



STAR STUFF

The Newsletter of the Ford Amateur Astronomy Club

Volume 22, Number 8

August 2012

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Queue Observing at
Mt. Paranal**

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A Brand New Age: Queue Observing at Mt. Paranal

By: Dr. Marc J. Kuchner

First a caravan of white observatory cars arrives, winding up the narrow road to the 2600-m- (~8500-foot-) high summit. Then the shutters around the domes open, and rays from the setting sun alight on colossal mirrors and metal struts. It's the beginning of another busy night at Mt. Paranal, Chile, where I am learning about new, more efficient ways of managing a modern observatory.

I stepped into the observatory's control room to soak up some of the new, unfamiliar culture. Here, under florescent lights and drop ceilings are banks of computer screens, one bank to control each of the four big telescopes on the mountaintop and a few others too. At each bank sits two people, a telescope operator and an astronomer.

The layout of this workspace was not unfamiliar to me. But the way these Mt. Paranal astronomers work certainly was. When I was cutting my teeth at Mt. Palomar observatory in California, I would only go to the telescope to take my own data.

In stark contrast, everyone observing at Mt Paranal tonight is taking data for someone else.

The Mt. Paranal astronomers each spend 105 nights a year here on the mountain performing various duties, including taking data for other astronomers. The latter, they call "executing the queue." Headquarters in Germany decides what parts of the sky will have priority on any given night (the queue). Then the Mt. Paranal astronomers march up the mountain and carry out this program, choosing calibrators, filling the log books, and adapting to changing conditions. They send the data back to headquarters, and from there it makes its way out to the wider astronomical community for study.

This new way of working allows the Mt. Paranal astronomers to specialize in just one or two telescope instruments each.

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FAAC General Meeting Minutes

July 26th, 2012

By Bob MacFarland

Opening:

- FAAC President, Gordon Hansen called the meeting to order at 5:30 pm in the Berry Amphitheater Auditorium at HFCC.
- All 41 persons present introduce themselves.
- Individual, group and/or outreach observing experiences over the last month were related by Rick Arzadon, Brian Kutscher, Doug Bock, Dan Barriball, Jon Blum, Chris Strang, Art Parent and Gordon Hansen.

What's Up In June:

- John Schroer was under the weather and unable to present his usual thorough summary and news updates. However, some members including Milton French pointed out that the Perseids shower peak is expected on August 11 - 14 and Venus will be occulted by the moon in the late afternoon of August 13th.

Main Program:

- Jim Frisbie gave a presentation entitled "Observing Double Stars". In it he overviewed the double star facet of amateur astronomy, by defining what double star observing is, how to get started, equipment and planning required, the challenges involved and the rewards for doing it.
- An estimated 50% of all stars in the universe are double stars. Optical double stars are two unrelated stars which appear close together through a chance alignment. A binary star is a star system consisting of two stars orbiting around their common center of mass. Visual binaries are gravitationally-bound stars which are visibly separated with binoculars or a telescope. Non-visual binaries are those which are only identified through means other than visual (i.e. occultation, spectroscopy, or anomalies in proper motion).
- Naked eyes, binoculars and telescopes can be used for observing double stars. A naked eye example is Mizar and Alcor in Ursa Major. Obviously, optics will significantly broaden the range of potential double star targets.
- In practice, counter to most star gazer's intuition, using your most expensive widest field, highest power eyepiece will not help achieve the best result. Flat fields are essential and simple, inexpensive, narrow

field orthoscopic eyepieces work best. Illuminated crosshair finder scopes, Telrad or variable spot finders are of great benefit in locating targets.

