STAR STUFF

The Newsletter of the Ford Amateur Astronomy Club

November - December 2002
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Editor: Jim Frisbie

In This Issue:

STAR STUFF is a monthly publication of the Ford Amateur Astronomy Club, an affiliate club of the Ford Employee Recreation Association.

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Submissions to STAR STUFF are welcome Please write to the address above or contact the editor:

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or email: w8tu@peoplepc.com

Dead line is the 15th of each month for the following month of publication.

Officers:

President	Don Nakic
Vice President	Ken Anderson
Secretary	Don Klaser
Treasurer	Mike Bruno

General Meetings:
The Ford Amateur Astronomy Club holds regular general meeting on the fourth Thursday of each month (except the combined November/December meeting held the first Thursday of December) at 5:00 PM at the Family Service and Learning Center, 18501 Rotunda, Dearborn, MI 48124.

Observing:
The Ford Amateur Astronomy Club observes at Spring Mill Pond within the Island Lake State Recreation Area near Brighton, Michigan. The club maintains a permit for after-hours access. Weather permitting, the club observes on Friday nights, Saturday nights, and nights before holidays.

Club Information:
Observing schedules and additional Club information is available by calling the Observing Hotline at: (313) 390-5456 or via the Ford Intranet: www.be.ford.com/astro/faac.html
or the public Internet: www.boonhill.net/faac.

Club Membership:
Membership in the Ford Amateur Astronomy Club is open to Ford employees and non-employees. Write or call for an application.
Annual - New Member: $25; Renewal: $ 20 (before Jan 31 of each year)
Lifetime - $ 150

Membership includes:
A subscription to the STAR STUFF newsletter and the quarterly newsletter the REFLECTOR published by the Astronomical League.
Discounts on ASTRONOMY and SKY & TELESCOPE magazines, after-hours access to the observing site and discounts at selected area equipment retailers.

Magazine Discounts:
Do not send money to FAAC for SKY & TELESCOPE or ASTRONOMY magazine subscriptions. We have a form that you send in with your subscription directly to the publisher to receive a $10 discount. Pick up a form at the next meeting, or contact a club officer.

Editors Note:
Current cost of duplication and postage for each Star Stuff copy is approximately $1.00 Please advise Mike Bruno if you prefer to read Star Stuff online and do not wish to continue receiving Star Stuff by U. S. mail. Mike is usually at FAAC meetings or can be reached via email at: mjbruno@umich.edu

SWAP & SHOP

For Sale: 6" Celestron Dobsonian Star Hopper. Like new and always stored in original wrapping $500 or best offer Contact Ed Augustyn (734)-641-8336

For Sale: 2003 Gold C Books are one sale now for $10.00. If you are interested, contact Ken Anderson at 313-845-0641 or via e-mail (kanders2@ford.com).

For Sale: Olympus, Varimagni Finder, "Minty" condition. Attaches to your OM-1, magnifies image 1.25X and 2.5 to improve focusing under dark skies. Includes original box, case and instructions. Asking $ 125.00 Contact Jim at 734-453-1422.

MINUTES OF THE OCTOBER 24, 2002 FAAC GENERAL MEMBERSHIP MEETING

by Don Klaser

President Don called the meeting to order @ 5:00pm. Introductions were held and then several members spoke about their observing experiences over the last month. Mike Bruno gave the treasurer's report. President Don reviewed the outline that was developed to help us run our annual star party more effectively. He also reviewed the set-up of our new library, asking for a volunteer to be club librarian and members for the library committee. We have some "Gold C" books from FERA to sell by January. They are $10.00 each. A reminder - our last meeting of the year is on Thursday, Dec 5th. The first meeting for the Imaging SIG will be at the Family Learning Center on Monday, Nov 11, @ 5:00pm. Two ideas for field trips were discussed – A Saturday visit to the Detroit Science Center and a week-end trip to the Science Center of Toronto. Greg Burnett gave a technical discussion on Stellar Magnitudes. Jeff Thrush presented the main program on cleaning of Schmidt – Cassegrain Telescopes. The meeting was adjourned @ 7:00pm.

TREASURER'S REPORT - 10/24/2002

by Mike Bruno

Balance on hand:	Checking	$ 810.75
	Savings	$1,421.15
Included in above	Scholarship	$ 532.13
	GLACC	$ 319.00
Cash Available		$1,380.77

A MESSAGE FROM THE PRESIDENT

by Don Nakic

Within a few days it will be Christmas Day 2002 ... Wow! As the proverbial expression goes, "Where has the time gone?" I usually start my Christmas shopping after Thanksgiving. In the meantime, I'm putting together a list of what I will be getting my wife, family and friends. My wish list this year focuses on astronomical equipment. The equipment that I would like to get is a Hydrogen-Alpha filter, collection of 35mm camera lenses, and a Kendrick heating strip.

You may wonder why these select pieces of equipment. My first inspiration came from Steve Mandel's article on "CCD Imaging with Hydrogen-Alpha Filters" that appeared in the January issue of *Sky and Telescope*. With such a filter one can photograph greater detail of the Sun, Moon, emission nebulas, supernova remnants, and a select number of galaxies. One cannot help but marvel over the intricate detail you can obtain with these filters. Steve described the images you take as, "reminiscent of those Ansel Adam's terrestrial masterpieces."

