Club News

August, 2003

John Kocijanski, Editor

Jim McKeegan, President
John Kocijanski, Vice President
Brian Deis, Secretary
Bud Wertheim, Treasurer

On July 19th an observation session was held to makeup for the canceled session of July 5th. Ten people participated. As the sky darkened some double stars were viewed such as Epsilon Lyrae, Albireo, and Ras Algethi were seen. Many Messier objects were viewed such as M13, M27, M57, M22, M17, M8, M6, M7, and M31. The Eagle Nebula (M16) was viewed through different telescopes using an OIII filter. An OIII filter was also used to view the Veil Nebula through Tony Kim's Starmaster 12.5" dobsonican reflector. Geoffrey Ginos brought his Astro Physics seven inch refractor. It provided great views of the Double Cluster as well as M16. A highlight of the evening was seeing the International Space Station pass overhead around 10:08. It moved from south-west to northeast across the entire sky. Howie Glatter tracked it at times through his ten inch dobsonian reflector and saw that it has distinct V shape. Some members stayed after midnight to observe Mars which came into view around 11:30. Geoffrey's Astro Physics refractor is shown below.

The July 26th observation session was held on July 25th due to better sky conditions. It was held at the Town of Thompson Park in Monticello. This site is quite dark but the view of the horizon is not as good as Walnut Mountain. There is light pollution in the southern sky due to Monticello but the northern sky is quite dark. The Milky Way was easily seen. Overall we felt the site was quite good. Five members attended the session. John Kocijanski's Stellarvue AT1010 78mm short tube refractor and Mark Rosengarten's Televue 76mm short tube refractor were put to a head to head comparison. At times the apochromatic Televue out performed the Stellarvue but we agreed the Stellarvue was not far behind and at times had equivalent views. The scopes were compared using the same eyepieces looking at the same objects such as Epslon Lyrae, M13, and M27. As the sky darkened we had some great views of deep sky objects. Both of the small refractors were able to see the faint galaxy M51. Many of the objects in Scorpius and Sagittarius were viewed. John Barabarite's 12" SCT showed a great view of the Lagoon Nebula, M8. Jim Mckeegan's 8 " SCT showed a great view of the Wild Duck Cluster, M11. Jim was also able to find Neptune in his scope. It appeared as a small green disk similar to a small planetary nebula. The highlight of the evening was seeing Mars at around 11:30. The sky conditions were quite steady which allowed for a good view of the planet. The AT1010 and 8" SCT showed the south polar cap and the dark area Syrtis Major well.

John Kocijanski wrote a review of his Stellarvue AT1010 that appears on the Cloudy Nights website. Check it out at http://www.cloudynights.com/reviews4/nighthawk.htm .

The observation sessions for August are on the 2nd and 30th. The makeup date is August 23rd.

Anyone interested in submitting an astronomical observation or photograph for the newsletter, please contact John at kocis@verizon.net.

Each month the photo section of our newsletter will highlight the telescopes and equipment of club members. If you have a photo of

your scope or equipment and a brief description of it that you would like to contribute please send it to John at kocis@verizon.net.

The club has selection of astronomy books, Stardate audio CDs, a Macintosh computer with astronomy software, and a Meade eight inch reflector for members to borrow. Please contact John at 791-5240 or kocis@verizon.net. if you are interested in borrowing any of these.

Astronomy News:

Here are some articles from various sources that might be of interest.

http://science.nasa.gov/headlines/y2003/09jul_marsdust.htm

Mars Dust
NASA Science News
July 9, 2003

Using only backyard telescopes, amateur astronomers are enjoying great views of dust clouds on Mars

July 9, 2003: Something is happening on Mars and it's so big you can see it through an ordinary backyard telescope.

On July 1st a bright dust cloud spilled out of Hellas Basin, a giant impact crater on Mars' southern hemisphere. The cloud quickly spread and by the Fourth of July was 1100 miles wide—about one-fourth the diameter of Mars itself.

