Volume 27 Issue 2

February 2013

The Observer

East Valley Astronomy Club

From the Desk of the President

by David Douglass

Wow! What a fantastic presentation we had for the January meeting. NASA Astronaut, Dr. Michael Barratt gave a simply amazing (I could say "Out of This World" [ok --- that was bad]) presentation.

It looks like the cold snap is past, and we are well into our normal winter time "fantastic" viewing opportunities. If you are wondering what to look at, consider one of the many EVAC observing programs. They make excellent programs for viewing and imaging.

And speaking of looking for targets…. Comet 2012 S1 [ISON] is heading our way. Will this be the "Comet of the Century" ?? Many are saying YES to that. And others are warning that comets are truly unpredictable. This one is supposed to be at its brightest, and possibly viewable with the naked eye, around Thanksgiving. Until then, its telescopes, cameras (long exposures), and binoculars. The comet offers good imaging opportunities, starting now. I posted some images on my website a couple of weeks ago (http://www.az-douglass.net/astronomy/DMD-ISON.htm), and will be trying to image the target at least once each month, to watch its progress.

ISON should be image-able (long exposures required) for Jan through May. It is estimated at Mag 16 or so currently, and should be about Mag 15 in May. Not all telescopes are going to let you "see" that magnitude, but cameras with long exposures can collect enough light to work. We will lose sight of the

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The Backyard Astronomer

Astro Potpourri

by Bill Dellinges

As I stretch out on my recliner and think about my column deadline coming up on the 25th and stare at the ceiling (hey, I think I see a bug up there), I think about how difficult it is anymore to get out and observe so I can write an intelligent article. Let's see, it's too hot in summer and too cold in winter. That leaves one week in March and one week in October – quite a narrow window for observing. Until then, allow me to share with you some interesting factoids from my trivia file.

Just about any star you see in the night sky is bigger than the Sun. But most stars are smaller than the Sun. Does that sound contradictory? It isn't really. The stars are so far away that only the biggest brightest ones are visible to us.

Let us put our Sun out at 32.6 light years (10 parsecs), the standard distance to judge a star's intrinsic luminosity (Absolute Luminosity). Then its apparent magnitude would drop to +4.8, barely visible to the naked eye.

So Sun-like spectral class G stars, even though they outnumber monsters like Rigel, Capella, Arcturus, don't "show" well. Add the fact that most stars are spectral class K, M and down – smaller and dimmer than the Sun. For every O,B,and A spectra class star, there are thousands of G,K, and M stars. Nature appears to like to make more small things

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Upcoming Events:

Local Star Party - February 2

Public Star Party - February 8

Deep Sky Observing Night - February 9

General Meeting - February 15

Check out all of the upcoming club events in the Calendars on page 8

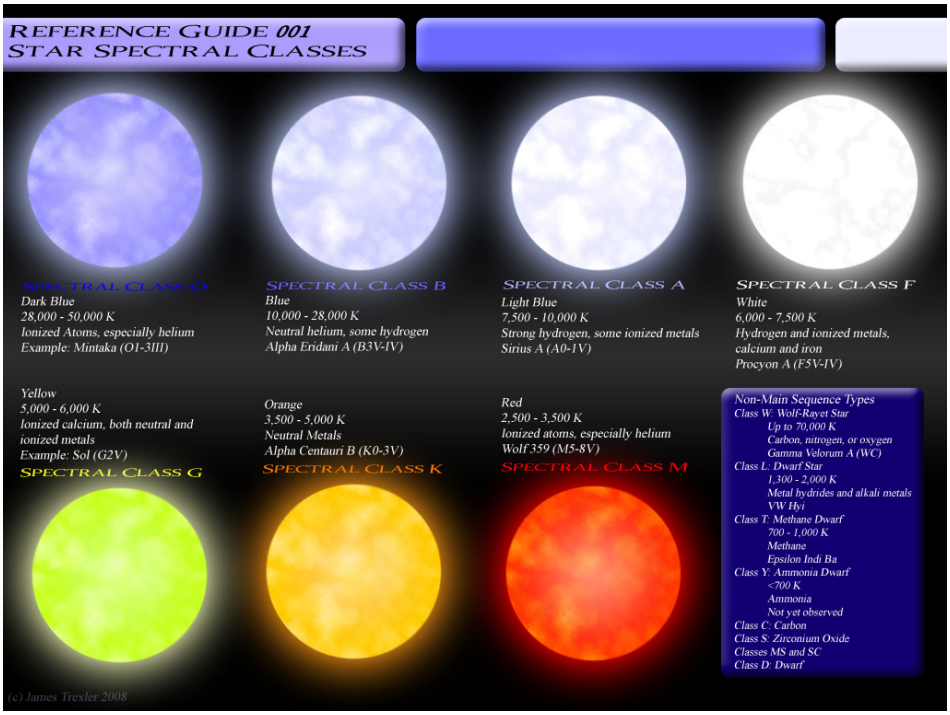
Inside this Issue:

The Backyard Astronomer

Continued from page 1 than big things. Are there more ants or elephants in the universe?

Speaking of our puny Sun, if we had to pay for one second of its power, the cost would be equivalent to 7 million years of the annual gross national product of the U.S. That's the cost of burning up 4 million tons of hydrogen each second. That's one heck of an SRP bill.

Quote: "There is a pleasing feel to operating a precision telescope – the weight of the metal, the glide of finely machined and lubricated parts, the luminous look of high quality optics." Kevin Dohmen, S&T Focal Point, Sept. 2003, p.10. Oh yeah, that's why I can't stop buying them.

