North Central Florida's
Amateur Astronomy Club
29°39' North, 82°21' West

May / June 2010
Issue 93.1/94.1

Member
Astronomical
League

Member
International
Dark-Sky Association

FirstLight

Newsletter of the Alachua Astronomy Club

NASA Early Morning Launch of Discovery STS-131 Provides Quite a Show!

Photo Below: Taken in Titusville on SR 406 / 402 Causeway by Mike Lewis. The camera is a Nikon D2X with Nikon 400mm / f2.8 lens on automatic exposure (f8 @ 1/250s). "First night launch I've made it to in a while, and it was great." - Mike Lewis

Photo Below: Time-lapse photo by Howard Cohen taken from SW Gainesville (190 seconds long, beginning 6:22:52 a.m. EDT). "I like others was struck by the comet-like contrail that eventually followed the shuttle as it gained altitude." - Howard Cohen

Newberry Sports Complex *and* Observatory **Rich Russin** | **The President's Corner**

As we head to press, work continues towards the establishment of an agreement between the AAC, the NSC, and the City of Newberry that would establish a permanent observing site on the grounds of the Newberry Sports Complex. The outcome will almost certainly be known before the next newsletter.

For those of you not familiar with the project, the club has been offered an opportunity to establish a base for both club and outreach events. Part of the proposal includes a permanent observing site, onsite storage, and possibly an observatory down the road. In return, the club will provide an agreed upon number of outreach events and astronomy related support for the local school science programs.

A steering committee has been charged with identifying the specifics of the agreement. The committee has met several times and produced a draft of the memorandum of understanding. Members of the committee include myself, Joe and Gay Haldeman, Chuck Broward, Tandy Carter, Marianne Gamble, Bob Lightner, Ivo Rabell, and Mike Toomey. Ivo and Mike have taken lead roles in helping with the committee planning and final preparations before we seek approval. I hope to have good news for you in the next newsletter.

Have Scope, Will travel:

Last month I asked if anyone had a story to share about a time where they combined travel and astronomy. I have always enjoyed a good tale of times on the road and this sounded like a great combination. First to reply was Andy Howell. Here is his story of a desperate attempt to save a once-in-a-lifetime moment. As it turned out, it was a 'Kodak' moment!

"My memory of observing on the road is the Venus transit in 2004. The transit occurred when I was scheduled to teach a six sigma class at Cooper Tire in Ohio. Prior to leaving Gainesville for Ohio, I packed my observing equipment. It consisted of No. 14 welder's glass and my unaided eye. I figured that with my keen eyes, I would be able to see Venus silhouetted on the disk of the sun.

Soon after sunrise on June 8, 2004, I stationed myself in the hotel parking lot and faced east. The sky was clear, but I noticed there was already quite a bit of heat rising off the parking lot and buildings on this steamy morning. I held up the filter and peered at the sun. To my shock, Venus was almost impossible to discern. The rising heat waves were wiping out the contrast between Venus and the sun. Every now and then, I thought I saw something in the lower right corner of the sun, but it was hard to tell.

