Bays Mountain Astronomy Club

☞*Next Meeting: Feb 4*☜

SKYWARD *BY BRAD DUNN*

Great food, great speaker, and great friends, you couldn't ask for a better meeting than the one we had last month. We met at the Great Food Buffet and had a meal fit for a king. I even tried octopus for the first time (and last). Our speaker was John Sakin from Appalachian State University. His presentation was on exoplanets and the stars they orbit. He showed that as technology has improved over the past few years, so has our ability to find and monitor exoplanets. He also showed us the projects that he and his fellow colleges are working on and asked for assistance with some observations. If you are interested in participating in any of these projects, please contact John through the ASU website. Due to the time constraints we didn't have a business meeting in January, but we will discuss any business at our February meeting.

The presentation for February will be on Earth Magnetic Polarity Reversals: What happens? How often, how quick and how bad? The speaker will be Dr. Mick Whitelaw. He received his B.S. in Geology from Monash University, Australia in 1983. He received his Ph.D. from the University of Florida in 1990. His dissertation research employed magnetic polarity stratigraphic methods to date Pliocene and Pleistocene vertebrate fossil sites in southeastern Australia. He held teaching positions at the University of Texas El Paso and the University of Louisiana at Lafayette before moving to East Tennessee State University in 2003. He currently serves as an Associate Professor and Assistant Chair in the Department of Geosciences at East Tennessee State University. He currently teaches Structural Geology, Plate Tectonics, Geophysics and Stratigraphy at ETSU and is the site stratigrapher for the Gray Fossil Site.

Calendar

Special Events

May 7 Astronomy Day!

SunWatch

Every Sat. & Sun., 3 - 3:30 p.m.,

Mar. - Oct., weather permitting.

BMACers are always welcome to help.

StarWatch

7 p.m.: Mar. 5 & 12

8 p.m.: Mar. 19 & 26

8:30 p.m.: Apr. 2, 9, 16, 23, & 30

BMACers need to arrive 30 min. early to set up.

BMAC Meetings

7 p.m., Discovery Theater

Feb. 4 Dr. Mick Whitelaw will speak on Earth's Magnetic Polarity Reversals.

Mar. 4 Meeting TBA.

EYE TO THE SKY *BY BOB SMITH*

February always seems to pass so slowly. I'm ready for some warmer days of early spring but Ol' Man Winter just seems to keep hanging on and on. Now is the time for some preplanning for spring observing and maybe the occasional trip out to those crystal-clear, but cold nights. You might also spend some time checking out all your equipment, cleaning and working on any problems that popped up last year.

Jupiter is still hanging in there, although it slips further west every evening. The "King of Planets" is still very accessible in the southwestern sky as the stars start to come out. In early February, Jupiter is about a quarter of the way up the western sky and well placed for observing. You should take advantage of each clear, warm (for February) evening and focus your telescope on Jupiter. By late in the month, it is only about 15° from the horizon and presents a much degraded face to the diligent observer. You should always start out with a low-power eyepiece and take in the spectacle of Jupiter's moons—Io, Europa, Ganymede and Callisto which are in constant motion. From time to time all four are on the same side of the planet and this month we may observe this happening twice. The evening of February 5 finds all four points of light east of the planet. On February 18 they are all located on the west of Jupiter. We also have two nice shadow transits of Jupiter by Io's shadow this month. The first on the 9th occurs from 6:15 p.m. EST to around 8:30 p.m. The second shadow transit on February 16 is visible from 8:15 p.m. till about 10:30.