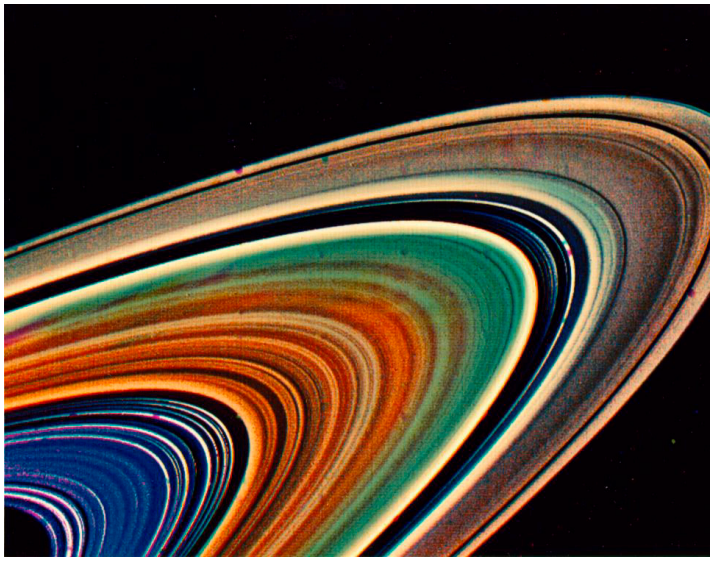


There are over 1 million asteroids, the biggest being 600 mile diameter Ceres. But their combined mass is only about 4% of our Moon. Saturn's mean density is less than 1, the density of water. Thus, if you could find a bathtub big enough to contain it, it would float. But can you imagine the ring it would leave? (I know, an old joke). If you combined all of Saturn's ring material into a ball, it would be 156 miles in diameter (under a modest density). No wonder the International Astronomical Union demoted poor Pluto to a Dwarf Planet in 2006, it's only 1400 miles in diameter (smaller than our moon) and 1/400th the mass of Earth. Good news though for Ceres. It was promoted to a Dwarf Planet.

On the subject of light years: Laypersons sometimes ask "How many light years away is that planet?" We tell them we measure their distances in millions of miles, not light years, because they're just in our backyard astronomically. To wit: the diameter of our solar system is only 0.12% of a light year. "Will we reach the speed of light someday?" Well, we're not doing so good in that department, as the typical spacecraft we have now only do about 25,000 MPH (a few have gone a little faster than that). That's only about 0.004% the speed of light. To appreciate how far away Alpha Centauri is, consider you could put 29,270,458 Suns between the two stars. Care to take a 500 MPH jet liner there? (bring your own air for the engines). The trip would take just over 5 ½ million years. You could cut that down to just over 100,000 years if you bumped your speed up to that 25,000 MPH mentioned above. Bring many lunches.

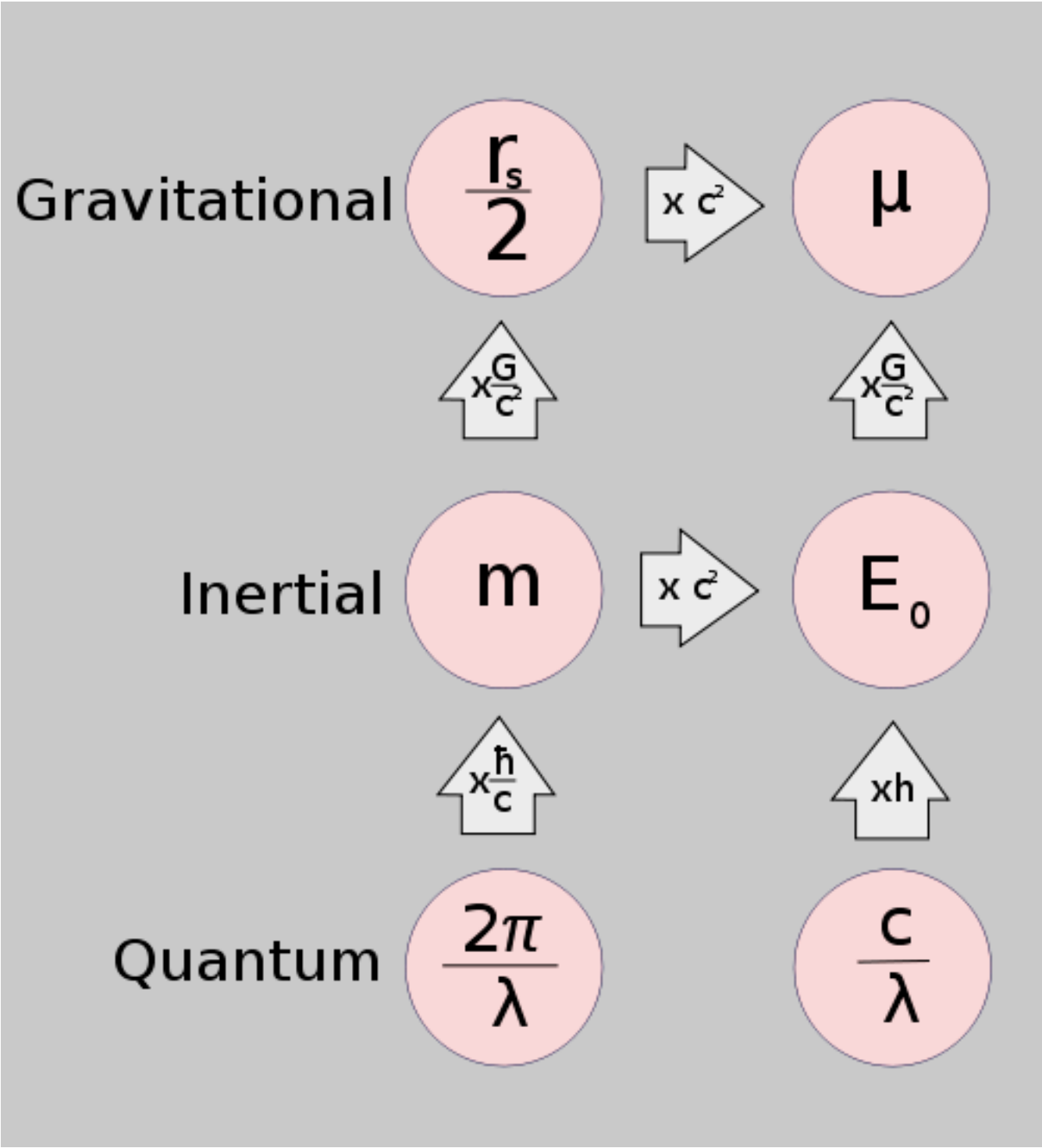
Quote: "The pain of poor quality lingers on long after the pleasure of low price wears off." Ed Ting.

