Morning Star

Fall 2018

*** Club Info ***

Editor's Note:
Based on some of the responses in the Site Survey I have changed the format and order of some items. In particular I have moved the club information from the back page to the front page to highlight the observing site and related info.

Announcements

Associate Members interested in becoming full members make your interest known to one of the board members.

Wanted - PR person and Webmaster
If interested in either position contact Jack St. Louis or Paul Walker.

Moving or Changing Email?
Please send changes to Paul Walker, 53 Valley View, Middlebury, VT 05753, paulwaav@together.net (info@vtastro.org will also work)

Hinesburg Observing Site

We have an observing site in Hinesburg, VT. (Located on town property)

Any member can obtain a gate key. Full members can also get an observatory key.

Requirement for Gate Key:

- Associate member for at least 3 months.
- Recommended for key issuance by 2 or more full members.
- Approval of the Board of Directors by a majority vote.

Requirement for Observatory key:

- Must be Full Member
- Trained on and/or demonstrate competence on the observatory equipment you will be using.
- Make entries in the Observatory Logbook.

Email for Observing at HOS

We have an email List for Member's interested in getting a heads up when someone will be at the Hinesburg Observing Site (HOS).

If interested in any of the above contact **info@vtastro.org (**Goes to President and Secretary

Observing Certificates

Several certificates (beginner to advanced) are available to members as encouragement to get out under the stars and hone their observing skills. Follow the link on our web site.

Outreach Acknowledgment Letter

To help record our broad community involvement with public star gazing events, projects and classes, we have developed an Outreach Acknowledgment Letter with a Sample Form. It is posted on the website and can be found under **Members, VAS Club Materials for Members, Outreach Acknowledgement Letter**.

We encourage you to use it any time you interact with the public. Having a folder of proof of what we do helps when we ask for donations for events and projects. Many people have never heard of us and have no clue of the extent of the knowledge and time we freely give to the public.

Please print it out and give it to the event coordinator you are working with or fill it out yourself to record your event. Thank you for helping us document what we do.

Direct Link: http://vtastro.org/wp-content/uploads/2018/03/VAS_Outreach_Ack_Letter_V3.pdf

Dues

Associate Members $15
Full Members $25

Contact Paul Walker
802-388-4220
paulwaav@together.net

Send dues and any updates to your address (or email) to
VAS, PO Box 782, Williston, VT 05495.

Or bring to any monthly meeting.

Web Site

www.vtastro.org
Email: info@vtastro.org (Goes to President and Secretary)
Acting webmaster Paul Walker:
webmaster@vtatro.org

Board Members

Jack St. Louis	Pres	658-0184
Joe Comeau	VP	238-1664
Doug Williamson	Treas	388-3482
Paul Walker	Sec'y	388-4220
Bob Horton		879-7802
Gary Nowak		879-4032
Bill Wick		485-7877
Keith Lawrence		453-5496

Editor and Publisher - Paul Walker

Contributors: Joe Comeau, Steve Grimsley, Maura Kelley, Stephen Scaravella, NASA's Space Place, JAXA, Paul Walker.
(My apologies if I missed anyone)

Contents

Gary's Astronomical Events for the Month
can be viewed via WCAX at www.wcax.com/story/6330547/astronomical-events

Jack on the Radio
Listen to Jack's astronomy update on radio station WJOY AM (AM 1230) on Ginny McGehee's 'Breakfast Table' morning show. Airs the first Wednesday of the month at 8:40 AM.

Stargazing and other Events

All observing events -are weather Permitting unless otherwise stated. Bring extra clothes. Even a summer evening can be chilly after standing still for a couple hours in damp air.

Contact: info@vtastro.org

We have an mail List for Member's interesting in getting a heads up when the Hinesburg Observing Site (HOS) will be opened.

If interested in being on this list contact **info@vtastro.org**

Public Star Gazing at Schools, Libraries, and other, groups.

If you know of a group or institution that would like to schedule a star gazing session have them contact: **info@vtastro.org**

Public Events

We have requests from several entities for presentations and/or observing events. Members interested in helping or for more info Contact: **info@vtastro.org**

Member & Invited Guest Star Gazing & other events

October 5, 6 or 7, Starts 6 PM. Dark sky viewing at the HOS.

Green Mountain Astronomers (GMA)

All events start about sunset.

Contact Ron Lewis for info
802-779-5913 (cell)
802-247-5913 (home)
vtpoet@gmail.com

Sat, Oct 6 - Hubbardton Battlefield - Solar, Deep Sky Night, Sliver of Moon sets at 5:29

New Members

VAS welcomes the following new member who joined us since the last newsletter:

James Falletti
Marie Agan

Meetings/Presentations

Meetings are held the first (non-holiday) Monday of the month, at 7:30 P.M. in the Kolvoord Community Room of the **Brownell Library**, 6 Lincoln St., Essex Jct (2nd building north of Essex 5 corners on the left on Rt. 2A). (see Map on our web site, top of Events page). Extra parking is available in the Bank North parking lot across from the library. **For inclement weather call Jack St. Louis (802-658-0184) or Paul Walker (802-388-4220) to confirm.**

October 1

2 presentations

Planet X
By Al Boudreau

Is there a giant, mysterious planet lurking in the outer reaches of our solar system? Some astronomers are convinced there is such a planet, which we are calling Planet X. Astronomer Al

Boudreau describes why astronomers think it does exist, and how they are searching for it. He explains why it's so difficult to find Planet X.

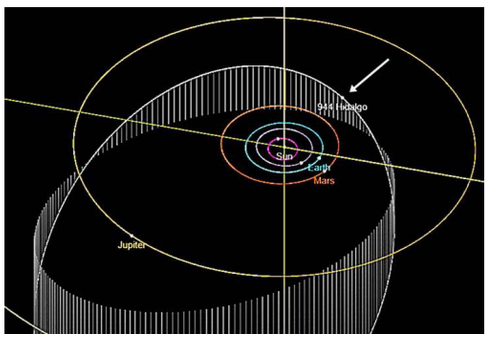
This is a distant view from Planet X back towards the sun. The object is thought to be gaseous, similar to Uranus and Neptune. Hypothetical lightning lights up the night side.

Image Credit:
Caltech/R. Hurt (IPAC)

****** And ******

Centaurs: Asteroids That Go Beyond Jupiter
By Mark Moyer

Asteroids lying in the main asteroid belt have a stable orbit, lying far enough away from the pull of Mars and Jupiter. In contrast, many small solar system bodies have orbits that come close to or even cross the orbits of planets, making them unstable. This is especially true of the centaurs, the family of small solar system bodies with orbits between Jupiter and Neptune. Because of this, centaurs have posed a mystery for astronomers. They must have come from somewhere else, but where? We'll visit the centaurs and, in particular, 944 Hidalgo, which orbits between the inner edge of the asteroid belt out to very close to Saturn's orbit. This fall, Hidalgo will be visible in modest telescopes, so you have an opportunity to see a centaur for yourself!