Saturn is slowly returning to the evening sky. Although I don't stay up much past 9:30 or so, Saturn now rises before midnight in early February and as early as 9:00 p.m. late in the month. Perfect time for a few minutes of observing and then hitting the old sack. The "Ringed World" is still located in the constellation of Virgo and a little less than 10° above 1st magnitude Spica. When looking through your telescope, keep an eye out for the easily observable moon Titan. At 8th magnitude, it is quickly found in most any small scope. Titan is north of the planet on February 5th and 21st and due south on the 12th and 28th. If you have a medium (8-inch) or larger scope, try to pick out the 10th magnitude moons Tethys, Dione and Rhea. These three are inside the orbit of Titan and generally appear to be closer to the planet. The Cassini spacecraft is still swooshing through the Saturnian system and taking wonderful observations of the planet and moons. I just checked online and everything is going well. On January 14th, the spacecraft passed within 43 miles of the surface of Rhea and sent back incredible pictures. It never ceases to amaze me that at one BILLION miles we can send a spacecraft this close to another world and have it live to tell the tale.

Venus is a predawn event and rises a couple hours before sunrise. The -4.2 magnitude planet is simply unmistakable in the dark eastern sky. If any of your non-astronomical friends ask you about any planet or bright "star" in the sky, it is usually Venus. If you have your telescope out, a look at Venus will show the planet shrinking throughout the month going from about 20″ at the start of February down to 16″ on the 28th. The morning of the 28th finds the thin-crescent Moon rising just before bright Venus. A photo of the pair only a little more than 5° apart is easily obtained with most any small camera (don't forget to turn off your flash) and a sturdy support or tripod. Try to include a foreground object such as a tree or barn or such.

The prominent asteroid 7 Iris is well placed for observing this month. The 8th magnitude space rock passes through Cancer and into the edge of Gemini by the end of February. It passes several similar magnitude stars through the month so sketches of the general area are required over a several hour period. The dot of light that moves is the asteroid. On the 4th and 5th, it passes close to 8 Cancerii and is quite close to other fairly bright stars throughout the month. Locate a finder chart online or use your favorite publication. It's a lot of fun to track down these "Space Vermin." Asteroid 7 Iris was discovered in 1847 by J.R. Hind and was his first discovery. Although the space rock was the 7th discovered, it is fourth in brightness among the minor planets. Its size is about 150 X 120 miles and is the source of many meteorites which have landed on Earth.

STAR STUFF *BY TERRY ALFORD*

Last November, I pondered over getting a Coronado PST (Personal Solar Telescope or a Lunt LS35T/ Hα (Lunt Solar 35 {aperture in mm} Telescope/Hydrogen alpha). These two solar telescopes are similar in physical size, they each weigh about 3 lbs and they are priced exactly the same. Some differences are that the PST comes with an eyepiece, has a built-in modified Sol Ranger Sun Finder, internal focuser and a screw-on metal objective lens cover. It is advertised as a <1.0 angstrom 40 mm f/10 telescope. The Lunt does not come with an eyepiece nor Sol Finder. It does have mounting rings on a small dovetail for mounting and a more conventional looking star diagonal with a built-in helical fine focuser. It is a <0.75 angstrom 35 mm f/11.4 telescope.

If you read my last month's column, you may remember that a review I read said the Lunt at <0.75 angstroms performed noticeably better than the PST at <1.0 angstrom even though the PST has a larger objective and can resolve a little more detail. So I ordered the Lunt. As soon as the scope arrived I compared it to the PST. The PST looks a little different from most small refractors as it has a solid "star diagonal/eyepiece holder." The build quality seemed to be about the same with maybe a slight edge for the Lunt. I built a wooden platform to place both scopes side by side on my alt-az cradle mount and set about viewing the Sun. It was clear that day, how fortunate!