Extreme stars: A billiard ball made from white dwarf material would weigh 70 tons on Earth. A teaspoon of neutron star stuff would weigh 3 billion tons on Earth. A teaspoon of black hole stuff? Not relevant. He who goes to retrieve some will not return. Anything can become a black hole if it's crushed down to a point where it is so dense, its gravity so strong, light cannot escape from it. Earth would be a black hole if it was reduced to a diameter of about one inch. Imagine that. The Sun would be a black hole if it were 4 miles in diameter. Something called the Schwarzchild Radius predicts these parameters. Basically, the black hole has an "event horizon" surrounding the "singularity." Step over event horizon and you're a goner, sucked mercilessly down to the singularity. For every solar mass you throw into a black hole, its event horizon radius expands outwardly 1.8 miles. So, even the Milky Way's 4 million solar mass black hole is only 14,400,000 miles in diameter, miniscule compared to the Galaxy's 100,000 light year diameter.



Quote: "I believe a leaf of grass is nothing less than the journey work of the stars." Walt Whitman.

I wish you dark skies and the best for 2013!



The relation between properties of mass and their associated physical constants. Every massive object is believed to exhibit all five properties. However, due to extremely large or extremely small constants, it is generally impossible to verify more than two or three properties for any object.
The Schwarzschild radius (rs) represents the ability of mass to cause curvature in space and time.
The standard gravitational parameter (μ) represents the ability of a massive body to exert Newtonian gravitational forces on other bodies.
Inertial mass (m) represents the Newtonian response of mass to forces.
Rest energy (E0) represents the ability of mass to be converted into other forms of energy.
The Compton wavelength (λ) represents the quantum response of mass to local geometry.

From the Desk of the President

Continued from page 1

comet during June and July (Arizona), but it will return to view in Aug at about a Mag 12.5, continuing through December, getting brighter as each week passes. When it returns, it will be early morning viewing only.

The school season star parties are well underway. Events Coordinator Lynn Young can use all the help that he can get. These events are truly rewarding to the members who venture out with their telescopes, and share their views with these young people and their parents. Outreach is something that EVAC is known for in the east valley. Give Lynn a call, and see if you can help out! He will appreciate it.

Reading all the advertising out there, it looks like many vendors are releasing some new mounts, OTAs, and cameras. If you happen to acquire one of these new models, please consider doing a review for the web site, and possibly a mini-presentation at one of the EVAC meetings.

This is the season we love. Long, dark nights, with excellent viewing. We even have the SAC Messier Marathon, which is coming up on March 15-16. Wow! So much to do, so much to see. We must all remember to Keep Looking Up !

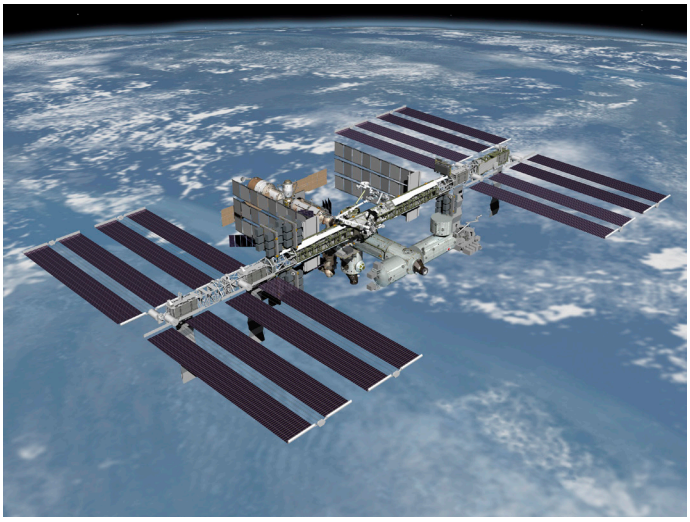
NASA Solicits Ideas for International Space Station Research

NASA wants to know how you can improve the International Space Station as a technology test bed.

NASA's International Space Station National Laboratory and Technology Demonstration offices are asking for proposals on how the space station may be used to develop advanced or improved exploration technologies. NASA also is seeking proposals about how new approaches, technologies and capabilities could improve the unique laboratory environment of the orbiting outpost.

The NASA Research Announcement, "Soliciting Proposals for Exploration Technology Demonstration and National Lab Utilization Enhancements," may be viewed at:
http://go.nasa.gov/Uqkccz

The annoucement will provide successful proposers access to the space station's microgravity environment, crew support and robotic servicing. It closes Sept. 30.



"The space station is a world-class facility and critical to NASA's plan to extend humanity's presence beyond low-Earth orbit," said Andrew Clem of the Technology Demonstration Office in the International Space Station Program at NASA's Johnson Space Center in Houston. "This is an opportunity for researchers, inventors and designers to demonstrate a technology needed for future human spaceflights or to improve an existing space station capability."

NASA will review submissions throughout the year as they are received. The agency will cover launch and integration costs for selected proposals. Successful submissions also may be eligible for limited additional funding.

Proposed technologies should help advance exploration and research capabilities aboard the space station. Concepts must fit within existing NASA standards for mass and volume to meet requirements for current launch vehicles. Suggested areas include in-space propulsion; space power and energy storage; components of highly reliable, closed-loop, human health, life support and habitation systems; thermal systems; robotics, telerobotics, and autonomous systems; and human exploration destination systems.