- The typical characteristics collected while observing double stars include the separation, magnitude and color of the components, and their position angle with respect to true north. As with all astronomy, there are certain limitations due to sky conditions, equipment used and the optical capability of the human eye.
- To observe double stars, up-front planning is required by using an array of references which might include some of the following:
 - Sky Atlas 2000
 - Double Stars for Small Telescopes
 - Norton's Double Star Atlas
 - Cambridge Double Star Atlas
 - Select Double Star Atlas
 - Double and Multiple Stars and How to Observe Them
 - Luis Argüelles' Difficulty Index Calculator freeware which returns a difficulty index for splitting doubles: www.carbonar.es/s33/fuzzy-splitting/LADIC.htm
- The benefits gained by the observation of double stars include: acquiring a greater knowledge of the sky, the satisfaction of accomplishment and potential certificate awards such as those issued through the Astronomical League. In addition, there is double star peer group interaction available online through the International Network of Double Stars Observers called the "Spirit of 33". This group offers background material for several groups of 33 double star challenges. See: <http://www.carbonar.es/s33/33.html>

Tech Talk:

Tim Campbell gave an overview covering the function and use of the various contemporary hydrogen alpha solar telescope offerings on the market entitled "Hydrogen Alpha Solar Observing".

The sun generates white light spread across the visible spectrum. Removable white light filters (i.e. Thousand Oaks, Baader, others) block 99.999% of this white light's intensity across the whole spectrum. White light filters (which may have a color cast such as orange) allow the viewer to see sunspots and some fissure lines. On the other hand, H-alpha filters block out all of the light except that generated by the hydrogen atoms at a 656.28nm wavelength. This allows the viewer to see solar sunspots, fissure lines and prominence activity in great detail.

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STAR STUFF

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STAR STUFF is published eleven times each year by:

FORD AMATEUR ASTRONOMY CLUB
P.O. Box 7527
Dearborn MI 48121-7527

PRESIDENT: Gordon Hansen
VICE PRESIDENT: Jon Blum
SECRETARY: Doug Bauer
TREASURER: Chuck Jones
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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: 248-207-2075. or send email inquiries to fordastronomy@comcast.net.

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 at jenzdanowski@yahoo.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 more! URL: groups.yahoo.com/group/FordAstronomyClub.

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/>

FAAC General Meeting Minutes July 26th, 2012

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H-alpha etalon filter designs are either tilted (i.e. Coronado), pressurized (between two pieces of glass - Lunt) or heated (i.e. Day Star) to achieve a desired change to the refractive index of the telescope system. In general, tilt tuned filters do not typically achieve a universal contrast across the field whereas pressure tuned designs will.

Unlike dark sky telescopes, greater apertures in solar telescopes do not present more light to your eye. However, they do provide greater levels of resolution to the image seen.

Calcium K Line filtered solar telescopes are also on the market. However, at 393nm, most persons over 40 years old have lost their receptive capability at this end of the visible spectrum. As a result, these units are typically limited to photographic applications.

Hydrogen alpha secondary or "double stacked" filters achieve a higher level of resolution than the standard models by reducing the flow through wave length width from 0.7angstroms to 0.5 angstroms. Objective end secondary filters are easy to set up but ergonomically less desirable to adjust. Mid-scope "double stack" filters (i.e. Lunt) are ideally ergonomically to adjust but are more involved to install or remove because of their internal position. Standard solar scopes may require and an additional blocking filter for photography.

WARNING! Unfiltered viewing of the sun can result in blindness. Extreme caution should be used when viewing the sun. Never view the sun with naked eye or with any unfiltered optics! Solar blindness is not immediately recognized or even painful. However, it propagates a deterioration of the eye receptors such that loss of sight will occur within 24-48 hours after initial exposure. In addition, extreme caution is also to be exercised to safely viewing the sun with add-on filters using standard telescopes. Be sure to block or remove finder scopes. A sample finder scope with burned out crosshairs and a hole through the viewing end eyepiece cap was passed around for display.

References:

Solar Telescope Reviews by Stephen Ramsden:
www.solarscopereviews.com

Solar Image Processing by Ken Crawford
www.imagingdeepsky.com/Tutorials/SolarFullDisk.htm

National Solar Observatory (GONG H Alpha Network Monitor) halph.nso.edu

Tim Campbell plans to upload this PPT presentation onto the FAAC Yahoo site for those interested in further detail.

