ECLIPSE

The Newsletter of the Barnard-Seyfert Astronomical Society

Organized in 1928

May 2012

The Membership meeting will be held on May 16, 2012 at the Cumberland Valley Girl Scout Council Building located at the intersection of Harding Place and Granny White Pike at 7:30 pm.

This month's membership meeting program will be a presentation on the upcoming June 5, 2012 Transit of Venus – the last such event until 2117 - by Theo Wellington. This program will touch upon the history and significance of past transits, provide observing tips, and give current venues with sessions for public viewing. Ms Wellington is a BSAS member and on the staff of the Sudekum Planetarium at the Adventure Science Center in Nashville.

Upcoming Events

Board of Directors Meeting, May 2, at the Cumberland Valley Girl Scout Building – 7:30 pm

Membership Meeting, May 16, at the Cumberland Valley Girl Scout Building – 7:30 pm

In this issue

President's Column

The news these days is rather grim: the U.S. economy is growing only slowly, while China's is roaring ahead. The U.S. appears to be in retreat in space exploration as well, with the space shuttles now museum pieces and astronaut commutes to the International Space Station (ISS) dependent upon Russian space vehicles. Meanwhile, China continues to make impressive gains in space, having become in 2003 the third nation after Russia and the U.S. to put an astronaut (or "Taikonaut" to the Chinese) in space. The Chinese space program even managed last November the difficult feat of orchestrating a remote-controlled docking of two unmanned spacecraft in orbit.

But let's review the record more closely. True, the Chinese are making strides. But the U.S. (both its government and private sector) is not dormant. Elon Musk's Space Exploration Technologies Corporation (better known as "SpaceX") is scheduled to launch its Dragon-X space capsule atop one of the company's Falcon 9 launch vehicles to rendezvous with the ISS in the next few weeks. That will restore U.S. capability to at least resupply the ISS and is a major achievement for a relatively small, private company with around 1500 employees. While "man-rating" the reusable Dragon-X capsule for crewed missions is a substantial challenge, SpaceX is intent on meeting that challenge by about 2016, restoring a U.S. capability to independently send astronauts to the ISS. SpaceX has even designed the Dragon-X capsule's heat shield to endure the higher reentry temperatures produced by a mission to the moon or Mars.

NASA is not comatose either, despite the retirement of the highly capable but aging and wickedly expensive space shuttles and termination of the Constellation program and its Ares launch vehicle. NASA, through its contractor Lockheed Martin continues work on the Orion space capsule, a larger and more capable capsule than Dragon-X. Orion is designed from

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Free Telescope Offer!
Did someone say free telescope? Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time. We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books. Some restrictions apply. A waiting list is applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear. For information on what equipment is currently available, contact Lonnie Puterbaugh at 615-661-9540.

Observing Highlights

Moon phases

May 2012
05/05 FULL Moon
05/12 LAST Quarter
05/20 NEW Moon
05/28 FIRST Quarter

June 2012
06/04 FULL Moon
06/11 LAST Quarter
06/19 NEW Moon
06/26 FIRST Quarter

Objects:

Galaxies
M51, M65, M66

Globular Clusters
M3, M53

Multiple Star Systems
Algeiba (Gamma Leonis)
Izar (Epsilon Bootes)
Alkalurops (Mu Bootes)

Planets
Venus, Mars, Saturn

BSAS STAR PARTIES FOR May & June 2012

May 18 Public Star Party at Bell's Bend Outdoor Center 8:30 – 10:30 pm Mars, Saturn, double stars, star clusters, galaxies

May 19 Private Star Party at Natchez Trace Parkway mm 412 (Water Valley Overlook)
NOTE: May be replaced by a joint star party with the Cumberland Astronomical Society
Check the BSAS website for update & details

Jun 05 Public Viewing of Solar Transit of Venus at Adventure Science Center 4:00 – 6:30 pm
Followed by Public Evening Star Party 7:30 – 9:30 pm (Mars and Saturn)

