaxy is in yellow and is always centered. To the right of the black rectangle is a list of all galaxies which appear in the frame. The list includes additional info on the galaxies. The target galaxy is always at the top.

It took me quite a while to program this new display, but it works. And because of it, I can now look at more galaxies, with no increase in the amount of pictures, and with only a modest increase in time.

Daniel Herrman

In the Astronomical News

Nova Brightens in Cassiopeia

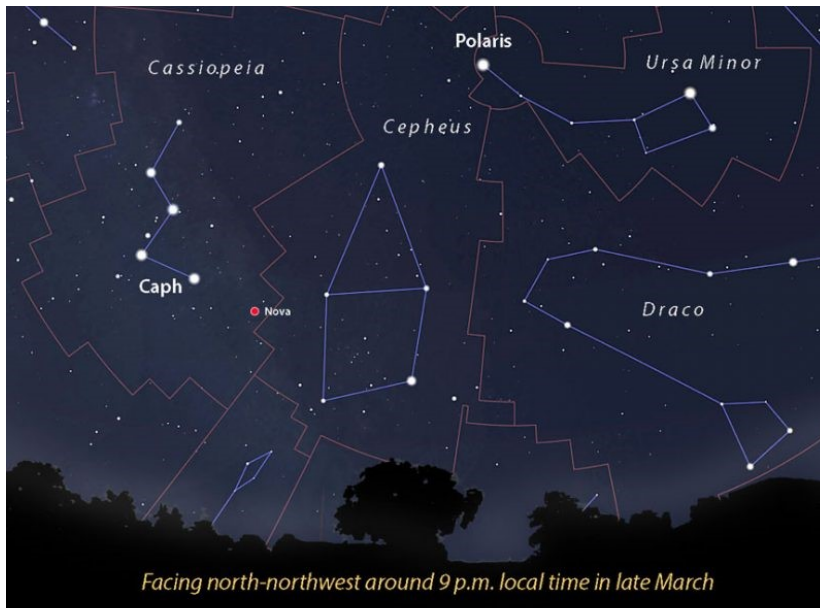
Japanese photographer Yuji Nakamura spotted a nova located in the direction of the constellation Cassiopeia the Queen on March 18, 2021. At that time, this light in our sky – which has been named V1405 Cas – was shining at about magnitude 9.6, much too faint to see with the eye. Just a few days later, though, the nova had brightened to about magnitude 7.6, making it bright enough to be visible with binoculars.

Use these maps as a guide to star-hop your way to the nova. Start with a small telescope or binoculars to help guide you to the right location. After it gets dark, look northward to spot Cassiopeia.

The constellation is often described as a W, although at the moment the letter shape is on its side, and it actually looks more like a chair, which fits its original description of a queen sitting on her chair. Take the bottom two stars in Cassiopeia and use them to draw a line. Extend the line to the right (north) for approximately the same distance as the two stars are apart from each other and start looking for a little star cluster known as M52. Then look just off of M52 and use the map to pinpoint the nova.

If you're using binoculars to spot the nova, imagine the right side of this map as the bottom of your sky, closest to the horizon. The flattened diamond shape at the top of this photo, known as

Cassiopeia's rhombus, can help zero you in on the right region of sky. If, as you scan to the right of the bottom two stars in Cassiopeia, you stumble across the rhombus, you know you're in the right area and you've gone a little too far, so back up and look to the left for the star cluster M52 and the nearby nova.



from its companion until the white dwarf heats up enough to blast material outward, creating the brighter light that we can spot across space.

Novae are rare. One of the last novae that could be spotted without optical aid was in 2013 in the constellation Delphinus, so take advantage of this nova while it lasts! As usu-

al, your best views will come in a dark sky.

Amateur astronomers across the globe have been watching a star brighten, and you can try to spot it, too. Use the photo and charts here to locate the nova named V1405 Cas.

Kelly Kizer Whitt, Earthsky.org

Adopt a Telescope Program - Signup Sheet

	Adopter	Scope	Location
1	Sue Timlin/John Hammetter	18" F/4.5 Obsession	Wiesen Observatory
2	Steve Volp	12.5" F/7.4 Buckstaff	B Dome
3	Robert Burgess	12.5" F/9 Halbach	A Dome (Armfield)
4	Russ Blankenburg	18" F/4.5 Obsession	Albrecht Observatory
5	Jeff Kraehnke	14" F/7.4 G-scope	Z Dome
6	Lee Keith/Tom Kraus	12" F/10 LX200 EMC	Tangney Observatory
7	Herman Restrepo/Colin Boynton	10" F/6.3 LX200	Ray Zit Observatory
8	Tamas Kriska	Stellarvue SVQ 100 F/5.8	Jim Toeller Observatory
9	Paul Borchardt	Solar scope	SkyShed POD



MAS Observatory

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At Your Service

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Asst. Observatory Director	Jeff Kraehnke	414-333-4656
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Jeff Kraehnke	414-333-4656
Jim Schroeter	414-333-3679
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Steve Volp	414-751-8334
Mike Wagner	262-547-3321

April Keyholders

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04/10	Brian Ganiere	414-961-8745
04/17	Lee Keith	414-425-2331
04/24	Steve Volp	414-751-8334