STARSCAN

Johnson Space Center
Astronomical Society

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IN THIS ISSUE

Star Party News

Lisa Lester

We are batting .500 for April with our star party events! The Haak Winery Meeting and Star party on April 17th was a great success! A number of club members, new and old, arrived early to set up their scopes. Then it was time to eat dinner during the meeting. Ann Micklos gave a wonderful talk on the Space Shuttle from the time it completes a mission to the moment it is ready to launch on it's next mission. After the meeting, it was time to head to the scopes and binoculars so that we could talk about them as the skies darkened and some of the clouds moved on. We were dealing with some sucker holes all night, but we were able to show Venus, Saturn, Jupiter, the Orion Nebula, M65/66, the double star in the handle of the Big Dipper and a few other objects to the attentive crowd. I counted 107 people at my scope, but I know that I missed some as I set the counter down to help kids up the ladder and would forget to pick it up again! As usual, we had a wonderful turn-out of JSCAS members and their equipment. For the first time since I've been a club member we tried to have people sign up and list the equipment they brought. Thanks to those who walked around with the clipboard! This worked great, but I know that we still missed at least one or two new members (If they didn't think that they were members they are now as they brought a scope and attended the event!). JSCAS members attending were Ann Micklos, Chris Randall, Bob & Karen Taylor, Triple, Karen, Travis & Todd Nickel, Randy & Dolly Brewer, Drel Setzer, John Erickson, Carl Reynolds, Sylvia Whittington, Ed & Eleta Malewitz, Matt Hommer, Ken & Lisa Lester, Leslie Logan, Kurt Maurer, Don & Cynthia Hanselman, Charlie & Pat McLeod, Hernan Contreras, Bob & Leslie Eaton, Nubia & James Eisenlohr, John Erickson, Connie Cavuoti & David Haviland. Thank you all for another very enjoyable and successful star party!

Photo: Carl Reynolds

Photo: Ken Lester

Photo: Ken Lester

Photo: Chris Randall

Photo: Carl Reynolds

Photo: Chris Randall

Photo: Chris Randall

Photo: Lisa Lester

Photo: Lisa Lester

Photo: Carl Reynolds

Unfortunately the weather did not cooperate for our Moody Gardens star party on April 24th! After checking the weather reports and talking to Johanna Goforth at Moody Gardens we cancelled the event in the early afternoon. Then the Sun came out and had me thinking that I'd made a mistake! By late afternoon the Sun was back behind clouds and the next rain band was rolling in and I was relieved that I hadn't made a bad call.

The next star party event will be the Texas Star Party at the Prude Ranch May 16 – 23rd. In June, we will be at Moody Gardens on Saturday the 19th. Hopefully, the third try will be the charm!

Hubble Watches Galaxies Engage in Dance of Destruction

NASA, STScI

NASA's Hubble Space Telescope is witnessing a grouping of galaxies engaging in a slow dance of destruction that will last for billions of years. The galaxies are so tightly packed together that gravitational forces are beginning to rip stars from them and distort their shapes. Those same gravitational forces eventually could bring the galaxies together to form one large galaxy.

The name of this grouping, Seyfert's Sextet, implies that six galaxies are participating in the action. But only four galaxies are on the dance card. The small face-on spiral with the prominent arms [center] of gas and stars is a background galaxy almost five times farther away than the other four. Only a chance alignment makes it appear as if it is part of the group. The sixth member of the sextet isn't a galaxy at all but a long "tidal tail" of stars (lower right) torn from one of the galaxies. The group resides 190 million light-years away in the constellation Serpens.

This densely packed grouping spans just 100,000 light-years, occupying less volume than the Milky Way galaxy. Each galaxy is about 35,000 light-years wide. Three of the galaxies [the elliptical galaxy, second from top, and the two spiral galaxies at the bottom] bear the telltale marks of close interactions with each other, or perhaps with an interloper galaxy not pictured here. Their distorted shapes suggest that gravitational forces have reshaped them. The halos around the galaxies indicate that stars have been ripped away. The galaxy at bottom, center, has a 35,000 light-year-long tail of stars flowing from it. The tail may have been pulled from the galaxy about 500 million years ago.

Although part of the group, the nearly edge-on spiral galaxy at top, center, remains relatively undisturbed, except for the slight warp in its disk. Most of its stars have remained within its galactic boundaries.

Unlike most other galaxy interactions observed with the Hubble telescope, this group shows no evidence of the characteristic blue regions of young star clusters, which generally arise during galaxy interactions.

The lack of star-forming clusters suggests that there is something different about Seyfert's Sextet compared with similar systems. One example is Stephan's Quintet, another congregation of interacting galaxies observed with the Hubble telescope. The difference between the two systems could be a simple one: astronomers may be seeing the sextet at the beginning of its interaction, before much has happened. This will not be the case for long, though. The galaxies in Seyfert's Sextet will continue to interact, and eventually, billions of years from now, all four may merge and form a single galaxy. Astronomers have strong evidence that many, if not most, elliptical galaxies are the result of mergers.

Astronomers named the grouping Seyfert's Sextet for astronomer Carl Seyfert, who discovered the assemblage in the late 1940s. Seyfert already suspected that one apparent member of the sextet was not a galaxy but simply a tidal tail stripped off of one of the other members.

The image was taken on June 26, 2000, with the Wide Field and Planetary Camera 2.

Ref: STScI-PRC2002-22, http://hubblesite.org/newscenter/newsdesk/archive/releases/2002/22/image/a

Crescent Moon Visibility

Although the date and time of each New Moon can be computed exactly, the visibility of the lunar crescent as a function of the Moon's "age" - the time counted from New Moon - depends upon many factors and cannot be predicted with certainty. In the first two days after New Moon, the young crescent Moon appears very low in the western sky after sunset, and must be viewed through bright twilight. It sets shortly after sunset. The sighting of the lunar crescent within one day of New Moon is usually difficult. The crescent at this time is quite thin, has a low surface brightness, and can easily be lost in the twilight. Generally, the lunar crescent will become visible to suitably-located, experienced observers with good sky conditions about one day after New Moon. However, the time that the crescent actually becomes visible varies quite a bit from one month to another. The record for an early sighting of a lunar crescent, with a telescope, is 12.1 hours after New Moon; for naked-eye sightings, the record is 15.5 hours from New Moon. These are exceptional observations and crescent sightings this early in the lunar month should not be expected as the norm.