Jun 05 Public Viewing of Solar Transit of Venus at Bowie Nature Park (Fairview) 4:00 – 6:30 pm

Jun 16 Private Star Party at Natchez Trace Parkway mm 435.5

Jun 23 Public Star Party and telescope clinic at Long Hunter State Park 8:30 – 10:30 pm Moon, Mars, Saturn, double stars, star clusters, nebulae

Happy Birthday Theodore von Karman by Robin Byrne

This month, we celebrate the life of the man known as "the father of supersonic flight." On May 11, 1881 Karman Todor was born in Budapest, Austria-Hungary. He later changed his name to Theodore von Karman. With a professor for a father and a descendant of scholars for a mother, it wasn't surprising that Theodore would be academically inclined. By the age of 6, he was already solving arithmetic problems in his head faster than his older brother could using paper and pencil.

After attending an elite elementary school, which was founded by his father, Theodore enrolled with a major in mechanical engineering at the Royal Joseph Technical University in Budapest (today it is known as the Budapest University of Technology and Economics). After attending an all-night party in Paris with friends, they watched a French aviation pioneer, Henri Farman, fly 1.25 miles. This inspired Theodore to devote his life to aeronautics. In 1902 he graduated and enrolled in the University of Gottingen, where he received his doctorate in 1908.

His first job was teaching at Gottingen. While there, he studied vortices in fluid flow. The vortices can create a form of drag, which prevents planes from flying. They are now known as Karman's Vortex. In 1912, Karman was offered the position of Professor of Aerodynamics and Director of the Aeronautical Institute at RWTH Aachen, Germany. Here, he continued his study of fluid dynamics.

In 1914, when World War I began, Karman returned to Hungary, where he headed research for the Austro-Hungarian Army Aviation Corps. To solve a problem they had with their observation balloons, Karman developed a device that could be tethered to the ground while maintaining flight hovering above ground. This design would eventually evolve into a helicopter.

After the war, Karman wanted to reconnect with colleagues from other nations. He helped organize an international symposium on aerodynamics and hydrodynamics in Innsbruck, Austria in 1922. The result of the meeting was the establishment of the International Applied Mechanics Congress Committee. This eventually became the International Union of Theoretical and Applied Mechanics, for which Karman was the honorary president. Throughout the 1920's, Karman traveled to many countries, continuing to establish better international cooperation. In 1926, he came to the United States to act as an advisor at the California Institute of Technology (Caltech) for the development of a graduate school in aeronautics.

Being of Jewish descent, by 1930 Karman no longer felt safe in Germany. He moved to the United States and became Director of the Guggenheim Aeronautical Laboratory at Caltech (GALCIT). The lab soon became the hub of all aeronautic research. In 1932, while working on ideas related to supersonics, Karman made a breakthrough by combining multiple equations describing faster-than-sound flow behavior into a single equation, which could then be applied to multiple positions along the object in motion. This is now known as the Karman-Moore Theory.

In 1936, The US Army Air Corps approached Karman to help develop aircraft that could use jets to shorten their takeoff distance (especially for aircraft flying off of aircraft carriers). The Jet Assist Take-Off (JATO) project led Karman, along with Frank Malina and Jack Parsons, to develop the Aerojet Company to develop the rocket motors. That same year, Karman became a U.S. citizen.

In 1939, General Henry "Hap" Arnold approached Karman about developing a wind tunnel for the Air Force. Built at Wright Field in Ohio, the wind tunnel was 20 feet across, and used 40,000 horsepower to produce the wind. This was the first large-scale wind tunnel ever built, and was put to good use by the Air Force to develop cutting edge aeronautic designs.

During World War II, Karman was frequently consulted by the U.S. military for analysis of rocketry being used by Germany. In 1944, Karman and others from GALCIT founded the Jet Propulsion

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Laboratory at Caltech. Here he began his study of using swept-back wings to reduce turbulence, which are now standard design.