Proposals for new exploration technologies could include strategies to reduce mass, maintenance and power requirements, while also increasing efficiency, reliability and safety. The idea could be a new technology or a new, improved use of existing space hardware. Proposals also may have the potential to yield benefits for humanity, such as testing a new material or stimulating economic growth.

Alternately, proposers could address improvements to the existing capabilities of the U.S. National Laboratory, such as new uses for existing experiment tools and infrastructure aboard the orbiting outpost, or potential efficiencies like advances in data communications. Other possibilities include ground equipment for space studies, in-orbit analytical tools, three-dimensional cell and tissue culture hardware, or improvements or new uses for existing station research resources.

The enhancements sought in this announcement will further efforts by the Center for the Advancement of Science in Space to promote research aboard the station's U.S. National Laboratory.

For assistance with responding to the announcement, visit the Guidebook for Proposers Responding to a NASA Research Announcement or Cooperative Agreements Notice at:
http://go.nasa.gov/W3HlSe

For more information on the International Space Station and its research, visit: http://www.nasa.gov/station/

February Guest Speaker: Sara Walker

EVAC is pleased to be able to present Dr. Sara Imari Walker, NASA Astrobiology Institute Postdoctoral Fellow, Adjunct Faculty, BEYOND Center for Fundamental Concepts in Science, Arizona State University, as the guest speaker in February. Her presentation is entitled "The Search for Extraterrestrial Intelligence in the 21st Century: Moving Beyond Radio Astronomy?"

Dr. Walker is currently a NASA Astrobiology Institute Postdoctoral Fellow working at Arizona State University as part of the Astrobiology program and the BEYOND Center for Fundamental Concepts in Science under the supervision of Paul Davies. She completed her undergraduate studies in Physics at Florida Institute of Technology and completed her Ph.D. in Physics and Astronomy at Dartmouth College under the supervision of Marcelo Gleiser. Her Ph.D. research focused on uncovering abiotic mechanisms for the emergence of life's homochirality. She has also worked as a Postdoctoral Fellow in the Center for Chemical Evolution at Georgia Tech with Nick Hud and Martha Grover studying the chemical evolution leading to living systems.

"We make our world significant by the courage of our questions and the depth of our answers." - Carl Sagan

Dr. Walker is fascinated by all questions regarding the nature of life in the universe:
How did life begin?
How common is life?
Are there universal laws of biological systems?

Her research focuses on the origin of life, combining techniques from theoretical physics, chemistry, and information science, to uncover how the first living systems might have arisen on a lifeless planet.

Education

Dartmouth College
Ph.D. in Physics and Astronomy (2010)
Thesis: Theoretical Models for the Emergence of Biomolecular Homochirality
Advisor: Professor Marcelo Gleiser

Florida Institute of Technology
B.S. in Physics (2005)

Cape Cod Community College
A.A. in Math/Science/Pre-Engineering (2003)

◑ Last Quarter Moon on February 3 at 06:57

○ New Moon on February 10 at 00:21

◐ First Quarter Moon on February 17 at 13:31

● Full Moon on February 25 at 13:27

Upcoming Meetings

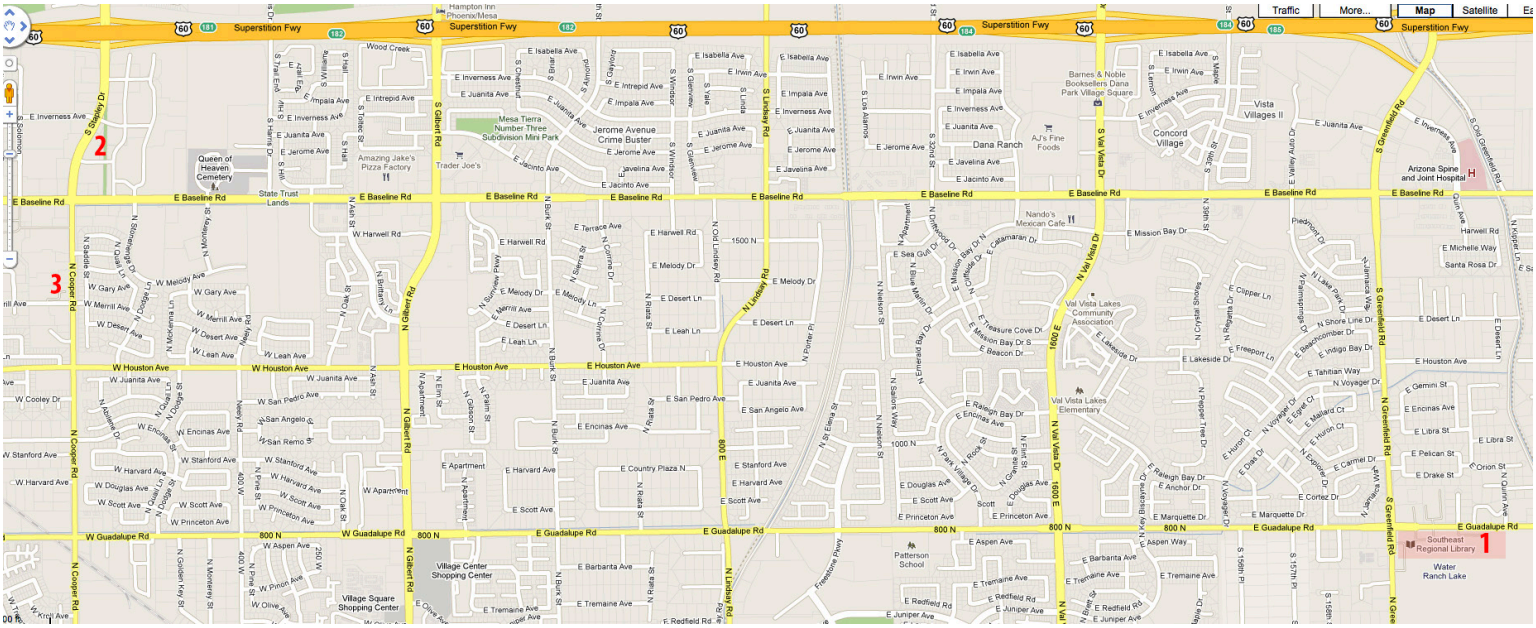
February 15
March 15
April 19
May 17
June 21
July 19

The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

Our meetings are held on the third Friday of each month at the Southeast Regional Library in Gilbert. The library is located at 775 N. Greenfield Road; on the southeast corner of Greenfield and Guadalupe Roads. Meetings begin at 7:30 pm.