Obviously, the visibility of the young lunar crescent depends on sky conditions and the location, experience, and preparation of the observer. Generally, low latitude and high altitude observers who know exactly where and when to look will be favored. For observers at mid-northern latitudes, months near the spring equinox are also favored, because the ecliptic makes a relatively steep angle to the western horizon at sunset during these months (tending to make the Moon's altitude greater).

If we ignore local conditions for the moment, and visualize the problem from outside the Earth's atmosphere, the size and brightness of the lunar crescent depend on only one astronomical quantity - the elongation of the Moon from the Sun, which is the apparent angular distance between their centers. For this reason the elongation has also been called the arc of light. If we know the value of the elongation at any instant, we can immediately compute the width of the crescent.

What is the value of the elongation when the Moon's age is one day? It varies, depending on several factors:

(1) The elongation at New Moon. The Moon can pass directly in front of the Sun at New Moon (when a solar eclipse will occur) or can pass as far as five degrees away. That is, the Moon can start the month with an elongation ranging from zero to five degrees. A minor complicating factor involves the definition of New Moon in the almanacs. Astronomical New Moon is defined to occur when the Sun and Moon have the same geocentric ecliptic longitude, which may not occur precisely when the Sun and Moon are closest together in the sky.

(2) The speed of the Moon in its orbit. The Moon's orbit is elliptical, and its speed is greatest when it is near perigee, least near apogee. If perigee occurs near New Moon, the Moon will appear to be moving away from the Sun in the sky at a greater than average rate.

(3) The distance of the Moon. Again, because of its elliptical orbit, the distance of the Moon varies, so even if the Moon moved with a constant speed, its angular motion as viewed from the Earth would be greater when the Moon is near perigee.

(4) The location of the observer. If the observer is located in the tropics such that the one-day-old-Moon is observed just before it sets, its elongation as seen by the observer will be about a degree less than that seen by a fictitious observer at the center of the Earth, which is the basis

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for most almanac calculations. This decrease in observed elongation is less for observers at middle or high latitudes (although other geometric factors are less favorable for these observers).

Factors (2) and (3) are linked by Kepler's second law, which predicts that the angular speed of the Moon as seen from the Earth will vary by about 22%. If we combine all these factors we find that geocentric elongation of the Moon from the Sun at an age of one day can vary between about 10 and 15 degrees.

This large range of possible elongations in the one-day-old Moon is critical, because at this time the width of the crescent is increasing with the square of the elongation, and the surface brightness of the crescent is also rapidly increasing. Some of the earliest reliable sightings of the crescent occur near elongations of around 10 degrees. Obviously, simply specifying the age of the Moon cannot tell the whole story. Of course, the elongation of the Moon does not tell the full story, either. But, of the two parameters, the elongation is a much more reliable parameter to use as a starting point in assessing the lunar crescent visibility at any given date and time.

The prediction of the first sighting of the early crescent Moon is an interesting problem because it simultaneously involves a number of highly non-linear effects. Stated in less technical language, a lot of things are changing very rapidly. Effects to be considered are the geometry of the Sun, Moon, and horizon; the width and surface brightness of the crescent; the absorption of the Moon's light and the scattering of the Sun's light in the Earth's atmosphere; and the physiology of human vision. The problem has a rich literature. Some modern astronomical references are:

Schaefer, B. E., 1988: "Visibility of the Lunar Crescent", Quarterly Journal of the Royal Astronomical Society, Vol. 29, pp. 511-523.

Schaefer, B. E., Ahmad, I. A., Doggett, L. E., 1993: "Records for Young Moon Sightings", Quarterly Journal of the Royal Astronomical Society, Vol. 34, pp. 53-56.

Ilyas, M., 1994: "Lunar Crescent Visibility Criterion and Islamic Calendar", Quarterly Journal of the Royal Astronomical Society, Vol. 35, pp. 425-461.

Doggett, L. E., Schaefer, B. E., 1994: "Lunar Crescent Visibility", Icarus, Vol. 107, pp. 388-403.
M. B. Pepin, 1996: "In Quest of the Youngest Moon", Sky & Telescope, December 1996, pp. 104-106.

Her Majesty's Nautical Almanac Office computes and distributes predictions of lunar crescent visibility. The Astronomical Calendar by Guy Ottewell includes good diagrams of the positions of young and old Moons during the year (drawn for the eastern U.S.) and an explanation of the factors affecting their visibility.

This article was written by the U.S. Naval Observatory, Astronomical Applications Department and appears on their web site at http://aa.usno.navy.mil/.

Sky & Telescope Discount Subscriptions

Renewing your subscription to Sky & Telescope? Subscribing for the first time? Contact David Haviland, tcell@hal-pc.org, to take advantage of the JSCAS Club Discount before you subscribe!

Current Events

RUSSIANS TO EXPLORE MARS?

With the Chinese setting their sights on the Moon and President George W. Bush mandating a return to the Moon and exploration of Mars, The space race is heating up. Are the Russians joining the space race? According to an AP article on CNN's web site, a group of Russian space experts have announced they will send a six man crew to Mars within 10 years.

The Central Research Institute for Machine-Building with funding provided by Aerospace Systems, a private Russian company, believe they can use existing spacecraft to send six people to Mars, explore the planet, then return home. The expedition would last 3 years and the projected cost is between $3 and $5 billion. The space craft would be equipped with its own garden and medical facilities.

Sergei Gorbunov, spokesman for the Russian Space Agency, said he had never heard of the project and that it "was absolutely impossible" to implement with such a meager budget and in such a short time period.