In the summer of 1944, Karman was diagnosed with intestinal cancer, and went to New York City for the surgery. His recovery was slow and kept him in New York through the fall. Here, he ran into "Hap" Arnold, who asked Karman to lead the newly developed Scientific Advisory Group for the military. Karman accepted the offer, and in December of that year, left Caltech and moved to Washington, D.C.

After World War II, Karman and others traveled to Germany to investigate German rocket facilities. He brought back to America information that helped the Air Force develop the facilities necessary to produce jet propulsion, ballistic missiles and supersonic aircraft. What ensued was the Arnold Engineering Development Center in Tennessee.

In 1960, Karman developed the International Academy of Astronautics, which, 2 years later, hosted the First International Symposium on the Basic Environmental Problems of Man in Space, held in Paris. This was the first time scientists from the United States and the Soviet Union shared their research on manned spaceflight with each other.

In 1962, President Kennedy awarded Karman the first National Medal of Science. In his speech, Kennedy cited Karman "For his leadership in the science and engineering basic to aeronautics; for his effective teaching and related contributions in many fields of mechanics, for his distinguished counsel to the Armed Services, and for his promoting international cooperation in science and engineering."

In May of 1963, Karman was on a trip to Aachen, Germany, when he unexpectedly died. He was buried in Pasadena, California, near Caltech. Although he never married, Karman was remembered as a man who enjoyed the company of colleagues from a wide variety of backgrounds, and was described as a colorful character. His legacy lives on in many ways, including: the annual awarding by the American Society of Civil Engineers of the Theodore von Karman award in mechanical engineering, Karman craters on the Moon and Mars, the boundary between Earth's atmosphere and space is called the Karman Line, and his image was on a 1992 U.S. stamp.

It's easy to forget the close ties between the early space program and conventional aeronautics, but in the beginning, they were one and the same. From the National AERONAUTICS and Space Administration to the Jet Propulsion Laboratory, aircraft were always a part of their intended mission. Theodore von Karman was an instrumental figure in those early developments, and for that we owe him our thanks.

References:

Theodore von Karman - Wikipedia
http://en.wikipedia.org/wiki/Theodore_von_Kármán

Theodore von Karman
http://www.nas.edu/history/members/karman.html

Theodore von Karman by Marco Casillas
http://www.csupomona.edu/~nova/scientists/articles/vonk.html

Theodore von Karman
http://www.centennialofflight.gov/essay/Theories_of_Flight/von_Karman/TH21.htm

SHOP AND/OR SWAP (new)

The BSAS is trying out a SHOP AND/OR SWAP section in the Eclipse.
The ground rules until set by the Board of Directors are as follows:

1. Each participant must be a fully paid up member in good standing in the BSAS;
2. He/She must furnish the text in Word or a compatible format. Pictures will be jpeg or equal.
3. Your contact address must be included so that all negotiations may be done independently of the BSAS or the Eclipse.
4. Your ad will be posted free for a period of two consecutive Eclipses, but must be removed as soon as a sale or swap has occurred.

Joe Velasquez

Meade 6" EXT-LS ACF comes with eye pieces, 26mm, 6.4mm, 9.7mm and ac adapter. Asking $800.00. Call Joe at 931-801-0641

John Harrington

FOR SALE: 14" F/5.2 dobsonian telescope (truss-tube type). In overall good mechanical and optical shape. Primary mirror sold to me years ago as a Swayze regrind of an amateur mirror, but not signed so can't confirm. Primary has a 3/8" x 3/8" clamshell chip at the edge that can be partially hidden by mirror clip. Secondary is an Antares 3.1" in very good condition. Includes Telrad finder and 2" focuser (older Meade unit). Nice 'scope, but a little more than I need these days. Asking $750. If interested, please contact John Harrington at 615-739-4500.

Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, April 4, 2012

The board of directors of the Barnard-Seyfert Astronomical Society (BSAS) met in regular session at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee on April 4, 2012. A sign-in sheet was passed around in lieu of a roll call. Board members Dr. Spencer Buckner, Steve Cobb, Bill Griswold, John Harrington, Melissa Lanz, Bob Norling, Curt Porter, and Bob Rice were present. Board members Joe Boyd, Kris McCall, and Theo Wellington were absent. A quorum being present, President John Harrington called the meeting to order at 7:43 P.M.