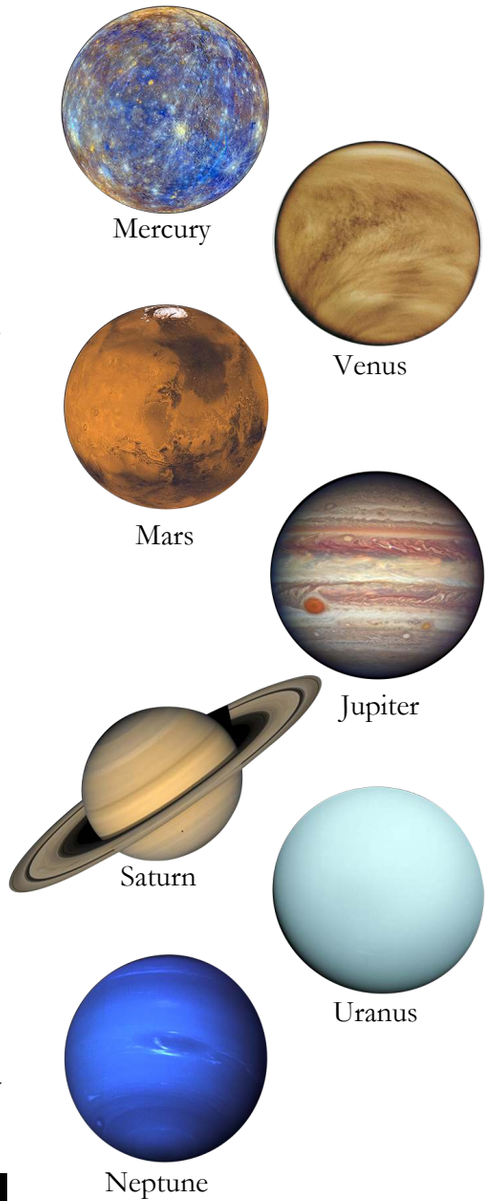


944 Hidalgo image caption:
Diagram showing asteroid 944 Hidalgo's orbit.

Image credits:
Screenshot of NASA's applet - httpssd.jpl.nasa.govsbdb.cgisstr=944;orb=1

November 5

The Planets - The Facts from the Jet Propulsion Lab - A Blueray Video Provided by Steve Grimley



Images credit: NASA

The Houston Symphony, in 2010, produced a special performance of Holst's Planet Suite which included a visual ensemble of the high definition images captured by NASA and the Jet Propulsion Lab team. The themes used by Holst for his now 100 year old music composition were from the astrological representations of the eight planets. As a counterpoise to the unscientific mindset behind the music a separate technical presentation from the scientists and engineers at JPL was included with the recording of the concert. This planet by planet tour includes the latest high definition images from the satellite flybys, orbiting satellites, and from the rovers on the ground at Mars. The technical story of what has been discovered about the planets is every bit as entertaining and informative as the music and includes spectacular views of the solar system. Running time is about 50 minutes.

December 3

2 Presentations

Project Gemini
by Steve Quigley

The December presentation will cover Project Gemini. Gemini, in its own historical context, was perhaps as important as Apollo because without Gemini there could have been no Apollo. Gemini was the teacher, and thanks to its lessons we were able to reach the Moon in 1969. During the Gemini program we learned to rendezvous, dock, perform "space walks", practice long duration flights, and built a cohesive and technically competent management and contractor team. This presentation

will follow Project Gemini from its beginnings to its successful conclusion in 1966, and set the stage for a presentation on Project Apollo in July, 2019.

****** And ******

Using a Planisphere
by Paul Walker

Planispheres are practically indispensable. They are used by beginner and advanced amateurs alike. They are computers but . Planispheres are analog computers that require no power cords or batteries.

They can answers the questions: "What is in the sky tonight?" and "When is the best time to observe a particular object?". And so much more.

You input a date and time and they output the location of the stars. Or input the part of the sky that holds a particular object you want to observe and the planisphere will output a list of suitable dates and times.

Planisphere or Star Wheel

Articles

This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!

A Trip Through the Milky Way
By Jane Houston Jones
and Jessica Stoller-Conrad

Feeling like you missed out on planning a last vacation of summer? Don't worry—you can still take a late summertime road trip along the Milky Way!

The waning days of summer are upon us, and that means the Sun is setting earlier now. These earlier sunsets reveal a starry sky bisected by the Milky Way. Want to see this view of our home galaxy? Head out to your favorite dark sky getaway or to the darkest city park or urban open space you can find.

While you're out there waiting for a peek at the Milky Way, you'll also have a great view of the planets in our solar system. Keep an eye out right after sunset and you can catch a look at Venus. If you have binoculars or a telescope, you'll see Venus's phase change dramatically during September—from nearly half phase to a larger, thinner crescent.

Jupiter, Saturn and reddish Mars are next in the sky, as they continue their brilliant appearances this month. To see them, look southwest after sunset. If you're in a dark sky and you look above and below Saturn, you can't miss the summer Milky Way spanning the sky from southwest to northeast.

You can also use the summer constellations to help you trace a path across the Milky Way. For example, there's Sagittarius, where stars and some brighter clumps appear as steam from a teapot. Then there is Aquila, where the Eagle's bright Star Altair combined with Cygnus's Deneb and Lyra's Vega mark what's called the "summer triangle." The familiar W-shaped constellation Cassiopeia completes the constellation trail through the summer Milky Way. Binoculars will reveal double stars, clusters and nebulae all along the Milky Way.

Between Sept. 12 and 20, watch the Moon pass from near Venus, above Jupiter, to the left of Saturn and finally above Mars!

This month, both Neptune and brighter Uranus can also be spotted with some help from a telescope. To see them, look in the southeastern sky at 1 a.m. or later. If you stay awake, you can also find Mercury just above Earth's eastern horizon shortly before sunrise. Use the Moon as a guide on Sept. 7 and 8.

Although there are no major meteor showers in September, cometary dust appears in another late summer sight, the morning zodiacal light. Zodiacal light looks like a cone of soft light in the night sky. It is produced when sunlight is scattered by dust in our solar system. Try looking for it in the east right before sunrise on the moonless mornings of Sept. 8 through Sept 23.

You can catch up on all of NASA's current—and future—missions at www.nasa.gov

Caption: This illustration shows how the summer constellations trace a path across the Milky Way. To get the best views, head out to the darkest sky you can find. Credit: NASA/JPL-Caltech

April 13, 2018
Batter Boards Installed
Left to right - Keith Lawrence and Doug Williamson

May 16, 2018
Backfill the 4 Deck Supports, Dig Holes for the 2 Scope Piers
Left to right - Bob Williams, Paul Walker and Doug Williamson

June 6, 2018
Installing Deck Framing
Left to right -
Doug Williamson, Jim Bosek, Keith Lawrence and Denis Woos

September 14, 2018
Completed closing in the sheds

Update on the
Russell Chmela Observatory
(a.k.a. the new observatory)
By Paul Walker

This will be a short update. Construction is going well. Work at the site started on April 14, 2018 with laying out the location for the new observatory.

Over the summer there have been at least 29 days on which work was done at the site. Most of the work has been done during the week. A benefit of having some retired members that are not yet too tired to do this kind of work. In addition Keith Lawrence built the frames for the 2 roll-off sheds in his front yard. Doug Williamson and Keith have also done other related work at home.

3 days were work parties on weekends with good participation. One involved laying down a ground cloth where the deck is and spreading peastone on top of it. Another was for building the frame for the deck. For the third we finished installing the deck boards.

Gary Nowak has refigured the primary from the Chmela scope. Bob Horton will double check it with his interferometer setup before we send it out for coating.

Still to be completed: Installing the rest of the "spindles" on the railing. Adding railings to the stairs. Finishing the accessibility ramp. Building 2 benches in the back of the roll-off sheds. Building wooden extensions from the concrete telescope piers up through the deck. Installing the electrical system (battery, inverter and solar charger). Yes, there will be 115v AC power available at the site. The details have not been completely worked out. Moving the 18" from the old observatory to the East shed. Installing the Byers mount and Chmela scope in the West shed.

We are targeting completing the accessibility ramp and moving of the 18" before Joe Comeau brings some folks from Wake Robin up to the site sometime in mid October.

Stellafane 2018
By Paul Walker

Stellafane was great this year. We had 2 good observing nights. The first one, if you came on Thursday, was best for observing deep sky objects and the other, on Friday, was best for viewing the planets.