SOAR DEDICATED

On April 17th, the SOuthern Astronomical Research (SOAR) telescope was dedicated and is expected to begin routine scientific operations at the end of the year. SOAR is located at an elevation of 8,800 feet above sea level on Cerro Pachon mountain in Chile, where gentle winds and scarce rain should give 300 observing nights per year.

The adaptive 4.1 meter f/16 Ritchey-Chrétien telescope's primary is a mere 10 centimeters thick and is supported by 120 electro-mechanical actuators. The actuators will adjust the primary mirror along two axes to compensate for atmospheric turbulence. SOAR has been designed to take the clearest possible images from Earth.

It took a year for Corning to make the ULE™ low expansion glass for the mirrors. It took the Goodrich Corporation three and a half years to polish the mirrors. The primary mirror weighs 7,000 lbs.

SOAR is funded by a partnership between the U.S. National Optical Astronomy Observatory (NOAO), the country of Brazil, Michigan State University, and the University of North Carolina at Chapel Hill.

Cerro Pachon is also the site of the Cerro Tololo Interamerican Observatory and the Gemini South telescope.

TESTING EINSTEIN'S THEORIES

Gravity Probe B was successfully launched on its mission to test two extraordinary predictions of Albert Einstein's general theory of relativity.

After a 24-hour delay, Gravity Probe B (GP-B) was launched Tuesday, April 20 at 12:57 p.m. EDT on board a Boeing Delta II rocket from Vandenberg Air Force Base, on the central coast of California.

GP-B is among the most thoroughly researched programs ever undertaken by NASA. GP-B will measure two parts of Einstein's general theory of relativity by assessing how the presence of Earth warps space and time, and how Earth's rotation drags space and time.

"The geodetic effect" describes how the presence of Earth changes space and time. Visually, it is similar to holding a bedsheet by four corners and placing a basketball in the center. The bedsheet will slightly wrap around the ball, somewhat similar to the way Earth warps space and time.

GP-B will also measure the "frame dragging," the effect of Earth's rotation on space and time. Einstein predicted that very large objects in

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space distort time and space as they spin, like a tornado. Frame dragging has not been measured because the effect is so small that technology hasn't yet been able to record it.

The experiment uses three key components: a spinning sphere, a telescope and a star. Building GP-B required fundamental breakthroughs in a variety of technologies to ensure this experiment could be performed.

At the heart of the experiment are four gyroscopes, instruments for studying the Earth's rotation by means of a freely suspended flywheel. The gyroscopes for Gravity Probe B are not flywheels but electrically supported spheres, spinning in a vacuum.

The center of the gyroscope is a jewel-like sphere of fused quartz. These spheres, the size of Ping-Pong balls, are the roundest objects ever made by man. The tiny spheres are enclosed inside a housing chamber to prevent disruption from sound waves, and chilled to almost absolute zero to prevent their molecular structure from creating a disturbance. The accuracy of these gyroscopes is 30 million times greater than any gyroscope ever built.

If Einstein's predictions were right, the gyroscopes should detect that small amounts of time and space are missing from each orbit. To measure each orbit, the gyroscopes are aligned with a guide star using a tracking telescope. A magnetic-field measuring device records the changes in respect to the guide star.

Using cutting-edge technology, the GP-B mission will provide researchers with a better understanding of the underlying structure of the universe and a clearer picture of how our physical world relates to the theory of gravity.

The GP-B experiment will have two months of preparation before calculating data for 16 months. The latest GP-B news and information is available online at http://einstein.stanford.edu.

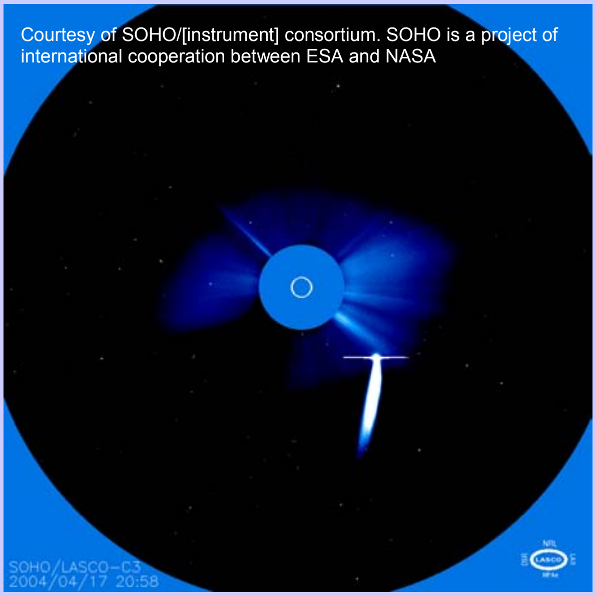
Chad Cooper, KSC Staff Writer, NASA's John F. Kennedy Space Center and Marshall Space Flight Center

NOVA ALERT

According to IAU Circular 8323, issued April 15th, 2004, Akira Takao, of Kitakyushu, Japan discovered a possible nova in Ophiuchus. The discovery magnitude was about 11.1 CCD and was located at R.A. 17h 38m 45.49s, Decl. -23° 28' 18.5". Congratulations to Akira Takao on his discovery!

COMET BRADFIELD

William Bradfield of Yankalilla, South Australia has discovered a comet using a 10" reflector. The comet, designated C/2004 F4 Bradfield, was discovered on March 28th. SOHO images show the comet as it rounded the Sun. It is now visible with binoculars just before dawn in the constellation Pisces.



Courtesy of SOHO/[instrument] consortium. SOHO is a project of international cooperation between ESA and NASA

Astronomy 101

LOW POWER HIGH POWER

Ken Lester

You've unpacked and assembled that new telescope and have scanned the heavens checking out the Moon, planets, and deep sky objects. You've been to several star parties and watched as other astronomers switch out eyepieces to achieve different views through their telescopes. At the last star party you attended, one of your friends increased the magnification while observing Saturn. You peeked through the eyepiece and were amazed at the view. You walk away mumbling to yourself, "..more power, … gotta have more power". You start making plans to buy that next eyepiece.

Someone from across the field yelled out, "Wow, I can see all three of Leo's Triplet of galaxies at once". You inquire and find they have reduced the magnification to increase the field of view. You start trying to figure out how to work two new eyepieces into the budget.