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Treasurer's Report August 15, 2012

By Chuck Jones

Ford Amateur Astronomy Club Balance Sheet As of August 15, 2012

	Aug 15, 12
ASSETS	
Current Assets	
Checking/Savings	
CD 200599272	1,055.80
CD 205196033	1,001.01
CD 89265268	1,101.20
Checking	517.14
FAAC Savings	
Equipment	1,401.22
FAAC Club Savings	484.32
Scholarship	106.06
Total FAAC Savings	1,991.60
Petty Cash Account	114.38
Total Checking/Savings	5,781.13
Other Current Assets	
GLAAC	2,542.15
Total Other Current Ass...	2,542.15
Total Current Assets	8,323.28
TOTAL ASSETS	8,323.28
LIABILITIES & EQUITY	
Equity	
Opening Balance Equity	8,890.38
Retained Earnings	-471.55
Net Income	-95.55
Total Equity	8,323.28
TOTAL LIABILITIES & EQUI...	8,323.28

Club Wear

To our "New and Current Members" Our club has "FAAC" Official Club Wear with our Logo Embroidered.

Anyone with an interest or need in FAAC Club Wear, I will be placing an order in the next few months, for more information please call me - Diane at 248 980-7832. The FILES section in the Yahoo group has a form noting each ITEM with PRICES. The listing name - "FAAC Club Wear" - please do not hesitate to call me.

Meeting Agenda - August 23rd

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

Opening/Introduction/Member Observing

Main Presentation:

The Way We Found the Universe Jim Shedlowsky

Tech Talk:

Why You Should Go to AATB and GLSG Jon Blum

Club Projects/Committees/Member Support

- Saturday, August 25 - FAAC Picnic at Island Lake
- September 13th – 16th – Great Lakes Star Gaze
- September 21st – 22nd – Astronomy at the Beach
- Open Discussion

Club Business/Secretary/Treasurer/Equipment Reports

Items For Sale

Orion 3 inch telescope-Orion spaceprobe 3EQ-complete with mount and tripod, finder and eyepieces. This is a reflector for beginners. Never used, like new. in box. Lists for \$150 on Orion website. Asking \$110. If interested please contact Tom Blaszak at stringfingerer@gmail.com.

- 8 inch Zhumell Dobsonian Telescope
- F/5
- 2 inch Crawford low profile focuser with 1.25 inch adapter.
- 26 mm 2 inch eyepiece and 9 mm 1.25 inch eyepice
- 8 x 50 right angle finderscope
- Laser Collimator
- cooling fan with battery pack
- 2 " and 1.25" eyepiece rack and glow-in-the-dark tape on bearing box.
- Extras Include: Desert Storm Shield, padded carrying case for optical tube, Telrad
- \$300 Firm Call John 248-538-1514 or email to ka8grh@gmail.com

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European Southern Observatory at Mt. Paranal, Chile.

A Brand New Age: Queue Observing at Mt. Paranal

(continued from Page 1)

Surely this plan is more efficient than the old-fashioned way, where each of us had to learn every instrument we used from scratch—sifting through manuals at 3:00 AM when the filter wheel got stuck or the cryogen ran out, watching precious observing time tick away. Here at Mt. Paranal, much of the work is done in a big room full of people, not off by yourself, reducing some dangers of the process. Also, queue observing cuts down on plane travel, an important step for cutting carbon emissions.

It's a brand new age, I thought as I watched the giant domes spin in the silent, cold Chilean night. And maybe with queue observing, some of the romance is gone. Still, my colleagues and I couldn't help saying as we stared out across the moonlit mountains: I can't believe how lucky we are to be here.

