

Bays Mountain Astronomy Club

☞ *Next Meeting: May 2* ☞

REFLECTIONS

Greetings fellow amateur astronomers! The end of April sees the official end of the 2014 Spring StarWatches at the Park. I hope you've been able to come out and be part of this wonderful weekly public event, for at least a few of them. I want to send a big thank you to all the members that were able to come out to help Joel, Jason and Adam to make this year's event a big success.

Last month's meeting started our new section entitled Amateur Astronomer Corner. The kick off featured Adam Thanz, who presented Planispheres. Terry Alford talked about the April Lunar eclipse as our Constellation Quest. I think both sections were well received by members and visitors. Our keynote speaker featured Brandon Stroupe and an update on his progress and development [hah!] in astrophotography.

May's meeting will focus on the final preparation for the May 10 Astronomy Day at the Park. This is a big outreach event for both the Park and the club. Listed below are the displays I hope we can offer to the public. I have contacted all the different groups to see if they can

BY WILLIAM TROXEL

send out information and hand-out stuff to have at the different displays. The final number of tables will depend on how many of you are able to help out. Below is a list of the displays and the concept I hope for each table.

*Club Information display: basic information about our club including who we are, meeting dates, location, dues and how to become a member.

*Getting Started in Amateur Astronomy/ Becoming a Professional Astronomer display: I'm hoping this display would be a point for the young person wanting to get into our hobby or make this their life's work.

*Astronomy Equipment display: I have hope that here we could display several different pieces of equipment that we use in our hobby. Hopeful we can offer some handouts on telescopes, the history of how they came to be. Maybe we could have some short bios of the key people in astronomy.

*Astrophotography Display: My vision here was to have some of the equipment that is involved in the art of astrophotography. Maybe even have a demo on how to set up the equipment; or some demo that is



Calendar

Special Events

May. 10 Astronomy Day.

SunWatch

Every Sat. & Sun., 3 - 3:30 p.m.,

Mar. - Oct., weather permitting.

BMACers are always welcome to help.

StarWatch

8:30 p.m.: Apr. 26

BMACers need to arrive 30 min. early to set up.

BMAC Meetings

7 p.m., Discovery Theater:

May 2 Tom Rutherford "The NITARP AGN Project;" Amateur Astronomer Corner: Robin Byrne: "Star Hopping the Night Sky;" Constellation Quest & TBA.

June 6 Speaker & Constellation Quest TBA; Amateur Astronomer Corner: Greg Love: "Binoculars for Astronomy."

offered several times during the afternoon.

*Computers and Astronomy Display: I envision having the modern tools we use like laptops, GPS, Goto mounts, Smartphones, tablets etc.

*Solar Display: This display would be where we offer handouts on our star, the sun. And give the visitor a chance to see and use the solar scope. I was thinking that we could set this display up at the observatory where the extended SunWatch would be taking place.

*NASA's Mission Update display: Here I am hoping we can offer an update on the New Horizons Mission update, or any other missions that might be of interest.

(Continued on page 2)

STAR STUFF

BY TERRY ALFORD

May is an interesting month for astro happenings. First of all is the Sun. I rarely mention it (my bad) but even though the Sun is slightly past it's peak activity for this cycle, it is still putting on a show. In hydrogen alpha light, there are numerous prominences and filaments nearly every day. On April 16th, I got out my 80mm refractor with a white light Baader Planetarium filter and saw seven sunspots. Unlike many other celestial targets, the Sun is constantly changing.

Mercury is at it's highest for the year this month. On the first of the month, it is too low to see naked eye but it rapidly rises each evening after that. The peak of this apparition is May 22nd and Mercury will not set until two hours after sunset. It will be fairly bright at +0.4 magnitude and will show an 8" long crescent.

Venus shines bright at -4.0 mag in the morning sky right before dawn. On the 15th and 16th, the planet Uranus is less than 1.5° north of Venus. If you have never found Uranus with your scope before this will be a good opportunity. Unfortunately, don't expect good details as they will both be very low in the pre-dawn sky.