OK, you've learned that by changing out eyepieces you can get higher magnifications or a wider field of view. However, with any given telescope, there are limits to the range of eyepieces that will successfully work. What will work for your telescope? Read on for the answer.

If you are not already familiar with the formula for calculating magnification, it is:

$$\mathbf{M = F_t/F_e}$$

Where M is the magnification obtained, F_t is the focal length of the telescope and F_e is the focal length of the eyepiece.

Notice, as the focal length of the eyepiece gets longer, the magnification drops. The inverse is also true; as the focal length of the eyepiece gets shorter, the magnification increases.

HOW LOW CAN YOU GO?

The key to selecting the lowest magnification (longest focal length) eye piece for your telescope is your own eye! That may sound strange, but let me continue. As astronomers, we know that a properly dark adapted eye will be able to see dimmer objects. That's because, in the dark, the pupil of your eye has dilated, letting in more light. How far the pupil can open varies with each individual person. It's a known fact that younger eyes can open far wider than older eyes. In absolute terms, young eyes may dilate as far as 8 or 9 mm. Older eyes may only dilate to 3 or 4 mm. The average dark adapted pupil for persons under 30 is between 6 and 7 mm.

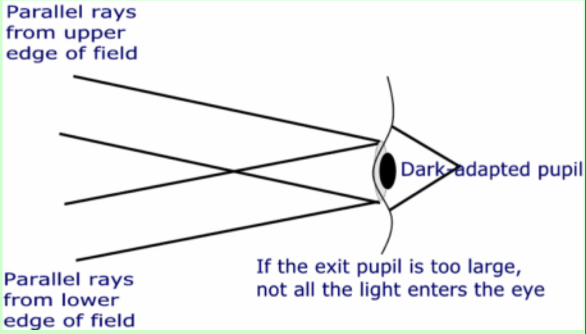
The exit pupil of a telescope is the imaginary disk where the bundle of light rays leaving a focused eyepiece is at its smallest diameter. The size of the exit pupil for any given telescope and eyepiece combination is a function of objective diameter and power.

$$\mathbf{d = D/M}$$

Where d is exit pupil diameter, D is objective diameter, and M is magnification

By the above formula, as the magnification increases the exit pupil size decreases. As the magnification decreases, the exit pupil size increases.

Now lets put your eye up to the scope. If the size of the scope's exit pupil is larger than your pupil diameter (dark adapted, of course), not all the light will enter the eye. You will be wasting light, so to speak. Now wasting light may not be all that important to you if you are simply seeking a wider field of view. However, the fully dark



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adapted human eye does set the fundamental limit on the lowest useful magnification of a telescope.

Combining our power formula and our exit pupil formula and selecting a fully dilated pupil size of 6 mm, we have the following formula for the longest useful focal length:

$$F_{emax} = 6*F_t/D$$

Where F_{emax} is the maximum eyepiece focal length, F_t is focal length of your telescope and D is the objective diameter in mm.

Since F_t/D is also the focal ratio of a telescope, we get:

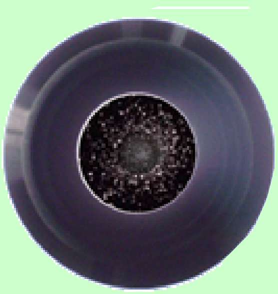
$$F_{emax} = 6*f$$

Where F_{emax} maximum eyepiece focal length, f is focal ratio of your telescope. The value 6 represents the average pupil diameter for someone under 30.

Let's see, for my 22" f4.54 and me wishing for a dilation of 6 mm, that would mean that any eyepiece longer that a 27 mm would be wasting light. I have three eyepieces greater than 27mm (35mm, 40mm, and 56mm). The 35mm and 40mm eyepieces give great views. However, I don't see the entire field of view at once. I need to move my eye around in the plane of the exit pupil to see everything.

Wasting light isn't the only concern with long focal length eyepieces. The secondary mirror found in reflectors will cause a dark shadow to appear at the exit pupil. The larger the secondary and the longer the focal length of the eyepiece, the greater the size of the shadow. At very low powers, this shadow spot could approach the size of the dilated pupil.

Since my reflector has a fairly large secondary mirror, and my 56mm eyepiece is a long focal length, there is a very large and noticeable shadow spot. I have attempted to simulate the shadow spot in this view of M5 through the eyepiece.



The size of the shadow spot is calculated as follows:

$$S = (d*S_d)/P_d$$

Where S is the diameter of the shadow spot, d is the exit pupil diameter, S_d is the diameter of the secondary mirror, and P_d is the primary mirror diameter

The good news: refractors don't suffer from shadow spot, since there is no central obstruction.

How low can you go? Too low a power will result in wasted light (which may not be that much of a concern to you) and/or a distracting shadow spot, which should concern you.

HOW **HIGH** CAN YOU GO?

According to the owner's manual that comes with a Celestron C-11, the maximum useful magnification for the telescope is 60 power per inch of aperture. *The Backyard Astronomer's Guide* says the maximum is 50 power per inch of aperture. So what's correct?

In the discussion about low power, you learned that increasing the magnification reduces the size of the exit pupil. The minimum diameter of the pupil is about .027 inches. Decreasing the exit pupil lower than that leads to a progressive impairment of vision. Based upon pupil size, the maximum theoretical power of a telescope is:

$$M_t = D/0.027 = 37*D$$

Where M_t is maximum theoretical power, D is the objective diameter in inches, .027 is the minimum diameter to which the average pupil can contract.

Although the theoretical maximum magnification is 37 per inch of aperture, every source I've found on the subject states that the maximum practical magnification is 50% higher, which is 55 power per inch of aperture. Right in the middle of the two values given earlier.

In practice, using high power really depends upon two things: 1) the quality of your optics and 2) the quality of the atmosphere. If your optics are low quality, you just won't have a us-

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able image at high magnifications. In addition, the air is rarely steady and clear enough to approach the maximum practical magnification.