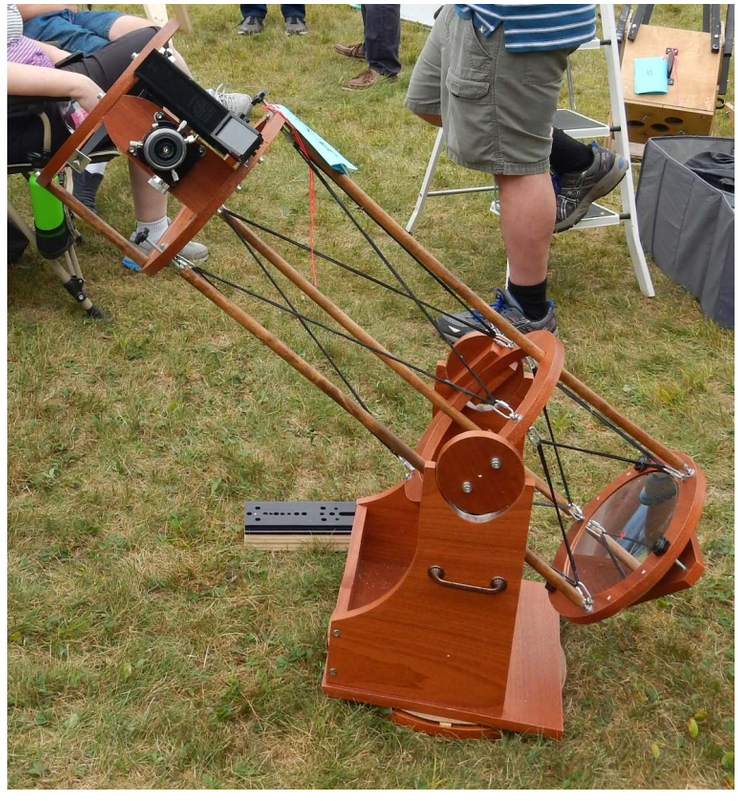
As with most Stellafane's the VAS had the Potluck Turkey Fry on Friday afternoon.

The selection of scopes up on the hill by the pink clubhouse seemed better and more than usual. There were some interesting entries.

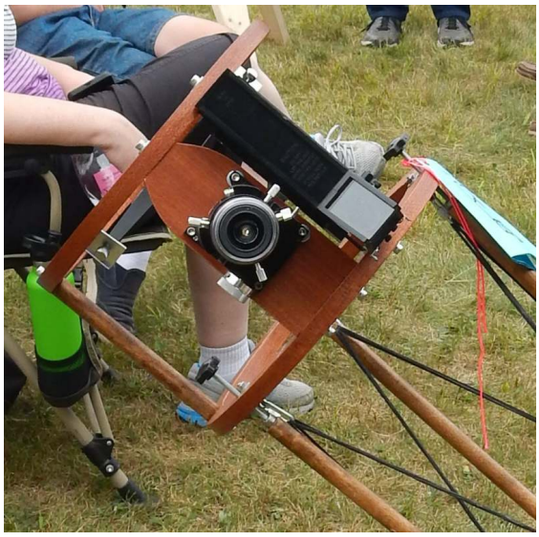
Stargazer Steve brought a Rube Goldberg looking contraption (upper right and lower left pictures). It is a binocular holder on steroids. It held binoculars but also a refractor and what looked like a Schmidt-Cassegrain or a maybe a Ritchie Crichton scope. This allows for easily comparing the view of a object with multiple instruments. As with a typical bino holder the height can be changed to accommodate different people and without change where the scopes are pointing. The eyepieces

are all positioned close to the altitude pivot so their height moves very little as the scopes are aimed higher or lower. He has counter weight that moves to maintain the balance as the scopes are pivoted up and down.

Another entry was an 8" travel scope (see below). The mirror cell goes into the carry-on, the rest comes apart and goes into the checked luggage. A key feature is the cord used between the rings to hold the "tube" rigid. The cord is bow string as in bow and arrow. The builder found that there is a particular material that is sometimes used that virtually does not stretch. And the length is easily customized. The cord starts out as a single thin filament. It is



wrapped around 2 pegs and the ends terminated. He said there is a YouTube video showing how this is done. As mentioned, there are 2 cords, 1 on the front, 1 on the back. The wooden poles apply tension to the cords (see close-up below).



Next up is a different type of binocular telescope (top right). Instead of the the typical side by side where the eyepieces sit between the scopes and you sit in front, this has the scopes above and below. The eyepieces are on the top front as on many Newtonians.

The primary of the bottom scope is set forward and light path of the bottom scope passes in one side of the top scope and out the other. The bottom scope has a larger diagonal mirror than the top scope to provide similar illumination to the fields of view. Even though the focusers for the eyepieces are very low profile, given the diagonal mirrors are of modest size for what appear to be f/4 or f/5 primary mirrors, I would be surprised if the low power views are fully illuminated. This would not be an issue at medium and higher powers.

I have never seen a counter weight system like this (above center). It is simple and worked well. Not so sure how it would be dragging such a large chain around. Sometimes a spring system is attached between the rocker box and the altitude bearings on the cradle where one end of a spring is attached off center, toward the back, of the half-moon altitude bearing. In both cases, as the tube is tipped down, more force is applied keeping the scope balanced.

The comradery at Stellafane is the high point for many of us. There are many interesting conversions and much more time to have in depth discussions than at the our monthly meetings or observing events.

And don't forget the Swap Tables. The Swap Tables are a good place get used or new equipment for a good price. But shop carefully, the prices are not great on everything and the condition and quality can vary a lot. Even if you don't buy much it can be fun.

There is something for everyone and I for one like it all.

Board Talk

July

There was no meeting

August

Jack opened the meeting. We discussed changing the date of the Board Meetings. We agreed to change them to the 2nd Wednesday after the monthly meeting. He reviewed the presentations for the next few months, we are set through December.

Jack related to us Joel Greene's concern that the topics of the presentations

at our monthly meetings are too advanced for many in the audience.

Joe said his is looking for more help with the "Spontaneous Night Under the Stars" event scheduled for Friday, August 31, 2018. He has scheduled 2 viewing events and 2 lectures at Wake Robin. Milton Library would like to schedule a presentation and observing event.

Paul went over his proposed changes to the by-laws to allow using modern electronic communications for sending official warning of meetings and voting and to allow voting by electronic means.

Keith and Dennis are exploring whether people would be interested in a mini-talk on the core collapse of supernovae and other mini-talks.

Gary brought a picture of Russ for possible posting in the new observatory that will be named in his honor. A reporter wants to do a report on our new observatory. The Chmela mirror is ready for testing with Bob's interferometer setup.

Bob reported that he is retired from work.

MOTIONS:

Paul made the motion that we accept the proposed changes to the By-Laws to allow using modern electronic communications for sending official warnings of meetings and voting and to allow voting by electronic means. This was 2nd by Keith. All voted in favor.

Keith made the motion that we authorize up to $500 (from the general account) to refurbish the 14" Cave telescope donated by Russell Paterson. (This scope will be set up for use on the Byers mount that the Chmela scope will be used on. The Byers mount was also donated by Paterson). This was 2nd by Paul. All voted in favor.

ACTION ITEMS

None.

September

Jack opened the meeting. We sold 3 of Mark Pendergrast's Mirror-Mirror books at the monthly meeting after Mark's talk based on the book.

Bob is getting ready to bring his interferometer mirror testing setup over to Gary's to test the re-figured primary from the Chmela telescope.

We discussed getting an outside lock box to hold the keys for the new observatory sheds. Jack will get the combination padlocks (approved at a previous board meeting) to replace the keyed padlocks currently on the gate, observatory and pot-a-potty. Plus one for the new observatory lock box.

We discussed the naming of the structures at the site. The west shed (with the Chmela scope) will be named the Russell Chmela Observatory. The east shed (with the 18" Obsession) will likely be called the Green Mountain Observatory and the old observatory may be named the Bob William's Warming Hut (Bob designed the old observatory and helped build it). We may give the observing deck a name.

