STAR STUFF

The Newsletter of the Ford Amateur Astronomy Club

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Twinkle, twinkle, variable star

By Dr. Ethan Siegel

As bright and steady as they appear, the stars in our sky won't shine forever. The steady brilliance of these sources of light is powered by a tumultuous interior, where nuclear processes fuse light elements and isotopes into heavier ones. Because the heavier nuclei up to iron (Fe), have a greater binding energies-per-nucleon, each reaction results in a slight reduction of the star's mass, converting it into energy via Einstein's famous equation relating changes in mass and energy output, E = mc2. Over timescales of tens of thousands of years, that energy migrates to the star's photosphere, where it's emitted out into the universe as starlight.

There's only a finite amount of fuel in there, and when stars run out, the interior contracts and heats up, often enabling heavier elements to burn at even higher temperatures, and causing sun-like stars to grow into red giants.

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President's Article

By Tim Campbell

Astronomy at the Beach, Eclipse, and other Updates

While September means its time to enjoy the fall colors and apple cider, for astronomers in Michigan it means it's time for Astronomy at the Beach. Last year, the park estimated that some 4500 visitors were entertained by solar system and deep space objects -- with a bit of help from the member clubs of the Great Lakes Association of Astronomy Clubs. David Eicher of Astronomy Magazine was the keynote speaker a few years back. He indicated that while he's been invited to many large star parties and outreach events, he has never seen anything on this scale and that it may be the largest event of it's kind.

While the event is normally a bit closer to a 1st quarter moon, this year the event is just a few days after the new moon. This means we'll have just a tiny sliver of a moon... and it'll be setting early which should provide us with slightly darker viewing.

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Club Information:

The Ford Amateur Astronomy Club(FAAC) meets on the fourth Thursday each month, except for the combined November/ December meeting on the first Thursday of December - at Henry Ford Community College Administration Services and Conference Center in Dearborn. Refer to our website for a map and directions (www.fordastronomyclub.com).

The FAAC observes at Spring Mill Pond within the Island Lake State Recreation Area near Brighton, Michigan. The club maintains an after-hours permit, and observes on Friday and Saturday nights, and nights before holidays, weather permitting. The FAAC also has use a private observing site near Gregory Michigan and lake Erie Metro Park. See the FAAC Yahoo Group* for more information.

Observing schedules and additional info are available on our website, or via the FAAC Yahoo Group.* Or call the FAAC Hotline, for info and leave a message, or ask questions: 313-757-2582. or send email inquiries to info@fordastronomyclub.com.

Membership in the FAAC is open to anyone with an interest in amateur astronomy. The FAAC is an affiliate of the Ford Employees Recreation Association (F.E.R.A.). Membership fees:

Annual - New Members: $30 ($15 after July 1)
Annual - Renewal: $25 ($30 after January 31)

Membership includes the STAR STUFF newsletter, discounts on magazines, discounts at selected area equipment retailers, and after-hours access to the Island Lake observing site.

Astronomy or Sky & Telescope Magazine Discounts

Obtain the required form from the FAAC club treasurer for a $10 discount. Send the completed form directly to the respective publisher with your subscriptions request and payment. Do not send any money directly to the FAAC for this.

Star Stuff Newsletter Submissions

Your submissions to STAR STUFF are welcome! Send your story and/or images to the editor: StarStuff@fordastronomyclub.com Email text or MS Word is fine. STAR STUFF will usually go to press the weekend prior to each general meeting. Submissions received prior to the 15th can be included in that issue.

* FAAC Members are welcome to join our Ford Astronomy Club Yahoo!Group. Messages photos, files, online discussions, and

This months background photos of the moon Page 1 courtesy of John Kirchhoff. See more of John's photos at:

http://www.flickr.com/photos/33926475@N06/with/4311533997/

Unfortunately Saturn and Mars are also setting early. Each year this situation improves as Jupiter arrives about one month later per year and Saturn arrives about 12 days later. By 2018, for example, we'll actually have Venus, and Jupiter, and Saturn, and Mars... all visible at the same time during Astronomy at the Beach, and all nicely distributed across the sky.

Erie Skies

It's time to brush-up on your Halloween-themed asterisms and deep space objects. The weekend after Astronomy at the Beach is the time for "Erie Skies" at Lake Erie Metropark. This is the Saturday nearest to the first-quarter moon in October. This is one of three public outreach events we do at the park each year and the event is advertised by the Metropark system. The event is October 4th at 7pm, although many of us will meet for dinner at The Three Hermanos before going to the park. Contact Gordon Hansen via the club mailing list if you'd like to reserve a seat for dinner.