Since the seeing is rarely good enough to support high magnifications, anything higher than the theoretical maximum magnification will probably prove to be a disappointment. If this is your first eyepiece purchase, I would recommend getting a high quality eyepiece that gives no more than the theoretical maximum magnification.

References:

- *Astronomical Equipment For Amateurs* by Martin Mobberley
- *Astronomical Formulae/Formulae for Telescopes,* Company 7 Library, http://www.company7.com/library/astforms.html
- *Three Functions of a Telescope*, Stephen Tonkin, http://www.astunit.com/tutorials/telescope.htm

Houston Area Astronomy Clubs

Brazosport Astronomy Club
Meets the Third Tuesday of the month, 7:45PM
At the Planetarium
400 College Drive
Clute, Texas
For more information, contact Judi James at the Planetarium
979-265-3376

Fort Bend Astronomy Club http://www.fbac.org/
Meets the third Friday of the month, 7:00 p.m.
First Colony Conference Center
3232 Austin Pkwy
Sugar Land, Texas

Houston Astronomical Society http://spacsun.rice.edu/~has/
Meets the first Friday of the month, 8:00 p.m.
University of Houston, University Park
Science and Research Building, room 117

North Houston Astronomy Club http://www.astronomyclub.org/
Meets the fourth Friday of the month, 7:30 p.m.
In the Teaching Theater at Kingwood College
20000 Kingwood Drive
Kingwood, Texas

Upcoming Events

SUDBURY NEUTRINO OBSERVATORY: Triple Nickel will present his "Neutrinos and the Sudbury Neutrino Observatory" lecture at the HAS meeting on May 7th. Triple will discuss the latest findings on neutrinos, and show a video of his trip to the Sudbury Neutrino Observatory in Canada.

CASSINI LECTURE: Steve Eckberg from the Cassini team will speak to the North Houston Astronomy Club on Friday, June 25, 2004 at 7:30 PM at the Kingwood College. Bill Leach extends his personal invitation to JSCAS members to attend and enjoy the latest information just 6 days before Saturn Orbit Insertion. Details on the speaker can be found at www.astronomyclub.org.

Visual Observing

By Chris Randall

Month

★**SSO**: (Solar System Objects) Summary for the 15 May 04

Object	Const	Mag	% Ill	Rise Time	Transient	Set Time
Sun	Tau	-26.7	100	06:28	13:16	20:05
Moon	Psc	----	9	04:31	10:47	17:08
Mercury	Psc	0.5	43	05:20	11:41	18:02
Venus	Tau	-4.4	15	08:17	15:27	22:41
Mars	Gem	1.7	96	09:07	16:09	23:15
Jupiter	Leo	-2.1	99	14:05	20:32	02:56
Saturn	Gem	0.8	100	09:33	16:29	23:30
Uranus	Aqr	5.8	100	02:41	08:20	13:59
Neptune	Cap	7.9	100	01:34	06:58	12:21
Pluto	Ser	13.8	99	21:44	03:12	08:41
Ceres (1)	Cnc	8.7	96	10:43	17:57	01:14
Massalia (20)	Lib	9.7	99	19:57	01:16	06:34
2003 YX151	Gem	8.0	98	10:15	17:08	00:05

Highlighted times denote daylight events.

★**BSO**: (Bright Sky Objects)

Zeta Ursa Major (Alcor & Mizar) – Multi-star system in Ursa Major, magnitudes 2.3, 4.0, 4.0, seperation 14.4", 709".
Mel 111 – Open cluster in Coma Berenices, magnitude 1.8, size 275'.
NGC 5139 – Globular cluster in Centaurus, magnitude 3.9, size 55'.
M3 (NGC 5272) – Globular cluster in Canes Venatici, magnitude 6.3, size 18'.

★**DSO**: (Dark Sky Objects)

NGC 5128 – Galaxy in Centaurus, magnitude 7.8, size 26' x 20'.
M104 (NGC 4594) – Galaxy in Virgo, magnitude 9.0, size 9' x 3.5'.
NGC 4485, 4490 (Cocoon Galaxy) – Galaxy system in Canes Venatici, magnitude 12, and size 2.6' x 1.9' and magnitude 10, size 6.3' x 2.7'.
Trio In Leo (M 65, M 66, NGC 3628) – Look at the face made of galaxies in Leo. Magnitudes 10.3, 9.7, 10.3, sizes 9' x 2', 9' x 4', 14' x 3'.

★**CDMP:** (Chris' Don't Miss Pick

NGC 4565 –Galaxy in Coma Berenices. Magnitude 10.4, size 15.9' x 1.8'. This bright, very large edge-on spiral galaxy will always impress you. Look for great detail in the dust lane running down the galaxy. William Herschel discovered it in 1785. It is approximately 31 million light years distant.