Treasurer Bob Norling reported that the BSAS had $2,048.53 in its regular checking account and $1,056.95 in its equipment account. Bob Rice, reporting for the Program Committee, stated that Dr. Chuck Higgins had confirmed that he would be the speaker at the upcoming April 18 membership meeting. John Harrington announced these upcoming star parties:

- Apr 21 – Messier Marathon @ Mark Manner's Spot Observatory (Back-up date for prior clouded out event).
- Apr 28 – Public star party @ Edwin Warner Park from 8:00 to 10:00 P.M.

John Harrington stated that a joint star party with the Cumberland Astronomical Society was tentatively planned for May 19 at Fort Bledsoe State Park, but was still awaiting final confirmation. He noted that this meeting would simply replace a private star party scheduled for that same date. Curt Porter stated that he had a logo for our previously discussed star party directional signs and would try to obtain price estimates to present at the next board meeting. Mr. Harrington emphasized that the upcoming solar transit of Venus during the afternoon of June 5 would be a major public outreach event at several mid-state venues and suggested that we contact Jana Ruth Ford, our NASA Night Sky Network representative, about obtaining related educational materials from that organization. He also reminded the board about our first telescope clinic scheduled for the June 23 public star party at Long Hunter State Park and suggested that members bring appropriate tools to assist attendees with their telescopes.

John Harrington announced that he and Mike Benson travelled to Austin Peay State University to present free BSAS memberships and $100.00, $50.00, and $25.00 monetary prizes to the top three astronomy project winners at the Middle Tennessee Science and Engineering Fair awards ceremony on April 2, 2012. Mr. Harrington asked the board for their input and comments regarding the new prototype BSAS website being developed by Webmaster Drew Gilmore. He also commented that he had emailed BSAS member Lonnie Puterbaugh about the Society's loaner telescopes and equipment and that he would try to get a copy of the last inventory from Joe Boyd.

Editor Bill Griswold asked board members to submit items of interest for inclusion in the BSAS' *Eclipse* newsletter. Dr. Terry Reeves said that he would provide "What's Up" tips about seasonal objects to be observed. John Harrington said that he send a list of astronomical equipment that he had for sale. Bob Rice said that he would provide a current list of upcoming star parties. The board again briefly discussed sending complementary copies of the *Eclipse* to area astronomy clubs.

Since there was no further business to discuss President John Harrington declared the meeting to be adjourned at 8:22 P.M.

Respectfully submitted,
Bob Rice, Secretary

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held on Wednesday, April 18, 2012

President John Harrington called the meeting to order at 7:43 P.M. in the Cumberland Valley Girl Scout Center and welcomed members and visitors. Treasurer Bob Norling reported that the BSAS had $2,271.05 in its regular bank account and $815.95 in its equipment account. John Harrington announced these upcoming events and star parties:

- Apr 21 – Messier Marathon at Mark Manner's Spot Observatory.
- Apr 28 – Public star party at the Warner Park's Nature Center from 8:00 – 10:00 PM.
- May 18 – Public star party at Bell's Bend Outdoor Center from 8:30 – 10:30 P.M.
- May 19 – Private star party at Natchez Trace Parkway mm 412 (Water Valley Overlook)
- Jun 05 – Public Viewing of Transit of Venus at the Adventure Science Center from 4:00 – 6:30 P.M. Followed by an evening public star party from 7:30 to 9:30 P.M.
- Jun 05 - Public Viewing of Transit of Venus at Bowie Nature Park (Fairview) from 4:00 – 6:30 P.M.
- Jun 16 – Private star party at Natchez Trace Parkway mm 435.5.
- Jun 23 – Public star party & telescope clinic at Long Hunter State Park from 8:30 to 10:30 P.M.