Keith and Paul gave an update on the construction. It is going well. We should have the east shed enclosed by the end of this Friday (September 13, 2018) and the west shed mostly enclosed. We are pushing to get the 18" Obsession installed in the east shed and the limited mobility ramp completed before Joe brings folks up in mid October. We are finalizing the details for box between the pier and the 18".

Paul gave an update and brief summary on the Site Survey the Site Committee and Chmela Observatory Committee developed and sent out via Survey Monkey. We have had a great response, 51 of 97 survey invitees responded to the survey (52%). Of the 51, 41 are interested in going to the observing site (42% of the invitees, 80% of respondents). About 30 people answered all or most of the questions. Presumably questions that were skipped either did not apply or the respondents felt they had no input for those questions. 21% were not aware of the "interested in going to observing site" email list. 54% do not know how to a gate key. 60% do not know how to get an observatory key. Even though information on the last 3 items is periodically sent via email and is included in the newsletter, we need to do more to get this information to the membership. Note that some of the invitees are not particularly active members and may read few if any of the VAS emails and therefore not read the observatory information.

Paul will send the by-laws changes that were approved at the last board meeting out to the Full Membership for a vote.

MOTIONS:

None.

ACTION ITEMS

None.

VAS Membership Committee

There were no meetings this quarter.

Site & Russell Chmela Committees

There were no meetings this quarter.

Observers Page

Summer of Planets

By Paul Walker

Seems like it has been a long time since so many of the planets have been visible in the evening sky at once. However, according to Starry Night Pro software it has only been 2 years. One difference is Mars was bigger this time. Last time it's apparent diameter only reached 18 arc seconds, this time is reached 24 arc sec. It has now down to 18 arc sec.

Another difference for me is I purchased an atmospheric dispersion corrector (ADC). This device eliminates the red and blue fringes one sees on the top and bottom of planets through a telescope when they are relatively low to the horizon. This is more visible in large telescopes than small ones. Probably because the image is not bright enough in small telescopes to activate one's color vision. This is similar to the difference between using your eye and a camera where the camera can "see" color even if the eye cannot.

Some people for whom I have demonstrated the improvement have vowed to get an ADC. However, I would suggest, based on the Cloudy Nights article (see below), that owners of small refractors may want to verify they can see the difference through their telescope before purchasing.

Cloudy Nights web site has a good description of atmospheric dispersion and how a the correctors work (Though

I don't know what reference they are using when talking about the height of an object above the horizon). As well as how to adjust them. (See https://www.cloudynights.com/articles/cat/user-reviews/the-atmospheric-dispersion-corrector-r2934)

I have found 4 ADC's ranging in price from $128 to $480.

ZWO - $128
1.25" Atmospheric Dispersion Corrector (available from several retailers in the USA)

Altair Astro - $138 US$
https://www.altairastro.com/Altair-ADC-Atmospheric-Dispersion-Corrector.html

Astro Systems Holland - $326 US$ including noise piece and eyepiece holder which are separate line items.
https://www.astrosystems.nl/atmosphericdispersioncorrector

Pierro Astro - $480 US$
https://www.apm-telescopes.de/en/ccd-astro-photography/accessories/pierro-astro-adc-mk3-atmospheric-dispersion-corrector

Below is a plug for an ADC from Pete Favreau. Pete was the first person who was convinced by viewing through my ADC, both on my 12.5" Newtonian and his 120mm (4.7") Semi-APO (refractor) at Hubbardton Battle Field back in May of this year.

The ADC works well. I tried it first on a gibbous Venus earlier this summer, when the planet was at about 20 degrees above the western horizon. Without the ADC Venus looked almost like a red, white and blue traffic light, with dispersion fringes above and below the planet about 2/3 the diameter of the disc. With ADC these fringes were gone, and the planet looked silvery white. The seeing was fair to poor, and the disc still showed tiny amounts of fringing which would appear in short arcs here and there around the entire limb during moments of really poor seeing. I've been told that this is a feature of doublet semi-apo's, which give great well corrected views when well focused and in steady air, but can suffer a bit in bad seeing. My own experience with the scope seems to bear this out.

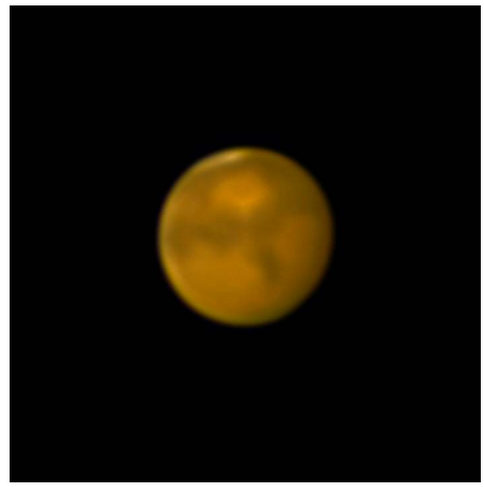
Brighter targets do seem to show a more obvious difference in the views with/without the ADC. A very noticeable difference on Jupiter, somewhat less on Saturn. However I was surprised how well it helped when viewing Mars, but several things could account for this. Mars was quite bright to begin with, and it's warmer hues contrasted more sharply with the blue fringe. There was no mistaking it for a limb haze or the polar cap. The red fringe was a lot tougher to make out, but when the ADC was used that limb of the planet looked a little cleaner and the blue fringe was gone from the other side.

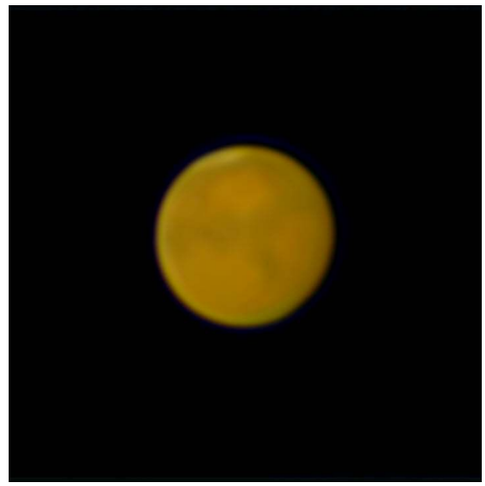
It's possible that smaller scopes aren't pushed to higher magnifications as often as larger scopes, resulting in smaller apparent fringe size. Perhaps many of the smaller scopes that were tried were [achromatic] refractors that contributed color of their own to the tests [a reference to the Cloudy Nights article]. I agree that the eye's color sensitivity plays the key role here. I'd love to do a side by side some night with both our scopes and perhaps the Castleton Unitron, should the opportunity arise. I also look forward to trying the ADC on Mercury and Uranus as well, and stars of different magnitudes. Overall it has proven very helpful with the views through the 120[mm] and I have found myself using it much more often than not on the planets. I agree with your assessment: Indispensable!

Mars on 8/16/18
By Paul Walker

This is an stack of 1700 video frames from a video of Mars (1 minute video clip) I took on 8/16/18 at approximately 9:50 PM EDT with Mars only 16.5 degrees above the horizon. It was magnitude -2.9 with an apparent diameter of 23 arc seconds. I tried to be careful to not over process the image and introduce too many processing artifacts.

By 9:30 or so that night the seeing improved considerably and stayed very good until about 11:00 when it degraded a little. I had the best views of Mars and Saturn that I have ever seen. I am glad I have an Atmospheric Dispersion Corrector. Occasionally I could see Cassini's Division all the way around the rings. I also got great views of Mars despite





it's low altitude. Syrtis Major is to lower right of center with Hellas Basin, the lighter area above it (South). The south polar cap with a dark area bordering it was visible (top of disk). Faint clouds on the North (bottom) and maybe East (left) limbs. The dust was definitely settling.

Visually, at 300x the views were almost crisp, 400x was quite good though a little soft and 500x was not too bad either. I thought I could occasionally glimpse a bit of a rift in the south polar cap. This image confirms that there were at least brighter and darker portions to the cap. The image has more contrast than I could see visually. The bottom image is closer to my visual impressions.

