Star Gazer News

Astronomy News for Bluewater Stargazers
Vol 6 No. 2 February 2012

The upper part of a statue called **"Perseus with the Head of Medusa"** by Benvenuto Cellini (1500-1571) now on display in Florence, Italy. Cellini was an Italian goldsmith, sculptor, painter, soldier and musician, who also wrote a famous autobiography. He was one of the most important artists of Mannerism. Besides his works in gold and silver, Cellini executed sculptures of grander scale. The most distinguished of these is the bronze group of *Perseus with the Head of Medusa*, a work (first suggested by Duke Cosimo I de Medici) now in the Loggia dei Lanzi at Florence, his attempt to surpass Michelangelo's David and Donatello's Judith and Holofernes. The casting of this work caused Cellini much trouble and anxiety, but it was hailed as a masterpiece as soon as it was completed. By 1996, centuries of environmental pollution exposure had streaked and banded the statue. In December of that year it was removed from the Loggia and transferred to the Uffizi for cleaning and restoration. It was a slow, years-long process, and the restored statue was not returned to its home until June 2000. (info from Wikipedia)

February 2012 Contents

A New Look at an Old Galaxy

A false-color far-infrared composite image of the Andromeda Galaxy, the nearest spiral galaxy to the Milky Way. The image consists of 11,000 separate exposures taken by the Spitzer Space Telescope's Multiband Imaging Photometer at 24 micrometres. The image is dominated by emission from hot cosmic dust; this is the sharpest image ever taken of this component of the interstellar medium in another galaxy. This is in dramatic contrast to the more-familiar view at visible wavelengths, which is dominated by starlight.

Image credit: NASA/JPL-Caltech/K. Gordon (University of Arizona)

The white box outlines the dust ring that is described below as evidence of a collision with M32. Astronomers have new evidence that the Andromeda spiral galaxy was involved in a violent head-on collision with the neighboring dwarf galaxy Messier 32 (M32) more than 200 million years ago. Infrared photographs taken with NASA's Spitzer Space Telescope revealed a never-before-seen dust ring deep within the Andromeda galaxy. When combined with a previously observed outer ring (box), the presence of both dust rings (the new one surrounds the nucleus) suggests that M32 plunged through the disk of Andromeda along Andromeda's polar axis approximately 210 million years ago.

This image was obtained by the Infrared Array Camera (IRAC) at a wavelength of 8.0 microns.

BAS Executive 2011-2013

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BAS Events Calendar

Mar 7	BAS meeting Grey Roots Museum 7 pm Speaker: Brett T. Topic: Webster 28-inch telescope
Mar 24	BAS viewing ES Fox Observatory at dark OSFN Tour 8 pm
Apr **4**	BAS meeting Grey Roots Museum 7 pm

Trillium Grant Purchases Underway

In a mid-January meeting of the BAS exec and board, a detailed list of purchases was approved. A list of items is provided below. Shortly after the grant was announced, two sub-committees were formed, one to oversee the ordering and suggest items and the other to oversee the disposition and tracking of the funds. The ordering committee at this point has identified items that are not top priority or can be deferred to later. We have a year (Oct 2013) to complete our purchases. The first purchases will involve those items that may have longer delivery times (Solar telescope, for ex.) or for which we can get discounts if we order in a group from one supplier. Some of these tenders have come in and the committee is sorting through the submissions. Incidentally, it appears that as a non-profit corporation we can get some rebates on HST for our purchases as well.

The other committee was charged with the task of keeping separate records of expenditures and with the actual handling of the finances. As part of this sub-committee, our treasurer has deposited the first cheque from Trillium into a special bank account for Trillium purchases. A detailed list of these purchases will be presented for BAS members at our March meeting.

Our biggest buy will be a large telescope and at this point, one like the Webster 28 pictured at right is being looked at. Our requirements included not only a large aperture, but a Go-To capability and the Webster has both Argo Navis and Servo-Cat. These two features make this scope especially attractive. In addition, the 28 can be used with a Mallincam to provide viewing for large groups at public events. This avoids having to ask granny to climb a ladder in the dark to get to the eyepiece, eliminating a host of liability issues for us when we do our public viewing. For our BAS viewing sessions, eyepiece viewing on a ladder is not so much of an issue and, to some, a preferable way to observe.

A salute to a great scope manufacturer: Eric Webster

The acquisition committee has been busy looking a several scopes in the 25-30 inch range including the Webster-28 pictured above. The current owner of this scope describes why he is selling it in his original posting at: http://webstertelescopes.com/forum/viewtopic.php?f=8&t=612 [Guy buys big scope, oil derricks and mega lights move in next door]. A detailed independent review is found at http://www.astromart.com/articles/article.asp?article_id=443. The reviewer Dave B. (the guy in the image above) gives you a sense of its size. It is not a big as some 28s with longer focal lengths. Both of the above links are well worth reading. More details will be provided at the March BAS meeting.

Internet at the ES Fox Obs

Brett T. and one of our BAS members Peter H. an employee of the BWDSB, among others, have been working on getting internet installed at the Fox Observatory.

During installation of the power conduit to the building by ES Fox (pro-bono!), a second conduit was put in the same trench to allow for future expansion. We hope to have a fibre-optic cable pulled through from the farm house as well as a separate cable for phone and Ethernet. BWDSB has been very cooperative in making internet access at the Fox a reality.

So, once all if this is operational, we will have internet access from the observatory to the outside world and wireless connections within the facility for our computers, etc. This makes it possible for members and others to receive broadcasts over the internet of the views through our telescopes since we are also getting a Mallincam as part of our Trillium purchases. Talk about jumping into the computer age with both feet! (See the item below for Mallincam Internet Astronomy.)

We have also initiated talks with Peter Brown at the University of Western Ontario to see if it is possible to install an All-Sky Camera at the Fox and become part of the Meteor Network that UWO has created in Ontario. Internet access is required for this link since the UWO needs to access the camera over the network. We will keep you posted of developments.