Continued on page 4

Photo Credit: Andy Howell—Venus transit in 2004

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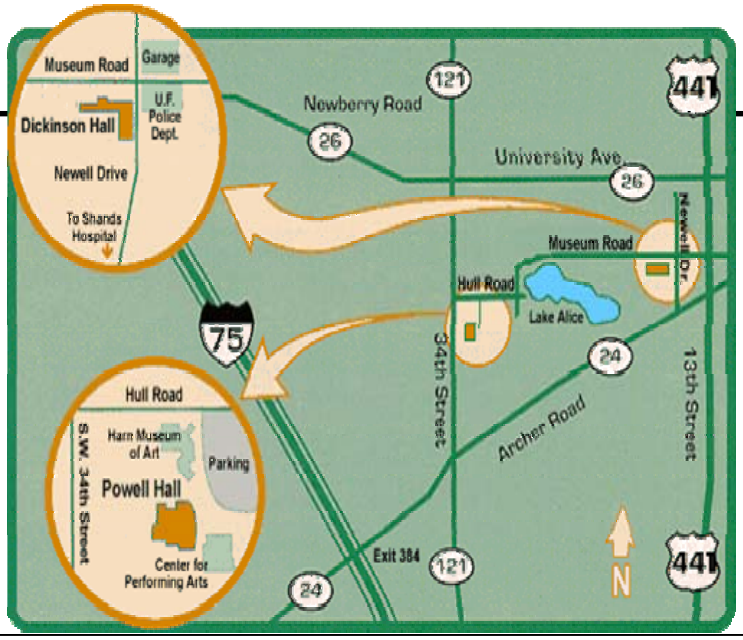
AAC Meeting Location - AAC regular meetings are held on the second Tuesday of each month **at 7:00 p.m.** at the Florida Museum of Natural History, **Powell Hall**, in the Lucille T. Maloney Classroom, on UF campus, unless otherwise announced. All meetings are free and open to the public. Join us for some great discussions and stargazing afterwards. Please visit our website for more information (floridastars.org). There is no monthly meeting in December.



Submitting Articles to FirstLight

The AAC encourages readers to submit articles and letters for inclusion in *FirstLight*. The AAC reserves the right review and edit all articles and letters before publication. Send all materials directly to the *FirstLight* Editor.

Materials must reach the *FirstLight* Editor at least 30 days prior to the publication date.

Submission of articles are accepted **by e-mail or on a CD**. Submit as either a plain text or Microsoft Word file. (In addition, you can also send a copy as a pdf file but you also need to send your text or Word file too.) Send pictures, figures or diagrams as separate gif or jpg file.

Mailing Address for Hard Copies or CDs

Note: Since our mailbox is *not* checked daily, mail materials well before the deadline date. (Hence, submission by e-mail is much preferred!)

c/o FirstLight Editor
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By E-Mail; Send e-mail with your attached files to **FirstLight@floridastars.org**.

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The President's Corner - continued from page 2

I realized I needed optical aid. I hopped in the car and dashed across the highway like a mad man to the Wal-Mart. I ran into the store and bellowed at an employee to direct me to the binocular section. It was at the far end of the store.

I huffed and puffed all the way to the end, grabbed a $10 pair of binoculars and ran at full gallop back to the cash register. Excitedly, I paid the cashier, jumped back into the car and careened across the highway to the hotel. I tore open the binocular packaging, pulled out the binoculars and held the welder's filter in front. Ah, yes, now I could see Venus clearly as a black dot in the lower right part of the sun's disk.

One of the Cooper Tire students snapped several pictures as I held the binocular and filter in front of his digital camera.

The attached image is not great, but it proves that I witnessed the Venus transit of 2004."

I got another response from Jeff Majewski, who combined a recent beach vacation with the launch of space shuttle Discovery's mission STS-131 on April 5 . For those of us who witnessed the launch, there was point after liftoff where the vapor trails began to look very ominous. I am aware of a number of people who quickly turned to the news for reassurance that nothing catastrophic had occurred. As it turned out, the launch went well with the only issue being a malfunction of the Ku-Band antenna system. Here is a note from Jeff's recollection of the launch:

"Up at 0600 to get in a good position on the coast in Ormond Beach for the launch. At 0621 the south-southeast lights up a bright orange against a dark pre dawn sky as shuttle Discovery reaches for space. Appearing like a comet with a large coma trailing behind, the shuttle disappears leaving only an iridescent vapor trail to mark its passage to space. "

Thanks to both Andy and Jeff for sharing their experiences (and photos) with us.

Next Issue:

As you have likely figured out by now, I enjoy the cultural side of astronomy as much as the technical. However, the tech side deserves a chance to share their deepest knowledge. For my next column I am asking our equipment aficionados to share their favorite astronomy hack. My challenge to them is to share one I have not heard. Email away!