Equipment:
10" f/5.6 Newtonian
Nikon AW-110 point & shoot camera at 5x optical zoom
2x Barlow (2.8x effective)
ZWO Atmospheric Dispersion Corrector.
24mm-8mm zoom eyepiece at 8mm
Effective magnification ~1900x
Stacking - Registax 5
Other - Picture Window Pro 7

Saturn 8/16/18

Taken by Paul Walker. Planet disk was 18 arc seconds in apparent size.

Equipment:

10" f/5.6 Newtonian
Nikon AW-110 point & shoot camera at 5x optical zoom
2x Barlow (2.8x effective)
ZWO Atmospheric Dispersion Corrector.
24mm-8mm zoom eyepiece at 17mm
Effective magnification ~925x
Cropped to an eff. mag. of ~2,040x
Stacking - Registax 6
Other - Picture Window Pro 7

Sh2-108 Nebula in Cygnus with the Crescent Nebula (NGC6888) to the Right
By Steve Grimsley

Takahashi FS-78 refractor with field reducer/flattener for 500mm focal length at f/6.5, Canon 60Da DSLR camera. 10 subs of 7 minutes. Taken at Stellafane this year.

Summer Montage

Here's a summer planets montage from Joe Comeau. Venus at the top, Jupiter left, Saturn right and Mars bottom. These were taken using a Celestron 14 with a Sentech video camera and processed in Registax 6.

Look closely on Jupiter's right side, is that a moon poking out? He caught the Great Red Spot, the Red Spot Hollow and some blue festoons.

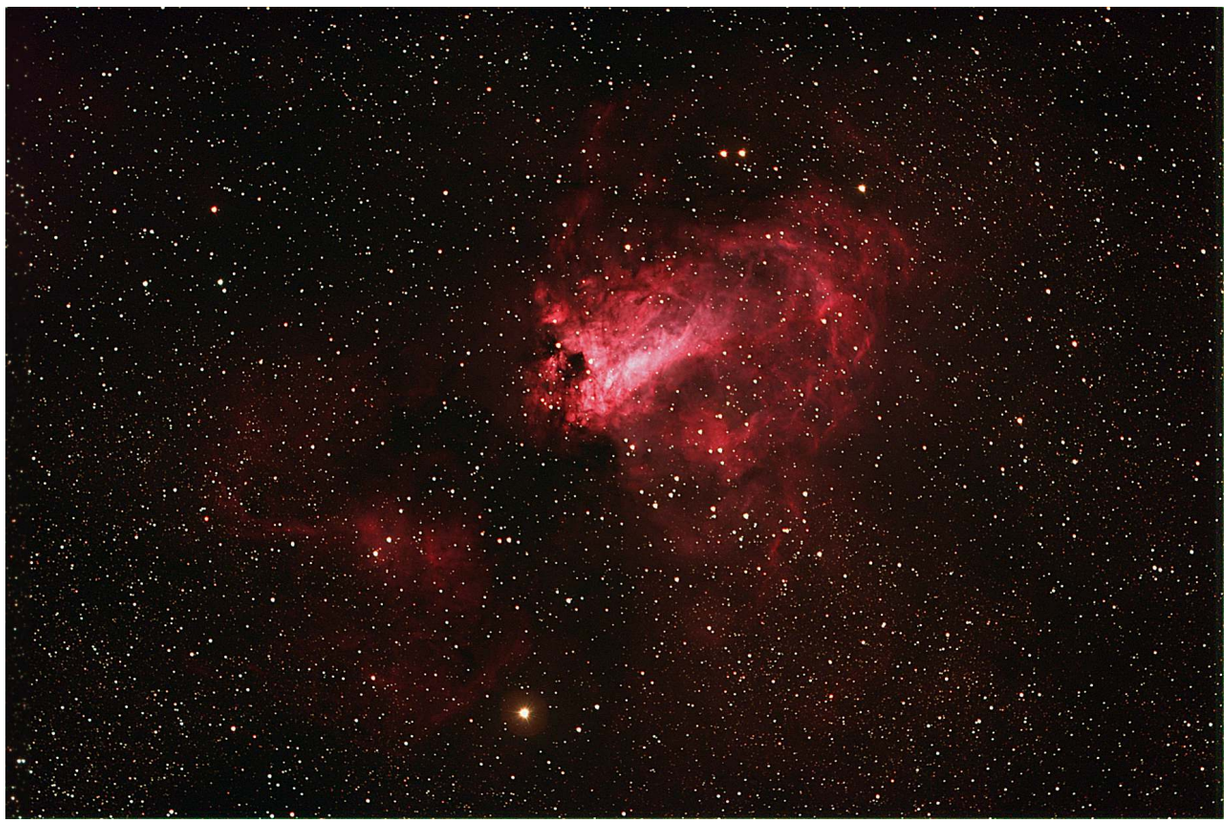
Mars shows Syrtis Major, Hellas Basin and the South Polar Cap among other features.

The Pleiades Star Cluster (M45)
By Maura Kelley

60 sec. x 37 shots (37 min total exp time) @ ISO 3200 + 24 Darks, Olympus E-M1 Mark II (4/3 size imaging chip, 2x form factor compared to a 35mm film camera), Explore Scientific ED80 80mm f/6 Carbon Fiber Refractor Telescope (480mm f.l., 960mm effective f.l.) and Explore Scientific EXOS2-GT Equatorial Mount with the PMC-Eight GoTo Computerized System

The Andromeda Galaxy (M31)
By Maura Kelley

2 min. X 11 shots (22 min total exp time) at ISO 1600 + (4) Darks, Olympus E-M1 Mark II, Explore Scientific ED80 80mm f/6 apochromat (480mm f.l., 960mm effective f.l.)

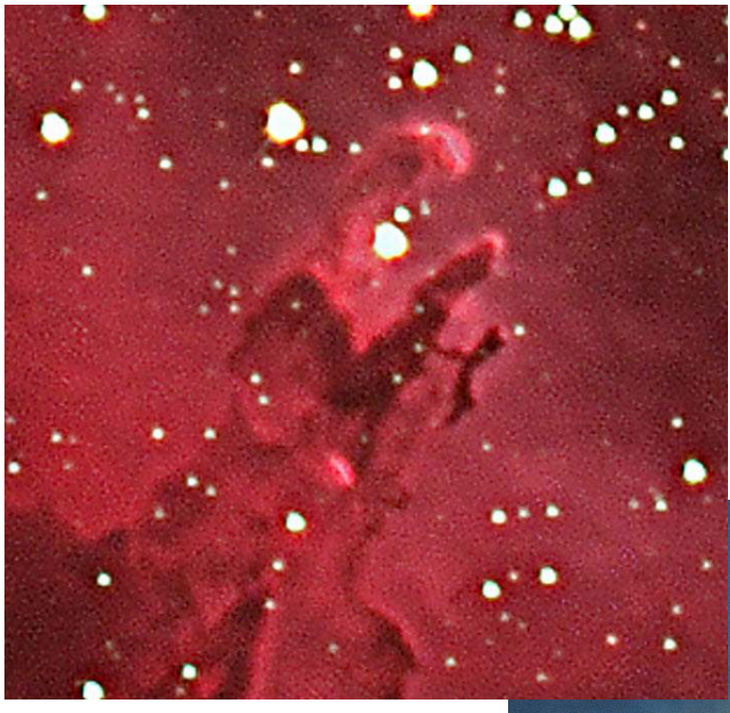


The Swan, Checkmark or Omega Nebula (M17)
By Paul Walker

7/20/18, 3 min x 26 shots (1 hr 18 min) 10" f/4 (1000mm f.l.), modified Canon XT camera, Orion Broadband Light Pollution Filter and Baader Coma Corrector, Rotated with North up to better show the "swan". Field of view: 0.79 X 1.21 deg.