Mallincam Internet Astronomy

I came across website recently and it gives an indication of what Mallincam users are up to. Night Skies Network is a site that users of Mallincams can log into and broadcast their images. There is audio as well as video and anyone can sign up (for free at this point) and via keyboard can “talk” to the Mallincam broadcasters. I just had a short session with a Rock Mallin himself broadcasting from Ottawa. He was commenting on the deep freeze having shifted his pier to the point where he was not able to track properly with his 16 inch. Sign in yourself as a guest at http://www.nightskiesnetwork.com/

FYI

Current Inventory of telescopes at ES Fox:

two 12-inch dobsonians (can become our BAS loaners)
three 8-inch dobsonians (two BAS scopes, one OEC property)
one 8-inch SCT Meade (needs collimation)
one 8-inch Meade reflector equatorial mount (OEC)
two 6-inch dobsonians (one operational)
three 4-inch scopes (2 mounts to be constructed)
one 12-inch Vernonscope (operational)
two 8-inch dobs (part of Trillium acquisition)

Note that OEC owns one 8-inch, one 6-inch dob, an equatorially-mounted 8-inch and the Meade 8-inch SCT along with one or two smaller (3 and 4-inch) scopes. Our intention is to collect all of the 8-inch and smaller scopes into a class set of a dozen or so that students and BAS members can use on site. The two 12’s will probably become our BAS loaner scopes since they are too large for students to handle easily. Let Pres. Brett or VP John know if you are interested in borrowing a 12-inch for a few months.

Brett also keeps his 16 inch at the observatory and he is always happy to show off a few objects through it during our star tours.

Partial Inventory of other BAS items:

- Several mirror grinding kits including at least two 8-inch mirror blanks
- one 12-inch mirror which may be ready for aluminizing
- one 16-inch mirror mount
- several focuser assemblies of various vintages
- complete set of mirror making books and reference texts
- laser collimator
- miscellaneous eyepieces

Call for Amateur Telescope Makers

If the list of items above caught your eye and you are interested in telescope construction, here is your chance. There are several telescopes that need some TLC or even major mount construction. Part of the Trillium budget allows for materials to build dobsonian mounts for telescopes. There is at least one equatorial that could see better service as a dobsonian and requires a total mount rebuild. The 12-inch mirror described on page 7 “The Gadget Page” needs someone to take it under their wing. Hopefully this mirror can be part of a third 12-inch telescope in our collection. And if you are an expert in SCT collimation or would like to try your hand at it we can accommodate you. And if mirror-grinding is your forte, we can help you out there too. Please email me or Brett if you are interested in any of these activities. It would be great to get a group of telescope builders going in the BAS! There is lots of tinkering that can be done.

Canada-France-Hawaii Telescope Helps Astronomers See Dark Matter

author: JASON MAJOR *for Universe Today*

We can't see it, we can't feel it, we can't even *interact* with it… but dark matter may very well be one of the most fundamental physical components of our Universe. The sheer quantity of the stuff – *whatever* it is – is what physicists have suspected helps gives galaxies their mass, structure, and motion, and provides the "glue" that connects clusters of galaxies together in vast networks of cosmic webs.

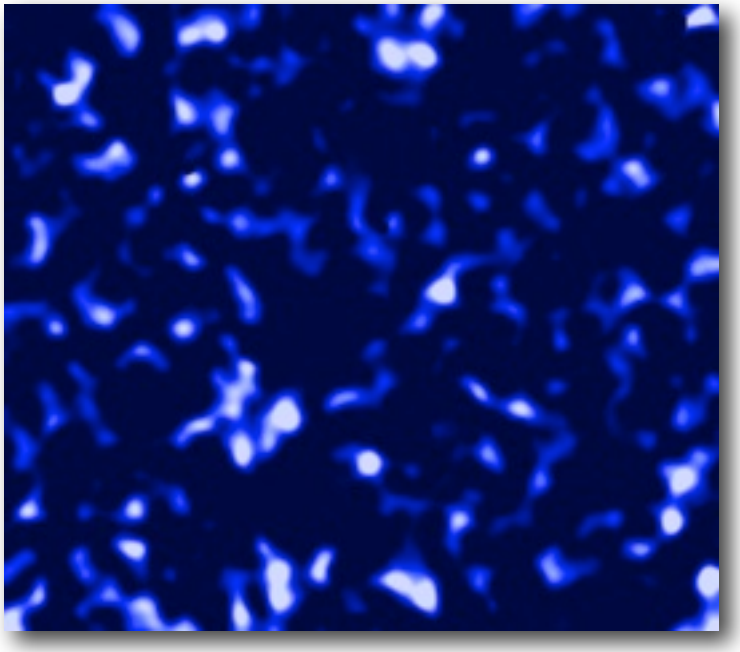
Now, for the first time, this dark matter web has been directly observed.

An international team of astronomers, led by Dr. Catherine Heymans of the University of Edinburgh, Scotland, and Associate Professor Ludovic Van Waerbeke of the University of British Columbia, Vancouver, Canada, used data from the Canada-France-Hawaii Telescope Legacy Survey to map images of about 10 million galaxies and study how their light was bent by gravitational lensing caused by intervening dark matter.

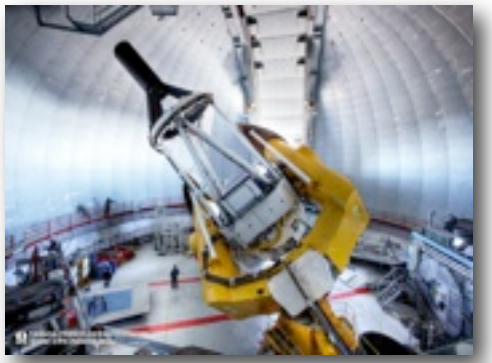
The images were gathered over a period of five years using CFHT's 1×1-degree-field, 340-megapixel MegaCam. The galaxies observed in the survey are up to 6 billion light-years away… meaning their observed light was emitted when the Universe was only a little over half its present age.

The amount of distortion of the galaxies' light provided the team with a visual map of a dark matter "web" spanning a billion light-years across.

"It is fascinating to be able to 'see' the dark matter using space-time distortion," said Van Waerbeke. "It gives us privileged access to this mysterious mass in the Universe which cannot be observed otherwise. Knowing how dark matter is distributed is the very first step towards understanding its nature and how it fits within our current knowledge of physics."



Dark matter in the Universe is distributed as a network of gigantic dense (white) and empty (dark) regions, where the largest white regions are about the width of several Moons on the sky. Credit: Van Waerbeke, Heymans, and CFHTLenS collaboration.