Partial Solar Eclipse

The club meeting on October 23rd just happens to coincide with the start of a solar eclipse which will be partially visible in Michigan. I suspect that if forced to choose between watching an eclipse and attending a club meeting, the eclipse will win. As such, we're trying to do both. The college's new wing on the science building has an observation terrace facing west. This puts you roughly at roof level of the building to the west and also a bit nearer to the height of the trees. I visited the terrace to test it's visibility. It looks like we get a clear view to the west down to within about 3º of the horizon... which is pretty good.

The eclipse begins about 15 minutes after the start of the club meeting. We've arranged for access to the observing terrace and members with solar scopes are encouraged to arrive early to set up their equipment to have everything ready for the event. We do live in Michigan which has been known to have the occasional cloudy sky.

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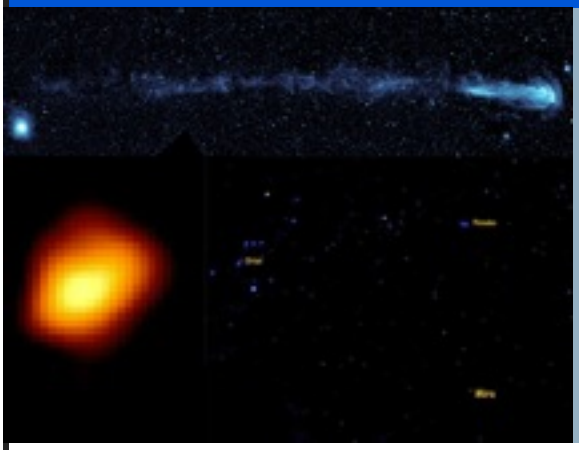

Images credit: NASA's Galaxy Evolution Explorer (GALEX) spacecraft, of Mira and its tail in UV light (top); Margarita Karovska (Harvard-Smithsonian CfA) / NASA's Hubble Space Telescope image of Mira, with the distortions revealing the presence of a binary companion (lower left); public domain image of Orion, the Pleiades and Mira (near maximum brightness) by Brocken Inaglory of Wikimedia Commons under CC-

Twinkle, twinkle, variable star

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Even though the cores of both hydrogen-burning and helium-burning stars have consistent, steady energy outputs, our sun's overall brightness varies by just ~0.1%, while red giants can have their brightness's vary by factors of thousands or more over the course of a single year! In fact, the first periodic or pulsating variable star ever discovered—Mira (omicron Ceti)—behaves exactly in this way.

There are many types of variable stars, including Cepheids, RR Lyrae, cataclysmic variables and more, but it's the Mira-type variables that give us a glimpse into our Sun's likely future. In general, the cores of stars burn through their fuel in a very consistent fashion, but in the case of pulsating variable stars the outer layers of stellar atmospheres vary. Initially heating up and expanding, they overshoot equilibrium, reach a maximum size, cool, then often forming neutral molecules that behave as light-blocking dust, with the dust then falling back to the star, ionizing and starting the whole process over again. This temporarily neutral dust absorbs the visible light from the star and re-emits it, but as infrared radiation, which is invisible to our eyes. In the case of Mira (and many red giants), it's Titanium Monoxide (TiO) that causes it to dim so severely, from a maximum magnitude of +2 or +3 (clearly visible to the naked eye) to a minimum of +9 or +10, requiring a telescope (and an experienced observer) to find!

Visible in the constellation of Cetus during the fall-and-winter from the Northern Hemisphere, Mira is presently at magnitude +7 and headed towards its minimum, but will reach its maximum brightness again in May of next year and every 332 days thereafter. Shockingly, Mira contains a huge, 13 light-year-long tail -- visible only in the UV -- that it leaves as it rockets through the interstellar medium at 130 km/sec! Look for it in your skies all winter long, and contribute your results to the AAVSO (American Association of Variable Star Observers) International Database to help study its long-term behavior!

Check out some cool images and simulated animations of Mira here: http://www.nasa.gov/mission_pages/galex/20070815/v.html

Kids can learn all about Mira at NASA's Space Place: http://spaceplace.nasa.gov/mira/en/-work/

Treasurer's Report
September 11, 2014

By Gordon Hansen

	Sep 11, 14
ASSETS	
Current Assets	
Checking/Savings	
10000 · Checking	586.98
11000 · FAAC Savings	
11100 · FAAC Club Savings	599.92
11200 · Equipment	1,370.36
11300 · Scholarship	295.76
11400 · GLAAC	5,251.21
Total 11000 · FAAC Savings	7,517.25
12000 · Petty Cash Account	180.87
13000 · CD's	
13100 · CD 200599272	1,060.03
13200 · CD 205196033	1,005.03
13300 · CD 89265268	1,107.65
Total 13000 · CD's	3,172.71
Total Checking/Savings	11,457.81
Total Current Assets	11,457.81

Meeting Agenda – September 25th

HFCC – Berry Auditorium -Admin. Services & Conference Center www.fordastronomyclub.com
5:30

Opening/Introduction/Member Observing

Main Presentation:
TBD

Club Projects/Committees/Member Support

Club Business/Secretary/Treasurer/Equipment Reports

President's Article

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In the extremely unlikely event that this should be the case on the day of the eclipse, we'll have our normal club meeting. We'll only get to see the first 30-40 minutes of the eclipse before the sun sets -- at which time we'll resume normal club meeting activities.