My next inspiration came from Jim Frisbie when he introduced me to wide field photography with a CCD camera. This is achieved by mounting a digital camera to a 35mm camera lens, instead of a telescope. With this method I can increase my field of view by ten fold. With a wide field lens and a Hydrogen-Alpha filter, one can capture spectacular images of such objects as the North American Nebula, Orion Nebula, and Andromeda Galaxy.

To complete this list, the last item I would like to get is a Kendrick heating strip to put over a 35mm camera lens. This way I can assure myself that I can take images for hours. For those that don't have this system, its works magic at keeping your lens clear on dew filled nights.

Well that's my short Christmas wish list. This is the first year that my Christmas wants are all around astronomical equipment. I feel this is the result of me becoming more active in the hobby as well as getting a lot of ideas from fellow FAAC members. It always feels good to know that boundaries of astronomy are constrained only by the boundaries of your imagination.

But Christmas is not just about receiving. It's a time for everyone to be together in joy and good cheer. Ann and I would like to wish all FAAC members and their families a joyous and safe holiday season. Have a Merry Christmas and Happy New Year!

OBSERVATIONS

by Greg Burnett

*[This article was first published as "***Ruminations Late on a Rainy Night...***" in the "President's Corner" column of* Star Stuff, *the newsletter of the* Ford Amateur Astronomy Club, *in October, 1993.]*

One of my first attempts at astrophotography is a 10 minute exposure of M13, an obvious target, a showpiece of the northern sky. Certainly photographed a million times, it poses serenely, unchanging among the stars of Hercules. But captured on my film as well, I found the galaxy NGC 6207, the tiniest smudge, barely noticeable compared to the splendor of M13. Only a few of its photons found their way through my lens and on to my film, just enough to betray its presence in the heavens, just where the chart said it ought to be.

What have we here, then, this "galaxy?" Classed as a "bright giant" spiral, it contains perhaps two hundred billion stars. If we accept a Hubble constant of 50 km/sec/Mpc (kilometers per second per mega-parsec), then its recession velocity of 1066 km/sec would indicate a distance of around 70,000,000 light-years. These numbers have the cold ring of statistics: annual rainfall, traffic fatalities, and on and on.

Can we even begin to appreciate the true nature of this Island Universe we've labeled "6207"?? Any one of its countless stars could be someone's Sun... Shining in angled autumn beams through a window, illuminating drifting dust motes in a quiet, cozy room; blazing down on desert sands where nomads eke out an arid existence; glowing golden, through sunset clouds, as day draws to a close for a culture we can never hope to know; driving surf and thunderstorms, all multiplied a million times. And "6207" is just one...

It's easy to see how folks get hooked on this astronomy stuff.

A REMINDER! *Election of FAAC officers for 2003 will be held at the meeting on the January 23, 2003. Please think about who you would like to nominate for office next year.*

PHOTOSHOP TECHNIQUES

by Tony Licata

Lately I have been seeing some pretty good results using Photoshop and haven't been able to tear myself away from it. I found that a great, undisturbed place to use it is at work, during lunch. Soon I began forgetting to actually eat during my lunch. So I thought about calling this article "Photoshop till you Drop" but I guess not. Anyway, I thought what I've been discovering might be worth sharing with other nuts like myself who might be willing to spend any length of time fixing otherwise bad astrophotography. (There, that should scare away any "purists".) After all, I've been finding there is much more data on most negatives than one might think. The trouble is that data, (in my case), is often lost in a muddle of background noise.

Now after a couple of lessons in photo editing in the Jim Frisbie school of astrophotography, I learned that my pictures suffer from what is called poor signal to noise ratio. Jim showed me how to adjust the levels, contrast and brightness to their optimal settings in Photoshop, among other things. The end result of doing this basically showed that I needed faster film or longer exposure times to bring up the signal in most of my pictures. Now, it's not always easy get out and re-shoot. Many of the opportunities I had are gone until next summer. Being fairly green at astrophotography, I wanted a wall hanger or two to show for all the time and money I've invested this year. To which friends and neighbors might say; "You mean your scope can 'pull' THAT in?" Then I would boast a big,