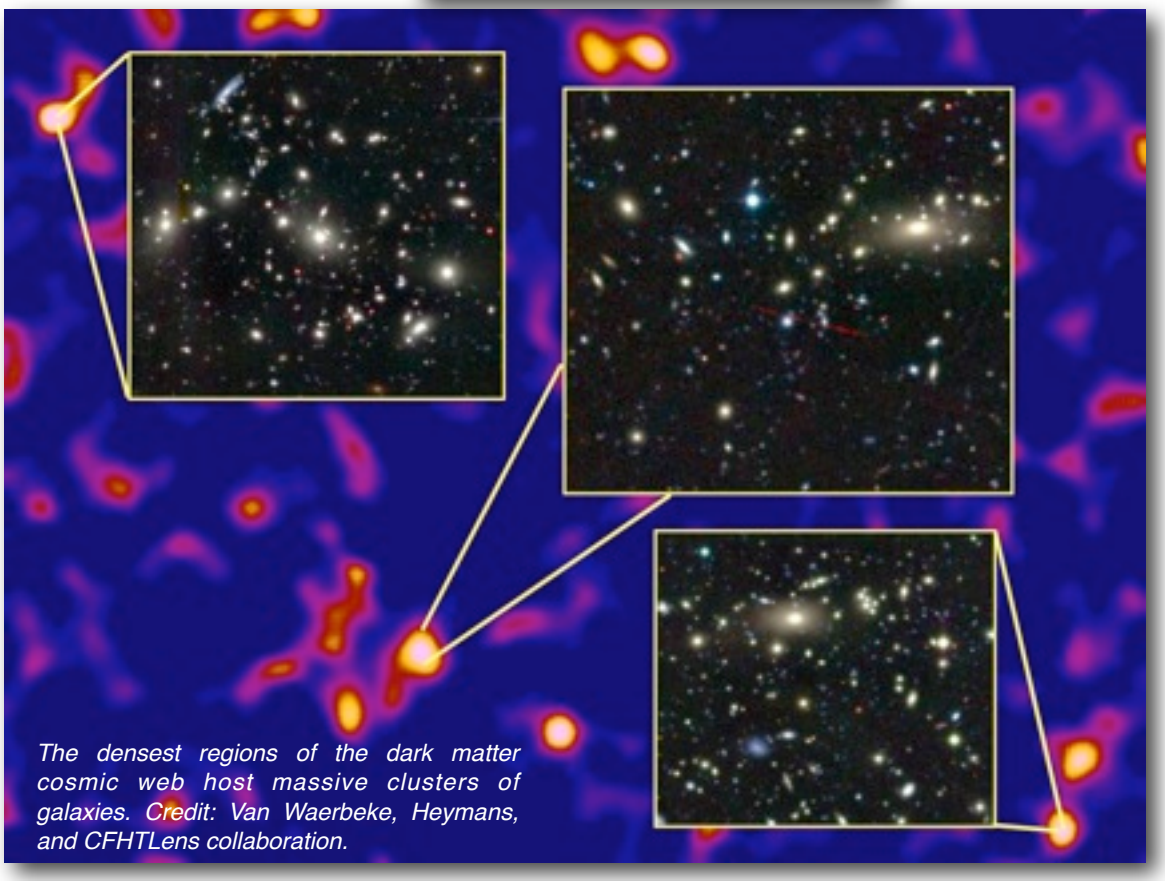


The Canada-France-Hawaii 3.6 m reflector (CFHT) on Mauna Kea

This is one giant leap toward unraveling the mystery of this massive-yet-invisible substance that pervades the Universe.

We hope that by mapping more dark matter than has been studied before, we are a step closer to understanding this material and its relationship with the galaxies in our Universe," Dr. Heymans said.

The results were presented today at the American Astronomical Society meeting in Austin, Texas. http://www.cfht.hawaii.edu/en/news/CFHTLens/



The densest regions of the dark matter cosmic web host massive clusters of galaxies. Credit: Van Waerbeke, Heymans, and CFHTLens collaboration.

Tracing Dark Matter with Ripples in the Whirlpool Galaxy

by Vanessa D'Amico Universe Today Jan 9, 2012

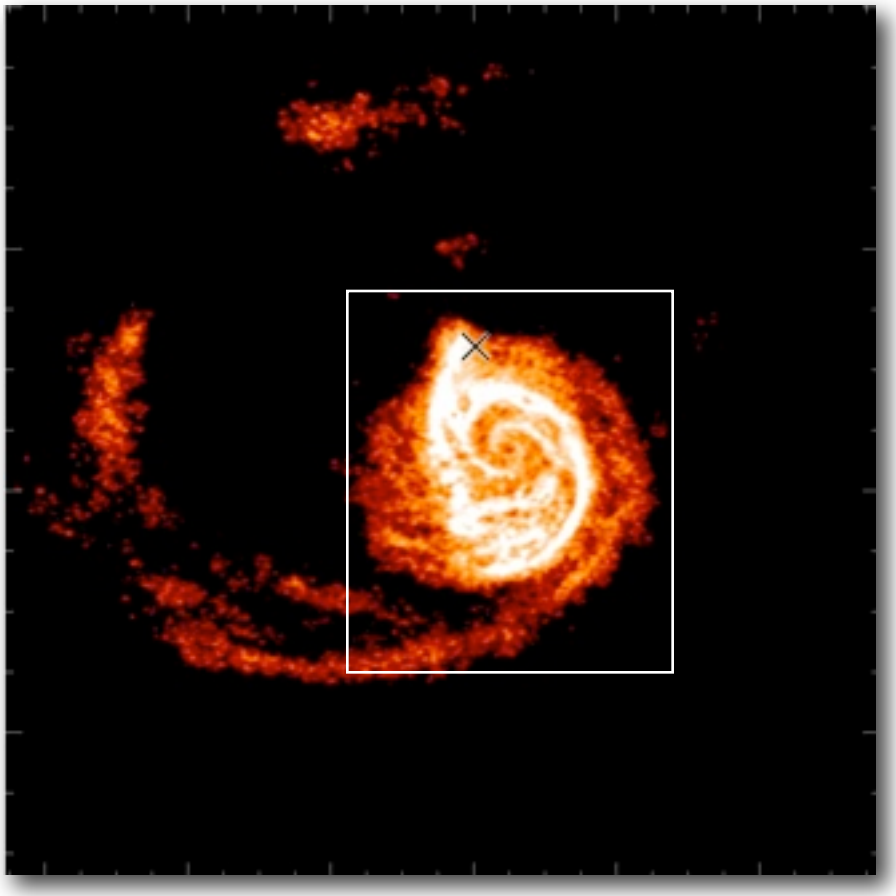
A new paper presented at this week's American Astronomical Society conference promises to shine some light, so to speak, on the pursuit of dark matter in individual galaxies. The current model of cold dark matter in the Universe is extremely successful when it comes to mapping the mysterious substance on large scales, but not on galactic and sub-galactic scales. Earlier today, Dr. Sukanya Chakrabarti of Florida Atlantic University described a new way to map dark matter by observing ripples in the hydrogen disks of large galaxies. Her work may finally allow astronomers to use their observations of ordinary matter to probe the distribution of dark matter on smaller scales.