Rich Russin,
President,
Alachua Astronomy Club
president
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Photo Credit:: Jeff Majewski - Space shuttle Discovery's mission STS-131

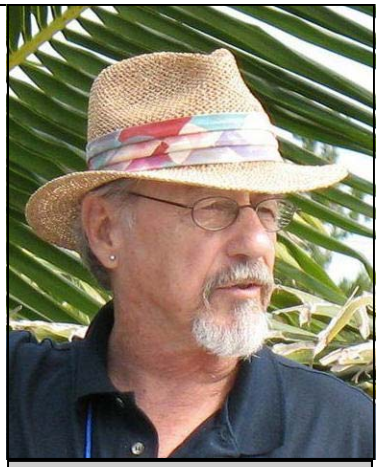
May Club Meeting

Tuesday, May 11, 2010, 7:00 p.m. ET

Speaker: Tippy D'Auria

Title: *Solar Heliocentric Illustration Tissue*

Location: Powell Hall, Florida Museum of Natural History (*Lucille T. Maloney Classroom*), UF Campus, Gainesville FL



Tippy D'Auria

Preview: This presentation takes one on an imaginary stellar journey, from the Sun out to one of our nearest stars, Sirius. This trip is taken at the speed of light, stopping along the way at each of the planets, using a new method for measuring distances at each stop. This new method is one that will make even old timers remember some of the distances. This is a great outreach presentation. It is both funny and informative.

About the Speaker: Tippy D'Auria is a retired Electronics Engineer and has a degree in Electronics Engineering Technology, and a degree in Computer Integrated Manufacturing. He has been an active astronomer since 1980. He is currently a member of the Southern Cross Astronomical Society and has served as a member of the Societies Board of Fellows and was a Vice President of that Society for many years as well. Tippy is also a member of the Local Group of Deep Sky Observers, the Institute for Planetary Research Observatories (IPRO), Association of Lunar and Planetary Observers (ALPO), The Alachua Astronomy Club and the Astronomical League. He is also a founding board member of Astronomy Outreach Network and an advisor for the Meade 4M Community.

Tippy is the founder of the Winter Star Party which is sponsored by the Southern Cross Astronomical Society and has been the Chairman of that Star Party for thirteen of its twenty five years. Tippy D'Auria is an international lecturer and has lectured on Astronomy at many Universities and Astronomy Clubs. He has been a guest speaker at the Winter Star Party on eighteen different occasions and has also been a guest speaker at events such as the Texas Star Party, Mt. Kobau Star Party, Southern Star Conference, Hidden Hollow Astronomy Convention, Peach State Star Gaze, Starfest Convention, Highlands Star Gaze, Nebraska Star Party, Chiefland Star Party, the 4th Annual Congress of Central American Astronomers and many Astronomy Day Conferences.

In 1987 and 1988 he was awarded the Southern Cross Astronomical Societies "Joe T. Doris Service Award for Outstanding Contributions". In 1992 he was honored with a Lifetime Membership to the Southern Cross Astronomical Society for Meritorious Service to that Society. In 2001, Tippy received recognition for his contributions to amateur astronomy, as he was honored by the International Astronomical Union, when an asteroid was given the name "11378 DAuria". He received the 2007 Astronomical League Award for his many contributions to the astronomical community and in 2008 he received the Astronomy Outreach Award in recognition of his contributions to public outreach and education.

In April of 2001, Tippy led an expedition to the Volcanoes of Costa Rica, to film a National Geographic documentary called "The Volcano Hunters". In June of 2001, he joined an elite group of some of the world's best planetary astronomers on a mission to record a predicted flash on the red planet...flashes that may be reflections from ice or other highly reflective land features on Mars in a region called Edom. He is also the author of numerous articles and papers and co-authored, along with Vic Menard, the definitive book on telescope collimation, "Perspectives on Collimation - Principles and Procedures".

Tippy is also an amateur telescope maker who has several instruments of 2, 4.5, 6, 10, 12, 14, and 18 inch aperture. His main astronomical interests are astrophotography, deep sky observing and solar system observing.

He is also a volcano hunter, and enjoys exploring and photographing active volcanoes, and is a member of the International Volcano Watch team.