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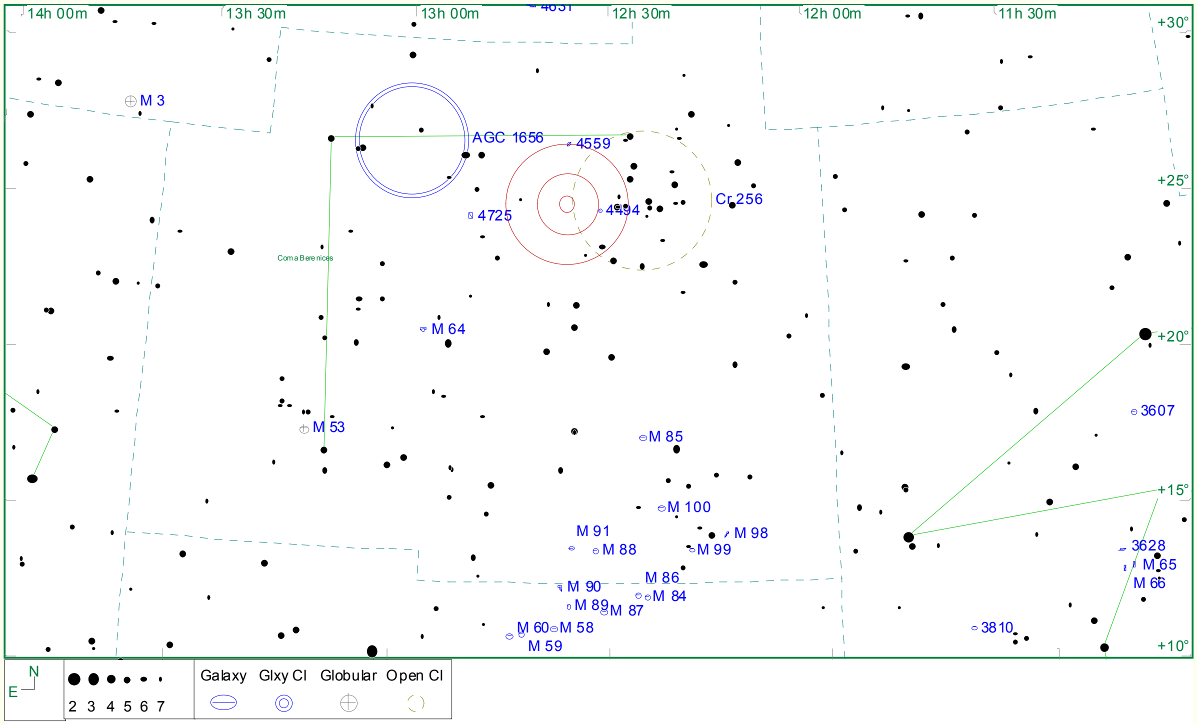
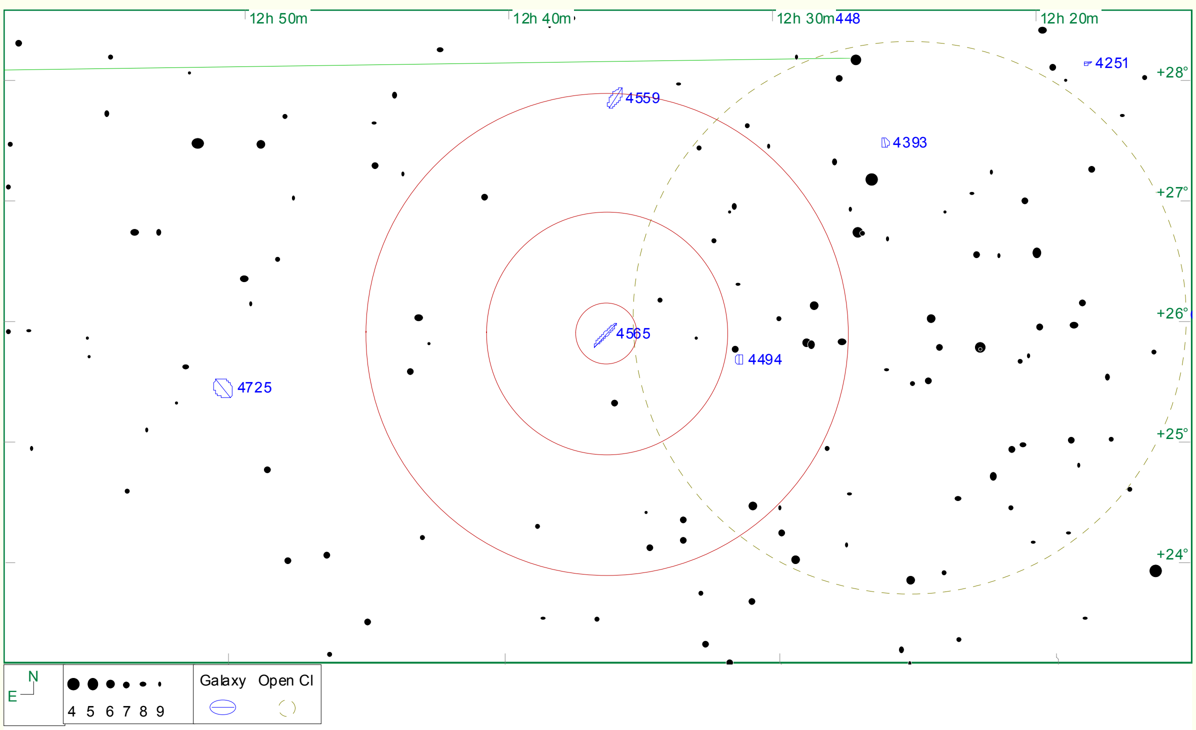
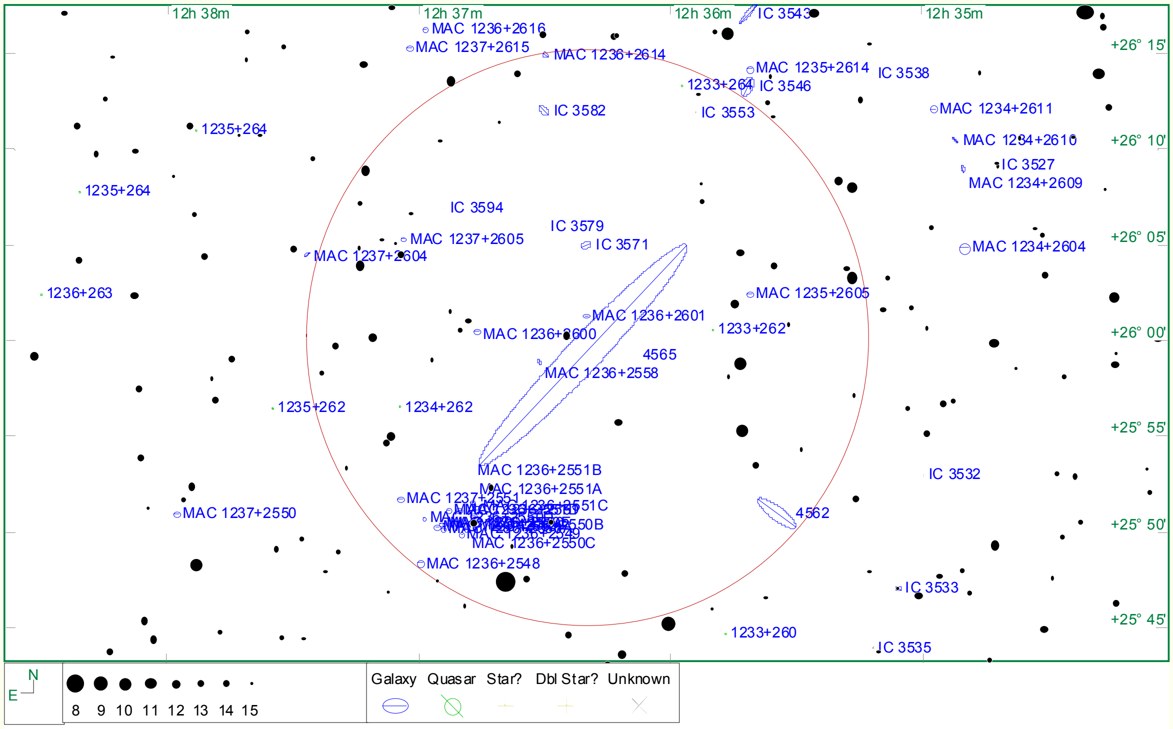