Spiral galaxies are typically composed of a disk, which is made of normal (baryonic) matter and contains the central bulge and spiral arms, and a halo, which surrounds the disk and contains dark matter. In recent years, surveys such as THINGS (conducted by the NRAO Very Large Array) have been undertaken to analyze the distribution of hydrogen in nearby galactic disks. Last year, Dr. Chakrabarti used such surveys to investigate the way that small satellite galaxies affect the disks of larger galaxies such as M51, the Whirlpool Galaxy. But the real prize lies in investigating what astronomers cannot see. Chakrabarti remarked, "Since the 70s, we've known from observations of flat rotation curves that galaxies have massive dark matter halos, but there are very few probes that allow us to figure out how it's distributed." She has now broadened her research to do just that.

Astronomers believe that the density distribution of dark matter relies on a parameter called its *scale radius*. As it turns out, varying this parameter visibly affects the shape of the galaxy's hydrogen disk when the influence of passing dwarf galaxies is accounted for.

"Ripples in outer gas disks serve to act like a mirror of the underlying dark matter distribution," said Chakrabarti. By varying the scale radius of M51's dark matter halo, Chakrabarti was able to see how it would affect the shape and distribution of atomic hydrogen in its disk. She found that large scale radii give rise to galaxies with a dark matter halo that becomes gradually more diffuse as it extends along the length of the disk. This causes the hydrogen in the disk to be very loosely wrapped around the central bulge of the galaxy. Conversely, small scale radii have density profiles that fall off much more steeply.

"Steeper density profiles are more effective at holding onto their 'stuff'," explained Chakrabarti, "and therefore they have a much more tightly wrapped spiral planform." Chakrabarti's map of the distribution of dark matter in the halo of M51 is consistent with existing theoretical models, leading her to believe that this method may be extremely useful for astronomers trying to probe the elusive, invisible substance that makes up almost a quarter of our Universe. A preprint of her paper is available on the ArXiv.



The distribution of HI hydrogen in the Whirlpool Galaxy (M51) as determined by the THINGS VLA survey extends far beyond the visible stars in the galaxy and its satellite NGC 5195 (marked by cross), which is situated in the short arm of the spiral. Analysis of perturbations in the hydrogen distribution can be used to predict the location of such satellites, in particular, those satellites that are composed primarily of dark matter and are thus too faint to be detected easily. (Sukanya Chakrabarti/UC Berkeley)

A typical B&W image of the Whirlpool Galaxy M51 in Ursa Major. Image on the SEDS website: http://messier.seds.org/m/m051.html

This image is inside the box on the image above.

"How Far Can You See?"

" Nothing ever built arose to touch the skies unless some man dreamed that it should, some man believed that it could, and some man willed that it must."

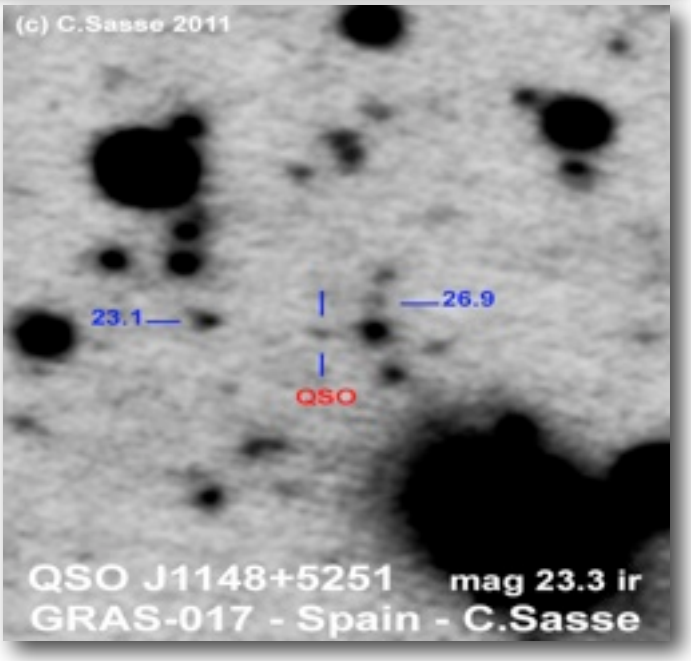
Charles Kettering

" For everyone . . . must see that astronomy compels the soul to look upwards and leads us from this world to another."

Plato

Every great endeavour starts out as someone's dream! As the Nike mantra says, "*If you can dream it, you can do it*!" Since the Fall of 2010, when I captured the Andromeda Galaxy's famous 19.3 magnitude variable star M31_V1 with a 10 minute exposure using my SBIG STL 11K camera attached to my Takahashi TOA 150, I've become fascinated with pushing my equipment to its ultimate. Now, enter German Canadian, Dr. Christian Sasse, from Vancouver. He is the 51 year old general manager of an electrical engineering company, and is an avid amateur astronomer. He is also the owner of three observatories which form part of the Global Rent-a-Scope network (now called the iTelescope network). This is an imaging system where amateur astronomers can rent time on telescopes located in New Mexico, Spain, and Australia. These telescopes can be controlled via the Internet and, after the images have been taken, they can be downloaded and processed by the user. This network provides a cost effective way for amateur astronomers to use telescopes and cameras that they could never afford to own themselves. These observatories are located in prime desert observing sites. They also have a "starter programme" whereby interested amateurs astronomers can use their system on a free trial basis. Later, rental fees are set according to the quality of the equipment used and the exposure times.

Dr. Christian Sasse
and one of his telescopes



Christian Sasse's Image of QSO J1148+5251

Christian's dream astronomy adventure began during an observing session in Sweden. He was showing the 9th magnitude Sombrero Galaxy (M104) to his neighbour when the question was raised about its distance. Sasse told him that the Sombrero was about 30 million light years away. His neighbor then asked him how far could he see with his telescope; that is, what was the greatest distance he could detect objects? The question was fascinating and started Christian on an astronomy adventure in which he became the first amateur to image one of the faintest and most distant objects in the Universe. Christian drew inspiration from another Canadian amateur, Paul Boltwood from Stittsville, Ontario. Paul won Sky and Telescope's "Deep Field Challenge" with an image taken in May, 1998, of a 24.5 visual magnitude object using his 16 inch telescope and a 25.5 hour exposure. At the time, Boltwood's image recorded the faintest object detected by an amateur astronomer.