Chasing the Pole

— Howard L. Cohen

Polaris like supernal beacon burns, a pivot-gem amid our star-lit Dome
~ Charles Never Holmes (1916)

New star gazers often believe the North Star (*Polaris*) is brightest of all, even mistaking Venus for this best known star. More advanced star gazers soon learn dozens of nighttime gems appear brighter, forty-seven in fact. Polaris only shines at magnitude +2.0 and can even be difficult to see in light polluted skies. On the other hand, *Sirius*, brightest of all nighttime stars (at magnitude -1.4), shines twenty-five times brighter!

Beginning star gazers also often believe this guidepost star faithfully defines the direction north. Although other stars staunchly circle the heavens during night's darkness, many think this pole star remains steadfast in its position always marking a fixed point on the sky. Indeed, a popular and often used Shakespeare quote (from *Julius Caesar*) is in tune with this perception:

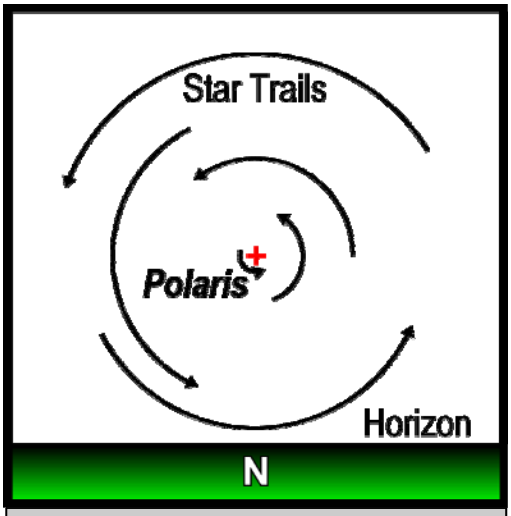


Fig. 1 Circumpolar Star Trails. All stars circle the pole (plus mark) including Polaris. The small circle traced by the pole star may make it seem like Polaris does not move.

"I am constant as the northern star,
Of whose true-fix'd and resting quality
There is no fellow in the firmament."

More advanced star gazers know better, that the "true-fix'd and resting quality" of the northern star is only an approximation. Not only does this north star slowly circle the northern heavenly pole (Fig. 1) but this famous star is also not quite constant in light, slightly varying about 0.03 magnitudes. Polaris, in fact, is the brightest appearing Cepheid variable, a type of pulsating star.

Still, Polaris is a good marker of the north cardinal point. Pointing the polar axis of an equatorial driven telescope mount at Polaris will allow celestial objects to remain visible for many minutes using moderate power eyepieces. However, following stars and planets more precisely requires adjusting the polar axis for the deviation of Polaris from the true north celestial pole. Of course, one can adjust or "polar align" modern portable astronomical mounts with their "GoTo" capabilities and several alignment stars. Yet equatorial mounts with an auxiliary polar sighting telescope can also do an excellent and quick job of accurately aligning the mount's polar axis. This method allows one to correct for the difference between the position of Polaris and the north celestial pole. Nevertheless, just how far is the North Star from the north celestial pole?

Polaris the Star—Some Basics

Since Polaris is so widely known, the literature is filled with an abundance of information about this north pointing star, especially about its interesting physical characteristics. In fact, this star goes by at least three dozen monikers including Alpha Ursae Minoris Aa (abbreviation Alf or α UMi Aa), One UMi Aa (1 UMi Aa), the "Lodestar" (rarely used) and dozens of catalog designations as HD 8890, SAO 308 and ADS 1477 A. This last name indicates this star is double by its inclusion in ***A**itken's New General Catalog of **D**ouble **S**tars (1932)*.

In fact, did you know Polaris has an eighth magnitude companion, Alf UMi B, 18 arc seconds away? This star may have an orbit about Polaris that requires tens of thousands of years to complete once. (This dim star was first seen by William Herschel in 1780.) Try observing this faint double even if you only have a two or three-inch aperture telescope. This star has even been seen with apertures less than two inches (Hirshfeld and Sinnott 1985).

Note: An *arc second* (arc sec or ") is 1/3600 of a degree and an *arc minute* (arc min or ') is 1/60 of a degree. A quarter (25 cents) viewed from 3.1 miles would look one arc sec wide!