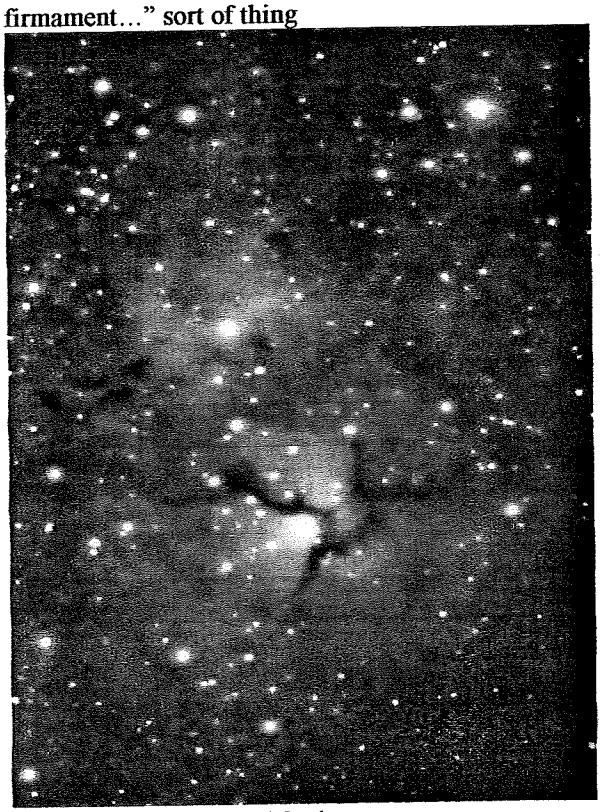
"EEEEYUPP...IT SURE CAN!" But alas, it looked like I would have to wait to add to my gallery of pictures...well, actually it is not really a gallery per se...ok, actually I don't have any pictures at all yet...but I will! In desperation, I began flogging a shot of M-20 to death that I took. I happen to work in a design studio where I am finding out, many artists use Photoshop extensively. One guy upon noticing what I was working on grabbed the mouse and said; "Look, with the rubber stamp you can erase stars". He did it by clicking next to a star while holding down the "Alt" key. Then "stamping" it down on the star. I thought: "This guy wants me to erase valuable star data that took months of planning to put there in the first place...what an idiot!" Then he said, while still laughing, "Look, you can add them back in a different place." "Very funny" I thought, but then I thought; "What if I can erase all the stars, process the remaining data, and then add them back later in the same place from a different file? This might fix the biggest problem I was having due to over contrasting the image." Over contrasting an image increases the apparent size of the stars and ruins their subtle glow. The nebulosity or gas also gets over processed looking. After acting unimpressed, but thanking him for showing me the rubber stamp tool, I went to work.

I began by literally erasing all but one of the stars from the woefully underexposed Trifid shot I had, by picking up some of the adjacent data to each star and dropping it on top of the star. In the same way, a nasty jet trail was also rendered undetectable. Once I had a scene showing only the Trifid gas plus a lot of noise, I adjusted the levels like Jim showed me and saved it away as "nostars1.jpg". Next I did a gaussian blur of about 20 percent on the gas. Then I added some noise by about the same amount. This had the effect of smoothing out the gas without loosing much detail, which I would gradually layer back in later anyway. After saving this as "nostars2", I re-opened "nostars1". Again I blurred the image but not as much, and added a different amount of noise. I then stacked the two images using "Apply Image" set at 50 percent opacity and the "Normal" method. The result was a big improvement. I saved the image as a new file and continued this process trying different settings and percentages each time until no more improvement could be detected. I still wanted more sharpness in the gas but I found that any adjustment to contrast or by doing an "unsharp mask", while helping in some ways, always hurt other areas of the picture. I saved one of these over-sharp images as a new file anyway, and re-opened my best effort so far together with the over-sharp version. I then used the one remaining star to align the two images via the rubber stamp tool. By zooming in on the star and encircling it with the right size rubber stamp brush, it is possible to "register" one image to the other by clicking on the star and stamping it down on the other with a one percent stamp pressure. (It doesn't go to zero.) Then bringing up the pressure, detail from the over-sharp version can be traced onto the other with perfect alignment. In this way, by following the character of the detail, I was able to selectively "layer in" sharpness only where it was needed. As anyone who uses Photoshop knows, you can do a lot of damage with many of the

tools that are available. But a whole lot of them, despite the damage, at the same time do some good things. The trick is to experiment with each of the tools, identify the positive aspects, and selectively layer in only those good parts to a continually improving original.

Now, a word about my ethics: First of all, I do not think this is going too far. After all, it is not like airbrushing where one is creating fake data over the real thing. Which by the way, as an artist and not a scientist, I am not opposed to either. This technique however, uses "real' data enhanced in a more specific way than just adding indiscriminant, over all effects and adjustments. Arguably, it only delineates what is already there. I believe it is more true to real science if the picture looks right, rather than over-processed or grainy. Furthermore, I'm fairly new at this and I really, really, really, REALLY want a PICTURE hanging on my wall!

I did some color correcting also using selective layering, adjusting hue, saturation and brightness. I also selectively brightened some things, including the stars, which I later added back in, using a variation of the same technique. First I applied the star field at about ten percent opacity using apply image as described above, just to locate them once again on the nebula gas. This left a faint ghost where each star lived before I removed them. Then using rubber stamp and registering to a brightened original star field, I stamped down the stars one at a time, in all their natural beauty, unaffected by all the other editing I did. I changed brush size occasionally to suit the different star sizes. Believe it or not, tedious though this was, this part was a real kick... sort of like... "And God said, Let there be lights in the firmament..." sort of thing



After!

The results of this technique were very pleasing, and I wonder if anyone else is doing it. I am learning many other ways to mask and edit picture data in Photoshop. "Lasso" is another great way to selectively edit a picture. It is fairly simple too. Click on the tool and encircle a portion of data taking care to follow the contour of the area you want to or don't want to edit. The edge of this mask can be feathered a few pixels so as not to leave a hard edge under "Select" and "Feather", or by right clicking. The selection can then be edited or "Select Inverse" can be selected under the same menu.