For Christian's effort, the astronomical prey was a quasar in Ursa Major (J1148+5251) and much further away and fainter than Boltwood's previous record. This quasar is so far away that its light started its journey towards us a scant 870 million years after the Universe began. With a redshift of 6.4, it has a look-back time of a whopping 12.8 billion years! In fact, this object is so far away and its redshift so large, that it has no visible magnitude as such! Indeed, this quasar was only discovered by SLOAN astronomers in 2003 and, at that time, it was crowned as the most distant and oldest object ever observed.

To have any chance of success in such a pursuit, the imaging platform must be at the cutting edge of technology and located under clear, dry skies. Christian's equipment was located in Spain and named, appropriately, the "Deep Red Telescope". It uses a FLI ProLine cooled CCD Camera (PL4710) bolted to a 17 inch PlaneWave CDK telescope attached to a Paramount Mount. This particular FLI camera is especially sensitive to the near infra-red region of the quasar's emission spectrum and was a major contributor to the success of the project.

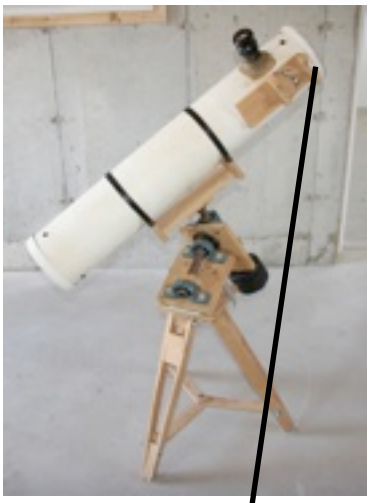
So, on Feb 7th, 2011, Christian centered the telescope on the quasar and began collecting photons. He took 199 exposures, each one of 300 second duration, and then stacked them to give a total exposure time of 16 hours ! He processed the data using Maxim DL plus VPhot and the resulting image had its reference stars and galaxies identified from the NASA-PAC Extragalactic Database. In the amazing image shown above, the actual quasar is fainter than the reference 26.9 magnitude object. What an achievement! According to former President of the AAVSO, Bill Dillon, " the image actually goes deeper than the 2003 SLOAN discovery image of the quasar and compares well with the Keck image of the same object." I found this even more amazing because I have visited the SLOAN and it employs a telescope of 2.5 metre aperture. So, congratulations to a Canadian, Dr Christian Sasse, for breaking amateur astronomy's deep time world record! Now, that's inspiring to all of us!

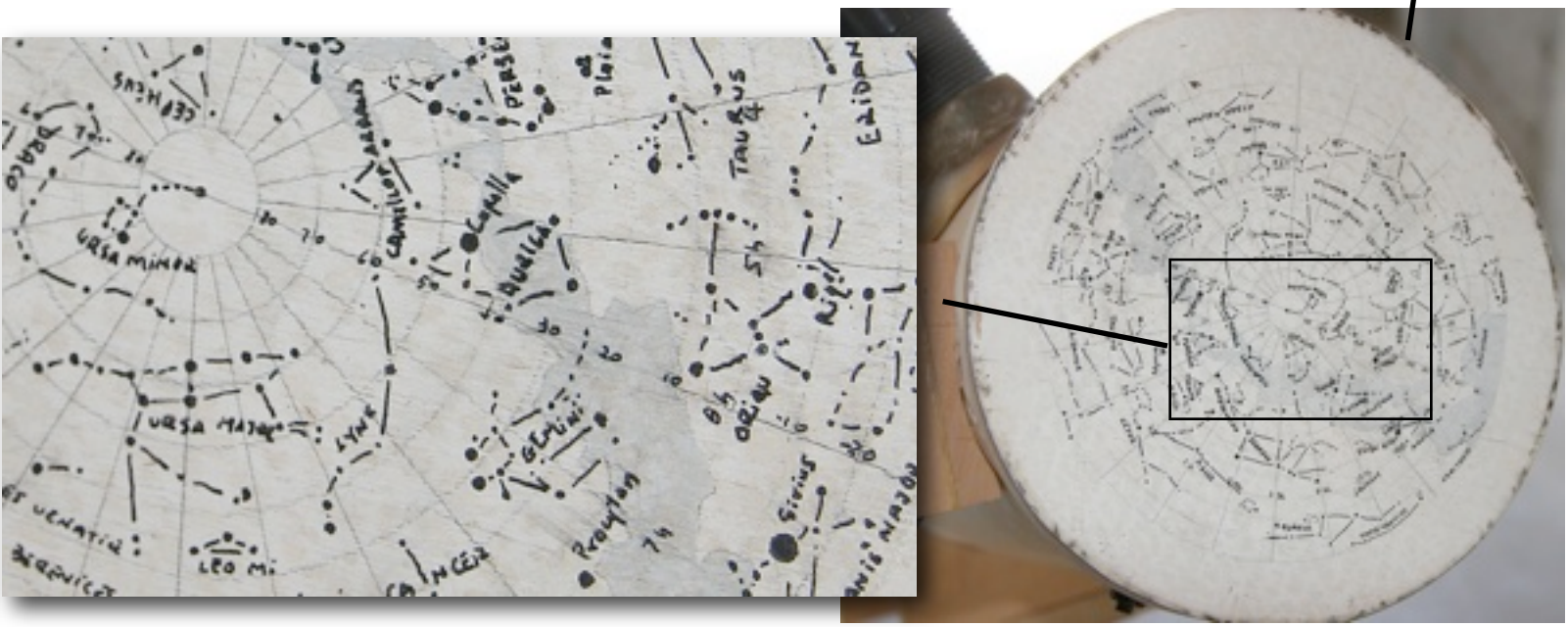
Home-Built 6" Telescope

(Continued from the Jan/12 Issue)

Last month, the Gadget Page featured a home-built 6-inch telescope made by Dr. Ricardo Olivarez. One of the unique features of the telescope was the fact that the telescope mirror was ground, figured and polished by hand. I have tried grinding a 6-inch blank hoping to progress to an 8-inch and larger mirror. It did not take long to realize that I did not have the disposition for the meticulous care needed to create a quality mirror. Having tired it, I have a lot of respect for anyone who actually completes a telescope mirror of good figure (and then actually uses it on the stars). Furthermore the good doctor also ground a second mirror -a much more difficult Cassegrain design having a perforation in its centre and this one was 12 inches across! I am hoping that all it needs is to have the hole punched out and then to be aluminized. We have the basic optical component for another 12-inch telescope. Down in my basement, one evening last month, I did a quick focal length measurement and got 50 inches or 1250 mm. In a remarkable coincidence this is identical to the 12-inch Vernonscope that is in operation at the Fox Observatory right now!