NGC 4565—star charts (3)



Member Recognition

SpaceWeather.com published Becky Ramotowski's awesome daylight image of the crescent Moon and Mars on March 27th.

Lisa Lester's image of an unusual cloud formation was the Earth Science Picture of the Day for April 17th.

Ed Grafton has a remarkable image of Jupiter appearing in the *Reader gallery* of the May issue of *Astronomy* magazine.

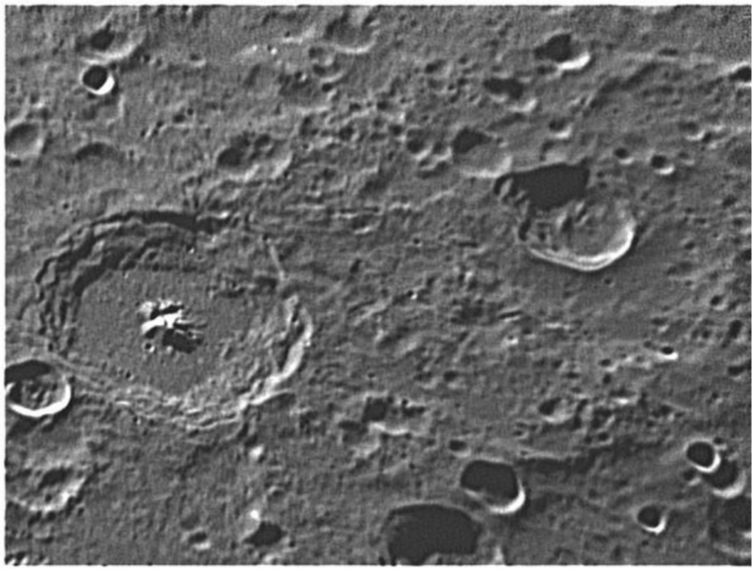
Help turn off the lights...

Join the
International Dark-Sky Association (IDA)
http://www.darksky.org
"To preserve and protect the nighttime environment and
our heritage of dark skies through quality outdoor lighting."