I am aware that most of this might be viewed as rather extreme measures, but it has boosted my enthusiasm. Except for the fact that I haven't been getting out much, I have learned that my photos are not as bad as I once thought. That's why I took a few minutes to share my experience from a beginner's perspective. I hope it can be of help for others who struggle with similar issues. I better stop here though. Some may be thinking; "What a freak." Indeed I am thinking the same thing. I've become a Photoshop freak. I need a few clear nights to get out of the house or something, and do some real astronomy again. I actually hate computers...but I sure like what they can do.... Somebody help me!

OFF AXIS GUIDING WITH THE TAURUS TRACKER III

by Clayton Kessler

Most of you have heard me grousing and grumping about the problem of flexure between my telescope and a guidescope. I have even been known to call this the "Flexure Devil". It has made doing astrophotography a more difficult and frustrating experience. I finally solved this problem with the help of a device called the Taurus Tracker III. Some background on my setup and technique may be in order.

I have been learning the "art" of astrophotography for about three years now. I started out doing piggyback photography using my Meade 8" SCT. As with everyone that does this, I am constantly trying to use longer and longer focal lengths. I eventually acquired a Losmandy G11 mount and an ST4 autoguider system. These items have made it much easier to take astrophotos, but.....not all has been "beer and pretzels". Like everyone, as my skills have increased I have become much more critical of any imperfections. I now notice tracking and focus errors that I would never have noticed two years ago. I am currently working with the G11, a variety of camera lenses and a 4" f6 refractor. I have been using a C90 for a guidescope but try as I might, my photos show tracking error at random intervals.

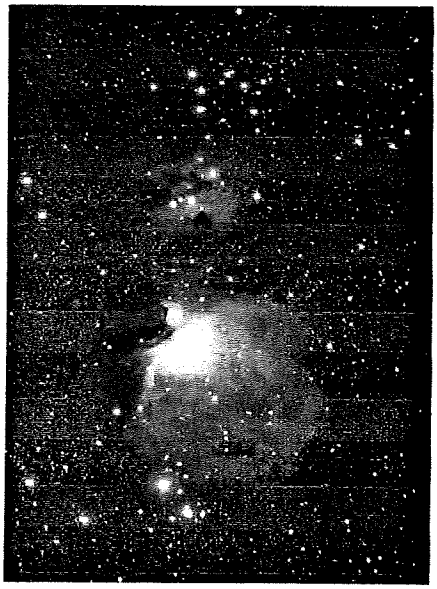
When I decided to take an astrophotography trip to Tucson Arizona this winter I was determined to find and excise the "flexure devil" in my setup. I went through many mechanical tweaks but I was not able to remove the flexure totally.

Panic time started to set in around early December. I was going to be disappointed if I could not rely on good tracking with my Arizona astrophotos. I was browsing the Astrophoto Mailing List when I began to notice how many of the "big guns" used off axis guiders. I was looking through a Sky and Telescope magazine when I came across an ad for the Taurus Tracker III. A trip to the web site (http://www.taurus-tech.com) a call to the owner and a simple credit card-ectomy and a TT III was on it's way.

The Taurus Tracker III is an interesting device. It is constructed of mainly plastic materials and is very light. The unit has four "Ports", the telescope port, the camera port, the guiding port and the viewing port. The "telescope port" and the "camera port" are simply the front and back of the unit. One end has an adapter to fit into a 2" focuser (a threaded SCT connection is also available) and the other end has a "T" thread to attach a camera. Each end adapter is held into the main body by four (4) nylon screws. Loosening these screws allows you to rotate the entire body, and/or rotate the camera 360 degrees.

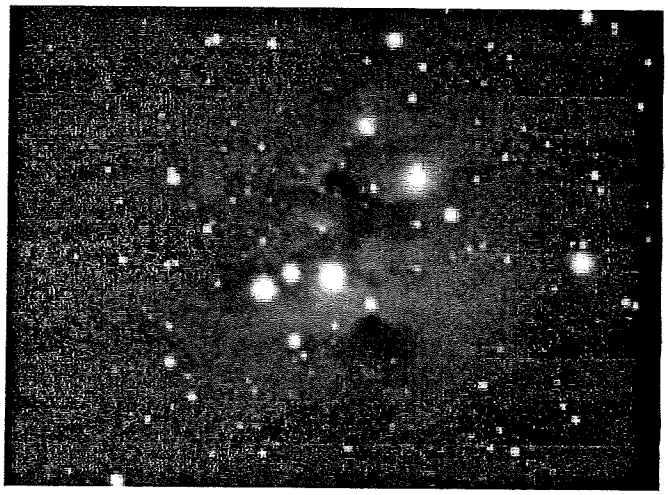
The other two ports are for eyepieces or guiders. The viewing port is a helical focuser on a sliding tube. The sliding tube has a lockscrew and it is "keyed" to prevent rotation. At the end of the tube is a large diagonal mirror. At one end of tube travel the mirror is in the center of the light path and at the other end of travel the mirror is completely out of the light path. You can put an eyepiece into the port, focus it and view through your telescope just like using a diagonal. The really interesting use for this is for focusing your camera. You can calibrate the system by focusing your camera during the day on a bright, distant object. Then you slide the viewport tube down into the light path. Insert a moderate or high power eyepiece and focus with the viewport helical focuser (I use a 7mm Nagler). There is a lockscrew for the focuser and this should be locked down securely. When you are ready to take astrophotos, you can focus your telescope using the eyepiece, slide the viewport tube up out of the way and your camera will be in focus! Take it from me, it is much easier to focus through an eyepiece than through a camera viewfinder.