The Eagle Nebula (M16) and the Pillars of Creation
By Paul Walker

7/18/18, 3 min x 50 shots (2 hr 20 min) 10" f/4 (1000mm f.l.) Newtonian, modified Canon XT camera, Orion Broadband Light Pollution Filter and Baader Coma Corrector, North down. Field of view: 0.79 X 1.21 deg.



Above is a blowup of the Pillars of Creation from my image. Left center is a Hubble Telescope shot for comparison. Left is a full resolution blow-up of the top of the "tallest" pillar from the Hubble image. I'll work on getting a little more resolution out of my scope.

Hubble shots courtesy of NASA, ESA, and the Hubble Heritage Team (STScI/AURA)

NGC 891

Picture of the monitor showing image from Steve Scaravella's Mallimcam Extreme II color video camera. Believe it or not this is a 15 second integration (exposure) through his 12" Schmidt-Cassegrain operating at f/3.3. His black & white Mallincam requires about 3 times this exposure.

NGC 891 is a beautiful edge-on galaxy with a dust lane in the constellation Andromeda. It is a moderately bright galaxy at magnitude 10.8 about 30 million light-years away. Stars of 17th magnitude are visible and some as faint as 18th magnitude.

Steve is planning to buy an 8" Schmidt-Cass that he can bring to public star parties and occasionally to the Hinesburg Observing Site. This is fore showing folks deep sky objects in a way you cannot see them through the eyepiece.

Venus and the Crescent Moon
By Paul Walker

7/15/2018 Canon XTi, 2 sec. exp., ISO 400, f/8, 55-200mm zoom @ 200mm, cropped. Processed with a 3 zone curve to bring out the earthshine, sharpened with unsharp mask.

Space Science

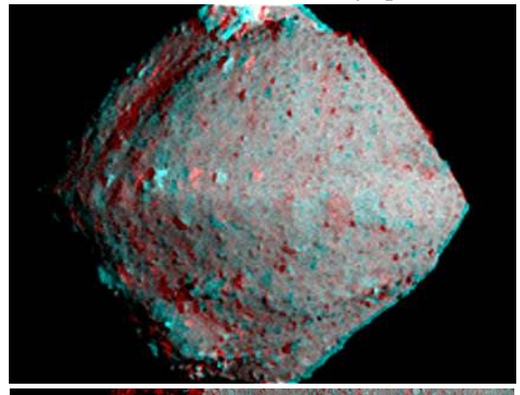
Hayabusa 2 at Asteroid Ryugu

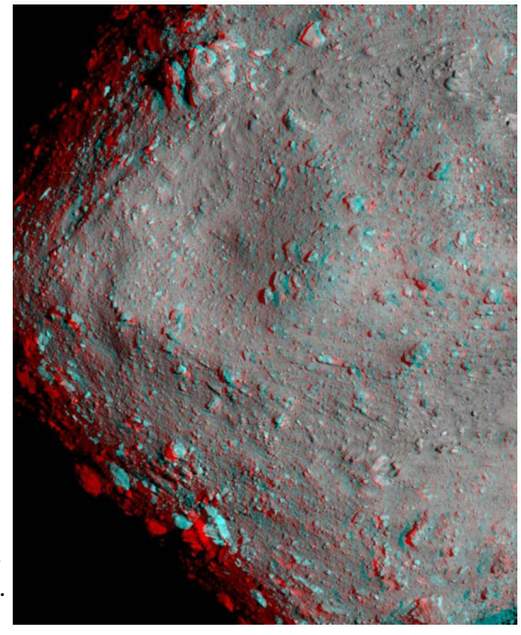
The Japanese space probe Hayabusa 2 just days ago successfully dropped 2 "rovers" onto the surface of Ryugu. Because the rovers don't weight enough on the 3000 ft asteroid for wheels to get any traction they will hop from place to place rather than use wheels.

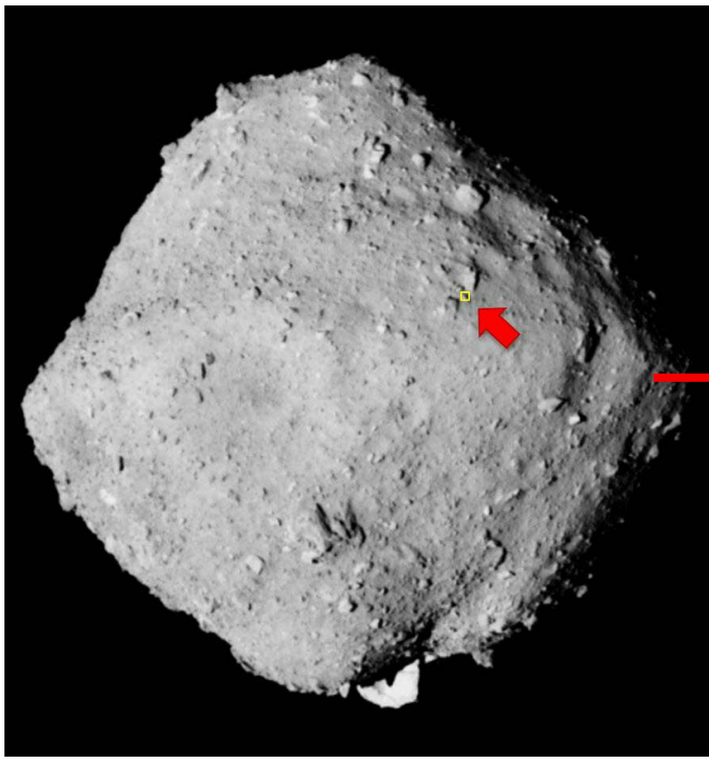
Unfortunately we do not hear much about other countries' space probes. I subscribe to space.com which flagged me on this event.

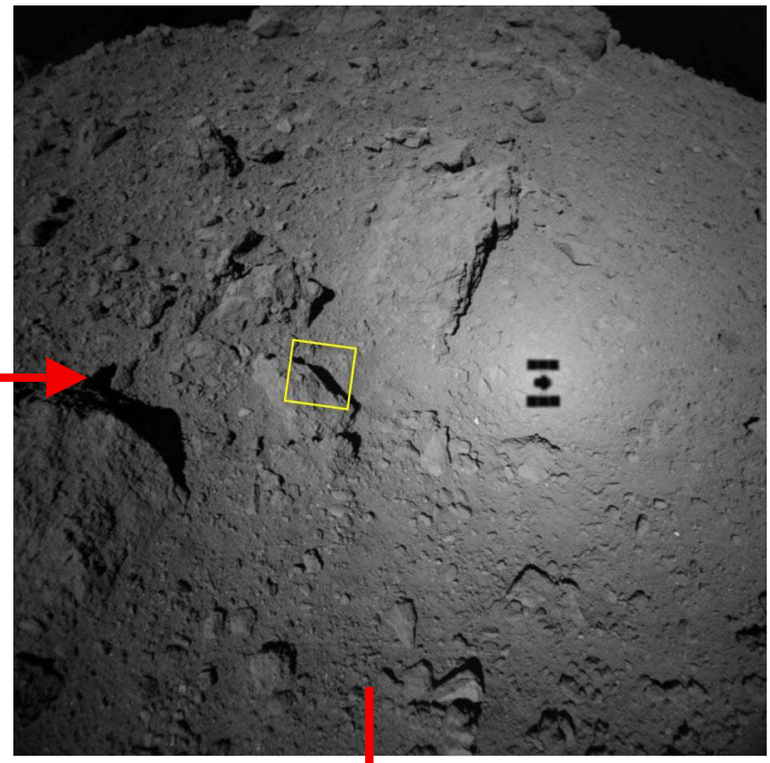
Ryugu reminds me of some of Saturn's moons where material has accumulated on their equators. How this would happen on a tiny asteroid orbiting between the planets, I don't know. The top 3-d image below shows the this shape nicely. The bottom image shows a crater on the equator.