Even though Mars reached opposition with the Earth in April it is still placed very well for telescopic observation. During the month, the disk shrinks from 14.5" to 11.8" but the Red Planet still shines brightly in Virgo very near Gamma Virginis. Get out your scope and crank up the magnification.

At the start of May, Jupiter is about 45° high in the western sky. It is still brighter than any other evening planet at around -2.0

magnitude for most of the month. The diameter of the globe shrinks ever so slightly from 35" to 33" but Ol' Jove still makes a tempting telescopic target. Now that the weather has warmed, spend some time with Jupiter and watch the Galilean moons dance around it. You can almost always see at least two major belts and with a moderate sized scope and steady seeing fainter details can be teased out.

Saturn is in opposition on May 10th and will be in the sky all night long. Although it is still a little low in the sky in the constellation Libra, its steady yellowish hue and brightness of +0.1 magnitude makes it a target easy to identify. A 6-inch scope will show several moons. A 10-incher on a good night will even show Enceladus. This moon was recently determined by astronomers to have a 25 mile deep ocean under the surface ice. Who knows what may be lurking there? And, of course, the magnificent ring system is always amazing to view.

The big astro news for this month is the possibility of a bright, new meteor shower (maybe even a meteor storm!) on the morning of May 24th. These meteors are predicted to be bright and slow moving, especially when compared to other meteor showers like the Perseids. The radiant point is near Polaris. Very interesting. Just GOOGLE "May meteor storm" [Ed: or Camelopardalids] and read all the juicy details.

Reflections*(continued from page 1)*

I have requested any information different groups and government offices can send to us. If you have any contacts that have information that you think will help at any of the displays let me know I will be happy to contact them. Should you have a handout that you developed over the years that you use at outreach events that you want to offer I will be happy to accept. I also still need as many volunteer's as can help. I really think it is a very exciting outreach that will get you excited. Just ask anyone that has helped before.

I asked Greg Love to contact Natural Bridge Tunnel State Park about us coming back up there for our July meeting. I will finalize the planning details during the business meeting in May. It's also time for any of you that want to place your name into consideration as club chairman, we elect that position at our June Meeting.

May's meeting will feature as our keynote speaker, Tom Rutherford, with the topic "The NITARP AGN Project." May's Amateur Astronomer Corner will feature Robyn Byrne with "Star Hopping the Night Sky." The Constellation Quest feature is TBA.

I sent out one "thanks for visiting" e-mail to one of our visitors of the April meeting. I hope this will result in future visits. See you on May 2nd.

Until then, clear skies.

HAPPY BIRTHDAY ESTHERVILLE METEORITE

BY ROBIN BYRNE

This month we celebrate an historic event that made a big impact on the state of Iowa. It was a Sunday afternoon on May 10, 1879, when several people saw something fly through the sky. It began with an explosion overhead that rattled homes and broke windows. What seemed to be a ball of fire was spotted flying through the air, heading from the Southwest to the Northeast.

There were many eyewitnesses to the event. The first came from a civil engineer working near Jackson, Minnesota (about 15 miles from Estherville, Iowa). He saw the fireball emerge from a storm cloud,