"The cloud can be seen now through a telescope as small as 6 inches," says Donald Parker, executive director of the Association of Lunar and Planetary Observers (ALPO). "Its core is quite bright."
Parker has been tracking the cloud through his own 16-inch

telescope. “A red filter helps,” he notes. “Even a piece of red or orange gelatin held between the eye and ocular will improve the visibility of the dust.”

Two years ago, a similar cloud from Hellas Basin grew until it circled the entire planet. Features on Mars long familiar to amateur astronomers—the dark volcanic terrain of Syrtis Major, for example—were hidden for months. “The planet looked like an orange billiard ball,” recalls Parker.

Will it happen again?

“No one knows,” says astronomer James Bell of Cornell University who studied the dust storm of 2001 using the Hubble telescope. “We don’t yet understand the mechanism that causes regional clouds to self-assemble into giant dust storms.”

Mars Global Surveyor and Mars Odyssey, two NASA spacecraft circling Mars, have seen many “regional storms” like the cloud near Hellas Basin now. They
persist for a few days or weeks, then dissipate. Rarely do they become a planet-wide event.

“Only 10 global or planet-encircling dust storms have been reported since 1877,” notes Parker.

All dust storms on Mars, no matter what size, are powered by sunshine.Solar heating warms the martian atmosphere and causes the air to move, lifting dust off the ground.

Because the martian atmosphere is thin—about 1% as dense as Earth’s at sea level—only the smallest dust grains hang in the air. “Airborne dust on Mars is about as fine as cigarette smoke,” says Bell. These fine grains reflect 20% to 25% of the sunlight that hits them; that’s why the clouds look bright. (For comparison, the reflectivity of typical martian terrain is 10% to 15%.)

Sunlight on Mars is about to become unusually intense. The planet goes around the sun in a 9%-elliptical orbit with one end 40 million km closer to the sun than the other. Mars reaches perihelion—its closest approach to the sun—on August 30th. During the weeks around perihelion, sunlight striking Mars will be 20% more intense than the annual average.

"This means the season for dust storms is just beginning," says Bell.

A total of four spacecraft from NASA, the European Space Agency and Japan are en route to Mars now. They include three landers and two orbiters. Will dust storms cause problems for those missions?

Probably not. NASA spacecraft have encountered Mars dust before. The Viking landers of 1976, for instance, weathered two big dust storms without being damaged. As far as researchers were concerned, it was a good opportunity to study such storms from the inside—something Mars colonists may do again one day for themselves. Viking data will give them a head start.

Five years earlier, in 1971, the Mariner 9 spacecraft reached Mars during the biggest dust storm ever recorded. The planet was completely obscured; not even the polar caps were visible. Mission controllers simply waited a few weeks for the storm to subside. Then they carried on with Mariner 9's mission: to photograph the entire surface of the planet. It was a complete success.

As 2003 unfolds, Earth and Mars are drawing together for their closest approach in some 60,000 years on August 27th. Already in July Mars is a pleasing sight. Step outside before dawn anytime this month. Mars will be there in the southern sky, a remarkably bright red star. (If you live in the southern hemisphere, look northeast instead.)

Even a small telescope will reveal the planet's orange disk and its

icy south polar cap. And if “seeing is good” you might catch a glimpse of some dust clouds. Swirling, surging, merging with others ... building the next global dust storm? “They’re fun to watch,” says Parker. Now is a great time to see for yourself.

European Space Agency
Science News Release No. 9-2003
Paris, France
16 July 2003

SOHO resumes full operation

ESA/NASA’s solar watchdog, SOHO, is back to full operation after its predicted 9-day-long high-gain antenna blackout. Engineers and scientists are now confident that they understand the situation and can work around it in the future to minimise the data losses.

Since 19 June 2003, SOHO’s high-gain antenna (HGA), which transmits high-speed data to Earth, has been fixed in position following the discovery of a malfunction in its pointing mechanism. This resulted in a loss of signal through SOHO’s usual 26-metre ground stations on 27 June 2003. However, 34-metre radio dishes continued to receive high-speed transmissions from the HGA until 1 July 2003.