Equipment

Bob MacFarland, Doug Bauer, and George Korody have been categorizing, labeling, and preparing the donated equipment for use and I'm told it may be ready for members to request. Some of more complex equipment will require that members become familiar with how to use the equipment before checking it out and I believe a few pieces of equipment are reserved for special events & outreach. Thanks to George, Bob, and Doug for their efforts getting everything organized. While most equipment is in excellent condition, not all equipment has been tested and we've encountered a few surprises (items requiring attention) on some equipment. Those first few people who ask to borrow equipment are being asked if they would be willing to provide a tech-talk to review the equipment and their experience with it.

Astro Imaging SIG

Gordon Hansen

All are invited to join us in the Astro Imaging SIG meetings, to share and discuss images, experiences, and techniques.

We always have a good time, with lively discussion, and sharing of valuable information.

Next meeting is **October 9th.** The meeting room location – HFCC Admin. Services and Conference Center (same building), Berry Amphitheater Auditorium.

Topics invited. Pizza served.

FAAC Events 2014

Sept 18-21st – Great Lakes Star Gaze in Gladwin, Michigan

Sept 26-27th – 6pm Astronomy at the Beach at Kensington Metropark

Background Photo from Lunt Solar Scope Image taken at the Hector J Robinson Observatory, June 28, 2010

One FAAC members blog

http://hjrobservatory.blogspot.com/

A few updates on the observatory, quick articles and photos. I'll try to improve my writing on this blog. Also, I try to keep daily updates on this blog. - Greg Knekleian, HJRO volunteer.

FAAC Equipment Report 9/10/14

By Dennis Salliotte

Item	Currently Held By:	Date Last Verified
Telescopes		
4" Dobsonian	George Korody	1/18/14
4 ½ " Galileo Alt/Az Reflector	James French	7/12/14
8" Orion 8XTi Dobsonian	James French	7/12/14
4" Donated Reflector in need of repair	George Korody	1/18/14
Presentation Tools		
Projector	Jim Frisbie	6/26/14
Projection Screen 8'	Bob MacFarland	2/13/14
Speaker System w/wireless mic	Bob Mac Farland	2/13/14
Bullhorn	George Korody	1/18/14
DVD Player	Jim Frisbie	1/26/14
Projection Screen 6'	Gordon Hansen	7/13/14
Projector, ViewSonic	Gordon Hansen	9/10/14
Demonstration Tools		
Weight On Planets Scale	George Korody	1/18/14
Lunar Phase Kit	Bob MacFarland	2/13/14
100 ft Scale Model Solar System Kit	Bob MacFarland	2/13/14
Display Items		
Astronomy Event Sign (3' X 6')	Gordon Hansen	7/13/14
PVC Display Board - Folding	Tim Campbell	6/5/14
Banner – Large (32" X 16')	Dennis Salliotte	9/10/14
Banner – Medium (24" X 72")	Chuck Jones	8/7/14
Banner – Small (24" X 32")	George Korody	3/15/14
Tri-Fold Presentation Boards	Don Klaser	1/23/14
Tri-Fold Poster Board (Early Club Photos)	George Korody	1/18/14
Other		
Sky Quality Meter	Jon Blum	8/7/14
Canopy (10' X 10')	Tim Campbell	8/10/14
Equipment Etching Tool	Gordon Hansen	4/22/14
Pop Cooler	Michael Dolsen	6/26/14

FAAC General Meeting Minutes August 28th, 2014

By Ellen Duncan

Opening:

Art P called the meeting to order. Members introduced themselves. We had one new member. A sign-up sheet for volunteers for Astronomy at the Beach sign up went around.

Observing Experiences:

Ellen D saw lots of cool stuff naked eye in the National Forest in Michigan's UP. Ken A observed via binoculars in the National Forest under the darkest skies of his memory. Other members were 30 miles N of Lapeer, under good skies observing the Perseids. Steve U saw a fireball from his driveway. Gordon H showed photos from the FAAC picnic, including time-lapse images of picnic.