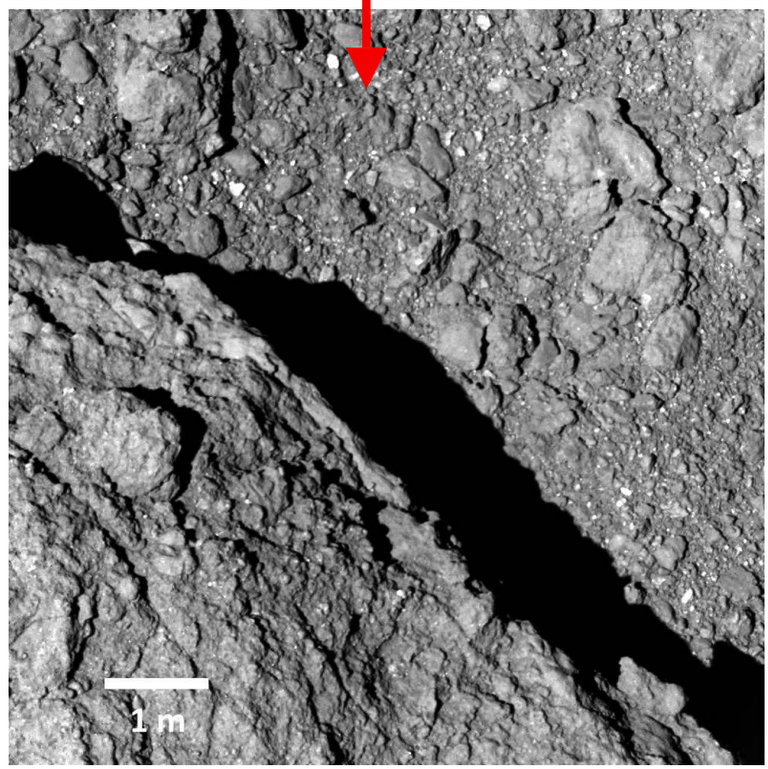
On the follow page 3 images taken by the mother ship on it's way down to drop the rovers give some idea of scale. Others are from the rovers from the surface of Ryugu.







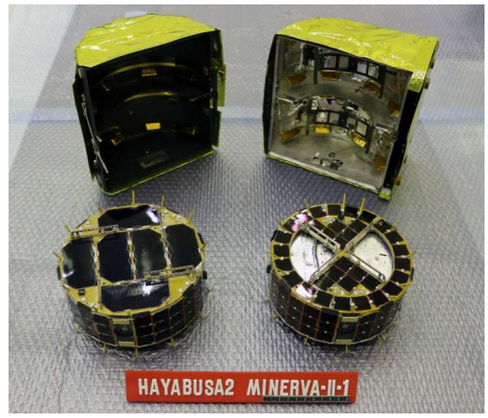




From rover Minerva-II1A.

From rover Minerva-II1A. Notice the lack of dust.

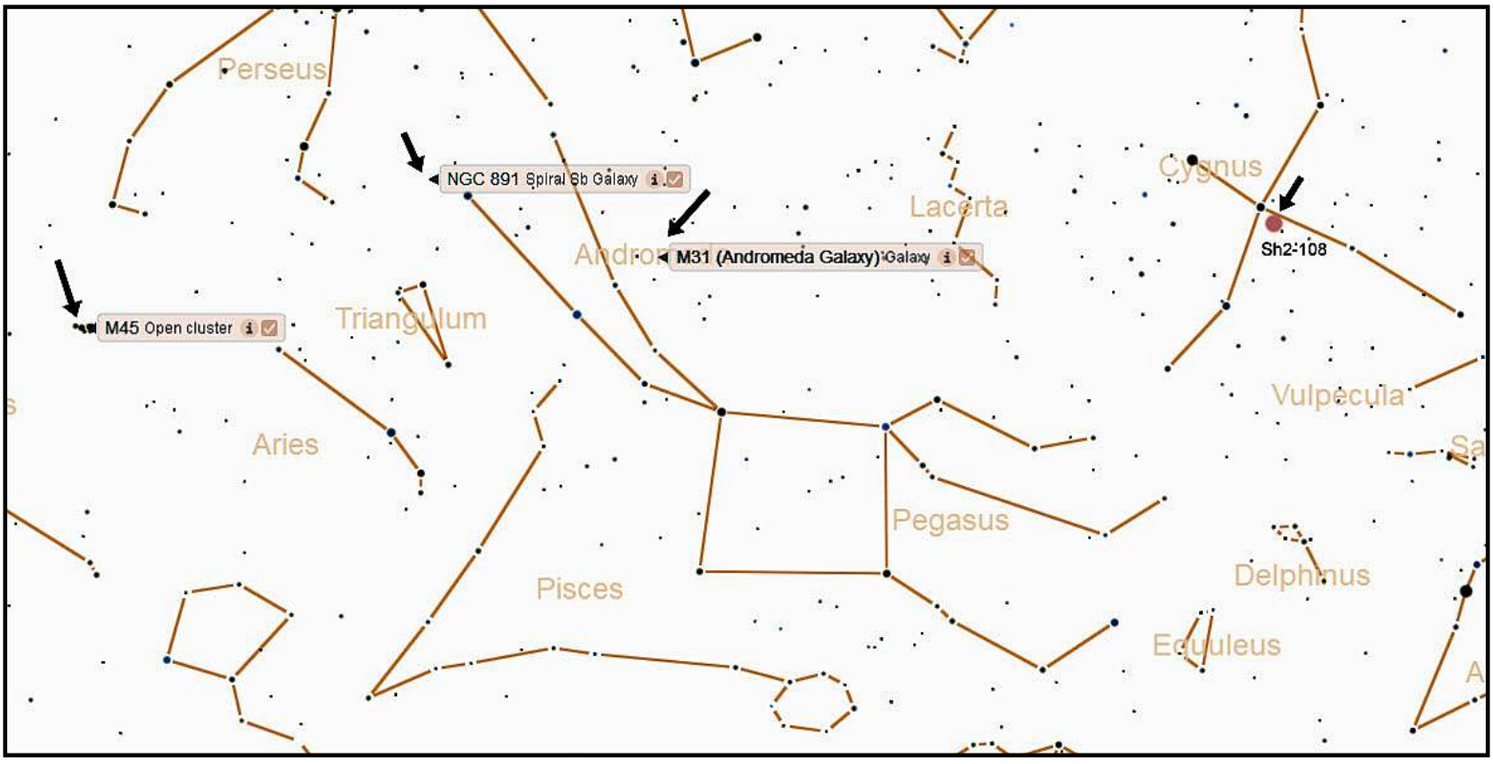
From rover Minerva-II1B. These are all color images.