Since then, astronomers have been relying primarily on a slower transmission rate signal, sent through SOHO’s backup antenna. It can be picked up whenever a 34-metre dish is available. However, this signal could not transmit all of SOHO’s data. Some data was recorded on board, however, and downloaded using high-speed transmissions through the backup antenna when time on the largest, 70-metre dishes could be spared.

SOHO itself orbits a point in space, 1.5 million kilometres closer to the Sun

than the Earth, once every 6 months. To reorient the HGA for the next half of this orbit, engineers rolled the spacecraft through a half-circle on 8 July 2003. On 10 July, the 34-metre radio dish in Madrid re-established contact with SOHO's HGA. Then on the morning of 14 July 2003, normal operations with the spacecraft resumed through its usual 26-metre ground stations, as predicted.

With the HGA now static, the blackouts, lasting between 9 and 16 days, will continue to occur every 3 months. Engineers will rotate SOHO by 180 degrees every time this occurs. This manoeuvre will minimise data losses. Stein Haugan, acting SOHO project scientist, says "It is good to welcome SOHO back to normal operations, as it proves that we have a good understanding of the situation and can confidently work around it."

http://science.nasa.gov/headlines/y2003/17jul_perseids2003.htm

The 2003 Perseid Meteor Shower
NASA Science News
July 17, 2003

Mark these dates on your calendar: August 12th and 13th.

It's time to get ready for the Perseid meteor shower.

The Perseids are probably the best-watched of any annual meteor shower. They come in mid-August when it's warm and comfortable to be outside at 4 o'clock in the morning. They are bright, numerous, and dependable.

This year the shower peaks on Wednesday, August 13th.

When skies are dark and clear, observers often see as many as one hundred Perseids per hour—an impressive display. This year, however, skies won't be dark. A glaring full moon will wipe out many faint meteors and reduce by a factor of two or three the number you can see.

Even so, it's worth planning a trip to the country or rearranging your camping schedule to be outdoors when the Perseids arrive.

"No matter where you live, the best time to look will be just before dawn on Wednesday morning, August 13th," says Bill Cooke of NASA's Space Environments Team at the Marshall Space Flight Center. At that time, the sky overhead will be tilted into the debris stream of Comet Swift-Tuttle—the source of the Perseid meteors. Furthermore, the moon will be low in the sky before dawn. You can stand in the shadow of a building or a hill or some other Moon-baffle to reduce its glare.

Last year in November Cooke led a team of astronomers to study the Leonid meteor storm, which likewise happened during a full moon. "Observers who ducked into the shadows counted twice as many meteors as those who stood in full moonlight."

Another way to minimize the bad effects of the moon is to travel to a site where the air is clear. Even when you face away from the Moon, Cooke explains, the air glows because of moonlight scattered from air molecules and aerosols (e.g., water droplets, dust and pollution). This glow will be less in places where the air is dry and pollution-free. Mountaintops are excellent because they rise above the humid lower atmosphere and most aerosols.

Once you find your observing site and settle in—a comfortable chair and blankets are recommended—there's no special direction you have to face. Perseids can appear anywhere in the sky.

"But don't look toward the Moon," Cooke cautions. "That will ruin your night vision."

Actually, go ahead and look at it just once, because on August 13th the Moon and Mars will be pleasingly close together, only a few Moon-widths apart. Other than the Moon itself, Mars will be the brightest object in the sky that night—red, piercing, and a joy to see through a telescope.

When the Perseid meteor shower peaks, Mars will be only two weeks away from it's closest approach to Earth in some 60,000 years.

When you see a Perseid, perhaps even one streaking past Mars, trace its tail backward. It will lead to the constellation Perseus.

"Perseid meteors stream out of a point in Perseus called the radiant," he explains. Because of foreshortening, meteors near the radiant appear short and stubby. Meteors away from the radiant are longer and more eye-catching.

Speaking of long meteors... You can see some really long ones on Tuesday evening, August 12th. They're called Earthgrazers. Earthgrazers are shooting stars that emerge from the horizon and streak horizontally through the atmosphere. They tend to be slow, bright and colorful.