Mr. Harrington also reported that a joint star party with the Cumberland Astronomical Society was tentatively planned for May 19, but not yet finalized. This event would simply replace the private star party listed above for this same date.

John Harrington announced that a "swap & sell" section will be added to the *Eclipse* newsletter starting with the May 2012 issue. Mr. Harrington also asked attendees to consider serving as volunteer drivers for members who would otherwise be unable to attend BSAS meetings. He said that a sign-up list will be circulated at the next membership meeting on May 16.

John Harrington introduced Dr. Chuck Higgins, Associate Professor of Physics and Astronomy at Middle Tennessee State University, who delivered the evening's program on "Radio Astronomy." Dr. Higgins began his presentation by describing the radio emission portion of the electromagnetic spectrum and especially the frequency bands most used for detecting astronomical objects. He emphasized the particular ability of radio waves to penetrate the galactic dust that obscures and blocks optical observations. In addition, he named some of the major discoveries and uses of radio astronomy including the cosmic microwave background that is a remnant of the Big Bang; radio galaxies powered by super-massive black holes; neutron stars and pulsars; some of the first exoplanets discovered; cold interstellar gas; and gravitational lensing – a prediction of Einstein's General Relativity. Dr. Higgins also touched upon the history of radio astronomy including the early work of Karl Jansky and Grote Reber in the 1930s. He followed this by describing some of the current famous radio telescopes including those at Arecibo in Puerto Rico and Green Bank in North Carolina along with the Ratan 600 in Russia, the Very Long Array in New Mexico, and the Allen Telescope Array in northern California. Dr. Higgins spent some time describing the basic components of a radio telescope such as the collector, receiver, and recorder along with the various antenna types including dipoles, dishes, and arrays. He concluded by talking about the Radio Jove project, a joint endeavor by NASA and the Goddard Space Flight Center, that encourages amateur participation in radio astronomy by making inexpensive radio receiver kits available along with detailed instructions and a website for communicating and exchanging information. Following his presentation, Dr. Higgins graciously answered questions from the audience.

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In a very pleasant surprise to all John Harrington introduced Vamsi Subraveti, a middle school student at Martin Luther King Magnet School, who received the BSAS sponsored $100.00 1st place award for the best astronomy related project at the Middle Tennessee Science and Engineering Fair on April 2, 2012. Using diagrams and printed materials mounted on a three-part poster board, Vamsi delighted the audience with a very mature and professional description of his winning project: Gravitational Slingshots – The Roundabouts In Space. His impressive graphic display used published data about Cygnus X-1, the first discovered stellar mass black hole, to calculate and describe how a hypothetical spacecraft could enter into an approach around this object to achieve a "gravitational slingshot" or extra acceleration boost as has been done by several of NASA's unmanned spacecraft around other planets on their long journeys to far-away destinations. This was followed by an enthusiastic round of applause when Vamsi completed his very impressive presentation.

Since was no additional business to discuss, President John Harrington declared the membership meeting to be adjourned at 9:06 P.M.

Respectfully submitted,
Bob Rice, Secretary

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the start for long-duration, deep space missions to asteroids and Mars. Launch vehicles for Orion will include the existing Delta IV and Atlas V rockets and possibly an upgraded version of SpaceX's Falcon 9 launch vehicle. First launch of an (unmanned) Orion spacecraft is scheduled for 2014.

So next time you read headlines about the latest Chinese accomplishments in space, just remember that China's program is roughly where the U.S. was towards the end of the Gemini program, when the U.S. was learning how to conduct a spacewalk. And that, folks, was the late 1960s. To date, China has about 19 person-days in space; the U.S. figure is over 15,000 person-days. No doubt the Chinese will advance quickly by building on the knowledge accumulated over five decades by the U.S. and Russian space programs (some of it obtained through espionage), but the U.S. still has a massive lead. The U.S. need not cede its leadership to the Chinese so long as our economy recovers and we have the will to persevere in space.

Clear skies,

John Harrington