The last port is a guiding port. It is similar to the viewing port in that it includes a helical focuser but the tube position is fixed in respect to the TT III body. The tube ends in a small diagonal mirror that is in the fringe of the telescope lightpath but does not intrude into the camera / film lightpath. By rotating the TT III body it is easy to find a guide star on a reticule eyepiece or in an autoguider like my ST4. This works in a very similar manner to the Lumicon Giant Easy Guider and it is a very effective method of guiding through the same instrument that you are imaging through.



Taurus Technologies makes a number of focal reducers and barlows available that fit into their system. These make it easy to shoot at focal lengths other than the telescope prime focus.

I received the unit just before Christmas and I immediately wanted to give it a try. The "Great Grey Rock" of Michigan winter had settled in so I was looking for a clear night. I finally found one on New Years Eve so out I went to the observing site at Island Lake Recreation Area. I was able to get things set up with relatively little trouble and I started guiding the mount and taking pictures. I finally felt confident that the Arizona trip had a good chance of success.
So – how did it work out? I gave the system a pretty good workout over three trips to the Empire Ranch dark site southeast of Tucson. Every shot with the 4" f6 refractor was well guided and well focused – much better than anything previous to the TT III. A close look at my scanned images show nice small round stars, even at high magnification. I am very pleased with the results and overall with the Taurus Tracker. It has become an important tool in my imaging "toolbox".



Of course, testing and research is never done. With this in mind I can see the need to travel back to Tucson on the next new moon and continue testing. I think I need to test the system some more on the cone nebula, and the seagull nebula, and the rosette nebula, and the..... well you get the idea. I will let you know how it turns out!

RIDDLE OF THE MONTH

submitted by Pat Korody

What keeps the moon in place?

NASA's Space Place

BLACK HOLES: FEELING THE RIPPLES

Astronomers have finally confirmed something they had long suspected: there *is* a super-massive black hole in the center of our Milky Way galaxy. The evidence? A star near the galactic center orbits something unseen at a top speed of 5000 km/s. Only a black hole 2 million times more massive than our Sun could cause the star to move so fast. (See the Oct. 17, 2002, issue of *Nature* for more information.)

Still, a key mystery remains. Where did the black hole come from? For that matter, where do *any* super-massive black holes come from? There is mounting evidence that such "monsters" lurk in the middles of most galaxies, yet their origin is unknown. Do they start out as tiny black holes that grow slowly, attracting material piecemeal from passing stars and clouds? Or are they born big, their mass increasing in large gulps when their host galaxy collides with another galaxy?

A new space telescope called LISA (short for "Laser Interferometer Space Antenna") aims to find out.

Designed by scientists at NASA and the European Space Agency, LISA doesn't detect ordinary forms of electromagnetic radiation such as light or radio waves. It senses ripples in the fabric of space-time itself--gravitational waves.

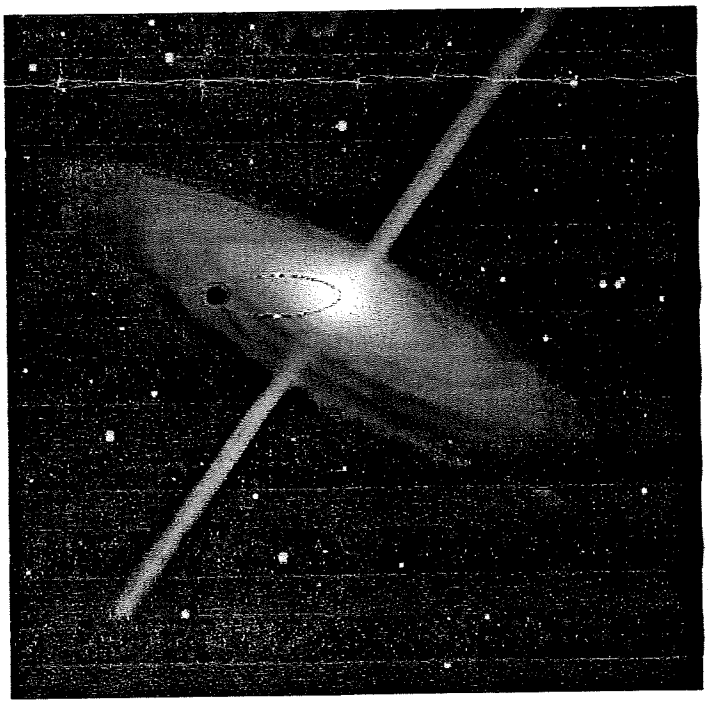
Albert Einstein first realized in 1916 that gravitational waves might exist. His equations of general relativity, which describe gravity, had solutions that reminded him of ripples on a pond. These "gravity ripples" travel at the speed of light and, ironically, do not interact much with matter. As a result, they can cross the cosmos quickly and intact.