Between 8 p.m. and 9:30 p.m. on August 12th is a good time to look for Perseid Earthgrazers because," explains Cooke, "the constellation Perseus will be hanging low near the northeastern horizon—a good geometry for grazing meteors."

The Moon will be hanging low then, too, so once again it should be possible to find some moon shadows where the glare is less. "Earthgrazers are somewhat rare," notes Cooke. "You won't see many of them, but they're very pretty."

Earthgrazing meteors. The Moon and Mars. The dependable Perseids. It all happens on August 12th and 13th. Mark your calendar and don't miss the show.

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July 16, 2003 Fewer Earthbound asteroids will hit home

Scientists say pancake model of asteroid impact won't stick

Scientists report in Nature today that significantly fewer asteroids could hit the Earth's surface than previously reckoned.

Researchers from Imperial College London and the Russian Academy of Sciences have built a computer simulation that predicts whether asteroids with a diameter up to one kilometre (km) will explode in the atmosphere or hit the surface.

The results indicate that asteroids with a diameter greater than 200 metres (the length of two football pitches) will hit the surface approximately once every 160,000 years - way down on previous estimates of impacts every 2,500 years.

The findings also predict that many more asteroids blow up in the atmosphere than previous estimates, which means the hazard posed by impact-generated tidal waves or tsunamis is lower than previous predictions. The researchers suggest that proposals to extend monitoring of Near Earth Objects (NEO) to include much smaller objects should be reviewed.

Dr Phil Bland of Imperial's Department of Earth Science and Engineering and a Royal Society University Research Fellow, said:

"There is overwhelming evidence that impacts from space have caused catastrophes for life on Earth in the past, and will do so again. "On the Moon it's easier to track the number, frequency and size of collisions because there is no atmosphere, so everything hits the surface. On Earth the atmosphere acts like a screen and geological activity erodes many craters too.

"Massive impacts of the type thought to have wiped out the dinosaurs leave an indelible print on the Earth but we have not been

able to accurately document the effect of smaller impacts. Now, we have a handle on the size of ’rock’ we really need to worry about and how well the Earth’s atmosphere protects us.”

When small asteroids hit the atmosphere the two forces collide like two objects smashing together, which often breaks the asteroid into fragments. Until now, scientists have relied on the ‘pancake’ model of asteroid impact to calculate whether the asteroid will explode in the atmosphere. This treats the cascade of fragments as a single continuous liquid that spreads out over a larger area - to form a ‘pancake’. But a new model known as the ’separate fragment’ (SF) model, which was developed by co-author of the study, Dr Natalya Artemieva of the Russian Academy of Science, has challenged this approach.

”While the pancake model can accurately predict the height from the Earth’s surface at which the asteroid will break up, it doesn’t give an accurate picture of how the asteroid will impact,” explains Dr Bland. “The SF model tracks the individual forces acting on each fragment as it descends through the atmosphere.”

To create a more accurate model of how asteroids interact with the atmosphere the researchers ran more than 1,000 simulations using both models. Objects made of either iron or stone, known as ‘impactors’, were used to reflect the composition of asteroids and experiments were run with varying diameters up to 1 km.

The researchers found the number of impacts for iron impactors were comparable using both models. For stone the pancake model significantly overestimated the survivability rate across the range used.

The SF simulations also allowed the researchers to define the different styles of fragmentation and impact rates for iron and stone, which correspond closely with crater records and meteorite data.

”Our data show that over most of the size range we investigated stony asteroids need to be 1,000 times bigger than the iron ones to make a similar sized crater. Much larger objects are disrupted in the atmosphere than previously thought.

”But we are not out of the woods yet,” added Dr Bland “asteroids that fragment in the atmosphere still pose a significant threat to human life.”

Dr Phil Bland is a member of the Meteorite and Impact Group that includes scientists from Imperial College London and the Natural History Museum.