estimating it to be 40 miles up and

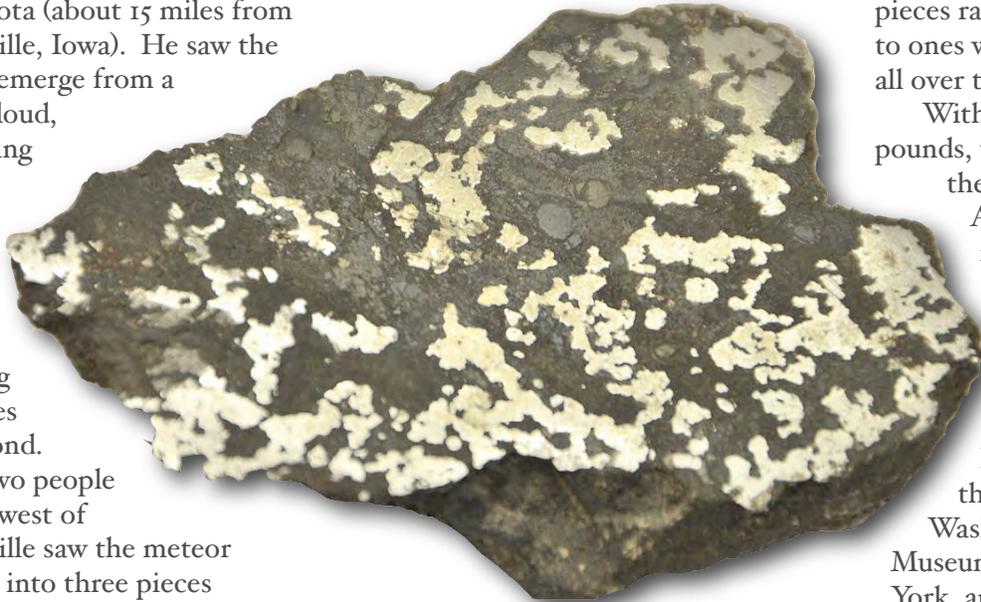
traveling at 3 miles per second.

Next, two people 6 miles west of Estherville saw the meteor explode into three pieces directly above them. Cattle in Superior, Iowa began stampeding after being showered with stones. More stones fell on Four Mile Lake, peppering the surface.

The largest piece fell two miles north of Estherville, on the farm run by Sever Lee. Lee wasn't interested in trying to raise the 437 pound stone from the 14 foot deep hole it had made, but others were very eager to try. Eight young men hired a well digger to bring it out and claimed

the meteorite for themselves. They had hoped to make some money off of it. They loaded it on a wagon, and hit the road with a large sign reading: "I am the Heavenly Meteor. I arrived May 10th at 5 o'clock. My weight is 437 pounds. From whence I came nobody knows, but I am en route for Chicago!"

However, who legally owned the meteorite began to be questioned, so they returned home and buried it. Sever Lee had defaulted on his farm, so an attorney named Charles Birge had



From High Contrast (wikipedia)

purchased the land. Since he now owned the property, Birge claimed ownership of the meteorite and took possession of it. He sold it to the British Museum for a reportedly large sum of money.

The second piece fell on the farm owned by A. A. Pingrey. The 151 pound piece made a hole over four feet deep. Pingrey wasn't

interested in it, so he gave it to his neighbor. He later realized the mistake he made. The neighbor, James Horner, hid the meteorite in a cave. There he met with a representative from the University of Minnesota. By the light of a lantern, the University became the owner of the second piece.

It was another 8 months before the third piece was found in a five foot hole. The 92 pound meteorite was purchased by Charles Birge, who made more money selling it off. Meanwhile, thousands of smaller pieces ranging from small pebbles up to ones weighing a pound were found all over the area.

With a total weight of 744 pounds, the Estherville meteor fall is the largest to occur in North America. Pieces of it are now on display worldwide in the Musee National d'Histoire Naturelle in Paris, the Naturhistorisches Museum of Vienna, the Field Museum in Chicago, the National Museum in Washington, the American Museum of Natural History in New York, and the Estherville Public Library.

The meteorite itself has been classified as a Mesosiderite-A_{3/4} and is the only meteorite with that specific classification. Mesosiderites are stony-iron meteorites composed of almost equal parts silicates and nickel-iron. The internal structure finds the nickel-iron and silicates appearing as lumps within a finer grain matrix.