The Lunt's mounting rings allowed me to fine tune the aiming of the scope so that the Sun was visible in both instruments at the same time. To keep the comparison fair, I used two pairs of identical 25 mm and 15 mm eyepieces. The first thing I noticed was that the Lunt's helical

focuser seemed to have a finer and smoother focusing action compared to the small focuser knob on the PST. The PST also had some minor image shift as the focuser knob was turned back and forth. The Sun was a bright red disk in both scopes. Hydrogen alpha solar scopes normally have a "sweet spot" where smaller, fainter prominences pop into view and larger prominences show even more detail. In the PST it was in the lower right portion of the field of view. In the Lunt the sweet spot was nearly centered in the fov. And there were prominences! Both scopes showed several prominences of various sizes and shapes. Neat. There were spicules visible abound the edge of the solar disk. There was a small sunspot and some faint "surface" detail visible in the 15 mm eyepieces. The scopes did differ some in the construction of the etalon tuner. The PST had a large rubber ring near the middle of the scope that was not real easy to access. The Lunt has a small brass wheel that tuned the etalon. I think the Lunt was easier to tune.

The image was very sharp in both scopes at 27X with the 15 mm eyepieces. I only had one 10 mm eyepiece so I put it into the Lunt. The diagonal had to be slid in about 10 mm to reach focus. I was rewarded with a larger, more detailed and slightly fainter view. Still awesome, though. I moved the 10 mm eyepiece to the PST and discovered it had less inward focusing travel and would not come to focus. Bummer. Still I found some other, shorter focal length eyepieces that did come to focus in the PST and had fun experimenting with higher magnifications with both scopes.

Over the next few days I compared the two scopes on as many occasions as weather permitted. My conclusion was that there was nothing visible with the Lunt that

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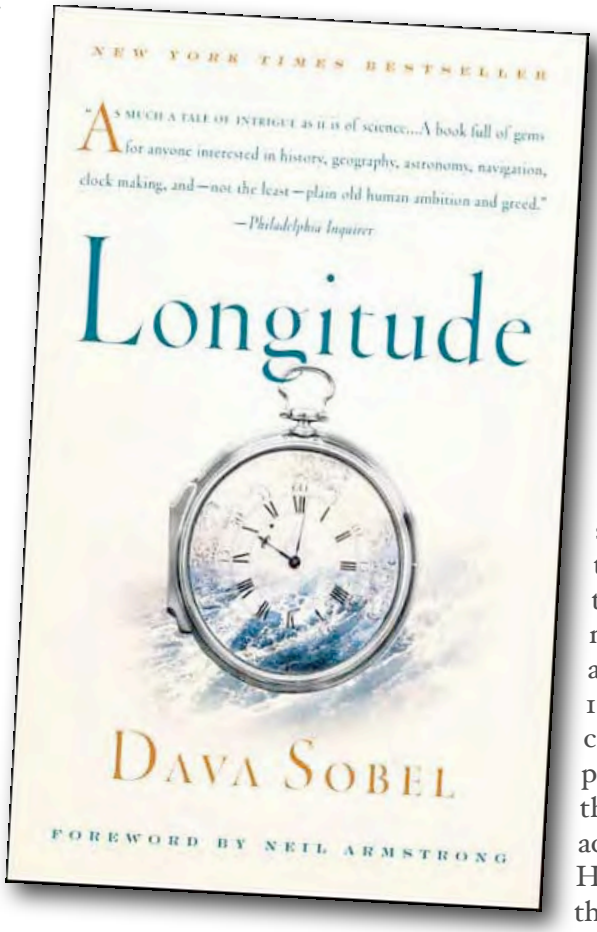
BOOK REVIEW: "LONGITUDE" *BY ROBIN BYRNE*

This month we'll look at another book written by Dava Sobel, "Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time."

Once again, Sobel tells the story of a scientific nature in terms of the people involved. In this case, the problem is how to determine your position while at sea. During the early days of exploration on the high seas, sailors could easily determine their latitude (position north-south) by observing the North Star. In the Northern Hemisphere, the North Star's altitude above the horizon (measured in degrees) is just about equal to your latitude. A similar technique could be used with stars near the South Celestial Pole in the Southern Hemisphere. However, longitude (position east-west) was trickier. Ideally, the sailor needed an object to determine the local time and a way to know the time at a home base. The difference between the times indicates your position east or west of the home base, where every hour difference equals 15 degrees of longitude. Local time could be found by observing the Sun's altitude. The trouble was, how do you know the time at your home base?