All are welcome to attend the pre-meeting dinner at 5:30 pm. We meet at Old Country Buffet, located at 1855 S. Stapley Drive in Mesa. The restaurant is in the plaza on the northeast corner of Stapley and Baseline Roads, just south of US60.

Visitors are always welcome!



2 Old Country Buffet
1855 S. Stapley Drive
Mesa, Az. 85204

1 Southeast Regional Library
775 N. Greenfield Road
Gilbert, Az. 85234

February 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

February 2 - Local Star Party at Picketpost Trailhead

February 6 - Navarette Elementary Star Party

February 7 - Mohave Middle School Star Party

February 8 - Public Star Party & SkyWatch

February 9 - Deep Sky Observing Night

February 15 - General Meeting at SE Library

February 16 - Veteran's Oasis Park Star Party

February 20 - Knox Elementary Star Party

February 21 - Settler's Point Elementary Star Party

February 24 - Arizona Museum of Natural History Star Party

February 26 - Maricopa Wells Middle School Star Party

February 28 - Sousa Elementary Star Party

March 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

March 1 - Andante Apartments Star Party

March 2 - Local Star Party at Boyce Thompson

March 5 - Tarwater Elementary Star Party

March 7 - Pomeroy Elementary Star Party

March 8 - Public Star Party & SkyWatch at Riparian Preserve

March 9 - Deep Sky Observing Night

March 15 - General Meeting at SE Library

East Valley Astronomy Club -- 2013 Membership Form

Please complete this form and return it to the club Treasurer at the next meeting or mail it to EVAC, PO Box 2202, Mesa, Az, 85214-2202. Please include a check or money order made payable to EVAC for the appropriate amount.

IMPORTANT: All memberships expire on December 31 of each year.

Select one of the following:

☐ New Member ☐ Renewal ☐ Change of Address

New Member Dues (dues are prorated, select according to the month you are joining the club):

☐ **$30.00 Individual** January through March

☐ **$35.00 Family** January through March

☐ **$15.00 Individual** July through September

☐ **$17.50 Family** July through September

☐ **$22.50 Individual** April through June

☐ **$26.25 Family** April through June

☐ **$37.50 Individual** October through December

☐ **$43.75 Family** October through December

Includes dues for the following year

Renewal (current members only):

☐ **$30.00 Individual** ☐ **$35.00 Family**

Name Badges:

☐ **$10.00** Each (including postage) Quantity: _____

Name to imprint: _____

Total amount enclosed: [ ]

Please make check or money order payable to EVAC

☐ Payment was remitted separately using PayPal ☐ Payment was remitted separately using my financial institution's online bill payment feature

Name: [ ] Phone: [ ]

Address: [ ] Email: [ ]

☐ Publish email address on website

City, State, Zip: [ ] URL: [ ]

How would you like to receive your monthly newsletter? (choose one option):

☐ Electronic delivery (PDF) *Included with membership* ☐ US Mail **Please add $10 to the total payment**

Areas of Interest (check all that apply):

☐ General Observing ☐ Cosmology

☐ Lunar Observing ☐ Telescope Making

☐ Planetary Observing ☐ Astrophotography

☐ Deep Sky Observing ☐ Other

Please describe your astronomy equipment:

Would you be interested in attending a beginner's workshop? ☐ Yes ☐ No

How did you discover East Valley Astronomy Club? [ ]

PO Box 2202
Mesa, AZ 85214-2202
www.evaconline.org

All members are required to have a liability release form (waiver) on file. Please complete one and forward to the Treasurer with your membership application or renewal.

Liability Release Form

In consideration of attending any publicized Star Party hosted by the East Valley Astronomy Club (hereinafter referred to as "EVAC") I hereby affirm that I and my family agree to hold EVAC harmless from any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), which may directly or indirectly be connected to EVAC and/or my presence on the premises of any EVAC Star Party and related areas.

I further agree to indemnify any party indicated above should such party suffer any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), caused directly or indirectly by my negligent or intentional acts, or failure to act, or if such acts or failures to act are directly or indirectly caused by any person in my family or associates while participating in an EVAC Star Party.

My signature upon this form also indicates agreement and acceptance on behalf of all minor children (under 18 years of age) under my care in attendance.

EVAC only recognizes those who are members or invitees and who also have a signed Liability Release Form on file as participants at an EVAC Star Party.