Dr. Marc J. Kuchner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center. NASA's Astrophysics Division works

on big questions about the origin and evolution of the universe, galaxies, and planetary systems. Explore more at <http://www.science.nasa.gov/astrophysics/>. Kids can explore these topics at <http://spaceplace.nasa.gov/space>.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Astro Imaging SIG

Gordon Hansen

The May meeting was held at HFCC in the Berry Amphitheater in Dearborn

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 **September 13th**. The meeting room location – HFCC Admin. Services and Conference Center (same building), Berry Amphitheater Auditorium.

Topics invited. Pizza served.

FAAC Events 2012

August 25 - FAAC Picnic at Island Lake-5 pm

**September 21-22 - Astronomy at the Beach-
Kensington Metropark Maple
Beach**

*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.

Items For Sale

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MEADE Telescope and Tripod 6 years old - in excellent shape **LXD 75** - Series Schmidt - Cassegrain 8" f/10 SC-8AT (Super Coated, Autostar Guided) - Focal Length 2000 mm Telescope weight = 24 lbs - with MEADE EMC Super Multi-Coatings and with optional Ultra-High Transmission Coating Tripod weight = 45 lbs - Die cast Aluminum German-Type Equatorial Mount with Variable-Height Field Adjustments Autostar Controller guides to 30,223 objects

Includes a Sun Filter, Overnight Protective Cover, Transportation Containers. Contact phone no. 248-851-5053, e-mail robertboswell@comcast.net

FAAC General Meeting Minutes July 26th, 2012

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Business Meeting:

- The Secretary's and Treasurer reports were printed in StarStuff and were approved.

Upcoming Project and Events:

- Saturday, August 11th – Perseids Meteor Shower – Part Crescent State Park – Art Parent is organizing the event.
- Thursday, August 23rd – General Membership Meeting, 5:30 pm, Berry Auditorium, HFCC Administration Building,
- Saturday, August 25th – FAAC Picnic at Island Lake Spring Mile Pond
- Friday and Saturday, September 21st/22nd – Astronomy at the Beach – Kensington Metropark Maple Beach

New Business:

Mike Bruno reported that he has completed the requirements for both Boy and Cub Scout Merit Badge Counselor and that anyone who would like to organize an astronomy badge program for their, should contact him at 313-980-5197.

Thanks to Sandra Macika and Greg Ozimek for bring the pop and pizza to the meeting!

HJRO Update

by Greg Knekleian

There were very few observing days at HJRO in the past couple of weeks. Construction delays have caused the need to keep the observatory closed as the field is being "updated" with new lighting and bleachers.

A few of us watched the Curiosity landing from HJRO. James French, a frequent local visitor had asked if anyone would be watching the mars landing from HJRO. Because we had clear skies I opened up HJRO that night. Those who made it out were able to view from the observatory, chat and watch the NASA updates on the Mar's landing. It was a lot of fun to be out under the stars and also witness the landing from a NASA internet stream.

We also had one impromptu solar observing day and Tim Campbell arrived and provided his solar telescopes. (Thanks Tim.) We had a couple visitors for the solar viewing. One of them was a guy I ran into while doing impromptu sidewalk astronomy in Wyandotte. One of the pedestrians turned out to be interested in Astronomy; Mark Bieniek is even a member of the "Warren club". He stopped by HJRO from my Wyandotte solar sidewalk invite.

We also had Sandra Macika stop by and work on drawing the sun. We also had a visitor show up who wanted to bring some groups of children by the observatory on tours later. We gave him contact information for later tours.

I didn't make it out to the Port Crescent event. They had clouds and low turnout. The FAAC members who showed up gave presentations to those who did show up. Art mentioned that the bird's eye images of the park are not exactly true to what is there. There were some dunes there. The sand dunes were smaller than those at Lake Michigan dune areas.

Tim Dey found out through the grapevine, that the "money to renovate" the observatory grounds isn't really in any budget. The idea according to the latest reports is that they would float this as a goal for fundraising. (This is good news, because it will likely mean less disruption and seemingly unnecessary renovation to HJRO, at least that's how some have expressed their feelings.)