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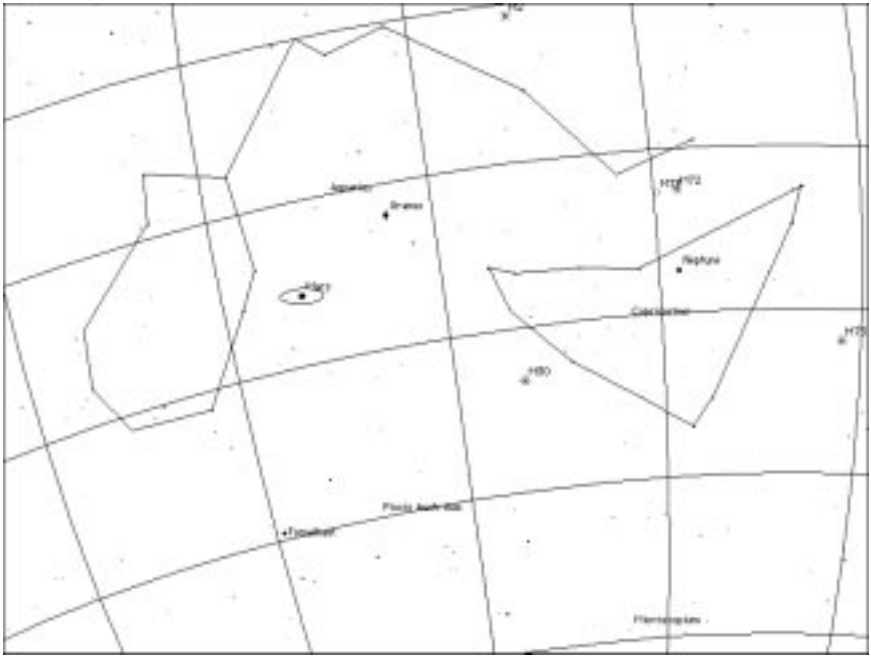
Middle Evening Observing Highlights for August

The Milky Way stretches across the sky from south to north. Sagittarius is in the southern sky. The globular cluster M22 can be seen at the top right of the “teapot”. Slightly west of the “teapot” is M8, the Lagoon Nebula. Closer to the southern horizon and west of the “teapot” M6 and M7 can be seen. Both are open clusters. The Great Square of Pegasus is rising in the east. To the northeast of the Great Square the constellation of Andromeda can be seen and just above its center is M31, the Andromeda Galaxy. The bright star Arcturus is in the western sky. Uranus is in the south-eastern sky in Aquarius. Mars is very bright and also in Aquarius. It will be closest to the Earth on August 27th. Its apparent size will be almost as large as Jupiter. The positions of Mars, Uranus, and Neptune are shown in the image below.



Full moon is on August 12th and new moon is on August 27th.

The Perseid meteor shower peaks on August 13th. Some Perseids are visible from July 23rd to August 20th. They are at about a quarter of their maximim intensity from August 9th to August 14th. The nearly full moon will interfere with viewing the shower. The best chance to see the meteors might be to look to the northeast before moonrise in the early evening.

Observations and Photographs

Here are some observations of Mars submitted by John Barbarite and John Kocijanski.

I was also out on my deck in Monticello between 3:30 and 4:30 with my 12"LX200. My clearest view was with the 26mm Meade [117x] Plossl but Mars was small. The ice cap was very clear. With 6.4mm Meade Plossl [476x] I could see smudges on the surface below the ice cap but not any sharp edges. With the 10mm Radian [304x] I could make out Utopia, Mare Cimmerium, Mare

Tyrrhenum and Syrtis Major. The views got better closer to 4:15 even though the sky was brighter. I tried a Thousand Oaks Broadband filter hoping to cut do on the Monticello light pollution. It made the ice cap clearer but didn't help any of the other features.