Please print name here ***Date***

Please sign name here

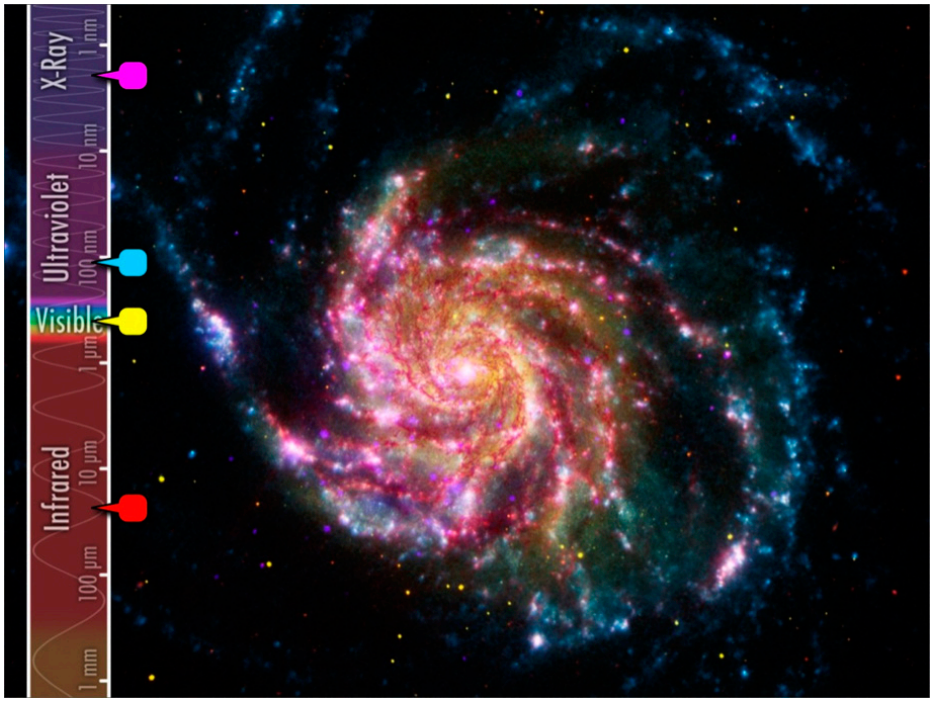
PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org

The Art of Space Imagery

by Diane K. Fisher

When you see spectacular space images taken in infrared light by the Spitzer Space Telescope and other non-visible-light telescopes, you may wonder where those beautiful colors came from? After all, if the telescopes were recording infrared or ultraviolet light, we wouldn't see anything at all. So are the images "colorized" or "false colored"?

No, not really. The colors are translated. Just as a foreign language can be translated into our native language, an image made with light that falls outside the range of our seeing can be "translated" into colors we can see. Scientists process these images so they can not only see them, but they can also tease out all sorts of information the light can reveal. For example, wisely done color translation can reveal relative temperatures of stars, dust, and gas in the images, and show fine structural details of galaxies and nebulae.



This image of M101 combines images from four different telescopes, each detecting a different part of the spectrum. Red indicates infrared information from Spitzer's 24-micron detector, and shows the cool dust in the galaxy. Yellow shows the visible starlight from the Hubble telescope. Cyan is ultraviolet light from the Galaxy Evolution Explorer space telescope, which shows the hottest and youngest stars. And magenta is X-ray energy detected by the Chandra X-ray Observatory, indicating incredibly hot activity, like accretion around black holes.

Spitzer's Infrared Array Camera (IRAC), for example, is a four-channel camera, meaning that it has four different detector arrays, each measuring light at one particular wavelength. Each image from each detector array resembles a grayscale image, because the entire detector array is responding to only one wavelength of light. However, the relative brightness will vary across the array.

So, starting with one detector array, the first step is to determine what is the brightest thing and the darkest thing in the image. Software is used to pick out this dynamic range and to re-compute the value of each pixel. This process produces a grey-scale image. At the end of this process, for Spitzer, we will have four grayscale images, one for each for the four IRAC detectors.

Matter of different temperatures emit different wavelengths of light. A cool object emits longer wavelengths (lower energies) of light than a warmer object. So, for each scene, we will see four grayscale images, each of them different.

Normally, the three primary colors are assigned to these gray-scale images based on the order they appear in the spectrum, with blue assigned to the shortest wavelength, and red to the longest. In the case of Spitzer, with four wavelengths to represent, a secondary color is chosen, such as yellow. So images that combine all four of the IRAC's infrared detectors are remapped into red, yellow, green, and blue wavelengths in the visible part of the spectrum.

Download a new Spitzer poster of the center of the Milky Way. On the back is a more complete and colorfully-illustrated explanation of the "art of space imagery." Go to spaceplace.nasa.gov/posters/#milky-way.

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

If It's Clear...

by Fulton Wright, Jr.
Prescott Astronomy Club

February 2013

Celestial events (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) customized for Prescott, Arizona. Remember, the Moon is ½ degree or 30 arcminutes in diameter. All times are Mountain Standard Time.

February is a good month to look for Mercury. Sunset is around 6:10 PM and you might catch the planet very low in the west, half an hour later. On February 8 Mars is near. On February 11 the thin crescent Moon joins the party. On February 16 Mercury is at greatest elongation, easiest to see and at "first quarter" phase.

On Saturday, February 2, the Moon is at last quarter phase and rises at 12:57 AM (Sunday).

On Thursday, February 7, in the evening, you can watch a complete transit of Io in front of Jupiter. Here is the schedule:
07:51 PM Io moves in front of Jupiter.
09:06 PM Io's shadow falls on Jupiter.
10:01 PM Io moves from in front of Jupiter.
11:15 PM Io's shadow leaves Jupiter.

On Saturday, February 9, it is new Moon and you have all night to hunt for faint fuzzies.

On Wednesday, February 13, from 10:19 PM to 10:33 PM you can watch an unusual event with one of Jupiter's moons. Europa will take a few minutes to emerge from behind Jupiter, stay at full brightness for a few minutes, then take a few minutes to disappear in Jupiter's shadow. You will probably want a small (3 inch) telescope to enjoy this event. If you like, you can watch Europa go behind Jupiter earlier (7:51 PM to 7:56 PM).

On Sunday, February 17, the Moon is at first quarter phase and sets at 1:48 AM (Monday).

On Monday, February 18, in the early evening, you can see an unusual arrangement of Jupiter's moons. As dusk falls (nautical twilight starts at 6:42 PM) Europa is east and Io is west of the planet (not that flashy). However, Ganymede and Callisto are hovering very close to the planet. At 8:16 PM Ganymede goes behind Jupiter. If you want to watch Ganymede reappear, look for it at 10:34 PM. You will want at least a small (3 inch) telescope to watch all this.

On the night of Wednesday, February 20, from 12:55 AM (Thursday) to 1:11 AM, Europa repeats it appearing-disappearing act of February 13. Europa goes behind Jupiter at 10:29 PM (Wednesday).