The actual ground construction is happening quickly, but we were told by one staff member that the observatory would be usable about a week and a half ago. Not being able to open up has allowed me time to get some observing in from a dark sky site at times. I've also been involved a bit with video stuff, which is unrelated to Astronomy.

OBSERVING FROM A DARK SKY SITE

A fairly good dark sky site is in the front of a friends house, who lives outside of Dexter. I have made it out there a few times to observe since HJRO has been unavailable. This gave me a chance to brush up on binocular observing and do a little star hopping and discovery under darker skies. I noticed what seems to be a repeatable 3d effect in viewing the double cluster. That will be written about in a different article



Mark Bieniek, Sandra Macika and Tim Campbell at HJRO for some solar observing. Sandra is holding some sketches she made.

The Double Cluster in 3D?

by Greg Knekleian

Stars were being displayed in glorious 3d space. At least that was the perception as I gazed up looking at the Double Cluster through my Vixen BT-80 binocular telescope. I always enjoy looking at this object, especially through this binocular. At 36x, under the darker skies near Dexter Michigan the "3d effect" was awesome.

How can it look so 3D? Some stars appeared to be in front of the others. The two cluster distances are 6800 and 7600 light years away. In theory, one should not be able to see these stars in 3d. But my eyes were telling me otherwise. Certain stars seemed to "pop out" and float in front of others.

I realized some stars can appear to move with a kind of "parallax shift" against "the background of other stars". I realized this shift effect could be repeated by moving my eyes side to side behind the BT-80 eyepieces. Certain stars would move as if they were behind the foreground stars. The fixed ones seemed to be "foreground" stars.

PLOTTING THE FOREGROUND STARS

I didn't have a tablet of paper and pencil handy, so I fired up my iPad and started to plot the stars in a "drawing app". I would only draw the "foreground stars". The iPad would work as a drawing tablet to chart the stars, but it was very bright, even at it's lowest brightness setting. This caused a bit of delay and frustration.

And I didn't draw the first cluster small enough, so I had to make two initial drawings or plots.

The two drawings both contained one of the cluster's foreground stars. I was able to use two "common stars" in both drawings, to align and combine the drawings.

WHAT CAUSED THE FOREGROUND EFFECT?

Was this an optical effect? (Like a kidney bean coma effect that one might see with cheap eyepieces.) The Vixen BT-80 is an Achromatic design and I was using Televue 25mm Plossl eyepieces. That first night, I only noticed a horizontal (left and right) shifting of the stars. When I moved my eyes left and right in relation to the eyepieces, touching my nose to one eyepiece and then the other the "parallax shift" would happen.

Sunday night, August 20th, I spent time getting the drawings aligned on my iPad. I tried to identify the stars in a photo I previously took at HJRO of "the double cluster and comet 103P Hartley" in the past. The photo had too many stars and was not the right scale I could not identify all the foreground stars accurately in the photo.

I looked at a couple of other photos from the web and they were framed with too wide a field of view and didn't give the right level of detail so I could identify the "foreground stars."

A better star chart was gathered from StarMap HD on the iPad. Zooming in to the double cluster provided a decent screen shot of the cluster. The StarMap chart had just the right number of stars to match my drawing. I was able to import the StarMap chart and my drawing. I then compared both and marked the StarMap chart (with blue markings) showing the apparent "foreground stars".

This wasn't a high end 3D rendering for 3D glasses or computerized viewing, but a poor man's 3d quick reference chart.

The Double Cluster in 3D?(continued)

I also put some comments in a PDF with some early thoughts and questions and sent it to a few FAAC members.

I wanted to verify the "left right shift" but no "top down shift", with further observing. I was close to Dexter and the sky was clear, so I went to observe the double cluster again.