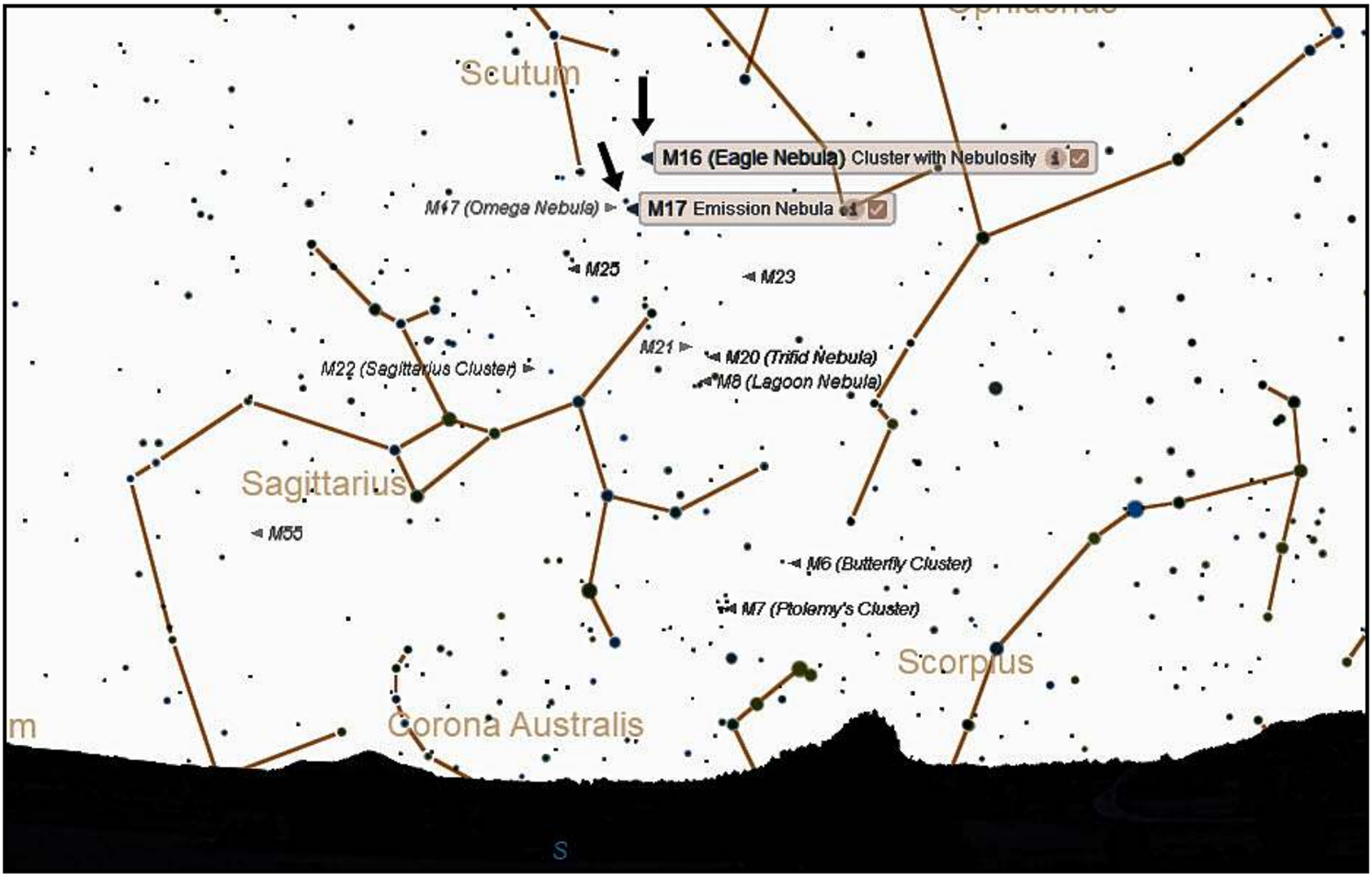


The rovers Minerva-II1A and Minerva-II1B are tiny with a diameter of 18cm (7 in), height of 7cm (2.75 in) and weight of about 1.1 kg (2.4 lb) (on Earth). One has 3 cameras the other 4. Other sensors include optical sensors, an accelerometer and a gyroscope.

Images credit: JAXA, http://www.hayabusa2.jaxa.jp/en/

Location Charts for the deep sky objects imaged on the previous pages (see black arrows)
Created using Starry Night Pro 7 & Picture Window Pro 7





For Sale

Celestron Power Tank 17 Ah 12 VDC Outdoor battery (list $115)---- **$50** or nearest offer

Meade Coronado PST Personal Solar Telescope 40mm f/10 1.0 Angstrom H-alpha bandpass, 20mm Kellner eyepiece, with tripod mount (but tripod not included) barely used, $699 value
PRICE $200 ONO

Location South Burlington.
Call Gary Glick at 203-247-5354

AstroTech 6" Ritchey Chretien OTA only. $250 obo
With Losmandy dovetail

Steve Yerby syerby@gmail.com

Copies of "Mirror Mirror" - A History of the Human Love Affair with Reflection by Mark Pendergrast of Colchester, Vt. available for **$25.**

Mark will split the profits with VAS.

Contact Mark at markp508@gmail.com

Celestron CGE Mount, $1200 obo
Includes base (no tripod) with two 20lbs counterweights and AC & DC power cords.
Mount has received a complete Hyper-Tune by Ed Thomas at deepspaceproducts.com
I replaced the problematic Celestron RA/Dec cables with Gary Bennet 6 point midi style cable replacements.

Steve Yerby
syerby@gmail.com

Explore Scientific 80mm f/6 Apochromatic Triplet Refractor Telescope. Paid - $600.

Asking $350.

Stephen Scaravella, 802-434-3884 or englishnotation@gmail.com

Celestron SP-C80 refractor telescope and tripod, rarely used. Comes with the original manuals, and 3 books on astronomy and a viewing the universe tool.
Asking $350 or best offer.

Contact Aimee Green, leftlanegreen@yahoo.com

Meade 6" LXD55 telescope with the following: 26mm eye piece, Spotting Scope, Anniversary eye piece kit with 15mm; 6.4mm; 9.7mm; 12.4mm; 40mm; 32mm; and 20mm. Solar filter, Dew cap, Autostar Instruction Manual, Martin Preston users guide

Asking $450 with the accessories listed.

Contact Bruce Harmon, 802-876-7535 or bdhinvt@yahoo.com.

Celestron Astromaster 70 EQ (German Equatorial Mount) Never used. Purchased for project, then changed my mind. Uses standard 1.25-in eyepieces. Very well built. New it goes for $170. **Asking $50 (new price)**.

Al Boudreau 802-758-2221 or astromanvt@gmavt.net

Meade DS-2114S (early 2000's vintage)
Dia. =114mm, f.l.=1000mm
focal ratio f/8.8
Automated, computerized with Meade Autostar handbox
Automatic tracking, guided tours, many other features
Like new condition, on a tripod, three eyepieces, original handbook

I called the company (Meade) and they say it is similar to their current Polaris 114 ($170-$200), but automated and computerized like their ETX 90 (currently $500. Their ETX series doesn't have a 114, but if they did it would cost more). So I am asking a 'hybrid", used (once or twice) **price of $150 (new price)**.
Contact Paul Cameron at paulcameron1@msn.com, 802-249-3595 or 802-223-2204

Telescope mirrors and a couple mounting cells
3.5" f/10 with 3/4" diagonal.
6", probably f/8.
8", probably f/8, in nice **cast aluminum cell**.
10" f/9, 1/10 wave (measured by Bob several years ago), Beral coating that is in good condition though the edge has several chips (edge not beveled) and a note from the coater says there are a few scratches and it is not fully polished (may be saying that because of the scratches). From St. Michael,s College.
12", probably f/8, plate glass mirror in **nice 18 point mirror cell**. The cell is worth more than the mirror. If I remember correctly this came from St. Michael,s College, from the old scope they had in their observatory.

Other than the 10" f/9 I cannot vouch for the figure of the mirrors.

The only one that may be Pyrex is the 8" mirror, I'd have to pull it out of the cell and look again. The rest have a slight greenish-yellow tint.

Make an offer on any of the items.

Paul Walker 802-388-4220 or paulwaav@together.net

4 inch, 550mm f.l. brass Televue Renaissance scope with carrying case
Equatorial mount with oak tripod

2", 20mm Nagler type 2
2" 45deg. righting prism
2" Big Barlow
2", 4.8mm Nagler
1-1/4", 26mm Plossl
2", 45deg. Prism camera adapter

New Price $1950 - will negotiate.

Contact Richard Cummings at Rick@vsbmetal.com
Or you can contact Ron Anstey anstyer@myfairpoint.net

Wanted

For selling & buying also check out: www.marketplace.skyandtelescope.com