Because of the difficulty of determining position, countless ships and men had been lost at sea. In 1714, the British Parliament passed the Longitude Act, promising 20,000 British Pounds to the individual who could provide a repeatable way of determining longitude at sea to within half a degree (equivalent to within 30 nautical miles at the Equator). A Board of Longitude was established, based at Greenwich Observatory. As such, Greenwich became the reference point from which longitude would thereafter be measured. The Board members included government officials, naval officers, and scientists, including the Astronomer Royal. Over the next 114 years that the Board was in existence, many individuals served among its members.



The scientific members of the board were, from the start, leaning toward an astronomical solution. Since the "clock of the heavens" always runs on time, they were sure that, given tables with enough detailed positions and times, a few observations and calculations would then give the longitude. Many objects were considered for the observations. The moons of Jupiter were a popular choice, but you were limited to when Jupiter was visible. The position of the Moon relative to bright stars was also a prime contender, but again, was limited to when the Moon could be seen. Those limitations did not daunt a number of individuals from persistently pursuing these options.

Meanwhile, another solution was possible. Make a watch that would run accurately at sea. Use the Sun's position to determine local time, while the watch would show the time at Greenwich. The time difference would be the key to your longitude. Although, to modern minds, a watch that runs at sea seems simple enough, in the 18th century, it was not. Most clocks were so unreliable that people would use sundials to reset their clocks daily. The most accurate clocks used a pendulum. However, on a rolling ship at sea, that pendulum is not going to work. Not to mention that the parts will change shape and size when heated and cooled, or subjected to extremely high and low humidity levels. So, how can a clock work, and work extremely accurately, on a rolling ship, in a variety of temperature and humidity

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NASA SPACE PLACE

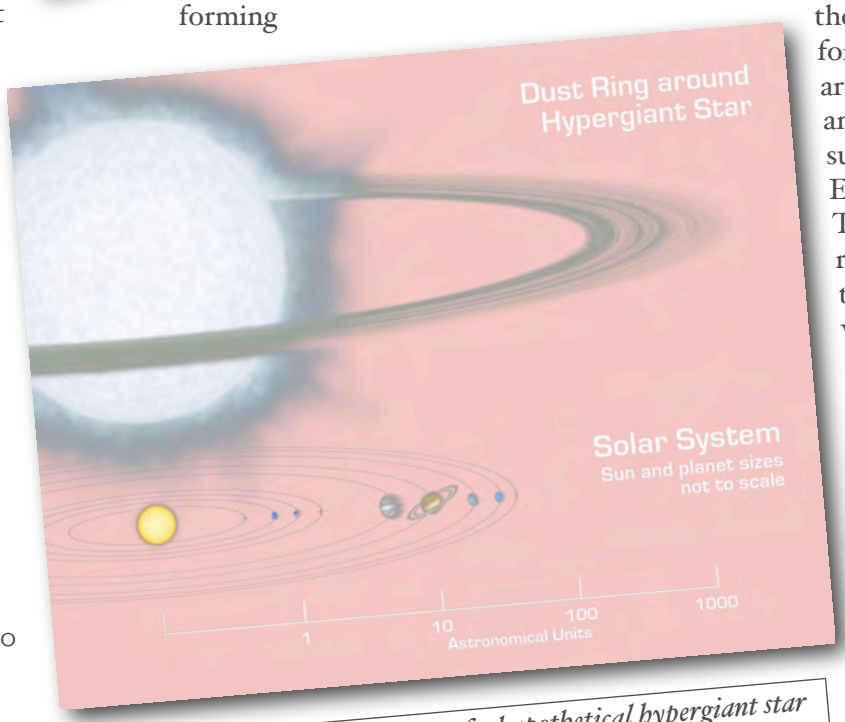
Planets in Strange Places

By Trudy E. Bell

Red star, blue star, big star, small star—planets may form around virtually any type or size of star throughout the universe, not just around mid-sized middle-aged yellow stars like the Sun. That's the surprising implication of two discoveries in 2006 from the 0.85-meter-diameter Spitzer Space Telescope, which is exploring the universe from orbit at infrared (heat) wavelengths blocked by the Earth's atmosphere.