Arriving at 1:30AM at a friend's house, I setup in his front yard. The same stars appeared to shift in the cluster, as in the previous observation. I noticed if I moved my eyes up and down in relation to the fixed binocular eyepieces, the background would shift up and down as well. It was like a simple video game with a single plane being the background star layer. (There were no middle layers in between the foreground and background, moving at a third speed.)

Looking further, I wanted to see if familiar or certain star patterns I would focus on "would pop out" and become a part of the foreground layer. "Foreground stars" could (at times) be selected - "by the central focus" of my eyes, not the eyepiece. Would stars move if they were half way to the edge of the apparent field of view? They did; meaning it was not dependent on the eyepiece FOV.

I could change the foreground pattern. Certain small groups of stars could be selected and would appear to be foreground stars. Was this just a psychological effect? *(Later in a quick phone call to one of the members, Larry Hoffman said, "there is a small grouping of stars 3d effect that can occur". This is something known. He could not validate my explanation here.)*

Stars further from the "edge of the field" seemed to move slightly longer distances, but it was very subtle and difficult to quantify. We focus on about 10 degrees of our central field of view and the rest often get's less attention.

Sometimes stars fairly close to the "foreground" stars would move a bit. How much? That would be nice to know. It was difficult to tell, but it was a shift equal to or greater than the distance between a small double star.

Was the shifting happening based on the center of the eyepiece field or the "center of my focusing inside the field of view"? I realized it was in the center of my field of view, and that became the answer to my question, ("Why do certain stars pop out in the foreground?")

Our eyes are wired for "flatscreen" our photoreceptors are spaced fairly evenly on the eye. They receive light in a linear manner, spaced apart evenly. The retina in our eye is not a flat image sensor, although our eyes are wired as if it is flat. The stars are moving against the walls of a round retina in my eyeballs. Near the center of the eye, the stars are moving against a flatter arc of the retina; so they move at a fairly uniform speed. But others further from the back central portion, are moving on a steeper curved slope. They are moving on a slope, at a different "nonlinear rate". It seems faster because the eye is curved. Photoreceptors are spaced evenly but they are not getting movement in even units of motion, but in a nonlinear manner.

My mind knows the sky is basically showing me a "flat field" out there at a virtual fixed distance. But my eye is looking at a flat moving field with a round receptor.

The Double Cluster in 3D?(continued)

When the image is still, the grey software in our brain will fix the image and all the relative spacing is figured out. It looks fairly uniform and our brain will make corrections for minor errors. When the image is moving the brain cannot compensate and do “non-linear to linear speed calculations” to fix the spacial relationships and speed of all the moving objects. The objects on the side of our curved eyeball, seem to be moving at a faster rate of speed, because they are. My mind tries to map a flat observation plane on the curved space of the retina. It can't map a correct image.