John Barbarite

I was wide awake at 4:00 AM this morning and decided to take a peek at Mars from my deck in Monticello. I used my XT 4.5 dob. The view was suprisingly good. Mars has a definite gibbous shape and is a bit smaller than Jupiter. The south polar cap was very distinct. There were also distinct dark areas in the southern hemisphere. According to Mars Previewer II I was looking at Mare Tyrrhenum, Mare Sirenum, and Mare Cimmerium. I used a 6mm UO ortho for 152x and then barlowed it for 303x. I also used tried three different filters. Using a green #58 filter made the ice cap jump out. The rest of the surface was darkened though. Using a #21 orange filter the icecap and dark areas came out more. It helped dim the glare alot. I felt the best view was using a blue 80a. It gave a nice contrast so the maria showed up well.

John Kocijanski

Member's Telescopes and Equipment

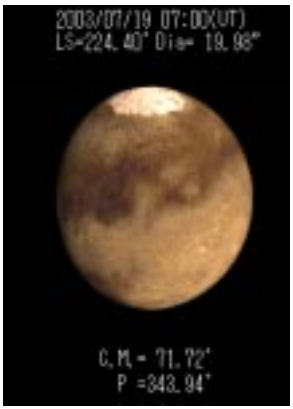
Geoffrey Ginos wrote this review of some of his eyepieces used at the 7/19 observation session.

John,

It was indeed a great session. As mars climbed higher in the sky from about 2am to 4am (earlier viewing of it through the long span of boiling atmospheric turbulence near the horizon was terrible), Howie Glatter, Tony Kim and I tried out various oculars in the 180 AP and were rewarded with some stunning views. The oculars were used with a Sirius variable filter wheel, which worked wonderfully to bring out details simply not visible using eyepieces alone. A 2" 2x Televue Barlow was used in order to increase magnifications and enable the oculars to come to focus despite the

lengthening of the light path by the filter wheel. Here are the results, listed in order of placement in the shoot out. The premium orthos, with their minimal glass and traditional tack sharpness and lack of extraneous color, took the top honors, to no one's surprise. I only regretted not having brought my 12mm and 16mm .965" Zeiss-Jenas to try them out as well. Based on past experience, I'm sure that would have resulted in a three-way tie for first place):

1st place tie: **12mm Clave & 12mm Pentax smc ortho** (270x magnification with AP 180 f/9's 1620mm f/l) — This magnification was the evening's "sweet spot" for Mars viewing. The white polar cap was clearly visible, in fact, startlingly so against the darker hues of the Red planet's features south of it ("north" in the inverted image). The darker mottling's irregular outline could be seen in contrast to the lighter ocher hues further away from the Pole. Even more remarkable was the way our view matched the image predicted by a Mars simulation program (2003 Mars Simulations by T.Ikemura) that I had downloaded (based on July 19, 3am observing) before coming up for the session, seen in the attached *gif* file. I did a pencil sketch of the god of War, which doesn't do justice to what I actually saw because of my limited drawing ability, the fact that my scope wasn't tracking (I'd left the electrical cord for linking the gel cell battery to the scope's AP1200 mount at home!! Aargh!!), and the lack of color, but when we later compared it to the simulation image, there were more similarities than differences between them, something which heightened the evening's immense satisfaction for me.



2d place honors: **Meade 10.5mm Research Grade Ortho** (308x magnification) — Same great image as with the Pentax and Clave, but just a hair less contrast and sharpness, probably because of the magnification being just a little beyond what the seeing conditions would sustain.

3d place: **Pentax 14mm XL** (231x magnification) — Admittedly close, but not as sharp and contrasty as the orthos.

4th place: **13mm Nagler T6** (249x magnification) — Nipping at thePentax 14mm XL's heels. I thought the Pentax was just a hair more contrasty, with the Nagler possibly suffering a hair from all those pieces of glass it takes to produce those sweeping 82 degree fovs).

No Shows: **8mm Radian & 7mm Nagler T6 —** To be fair, one can't really say that these oculars were beaten in a fair contest, since the magnifications that they generated in the aforesaid setup (respectively, 405x and 463x) were just too high for the evening's seeing conditions and Mars's relatively low altitude, and when the filter wheel was removed so that the barlow could be dispensed with and lower magnifications obtained (204x and 231x), not only were details no longer accentuated by the filter, but, Mars' resulting brighter glare (boy oh boy was it bright!) actually reduced contrast and effectively washed out some detail.