On Friday, February 22, after nautical twilight begins (6:45 PM), you can see the planetary northwest part of the Moon at its best. Libration tips that part of the Moon toward us. In particular, look for Mons Rumker, a low, lumpy mountain in the mare northwest of Mare Imbrium.

On Monday, February 25, at 6:37 PM (14 minutes after sunset) the full Moon rises, spoiling any chance of seeing faint fuzzies for the night.

On Thursday, February 28, from 10 PM to 11 PM, you can watch the gibbous Moon pass very close to Spica. Look low in the east-southeast for the pair. You should be able to see them with your unaided eye, but binoculars or a small (3 inch) telescope will enhance the view.

Looking for that perfect weekend activity?

Why not resolve to getting involved?

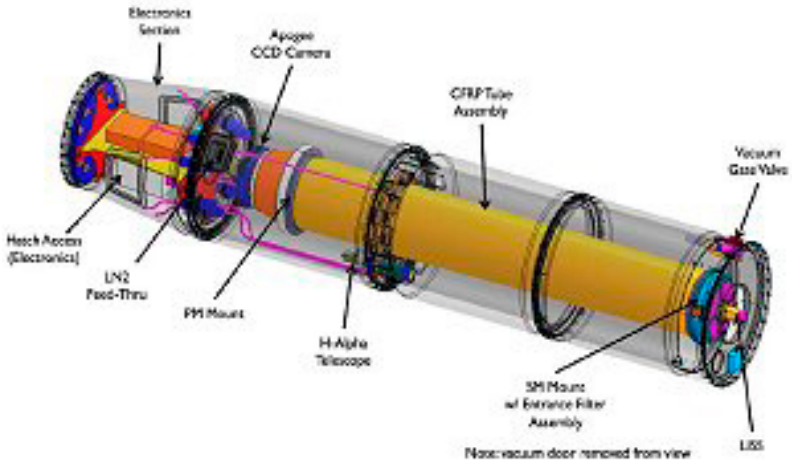
Contact Dave Coshow to join the staff at GRCO

Email: grco@evaconline.org

NASA Telescope Observes How Sun Stores and Releases Energy

A NASA suborbital telescope has given scientists the first clear evidence of energy transfer from the sun's magnetic field to the solar atmosphere or corona. This process, known as solar braiding, has been theorized by researchers, but remained unobserved until now.

Researchers were able to witness this phenomenon in the highest resolution images ever taken of the solar corona. These images were obtained by the agency's High Resolution Coronal Imager (Hi-C) telescope, which was launched from the White Sands Missile Range in New Mexico in July 2012.



The High resolution Coronal Imager is a 464 lbs and 3.2m long telescope with an advanced CCD camera. The major components of the instrument are listed in this engineering schematic. Image credit: NASA

"Scientists have tried for decades to understand how the sun's dynamic atmosphere is heated to millions of degrees," said Hi-C principal investigator Jonathan Cirtain, a heliophysicist at NASA's Marshall Space Flight Center in Huntsville, Ala. "Because of the level of solar activity, we were able to clearly focus on an active sunspot, and obtain some remarkable images. Seeing this for the first time is a major advance in understanding how our sun continuously generates the vast amount of energy needed to heat its atmosphere."

The telescope, the centerpiece of a payload weighing 464 pounds and measuring 10-feet long, flew for about 10 minutes and captured 165 images of a large, active region in the sun's corona. The telescope acquired data for five minutes, taking one image every five seconds. Initial image sequences demonstrated the evolution of the magnetic field and showed the repeated release of energy through activity seen on the sun at temperatures of 2 million to 4 million degrees.

Many of the stars in the universe have magnetic fields. The evolution of these fields is used to explain the emission of the star and any events like flares. Understanding how the magnetic field of the sun heats the solar atmosphere helps explain how all magnetized stars evolve.

These observations ultimately will lead to better predictions for space weather because the evolution of the magnetic field in the solar atmosphere drives all solar eruptions. These eruptions can reach Earth's atmosphere and affect operations of Earth-orbiting communication and navigation satellites.

The images were made possible by a set of innovations on Hi-C's optics array. The telescope's mirrors were approximately 9 1/2 inches across. New techniques for grinding the optics and polishing the surfaces were developed for the mirrors. Scientists and engineers worked to complete alignment of the mirrors, maintaining optic spacing to within a few ten-thousandths of an inch.

"The Hi-C observations are part of a technology demonstration that will enable a future generation of telescopes to solve the fundamental questions concerning the heating of the solar atmosphere and the origins of space weather, "said Jeffrey Newmark, sounding rocket program scientist at NASA Headquarters in Washington.

Hi-C's resolution is about five times finer than the imaging instrument aboard NASA's Solar Dynamics Observatory (SDO) launched in February 2010 to study the sun and its dynamic behavior. The Hi-C images complement global sun observations continuously taken by SDO.

NASA's suborbital sounding rockets provide low-cost means to conduct space science and studies of Earth's upper atmosphere. The Hi-C mission cost about $5 million.