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NASA SPACE PLACE

The Power of the Sun's Engines**By Dr. Ethan Siegel**

Here on Earth, the sun provides us with the vast majority of our energy, striking the top of the atmosphere with up to 1,000 Watts of power per square meter, albeit highly dependent on the sunlight's angle-of-incidence. But remember that the sun is a whopping 150 million kilometers away, and sends an equal amount of radiation in all directions; the Earth-facing direction is nothing special. Even considering sunspots, solar flares, and long-and-short term variations in solar irradiance, the sun's energy output is always constant to about one-part-in-1,000. All told, our parent star consistently outputs an estimated 4×10^{26} Watts of power; one second of the sun's emissions could power all the world's energy needs for over 700,000 years.

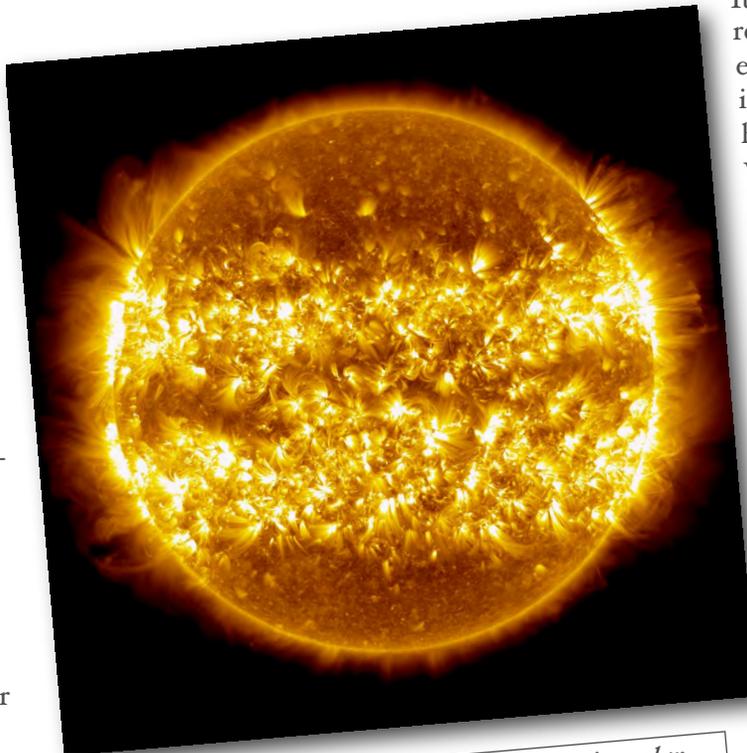
That's a literally astronomical amount of energy, and it comes about thanks to the hugeness of the sun. With a radius of 700,000 kilometers, it would take 109 Earths, lined up from end-to-end, just to go across the diameter of the sun once. Unlike our Earth, however, the sun is made up of around 70% hydrogen by mass, and it's the individual protons — or the nuclei of hydrogen atoms — that

fuse together, eventually becoming helium-4 and releasing a tremendous amount of energy. All told, for every four protons that wind up becoming helium-4, a tiny bit of mass — just 0.7% of the original amount — gets converted into energy by $E=mc^2$, and that's where the sun's power originates.

You'd be correct in thinking that fusing $\sim 4 \times 10^{38}$ protons-per-second gives off a tremendous amount of

that's spread out over 2.2×10^{25} cubic meters, meaning the sun's energy output per-unit-volume is just 18 W / m³. Compare this to the average human being, whose basal metabolic rate is equivalent to around 100 Watts, yet takes up just 0.06 cubic meters of space. In other words, you emit 100 times as much energy-per-unit-volume as the sun! It's only because the sun is so large and massive that its total power is so great.

It's this slow process, releasing huge amounts of energy per reaction over an incredibly large volume, that has powered life on our world throughout its entire history. It may not appear so impressive if you look at just a tiny region, but — at least for our sun — that huge size really adds up! Check out these “10 Need-to-Know Things About the Sun”: <http://solarsystem.nasa.gov/planets/profile.cfm?Object=Sun>. Kids can learn more about an intriguing solar mystery at NASA's Space Place: <http://spaceplace.nasa.gov/sun-corona>.