There were some great views of DSOs too, but Howie left at 4am (?) and Tony and I broke down our scopes and headed home at about 5:50am, having pulled all-nighters, so I am too pooped to write another word.

Many thanks to all for a fine night of observing and amateur astro cameraderie. Next time. I should bring my Traveler so that I'll have time to circulate and chat and get to know people. Maybe I will.

Best regards,

Geoff

BARLOW BOB'S CORNER

Barlow Bob is a member of the Rockland Astronomy Club.

STAR PARTY U

You know that you are destined to attend Star Party University, when your parents refer to your birth as: "Baby's first light".

Your amateur astronomy education begins in early childhood, when sunlight through a whole in the wall, projects an image of the Analemma, on the floor of your nursery. A telescope at the window with a solar filter, projects an image of sunspots on the wall. You are encouraged to trace the sunspots on the wall, during your first solar cycle. Your parents take you out in your stroller, only at night, to observe the night sky. Your bedtime stories are read, from Curious George, written by Margaret and H.A. Rey and The Stars, written by H.A. Rey. You watch Mr. Rogers on television, during the day and The Star Hustler at night.

Holidays are special. You go out on Halloween, dressed as your favorite constellation. You create your own costume, using florescent paint, to drawn your constellation, on a T-shirt. You also spray your hair silver, to simulate the Milky Way. On Christmas, you arrange your Christmas lights, in the form of constellations, observing the spectrum of the lights, through a holographic diffraction grating. You arrange the candles on the Hanukkah menorah, in the shape of Sagittarius.

Education continues into childhood, as you fail to catch a baseball, at a Little League game, while observing large sunspots, through your sunglasses, coated with mylar solar filters. On your first Boy Scout hike, you create the Thousand-Yard Model of the Solar System. You use the money earned from the sale of Girl Scout cookies, to buy your first telescope. Reading Night Watch, you learn more about the night sky. You subscribe to "Odyssey" magazine.

You explore a variety of subjects in High School. In Computer

Science, you use an Astronomy program, to create a spreadsheet, for your first Messier marathon.

The topic of your term paper in History is “Women in Astronomy”. You create a rocker box in Occupational Education class, for your first dobsonian telescope.

You also subscribe to “Sky and Telescope” magazine.

Amateur astronomers pledge to join their local fraternity/sorority astronomy club. These “Newbee” pledges learn about the basics of amateur astronomy and discover Star Party University.

Classes at Star Party U are not held in buildings on campus. Depending on the diversity of the student body on campus, classes are distributed on the observing field. They are divided into several areas including: Tele Vue Terrace, Meade Meadow, Celestron Cove, Astrophysics Acres and Questar Square. There are more nighttime classes, than daytime classes. Lectures teaching Astronomy theory are held during the day. Laboratories for these classes, are held from sunset to sunrise.

Solar observing laboratories are held on campus, from sunrise to sunset. Solar Astronomy classes are also distributed on the observing field. White light sunspot solar laboratories are divided into three areas: Baader Base, Thouand Oaks Town and Solar Skreen Section. Graduate students teach these classes. Graduate H-alpha filter solar Astronomy laboratories are divided into two areas: Daystar Dell and Coronado Center. Adjunct Professors teach these classes. At Star Party U, everyone is both a student and teacher. The faculty consists of the best amateur astronomy professors on the planet. Some people are content being only a student, while others are born teachers, in search of a class.

Tuition at Star Party U. is inexpensive. However, tuition only includes: access to the campus, dormitories and cafeteria. Students must pay for their own books, supplies, warm clothing and laboratory equipment.

Some students prefer the small classes and friendly family atmosphere, at local community college campuses, affiliated with Star Party U. These include:

Connecticut Star Party in CT, Arunahj Hill Days Star Party in MA, Jersey Starquest Star Party in NJ, and Delmarva Star Party in MD and Cherry Springs Star Party in PA. While other students want to attend the Ivy League college campus of the Texas Star Party in TX and Riverside Star Party in CA.