The other aspect that fascinated me was the home-made dust caps for the telescope tube. Bent strips of wood were capped with circular disks. Then Dr Olivarez hand drew the stars of the N and S constellations, -the Northern on the top cap, Southern on the bottom, of course!





A Mirror Grinding Machine

Mirror grinding can be a tedious, time-consuming, meticulous process. Something as simple as not cleaning ALL the coarser grit from your work area can wreak havoc on a mirror. A single piece of grit can leave a scrape that is like a canyon on a smooth piece of glass surface and necessitate hours of regrinding to polish the defect out. Some of the grunt-work can be alleviated by automating the repetitive grinding stages using a grinding machine like the one in the image at right.

BAS member Frank C. constructed this grinding machine and is nearing the point where he can actually start using it to grind mirrors. In a recent email to me, he sounded hopeful of getting it into service relatively soon. (FYI, Frank, the BAS has more than one 8-inch mirror blank sitting around that you can test out if you want.)

Many astronomy clubs in the past have had mirror grinding groups that tackled various sized mirrors for their members. This has become a rare activity when the cost of manufactured mirrors in sizes under 12" has come down dramatically. Well-figured big mirrors are still expensive, but once you get up to 12 to 16-inch, home-made mirrors are getting too difficult for a basement hobbyist (like me anyway).

If you would like to send Frank some words of encouragement or you are interested in mirror-making yourself and you are looking for a kindred spirit, send me an email (stargazer@wightman.ca) and I will forward your contact info to Frank.

A Rare Flyby of Asteroid Eros

The first near-Earth asteroid to be discovered was 433 Eros in 1898. In 2000 and 2001, NASA's NEAR-Shoemaker probe took up orbit around it and then descended to its dusty surface. Eros is the second-largest near-Earth asteroid, after 1036 Ganymed, measuring 34 × 11 × 11 km.

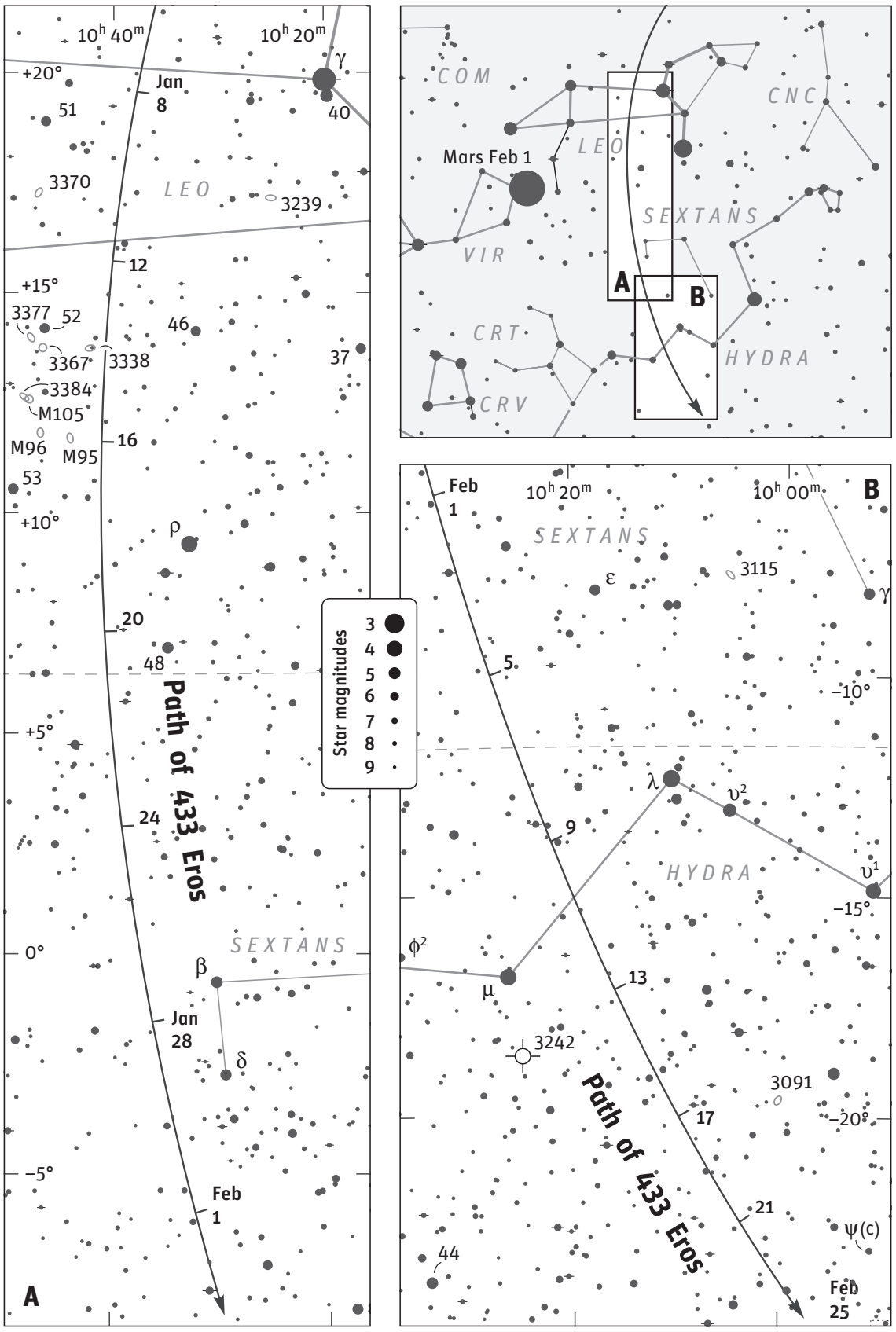
You have an opportunity to view Eros telescopically, as it makes a swing past the Earth this month and next. This is Eros's closest approach since the much-observed one in January 1975, when it reached magnitude 7.0, and it'll be its last close pass until January 2056.