Composite of 25 images of the sun, showing solar outburst/activity over a 365 day period; NASA / Solar Dynamics Observatory / Atmospheric Imaging Assembly / S. Wiessinger; post-processing by E. Siegel.

energy, but remember that nuclear fusion occurs in a huge region of the sun: about the innermost quarter (in radius) is where 99% of it is actively taking place. So there might be 4×10^{26} Watts of power put out, but

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*MISCELLANEOUS***Happy Birthday***(continued from page 3)*

These are rare meteorites, with 167 known samples (as of 2011), seven of which were from observed falls.

The town of Estherville has reason to be proud of its meteorite, and they have been making an effort to publicize it. In 1980, the Estherville Area Arts Council held a sculpture competition with the meteorite as the theme. The winning piece, created by Tom Gibbs, is a stylized ball with a tail, the ball breaking into three fragments. The sculpture has been on display near the town library since the competition.

In 2010, the town purchased a piece of the meteorite (rather than continuing to display a loaned piece from the University of Minnesota). The plan has been to build a museum to tell the story of the meteorite. As of 2012, a building had been set aside for the Meteorite Center, with plans for a mural depicting the fall, display of the newly purchased piece visible from outside, a garden area to house Tom Gibbs' sculpture, displays of documents related to the meteorite, and videos about other meteor falls. It was scheduled to open Spring 2013.

On any clear night you can see several meteors whizzing across the sky. However, most of those will burn up long before they reach the ground. Witnessing an actual meteorite fall is incredibly rare. The people of Estherville, Iowa are truly fortunate to have as their legacy a piece of space that landed in their own backyard.

References:

Estherville Area Chamber of Commerce - Estherville Meteorite
<http://estherville.org/estherville-meteorite.htm>

Meteoritical Bulletin: Entry for Estherville

<http://www.lpi.usra.edu/meteor/metbull.php?code=10059>

Mesosiderite - Wikipedia
<http://en.wikipedia.org/wiki/Mesosiderite>

Estherville Iowa Meteorites
http://www.iowagold.com/estherville_iowa_meteorites.htm

Jensens Initiate Plan for Meteorite Center - The Estherville News

<http://www.esthervilledailynews.com/page/content.detail/id/516083/Jensens-initiate-plan-for-Meteorite-Center.html?nav=5003>

Astronomical League Convention

San Antonio, Texas – July 10, 11, & 12, 2014

Lots of great speakers and activities. Visit the website for details and registration.

<http://alcon2014.astroleague.org>

StarFest 2014

The details for our annual astronomy convention/star gathering event from our club has been set. The dates are October 17-19, 2014.

Read all about it here:

<http://www.baysmountain.com/astronomy/astronomy-club/?GTabs=4>

Regular Contributors*WILLIAM TROXEL*

William is the current chair of the club. He serves as activities coordinator for a local retirement living community.

TERRY ALFORD

Terry is also a founding member since 1980 and has been chair many times, as well. He has worked as an astronomy lab instructor at ETSU since 2001.

ROBIN BYRNE

Robin has been writing the science history column since 1992 and was chair in 1997. She is an Associate Professor of Astronomy & Physics at Northeast State Community College (NSCC).

ADAM THANZ

Adam has been the Editor for almost all of the years since 1992. He is the Planetarium Director at Bays Mountain Park as well as an astronomy adjunct for NSCC.

The Bays Mountain Astronomy Club



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Dues:

The Bays Mountain Astronomy Club requires annual dues for membership. It covers 12 months and is renewable at any time.

Rates:

\$16 /person/year

\$6 /additional family member

If you are a Park Association member, a 50% reduction in fees is applied.

Find out more at our website:

<http://www.baysmountain.com/astronomy/astronomy-club/>

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