At one extreme are two blazing, blue "hypergiant" stars 180,000 light-years away in the Large Magellanic Cloud, one of the two companion galaxies to our Milky Way. The stars, called R 66 and R 126, are respectively 30 and 70 times the mass of the Sun, "about as massive as stars can get," said Joel Kastner, professor of imaging science at the Rochester Institute of Technology in New York. R 126 is so luminous that if it were placed 10 parsecs (32.6 light-years) away—a distance at which the Sun would be one of the dimmest stars visible in the sky—the hypergiant would be as bright as the full moon, "definitely a daytime object," Kastner remarked.

Such hot stars have fierce solar winds, so Kastner and his team are mystified why any dust in the neighborhood hasn't long since been blown away. But there it is: an unmistakable spectral signature that both hypergiants are surrounded by mammoth disks of what might be planet-forming dust and even sand.



Artist's rendering compares size of a hypothetical hypergiant star and its surrounding dusty disk to that of our Solar System.

At the other extreme is a tiny brown dwarf star called Cha 110913-773444, relatively nearby (500 light-years) in the Milky Way. One of the smallest brown dwarfs known, it has less than 1 percent the mass of the Sun. It's not even massive enough to kindle thermonuclear reactions for fusing hydrogen into helium. Yet this miniature "failed star," as brown dwarfs are often called, is also surrounded by a flat disk of dust that may eventually clump into planets. (This brown dwarf discovery was made by a group led by Kevin Luhman of Pennsylvania State University.)

Although actual planets have not been detected (in part because of the stars' great distances), the spectra of the hypergiants show that their dust is composed of forsterite, olivine, aromatic hydrocarbons, and other geological substances found on Earth.

These newfound disks represent "extremes of the environments in which planets might form," Kastner said. "Not what you'd expect if you think our Solar System is the rule."

Hypergiants and dwarfs? The Milky Way could be crowded with worlds circling every kind of star imaginable—very strange, indeed.

Keep up with the latest findings from the Spitzer at www.spitzer.caltech.edu. Kids and their grownup friends can enjoy beautiful images from Spitzer while playing Spitzer Concentration at The Space Place spaceplace.nasa.gov/en/kids/spitzer/concentration.

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

MISCELLANEOUS

Star Stuff

by Terry Alford

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could not be seen in the PST. The Lunt seemed to have a brighter image which means that just a tiny bit more magnification might be useable. Elusive "surface" details were just a tiny bit easier to see in the Lunt. Even though the Lunt did not come with the Sol Ranger standard there is a Deluxe version that includes one and a wide field 10 mm eyepiece. This adds $150 to the price. Since I have plenty of eyepieces and a mount with a homemade Sun finder I opted for the basic package.

So why did that observer state that the Lunt was a clear winner a couple of years ago? I dunno. Since he was beta testing a prototype maybe he was sent a "ringer." Or perhaps the PST model he had was older and the newer ones perform better. There are physical differences in these scopes as mentioned above but both scopes provide a lot of "bang for the buck." I think nearly any observer starting out with Hα observing of the Sun would be very happy with either telescope.

Happy Birthday

by Robin Byrne

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conditions? The man who would ultimately find the answer to that question was a clock maker named John Harrison.

Dava Sobel takes you through the high's and low's of Harrison's quest to build a clock that would meet the needs of accurately determining longitude at sea, while providing a glimpse into Harrison's compulsive, perfectionist nature. Along the way, you meet his allies and nemeses, and get a taste of their personalities, as well. As is Sobel's style, the story of the individuals is inextricably intertwined with the science, providing the complimentary coordinates that keep your bearings on this rolling journey.