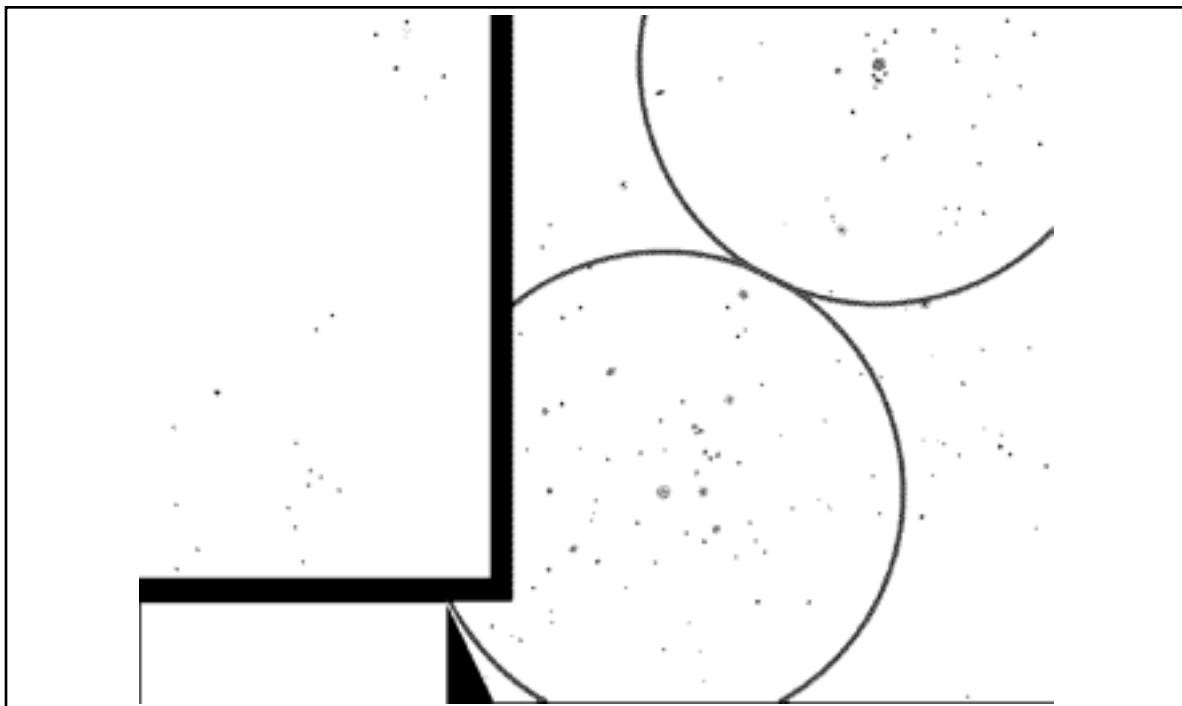
With this observation, the real nature of the curved surface of my eyes becomes evident. **The star's aren't 3d, my eye is.**

CONCLUSION

A “parallax effect” can occur, and it's especially visible with some targets, like the double cluster with the certain powers in binoculars. I also want to note: that the effect is greatly reduced at 48 power with 15mm plossl eyepieces.

This visual special effect is much more visible with the double cluster than some other objects. M45 is a nice large open cluster with plenty of stars. I could barely see the effect when looking at M45. I think the reason is M45 has a broader pattern of more evenly space stars. There are no small groups to easily fix on and many bright stars in M45 likely overwhelm the 3d optical effect.

I welcome comments, alternate theories, and of course would welcome others to view and try this test themselves.



(left) Plot of foreground stars (right) StarMap shows all the stars.

(Note: Color removed for printed inverted version. Web version may have color chart)

Fourth Annual FAAC Multi-Club Picnic



Saturday August 25th, 2012

5pm-Late

Island Lake Recreation Area – Spring Mill Pond



State Park Pass Required.
You may purchase a day
pass at the gate if you do not
have one.

Image above: Suat Eman / FreeDigitalPhotos.net

Members of the
following
Astronomy Clubs
and their families:

All Ford

Ford Amateur
Astronomy Club

University Lowbrows

Oakland Astronomy
Club

Seven Ponds
Astronomy Club

Warren Astronomical
Society

SEMSA Soaring Club

Henry Ford
Community College

Bring your scope
or binoculars.
Mini observing
contest if it is clear

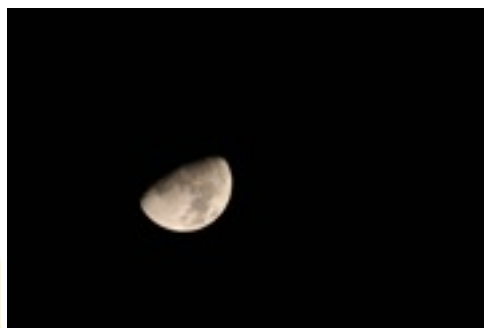


Image above: Jennifer Zdanowski

FAAC will provide hamburgers, hot dogs,
veggie burgers, soft drinks, plates & utensils

Please bring a dish to pass
salads, snacks, fruit, desserts.....



Ford Amateur Astronomy Club
Star Stuff Newsletter
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