The finder charts here show its path southward across Leo, Sextans, and Hydra as Eros brightens from 9.2 on January 12th to 8.8 on the 18th and then 8.6 from January 25th to February 13th. It fades back to mag 9.0 by February 25th. Eros passes its closest to Earth on January 31st, - not very close as near-Earth asteroids go: 0.18 a.u., or 70 times the Moon's distance.

On the charts, the ticks mark its position at 0:00 Universal Time on the indicated dates. This falls on the evening of the previous date in our time zone. Interpolate to put a pencil dot on the track for when you plan to look. Stars are plotted to magnitude 9.0. In late January and early February Eros will be creeping along by almost 3′ per hour, so you can see its motion during an evening.

Information from an article by
Alan MacRobert (c)Sky and Telescope

Path of Asteroid Eros in 2012



SGN Featured Constellations: **Auriga and Perseus**

Auriga

α Aurigae - Capella β Aurigae - Menkalinan
ζ Aurigae - Sadatoni

The outstanding feature of this beautiful and prominent constellation is the star Capella, magnitude 0.2, the third brightest star visible in the northern latitudes. Capella means "She-Goat"; the three stars ε, ζ and η Aurigae were called the "Kids" by the ancient Arabs. Nath (β Tauri) properly belongs to the constellation Taurus, but is shared by both constellations. β, ε and ζ Aurigae are all eclipsing variables; ε Aurigae is one of the largest stars in the sky. The area within the pentagonal figure of Auriga is rich in stars and clusters and is well worth sweeping with binoculars; Auriga lies directly in the plane of the Milky Way.

Double Stars

	Mag.	Separation (s)	Location	Remarks
θ	2.7-7.1	1	055737	
λ	5.2-8.7	104	051640	
ψ5	5.3-9.0	41	064344	
ω	5.0-8.0	6	045638	Pale Green-Bluish White.
14	5.0-7.2-11	15	051233	Yellow-Blue; triple.
26	6.1-6.4-8.0	12	053631	Yellow-Blue; triple.
41	6.1-6.8	8	060849	White-Violet.
Σ681	6.3-8.3	23	051747	
Σ698	6.2-7.7	31	052235	Yellow-Pale Blue; beautiful.

Messier Objects

	Mag	Location	Remarks
M 36	6.3	053334	Open Cluster.
M 37	6.2	054933	Open Cluster. Beautiful.
M 38	7.4	052536	Open Cluster. Unusual shape.

Other Objects of Interest

R Aurigae - Long period (459 days) variable, maximum magnitude 7.7. Location 051354.

Perseus

α Persei - Algenib (Mirfak) β Persei -Algol
ξ Persei - Menkib ο Persei - Atik

Perseus can easily be identified; an imaginary line connecting Capella in Auriga and γ Andromedae passes about halfway between Algenib and Algol, the two brightest stars in this constellation. Note also the characteristic curve from η to λ Persei. One of the most interesting features of Perseus is the star Algol, the "Demon Star," an eclipsing variable. In only 4.5 hours, it wanes from magnitude 2.3 to 3.5. It remains at minimum for 20 minutes, then increases to its original brightness where it remains for 2 days, 20 h 48 min. The famous double cluster χ-h (NGC 869 and 884) is visible in fieldglasses; it is one of the most spectacular sights in the sky. There is a rich area for sweeping with fieldglasses around Algenib; it lies directly in the Milky Way.

Double Stars

	Mag.	Sep (s)	Location	Remarks
ε	3.0-8.3	9	035540	Green-Bluish White.
ζ	2.9-9.3	13	035232	
η	3.9-8.5	28	024756	Pale Yellow-Blue.
ο	3.9-8.5	1	034232	
Σ331	5.3-6.7	12	025852	
Σ369	6.5-7.8	3	031340	Yellow-Blue.
Σ533	6.0-7.5	20	042134	
Σ552	6.3-6.5	9	042840	Both White.

Messier Objects

	Mag	Location	Remarks
M 34	5.5	023943	Open Cluster; beautiful; good for low power.
M 76	12.2	013951	Planetary Nebula.

Other Objects of Interest

NGC 869 - The famous double cluster; a beautiful sight at low power.
NGC 884 There are many beautifully contrasting stars in this area.
Locations 021657 and 022057 respectively,

Star magnitudes are labeled as numerical values above (or near) the star. Underlined values are half magnitudes. Larger star dots denote brighter stars.