Polaris is also designated **SBC9** denoting inclusion in the ***9th S**pectroscopic **B**inary **C**atalog*. Another companion, Alf UMi Ab (about 0.2" away), orbits much closer, approximately 20 astronomical units from Polaris in a highly eccentric orbit requiring about 30 years for one revolution. Since an *astronomical unit* is effectively the Earth's mean distance from the Sun, this makes this star's orbit similar in size to the orbit of Uranus (but much more noncircular). The Hubble Space Telescope finally imaged this third star a few years ago (Hupp et al. 2006).

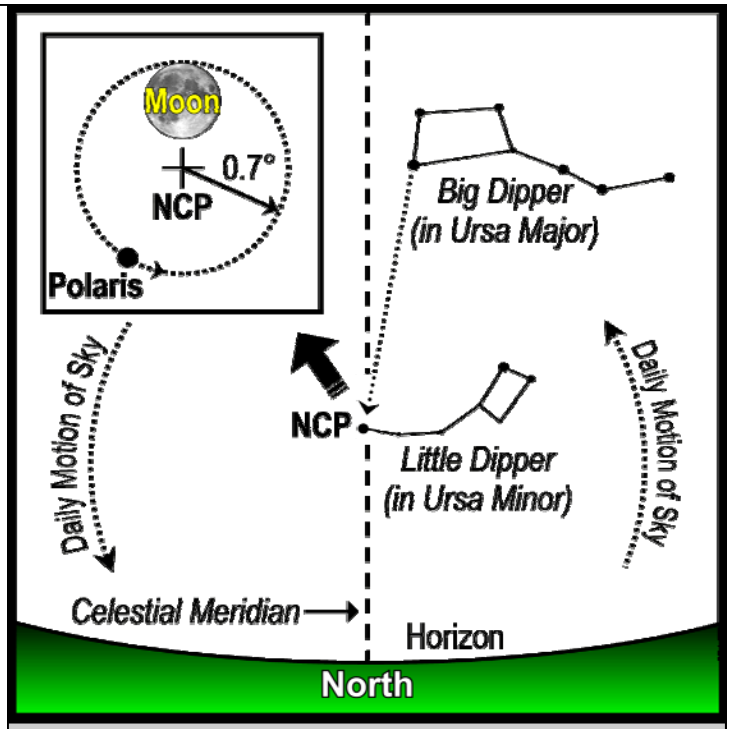


Fig. 2 Polaris and the North Celestial Pole (NCP). The pole star is currently about 0.7° from the NCP, which it circles in a celestial day. Nearly 1-1/2 full moons can presently fit between Polaris and the NCP. (See inset.)

Interestingly, all three stars in this triple system have similar principle spectral classes (Type F) showing they are all slightly hotter than the Sun. Polaris, however, is a supergiant or bright giant star, about 2,400 times more luminous than the Sun and 45 times larger in diameter, but much more evolved. It is passing through a stage of instability probably having exhausted most of its core hydrogen fuel.

This type of instability marks Polaris as a Cepheid variable, the closest known, approximately 130 parsecs or 430 light years away. Some astronomers think Polaris could be closer, only about 300 light years away. (If so, this star is less luminous than previously believed.) Polaris rhythmically shrinks and swells changing its luminosity about 2 percent over 4.0 days. Recent studies suggest, however, that this star's luminosity varied more strongly a century ago (15 percent) while its overall brightness has increased 15 percent. Meanwhile, its period may be decreasing eight seconds per year. In addition, historic records suggest Polaris may have been 2-1/2 times fainter looking (one magnitude) 2000 years ago (Irion 2004). Our North Star may not be brightest in our sky but it may be even more fascinating and odd than previously thought—and more inconstant!