Gravitational waves are created any time big masses spin, collide or explode. Matter crashing into a black hole, for example, would do it. So would two black holes colliding. If astronomers could monitor gravitational waves coming from a super-massive black hole, they could learn how it grows and evolves.

Unfortunately, these waves are hard to measure. If a gravitational wave traveled from the black hole at the center of our galaxy and passed through your body, it would stretch and compress you by an amount far less than the width of an atom. LISA, however, will be able to detect such tiny compressions.

LISA consists of three spacecraft flying in formation-a giant triangle 5 million km on each side. One of the spacecraft will shoot laser beams at the other two. Those two will echo the laser signal right back. By comparing the echoes to the original signal, onboard instruments can sense changes in the size of the triangle as small as 0.0000000002 meters (20 picometers).

With such sensitivity, astronomers might detect gravitational waves from all kinds of cosmic sources. The first, however, will probably be the weightiest: super-massive black holes. Will "feeling" the ripples from such objects finally solve their mystery, or lead to more questions? Only time will tell. Scientists hope to launch the LISA mission in 2011.



ENLIGHTENED BY THE DARKNESS

By Diane K. Fisher

On the clearest of nights, I may see a dozen stars from my suburban backyard near Los Angeles. Unfortunately, my

studies of space and astronomy have been confined to books and the pictures taken by others. Seldom have I experienced for myself a truly dark, clear, moonless sky.

One of those rare times was a summer camping trip in Bryce Canyon, Utah. I lay on my sleeping bag in an open area away from trees. I saw millions of stars (so it seemed) and the cloud of the Milky Way streaking across the sky. Nothing of planet Earth was in my view. It was then I glimpsed my true situation in the universe, a speck of dust clinging to a tiny stone hurtling through the darkness of a cold, infinite universe. I was awestruck by the beauty of the stars and the darkness-and terrified!

In the light of day and a more "down-to-Earth" state of mind, I wondered: With around 100 billion galaxies out there, why is it still so dark out there?

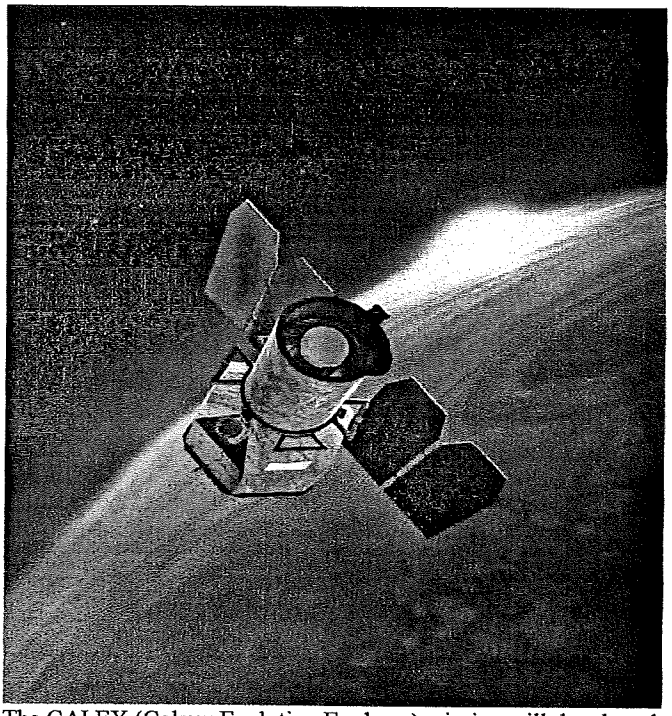
Until the 20th century, astronomers thought the universe was infinite. They were perplexed though, because in an infinite universe, no matter where you look in the night sky, you should see a star. Stars should overlap each other and the sky should be blazing with light and hot as the sun. This problem became known as "Olber's Paradox."

Astronomers now realize that the universe is not infinite. A finite universe-that is, a universe of limited size-even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although a finite universe is enough to explain the darkness, the expansion of the universe also contributes. As light travels from a distant galaxy to us, the space through which the light is traveling is expanding. Therefore, the amount of energy reaching us dwindles all the time, thus causing the color of the radiation to be "redshifted." (The wavelength is stretched out due to cosmic expansion.) The more distant the galaxy, the more redshifted the light. The largest redshift astronomers have measured comes from radiation that was emitted when the Universe was only 300,000 years old. This radiation has taken over 12 billion years to reach us and although it began as infrared radiation, it is now seen as the microwave background radiation.

GALEX (Galaxy Evolution Explorer) is a NASA space telescope that will survey the universe, including galaxies with redshifts that indicate their light has been traveling for up to 10 billion years (or 80% of the history of the universe). Read about GALEX at www.galex.caltech.edu/ . For budding astronomers, print out The Space Place New Millennium Program calendar at spaceplace.nasa.gov/calendar.htm to identify great sky watching opportunities.

Diane K. Fisher is the developer and writer for The Space Place web site.



The GALEX (Galaxy Evolution Explorer) mission will do a broad survey of galaxies in various stages of evolution and identify interesting objects for further study by the Hubble Space Telescope.