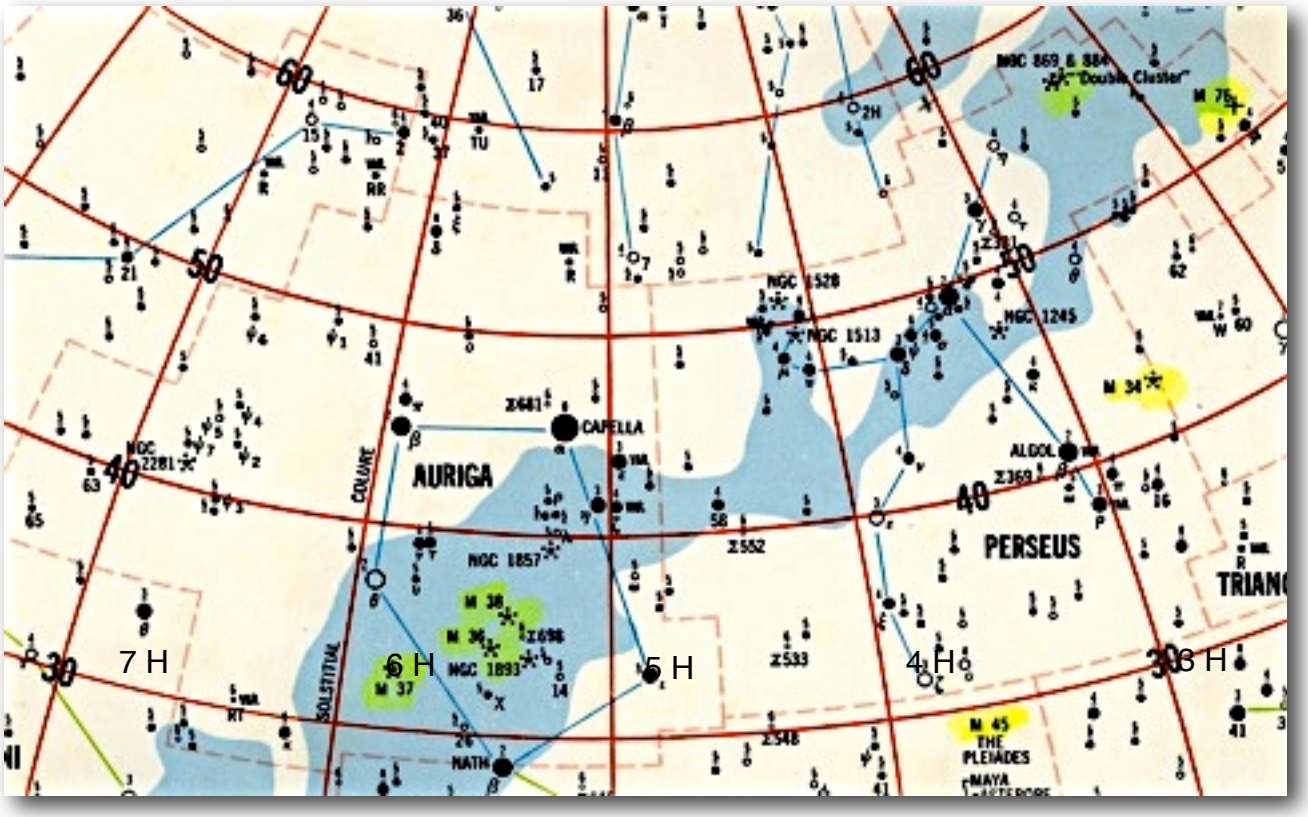


Chart Legend
- Star Location
- Double Stars
- \+ Nebulae
- ★ Clusters
- Variable Stars
Var

Sky Calendar — February 2011

compiled by John Hlynialuk (**stargazer@wightman.ca**) using the Observer's Handbook 2012(RASC), Sky and Telescope and Sky News magazines. Please contact the editor if you

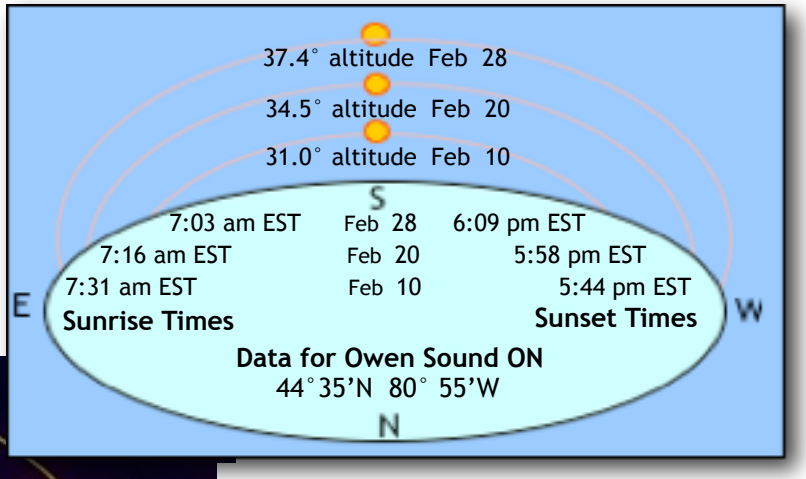
Feb 7 **Full Moon (Moon) rises at pm EST**
Feb 10 Zodiacal Light visible in West after sunset for next two weeks
Venus 0.3° N of Uranus (on Feb 9, 18 min sep)
Mars 10° N of Moon
Feb 12 **Spica 1.7° N of Moon**
Saturn 6° N of Moon
Feb 14 **Last Quarter Moon rises at am EST**
Feb 21 **New Moon rises at am EST**
Feb 23 Mercury 6° S of Moon
Feb 25 **Venus 3° S of Moon**
Feb 26 Jupiter 4° S of Moon
Feb 29 Leap Day

BAS Events

Mar 7 BAS meeting Grey Roots Museum 7 pm, Speaker: Brett T. Topic: Webster 28-inch telescope
Mar 24 BAS viewing ES Fox Observatory at dark
OSFN Tour 8 pm
Apr **4** BAS meeting Grey Roots Museum 7 pm

Planets

MERCURY, passes into the evening sky in the last part of February reaching magnitude -1.5 by Feb 11. It is very close to Uranus on Mar 4. **VENUS**, (-4.1), the bright Evening Star above the western horizon, is only 18 min of arc from Uranus on Feb 9. There is a thin crescent moon above Venus (again) on Feb 25. **MARS** brightens to mag -1.0 by Feb 21 and only Venus, Jupiter and Mercury (for a short time) are brighter. It rises in Leo around 8 pm and appears 2 hours earlier by month-end. Mars opposition is next month. **JUPITER**, (mag -2.3) is still well-placed in the sky. The crescent moon passes it on Feb 25/26 and with Venus shining brightly below, it is a nice group of planets (see Special Events). **SATURN**, (mag 0.6), rises in early evening by month-end and appears near Spica all Feb. The gibbous moon, Spica and Saturn are nicely lined up after midnight on Feb 12/13. **URANUS**, (5.8) is higher at sunset than **NEPTUNE**, (7.9) and they set by 9 pm EST and 7 pm respectively. Jupiter is nearby and Venus passed Uranus in Jan and Neptune on Feb 9 (see Special Events). Mercury, Uranus, Venus, the Moon and Jupiter are nicely lined up on Feb 25 to 27. Ceres is also visible in the same part of the sky (chart on pg 5 of the Sep issue). **PLUTO** rises in the East just before sunrise and is too faint to observe. The diagram below gives the sunrise/sunset times and the sun's altitude on three dates this month. The calendar below the sun chart shows the moon phases for the month. Times of moonrise for NM, FQ, FM and LQ are in the Sky Calendar listing at left.



Special Events — Planetary Alignments

Venus, in the last part of January, is in the western sky and meets up with 3 of the 4 gas giants before it slips below the western horizon in late spring. But before it leaves the western sky, it transits the sun in June! (Stay tuned for details later this spring).
On Jan 13, Venus slipped past Neptune with barely a whimper. There was a very short clear patch in OS on Jan 12 but it closed before I could get binos out to look for the 8th magnitude planet near Venus. This month, Venus slides past the much brighter Uranus (5.8) so seeing this event will be easier (weather-permitting). The two are so close (0.3°) that low power binos may not be able to split them unless they are mounted on a steady support. Try low to medium power in a small scope. A 25 mm eyepiece in a SCT should show both the bluish colour of Uranus and the waning gibbous phase of Venus.

The yellow circle in the diagram at right, is the FOV for a 7x50 pair of binos. On Feb 9, even 100X will still enclose both Uranus and Venus in the same view.