Main Presentation:

The main presentation was "Astrophotography Elements" by Chris Strang, which was an overview for the beginning imager. Chris suggests a very good mount to begin with. Major items needed: lens, cameras, mount, computer and software, sunject, warm clothes, and luck, Scope: Reflector is a good value, SCT is easiest to use, and a refractor, best detail most expensive. Many different types of cameras can be used from a cell phone camera to a DSLR or video with AVI files. A computer with appropriate software can be important for processing the images. What to shoot? Start with bright & large objects such as the moon and sun, then planets, then deep sky, or try wide angle milky was, constellations, star clusters, galaxies. You need a motorized mount w auto-guiding, additional scope and camera for auto-guiding, computer and program to complete camera-feedback loop to make small guiding corrections to mount. You need precision. then lots of time to process images & stack

Ellen D talked about Night Sky Network (NSN) and our first tool kit "Exploring Our Solar System". Any interested member can have a copy of the kit manual on CD and a DVD of training videos of different projects to use the kit for. Also, please report to Ellen any astronomy-related volunteer work you do, including event, date and time, how many volunteers, and how many visitors. The more volunteer work we log into the NSN, the more likely we will receive bigger and better tool kits to use.

Doug B gave overview of what's been done with the newly donated equipment--put into kits, some for loan, some for special events. The club is looking for volunteer caretakers who will learn to use kit, train others who want to borrow the kits, and store them in between loans. The club may have to buy a few eyepieces of other small things to complete kits, and a few things may be sold (club members will probably have first crack). Any money will go to club equipment fund. A list of all kits will be distributed once they are finished.

Business Meeting:

- The secretary's report is in Starstuff,as is the treasurer's report.

Projects and Events:

- September 18-21 - Great Lakes Star Gaze in Gladwin, MI
- September 26-27 - Astronomy at the Beach, Kensington Metro Park, 6pm to Midnight both nights. Volunteers are encouraged to sign up.
- Oct 4 Final Erie Skies at Lake Erie Metropark, Marshall Museum Nature center 7-12 pm

Announcements:

Don't forget to sign up to work at AATB!

Dan B, our social media guy, suggests to follow FAAC on Facebook--hit Follow FAAC button and like FAAC stuff. The Twitter address for FAAC is @ford_astro.

The meeting was adjourned at 7:45 pm by Vice President Art P.

Lincoln Park Mi, HJRO Update

by Greg Knekleian

We opened up HJRO only two times (as far as I can tell) last month. The second time we opened up was more of an official opening where many were notified and about a dozen FAAC members showed up.

Tim Campbell, Tim Dey, Art Parent, Rick Arzadon, Syed Saifullah, Dan Barriball, Joe Bostic, John McGill and many others showed up.

I didn't take notes after the opening, so I likely forgot some of the names for this months report. Astronomers were in a few different groups, a few sat outside and chatted taking turn observing through the BT-80 binoculars outside and the C14 inside. The C14 had the image intensifier on it. The views from the image intensifier were interesting, the green caste on the objects was interesting giving a typical night vision optical look.

The ring nebula showed up like a bright glowing green ring, appearing much like it would with a stacked live Stellacam image, but instead of being monochrome as the Stellacam would present it, the image was live and green, like an O3 filtered image.

Members also looked at M13 and the Dumbell nebula. The dumbell nebula showed at least as much detail as an o3 filter would show. It was brighter than an o3 filter would show it. The image intensifier screen has a screen that is like a small TV screen inside a viewport surrounded by a nice rubber eyecup like port that really is a seal around both eyes. The viewer looks with both eyes at one screen through the viewport. I think it will a very public friendly addition to dark sky outreach events, (better than a binoviewers).

It's a lot like the experience one would get looking at a Stellacam image, but instead of looking on a TV screen one looks through a viewport. Much care was taken in aiming and turning on and off the image intensifier. A 'light leak" was discovered and covered on the image intensifier.

Outside I spent quite a bit of time trying to find and show off the double cluster. The double cluster was low in the Detroit sky glow dome and difficult to find. Once found at it's low horizon position the double cluster showed up poorly in my Vixen BT80 binoculars.

Also near the parking lot, Syed setup his 8 inch dobsonian telescope and some members viewed some faint objects he was showing as well. I had a medical errand to run, so I missed some of the viewing. I should have taken photos of the large group of visitors, but was too distracted and busy with observing and fun chatting at HJRO.

(This month's photo below is from our BT100 test.) During the super moon night, Art Parent and I stopped by George Korody's house to do a quick test of the Orion BT-100 binoculars. I brought my binocular eyepiece set and my BT80 to do a comparison test. That test was unexpectedly shortened by a technical difficulty. I'll give my early impression the Orion BT100, at the general meeting this month.

Comparing the view BT80 vs BT100 (right)
FAAC Vice President, Art Parent checks out a view of the super moon during a test of the Orion BT-100 Binoculars. The green tinted image came from a Sony Camcorder with night vision. This tint is typical of the night vision look that the image intensifier provides.

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