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

WINTER OBSERVING CHALLENGE

By Don Nakic

NGC 404: RA 1h 09 m 27s Dec +35° 43' 04"
11.2 magnitude galaxy in Andromeda. Small, round, faint with brighter nucleus. Nice view with yellow Beta Andromeda in same field of view. Galaxy brightens when Beta is outside the field.

NGC 457: RA 1h 19m 33s Dec +58° 17' 24" ET CLUSTER
6.4 magnitude open cluster in Cassiopeia. Bright, large, scattered. Looks like a stick figure E.T. The bright double star, Phi Cassiopeia, forms his eyes. Dimmer stars form his body. His arms are held out at his sides with stars coming to a point to form his long fingers. Young children really relate to this object. A favorite for public star parties.

OPEN CLUSTER
Gamma Andromeda (Almach): RA 2h 3m 52.9s Dec +42° 19' 46.9"
A beautiful double star. Very close pair. Primary is vivid yellow and secondary is very blue.

NGC 1528: RA 4h 15m 19s Dec +51° 12' 42"
6.4 magnitude open cluster in Perseus located almost 2 degrees northeast of Lambda. Takes up most of the eyepiece field. It reminds you of the Beehive Cluster as most of the stars are of the same magnitude. There is a yellow star just to the east.

NGC 1528 (M1, Crab Nebula): RA 5h 34m 30s Dec +2° 1' 0"
A very bright, large supernova remnant in Taurus, located about I degree northwest of Zeta. Oval shaped, it has a mottled appearance.

NGC 2169: RA 6h 08m 25s Dec +13° 57' 54"
5.9 magnitude open cluster in Orion, located 3/4 degrees south and slightly east of Nu. Forms a triangle with Nu and Xi Orionis. Shaped like the number 37 in a scope with an even number of reflections, or an upside down 37 or backward 73, in a scope with an uneven number of reflections. If you have a problem determining the orientation of your eyepiece field, whether your images are flipped top to bottom, left to right or upside down, use this object as a test.

A Special Reminder:

*This months program includes **"Ask the Astronomer"** and a **"Swap and Shop"** bring lots of money and any of your stuff that is not needed or you would like to sell to upgrade.*

FAAC
December 5, 2002
General Membership Meeting
5:00 pm to 6:45 pm
Agenda

- Introductions	Don Nakic	20 min
- Reports: Treasurer's Secretary's	Mike Bruno Don Klaser	5 min
- Old/New Business	Don Nakic	10 min
- Upcoming Events	Don Nakic	10 min
- Observing Challenge	Don Nakic	15 min
- UFO Sightings	George Korody	15 min
- Swap & Shop Ask the Astronomer	All Doug Bock	30 min

ASTRONOMICAL CALENDAR 2002

December

All times are Eastern Standard Time or Eastern Daylight Saving Time, whichever applies.

December 1	Moon-Venus-Mars triangle, with Spica 9° upper right of trio at dawn.
December 2	Dim Mars within 2° of brilliant Venus low in SE (Dec 2-12 dawn); closest on Dec 6
December 4	New Moon 2:34 am Total Solar Eclipse. Path of Totality over southern Africa, Indian Ocean, Australia.
December 11	First Quarter 10:49 am
December 12	Geminid Meteor Shower. Best nights Dec 12 & 13 after moonset.
December 17	Saturn at opposition. Visible all night. Aldebaran below Moon, with Saturn far to their lower left at dusk.
December 18	Moon near Saturn (Dec 18 & 19 dusk)
December 19	Full Moon 2:10 pm *(Cold Moon)* Mercury very low in SW rest of month at dusk.
December 21	Solstice 8:14 pm Moon below Gemini Twins (8 pm)
December 22	Moon near Jupiter (9 pm to dawn)
December 23	Moon near Regulus (10 pm to dawn)
December 26	Last Quarter 7:31 pm
December 28	Moon near Spica (dawn)
December 30	Moon near Venus, with dim Mars 4.5° right of Venus at dawn.
December 31	Moon near red Antares (dawn)

This information was obtained from the Henry J. Buhl, Jr. Planetarium in Pittsburg, PA.

FAAC CALENDAR

Activity	Date	Time
- General Meeting	Dec 5	5 pm
- Astro Image SIG	Dec 9	5 pm
- Lake Erie Ice Days	-	-
- FAAC Board Mtg	Jan 9	5 pm
- General Meeting	Jan 23	5 pm
- FAAC Board Mtg	Feb 13	5 pm
- General Meeting	Feb 27	5 pm
- FAAC Board Mtg	Mar 13	5 pm
- General Meeting	Mar 27	5 pm
- FAAC Board Mtg	Apr 10	5 pm
- General Meeting	Apr 24	5 pm
- FAAC Board Mtg	May 8	5 pm
- UMD Star Party	May 9	9 pm
- General Meeting	May 22	5 pm
- FAAC Board Mtg	Jun 12	5 pm
- General Meeting	Jun 26	5 pm

RIDDLE OF THE MONTH ...Answer

Moon beams!

ASTRONOMICAL IMAGING S.I.G.