Summer classes at major campuses of Star Party U, are held on three-day weekends, during the New Moon. However, The Rockland Astronomy Club Summer Star Party campus in Savoy, MA, is an annual ten-day amateur Astronomy seminar in August. The Stellafane Institute campus, conducts their annual Summer Astronomy engineering seminar, in Springfield, MA. Stellafane offers certificate and degree programs, in several subjects related to Amateur Telescope building.

During the Winter Solstice recess, from late Fall, until early Spring, the Winter Star Party campus offers students classes, observing Southern skies in Florida.

Educational opportunities are also available to students outside of Star Party U.

The amateur astronomy Spring break has never been the same, since the annual NEAF, The Northeast Astronomy Forum and Telescope Show, held in May. After Winter recess, an increasing number of Star Party U. Students converge on the campus of Rockland Community College in Suffern, New York, ready to party.

At NEAF, you can listen to lectures on a variety of subjects related to amateur astronomy from famous professors. You can buy the latest lab equipment and meet representatives from many astronomy fraternity/sorority clubs and affiliated Star Party U campuses.

Unlike most colleges and universities, you never graduate from Star Party U. Classes are starting at your local campus. So enroll now, for a lifetime of education, camaraderie and fun at Star Party U.

By Barlow Bob

Adjunct Professor of H-alpha Solar Astronomy

Star Party U.

NASA Space Place

From the Belly of an Airplane: Galaxies

By Dr. Tony Phillips

On April 28th a NASA spacecraft named GALEX left Earth. Its mission: to learn how galaxies are born, how they grow, and how they die.

”GALEX-short for Galaxy Evolution Explorer-is like a time machine,” says Caltech astronomer Peter Friedman. It can see galaxies as far away as 10 billion light years, which is like looking 10 billion years into the past. The key to the mission is GALEX’s ultraviolet (UV) telescope. UV rays are a telltale sign of hot young stars, newly formed, and also of galaxies crashing together. By studying the ultraviolet light emitted by galaxies, Friedman and colleagues hope to trace their evolution spanning billons of years.

This kind of work can’t be done from the ground because Earth’s atmosphere absorbs the most energetic UV rays. GALEX would have to go to space. To get it there, mission planners turned to Orbital Science Corporation’s Pegasus rocket.

”Pegasus rockets are unusual because of the way they’re launched-from the belly of an airplane,” says GALEX Project Engineer Frank Surber of JPL.

It works like this: a modified L-1011 airliner nicknamed *Stargazer* carries the rocket to an altitude of 39,000 feet. The pilot pushes a button and the Pegasus drops free. For 5 seconds it plunges toward Earth, unpowered, which gives the *Stargazer* time to get away. Then the rocket ignites its engines and surges skyward. The travel time to space: only 11 minutes.

”The aircraft eliminates the need for a large first stage on the rocket,” explains Surber. “Because *Stargazer* can be used for many missions, it becomes a re-useable first stage and makes the launch system cheaper in the long run.” (To take advantage of this inexpensive launch system, GALEX designers had to make their spacecraft weigh less than 1000 lbs-the most a Pegasus can carry.)

A Pegasus has three stages—not counting the aircraft. “Its three solid rocket engines are similar to the black powder rockets used by amateurs. The main difference is that the fuel is cast into a solid chunk called a ‘grain’-about the consistency of tire rubber. Like black powder rockets, once the grain is lit it burns to completion. There’s no turning back.”

In this case, turning back was not required. The rocket carried GALEX to Earth orbit and deployed the spacecraft flawlessly. On May 22nd, the UV telescope opened its cover and began observing galaxies-”first light” for GALEX and another success story for Pegasus.

For adults, find out more about the GALEX mission at http://www.galex.caltech.edu/ . Kids can read and see a video about Pegasus at http://spaceplace.nasa.gov/galex/pegasus.html.

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

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