"Longitude" by Dava Sobel, Walker & Company, 1995

Regular Contributors

BRAD DUNN

Brad is the current chair of the club and a member since 2007. During the day, he runs Dunn Professional Billing and Dunn Construction.

BOB SMITH

Bob is a founding member of BMAC, since 1980. He has also served as chair many times over the years. He currently works at Pioneer Industrial Sales.

TERRY ALFORD

Terry is also a founding member since 1980 and has been chair many times, as well. He has worked as an astronomy lab instructor at ETSU since 2001 and is also the sole proprietor of Celestial Woodworks.

ROBIN BYRNE

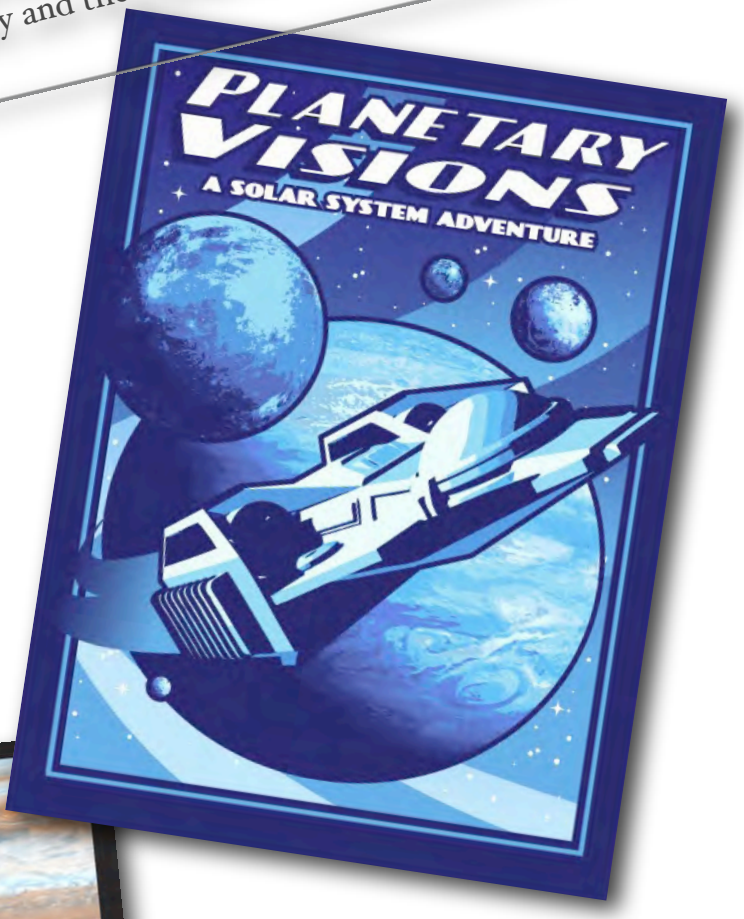
Robin has been writing the science history column since 1992 and was chair in 1997. She is an Associate Professor of Astronomy & Physics at Northeast State Community College (NSCC).

ADAM THANZ

Adam has been the Editor for almost all of the years since 1992. He is the Planetarium Director at Bays Mountain Park as well as an astronomy adjunct for NSCC.

See "Planetary Visions"

Bays Mountain's latest planetarium creation. It's filled with surprises and sure to please.
Your whole family will love this adventurous tour of the Solar System!
The show will run through February and then return for Summer 2011.



The Bays Mountain Astronomy Club

Find out more at our website:
www.baysmountain.com
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Dues:

The Bays Mountain Astronomy Club requires annual dues for membership. It covers 12 months and is renewable at any time.

Rates:

$12 /person/year

$4 /additional family member

If you are a Park Association member, a 50% reduction in fees is applied.

Made on a Mac!

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