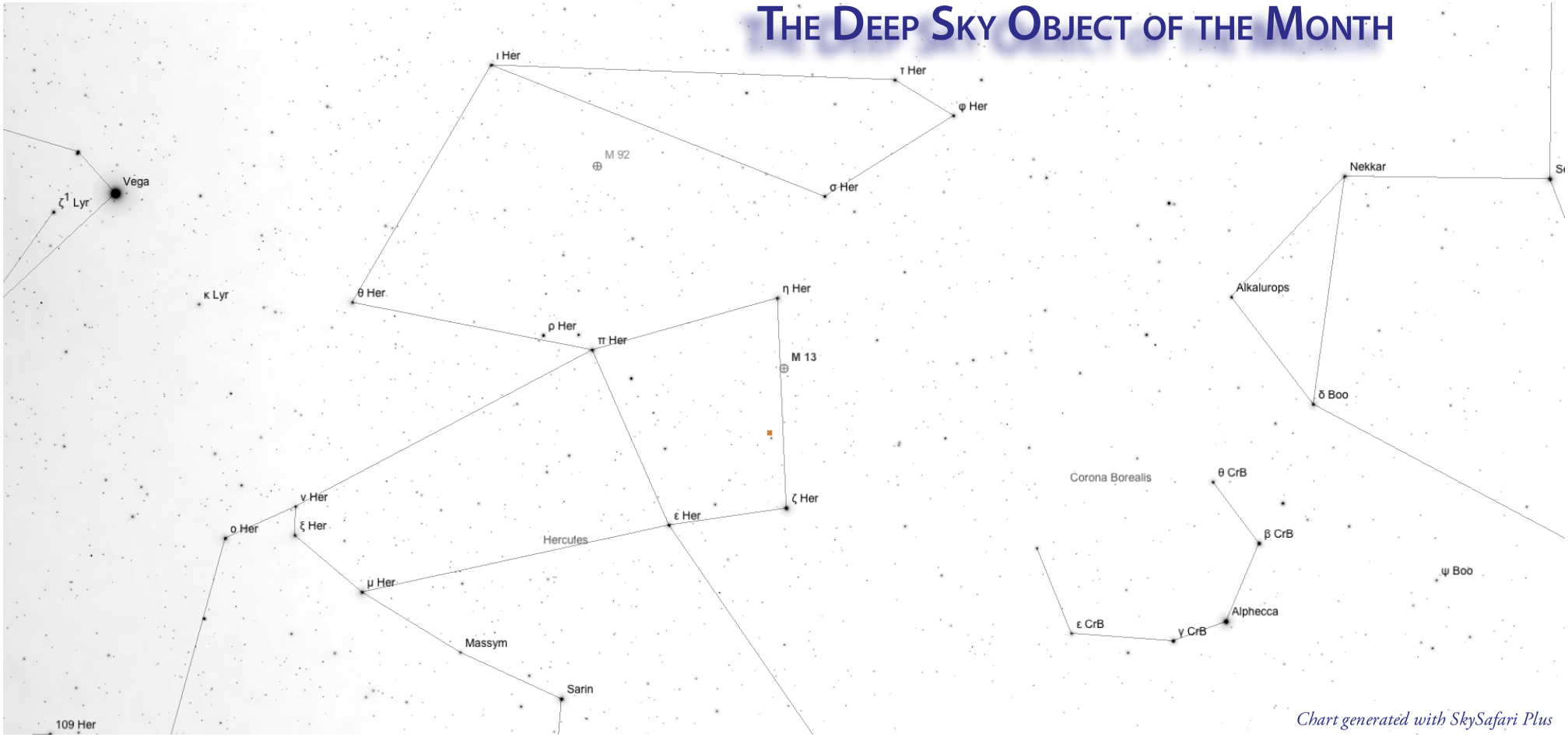
"This suborbital mission has given us a unique look into the workings of the sun addressing a major mystery in nature. Hi-C has demonstrated that high value science can be achieved on a small budget," said John Grunsfeld, associate administrator for NASA's Science Mission Directorate (SMD) in Washington. "NASA's sounding rocket program is a key training ground for the next generation of scientists, in addition to developing new space technologies."

Partners associated with the development of the Hi-C telescope include the Smithsonian Astrophysical Observatory in Cambridge, Mass.; L-3Com/Tinsley Laboratories in Richmond, Calif.; Lockheed Martin's Solar Astrophysical Laboratory in Palo Alto, Calif.; the University of Central Lancashire in England; and the Lebedev Physical Institute of the Russian Academy of Sciences in Moscow. NASA's Goddard Space Flight Center in Greenbelt, Md., built, operates and manages SDO for SMD.

To view the Hi-C images, visit: http://go.nasa.gov/10Ss9MA

More information about NASA's sounding rocket program, visit: http://www.nasa.gov/soundingrockets

The Deep Sky Object of the Month



Messier 13, also designated NGC 6205, and sometimes called the Great Hercules Cluster, is considered the most spectacular globular cluster in northern skies. The Great Hercules Cluster was discovered by Edmond Halley in 1714, who noted that "it shows itself to the naked eye when the sky is serene and the Moon absent." Fifty years later it was examined by Charles Messier, who cataloged it in 1764. M 13 is also reported in John Bevis' Celestial Atlas. In 1787, Sir William Herschel pronounced it "a most beautiful cluster of stars, exceedingly compressed in the middle, and very rich."

At magnitude 5.8, M 13 is barely visible to the naked eye on very dark nights. It appears about 1/3 of the distance from Eta to Zeta Herculis, the two western (leading) stars in the Keystone asterism of Hercules. Even small telescopes resolve it into an extensive, magnificent mass of stars, perhaps 13' across visually. Observers note four apparently star-poor regions. The faint, 11th-magnitude galaxy NGC 6207 lies nearby, about 28' to the north east, and is visible in many wide-field photographs of M 13.

One of the reasons M 13 appears so large and bright is that is relatively nearby, about 25,100 light years away. At that distance, its angular diameter of 23' corresponds to 145 light years. The cluster also looks large and bright because it is, intrinsically, large and bright. M13 has an absolute magnitude of -8.7, which corresponds to a luminosity of a quarter million suns.

M13 (NGC 6205) Globular Cluster in Hercules

RA: 16h 42m 10.04s Dec: +36° 26' 10.4" Size: 3.4' Magnitude: 5.78

As one of the many benefits to becoming an East Valley Astronomy Club member, we have the following telescopes available for monthly check-out to current EVAC members:

8 inch Orion manual Dobsonian
8 inch Orion Intelliscope Dobsonian
60mm Tasco Alt-Azimuth Refractor

For more information, or to check out one of these scopes, please talk to:

David Hatch
EVAC Properties Director
480.433.4217

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