By George Korody

The first meeting of the Astronomical Imaging S.I.G. was held on November 11. Of the 28 Club Members participating in the S.I.G., 18 were able to attend this first meeting. Total participation has now increased to 32. After introductions there was a discussion on the S.I.G.'s objectives, source material, and future meeting plans and topics. Jeff Thrush then gave a very informative talk and display of film imaging equipment, which was followed by a group discussion and Q&A period. The meeting was enthusiastically received.

All Club Members are invited to participate in the S.I.G.. Any members wishing to join the group can do so at the next meeting. There is no charge. The next meeting will feature discussions on digital imaging equipment and image acquisition techniques; and if time permits, a discussion on film image acquisition. The next meeting of the S.I.G. will take place on Monday, December 9, from 5-7:00 PM in the Training Conference Room (a different room) in the Ford Family Service and Learning Center. Directions to the building can be found at http://www.boonhill.net/faac/

Fish Lake Astro Imaging Workshop
The Art and Science of Photography and CCD Imaging

January 31 - February 2, 2003

The **"Fish Lake Astro Imaging Workshop"** field trip takes place **January 31, 2003 through February 2, 2003** at the Eastern Michigan University's Kresge Environmental Education Center, located 7 miles northeast of Lapeer, MI. KEEC is located in an area where skies allow viewing of faint astronomical objects such as clusters, comets, galaxies and more. Telescopes typically from 4" to 14" in aperture will be operating both Friday and Saturday night, weather permitting. If you do not bring a telescope, several of them will be available to look through. Those attending this unique Fish Lake experience are encouraged to bring photographic gear and/or CCD imaging systems, if they have them, to share ideas and information with others, or to learn "tricks of the trade" from veteran observers. Cost is **$50.00** per person for 3 meals, 2 nights stay, observing, workshops, talks, hikes, and more. **To attend, print out, complete, and return the** Registration Form(.pdf format) ***before*** **January 27, 2003 - Note: The registration fee is non-refundable.** Registration limit is 60 persons. Full Friday night through Sunday noon attendance is assumed and *strongly encouraged* (but not required) so no variance on meal plan or fee is offered.

NOTE: This fee is non-refundable

Make checks payable to: **Eastern Michigan University**

Registrations must be received by January 27, 2003. Mail-in registration ends Friday, January 24, 2003. (postmark on or before).

Trip Highlights

FRIDAY, January 31:

-Registered folks arrive at Fish Lake any time after 5 p.m.; check-in at kitchen area.
-Observing/imaging all night, skies permitting, with a wide variety of portable telescopes.
-Talks and discussion groups, if cloudy. Dorm stay-over - no meal.
-Coffee, hot chocolate in kitchen area.

SATURDAY, February 1:

-Breakfast served at 10 a.m.
-Solar observing and photography, if clear

-Nature trails to explore (many biological and geological features to see).
-Workshops and presentations (a *schedule of presenters will be posted here by early January*)
-Dinner served at 5 p.m.(vegetarian plate available, too)
-Observing/imaging all night, skies permitting.
-Talks and discussion groups, if cloudy

SUNDAY, February 2:
-Breakfast served at 10 a.m. for anyone still moving :)
-Clean up
-Departure from Fish Lake around 12:00 noon

Other Notables....

The Fish Lake dorms offer comfortable beds and bathroom facilities but you will need to bring:

-sleeping bag and pillow...there are beds, just no sheets

-towels and toiletries...the showers are hot, just no linens

The dorm is divided into men/women wings plus a common area with fireplace. You should also bring a red flashlight, and **warm winter** clothing (it gets *cold* at night this time of year). Optional items to bring include telescope, binoculars, camera equipment, playing cards, snacks, notebooks, pop, etc. Lapeer is about 10 minutes from Fish Lake and offers a delicious selection of fast food if you need your fix. Notice in small print: Though not a problem in the past, the University and EMU Astronomy Club are not responsible for lost or stolen items - keep an eye on your stuff. Our general policy is, "if it ain't yers, DON'T touch it!".

Make sure you check-in at the registration desk in the kitchen area (see map) upon arrival. Only registered guests are allowed on the grounds! **This trip is open to anyone with an interest in astronomy but especially to those with an interest in astronomical imaging since the trip is designed with them in mind.** Fish Lake has been a fun and enjoyable experience for EMU's introductory astronomy students for many years....it's meant to be fun for all, from novice to veteran observers.

To reach Fish Lake, take US-23 / I-75 to I-69, east to Lapeer, MI, or M-24 north to Daley Rd. (just 1 mile north out of Lapeer). 3 miles east on Daley Rd. and 1 mile north on Fish Lake Rd. just past Vernor Rd.. Our site is located at the east end of KEEC's service drive...look for the green EMU KEEC sign at the dirt drive entrance. Drive SLOWLY up the service drive with parking lights only if arriving after dark. Print out the available map for reference.

Additional information available from Mr. Norbert Vance or Mr. Jeff Thrush.

Map to Fish Lake (KEEC)
Map may take several seconds to load - 95K GIF file

Registration form

.pdf format
(Flier updated by alumnus Heather Tarvis, Senior Electronic Artist, Meridian, Inc.)

Return to EMU Astronomy Club page
Pictures of Astronomy at Fish Lake

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