Member's Gallery

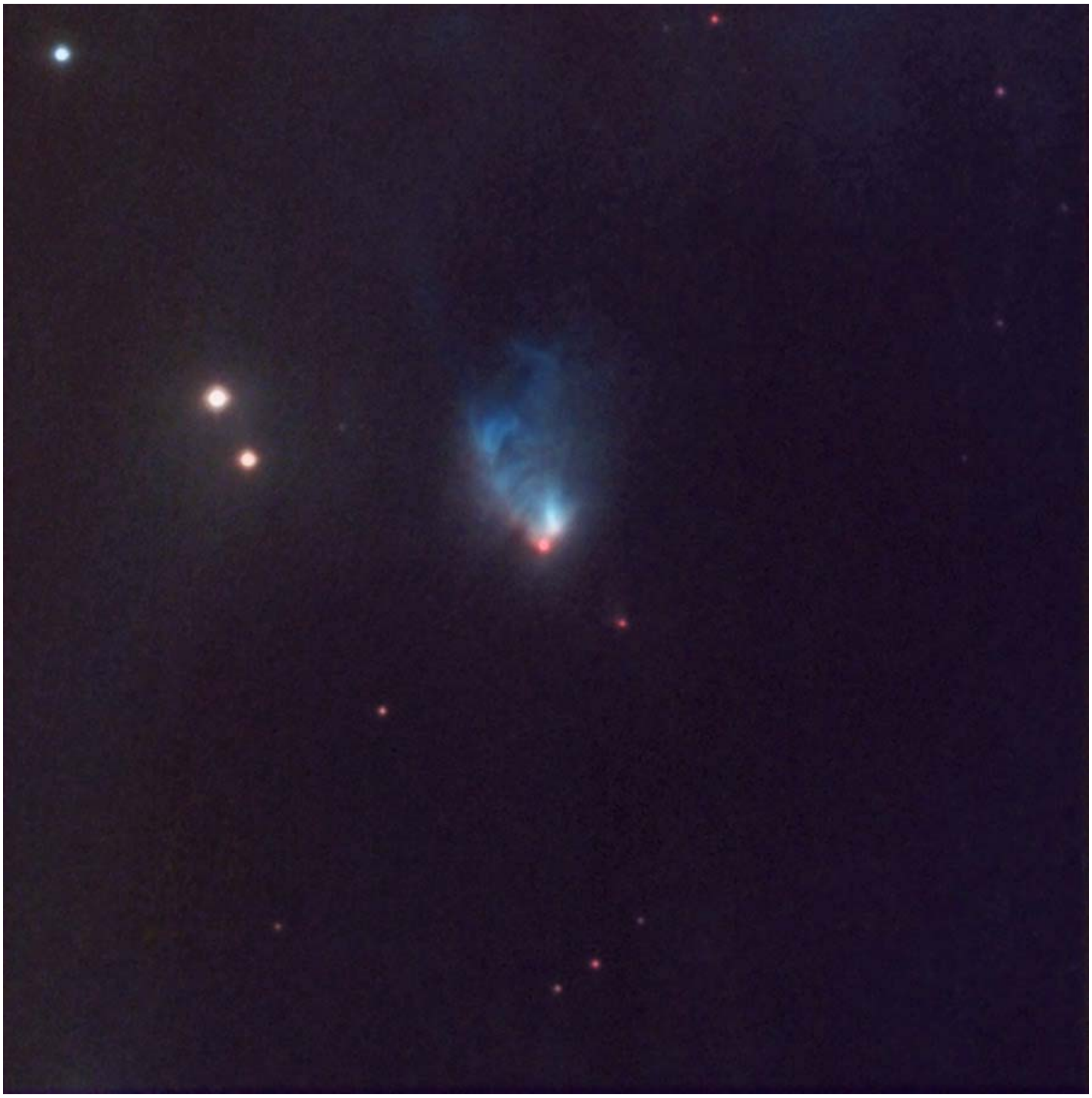
NGC 5078
Randy Brewer ©

NGC-5078 is a strange little galaxy "hovering" above a smaller Z shaped galaxy. Taken in Ft. Davis on 3/24/04 with a Mewlon 300 at F/9, ST-10XME, and AO-7. LRGB = 60:20:20:20 minutes. This is the first image taken with Don Goldman's new color filters.



Creater Piccolomini
Glenn Schaeffer ©

According to Glenn:"This image was taken on February 26, 2004. It was the first Image using my new ToUcam Pro II webcam. I just pointed it at the moon in broad daylight to align the finder and get it ready for viewing that night. The mirror was still warm and the image was swimming all over the place. I did not know what crater this was at first but a nice gentleman named John from the Yahoo Obsession User Group Forum correctly identified it as Piccolomini."



McNeil's Nebula
Arne Henden and Al Kelly ©

L/RGB color composite of McNeil's Nebula, the newly born reflection nebula recently discovered by Jay McNeil near M78. Made by Al Kelly from images taken on 2/26/04 by Arne Henden of the US Naval Observatory in Flagstaff, AZ. Arne made numerous CCD images through the 1.55-meter USNO scope using BVI filters. All images were summed to create the luminance layer, while red=I, green=V, and blue=B.

FOR SALE

Celestron CG-11 Schmidt-Cassegrain Package

This package features an 11” Schmidt Cassegrain OTA with Starbright™ coatings on a Losmandy G-11 German Equatorial mount. Included are some of the standard Celestron accessories: a 26mm 1¼” Celestron Plössl eyepiece, 1¼” visual back, 7x50mm finder scope, and lens cap.

In addition to the standard items, there are numerous enhancements to the system. They include a 2” Televue Everbright star diagonal, a JMI NGF 2” focuser with “moto-focus”, a polar alignment scope, Celestron focal reducer, full aperture white light solar filter, and Skywizard 3 digital setting circles with encoders. A Telrad mounting plate has been installed, but the Telrad is not included. The 1¼” eyepiece will require the purchase of a 2” adapter.

The Losmandy mount is great for astrophotography or CCD imaging. Included in the package is an additional 7 lb counterweight, an OTA counter balance system, and a piggy back photography mount with standard ¼-20 bolt for attaching a camera. Also included is a Celestron T-adapter for attaching Nikon, OM-1, and Pentax cameras.

For those damp humid nights, a flexible dew shield and a dew strap heater are also included. Unfortunately, due to a mix up on a recall notice, the replacement dew strap was an inch or so too short. The manufacturer refused to correct the problem.

After witnessing electronic problems on a Meade scope at a major star party, I purchased spare electronic parts prior for a TSP trip. They have never been needed. However, if you purchase the scope you will have the following spare parts: a stepper motor PC board and hand control for the Losmandy mount and an electronic drive board. Electronic assembly skills are required.

The total purchase price for this system was $5,478.50. The entire system can be yours for $2,500. Call Ken Lester to arrange a time to check out the scope. (281) 744-7720 or e-mail (lesteke@swbell.net — put C11 in subject line).

Meade Super Plössl 56mm Multi-coated Eyepiece

This 2” Meade Super Plössl has excellent optical quality with a 52° apparent field of view. There are scratches around the housing inside the rubber eyecup** which do not interfere with the quality of the optics. This eyepiece sells for $199.00 on the net. Sacrifice for $100.00. Call Ken Lester to arrange a time to check out this eyepiece. (281) 744-7720 or e-mail (lesteke@swbell.net — put Meade Eyepiece in subject line).

Johnson Space Center Astronomical Society

An association of amateur astronomers dedicated to the study and enjoyment of astronomy. Membership is open to anyone wishing to learn about astronomy.

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Month Meeting Agenda

May 14th, 7:30 p.m., Center for Advanced Space Studies/ Lunar Planetary Institute, 3600 Bay Area Blvd. (at Middlebrook Drive).

- Welcome!!!
- Guest Speaker — Dr. John Charles from the Bioastronautic Division
- Break
- SIG reports
- Charlie's Challenge
- Astronomical Oddities — Hernan Contreras
- Last Words, Door Prizes

Any unfinished discussions can be continued at Double Dave's Pizza after the formal meeting.

Starscan Submission Procedures

Original articles of astronomical interest will be accepted up to 6 P.M. May 25th.

The most convenient way to submit articles or a Calendar of Events is by electronic mail, however computer diskettes or CDs will also be accepted. All articles should include author's name and phone number. Also include any picture credits. The recommended format is Microsoft Word. Text files will also be accepted.

Submitter bears all responsibility for the publishing of any e-mail addresses in the article on the World Wide Web.

Editor's electronic address is: lesteke@swbell.net. Be sure to include the word Starscan in the subject line for proper routing of your message.

Starscan Staff

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	Ken Steele

Cover Image

Seyfert's Sextet

STScI and NASA

The image was taken on June 26, 2000, with Hubble's Wide Field and Planetary Camera 2.