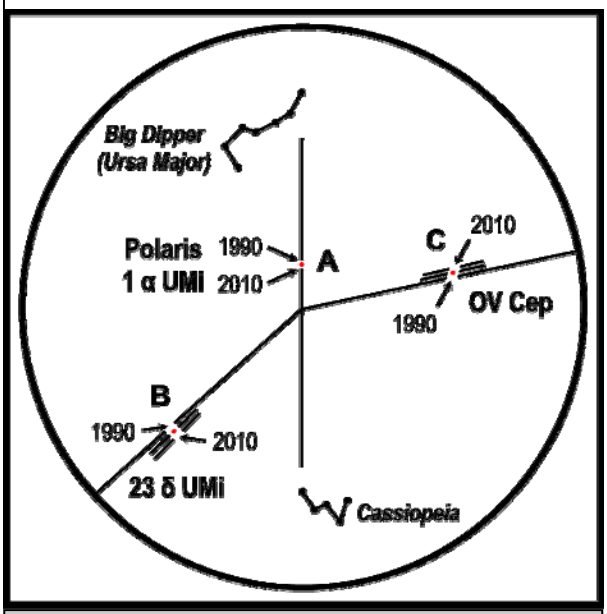


Fig. 3 Polar Aligning Reticle. Engraved reticles like this can be used to quickly and accurately align the polar axis of an equatorial telescope mount that has a polar alignment finder. See text for instructions.

How Far the Pole?

However, we are drifting from our main point, how far the pole? According to Meeus (1997), Polaris is currently (epoch 2010.0) at a mean declination of +89°18'25". (*Declination* is like latitude on the Earth, but a measure of how far from the *celestial equator*.) This puts Polaris 2,495 arc seconds (41'35" or about 0.693 degrees) from the celestial pole.

Since the angular diameter of the Moon is about one half degree, about 1.4 "moons" can fit between Polaris and the

Continued on page 8

north celestial pole. Thus, during a celestial day (23h56m), Polaris circles the pole staying about 0.7 degrees away from "true north" (Fig. 2). Only when the North Star is directly above or below the celestial pole as it crosses the *celestial meridian* (called *upper* and *lower transit* respectively), is Polaris accurately north. Figure 2 also shows the celestial meridian is an imaginary vertical circle to the horizon passing through the celestial pole and the *zenith*, or over head point. Its intersection with the horizon defines the north cardinal point.

Polar Alignment Reticles

Equatorial mounts with a polar alignment telescope can easily and quickly adjust for Polaris not being true north by using an appropriately engraved *reticle* (pattern) in the alignment telescope's eyepieces. (See Figure 3.) The procedure is simple and straightforward:

1. Approximately center Polaris in the alignment scope by moving the mount.
2. Rotate the alignment scope's reticle eyepiece so the Big Dipper (an asterism in *Ursa Major*) or *Cassiopeia* is oriented as seen on the sky.
3. (Neither constellation will probably appear in the alignment scope's narrow viewing field.)
4. Place Polaris in gap A using the mount's fine azimuth and altitude adjustments.

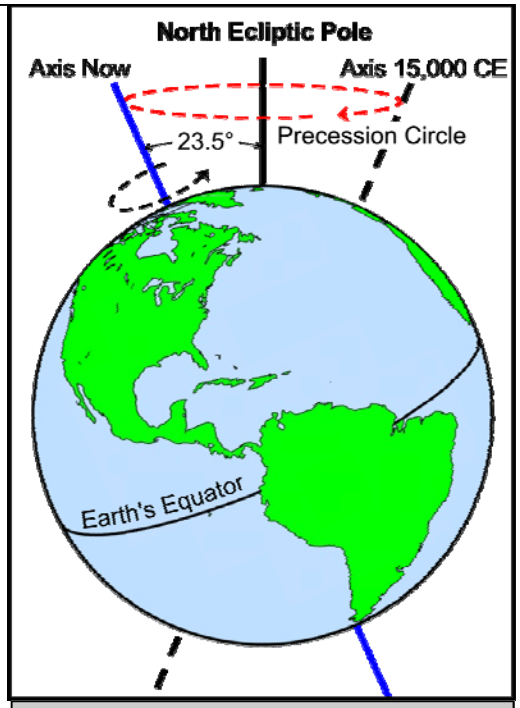


Fig. 4 Precession of Earth's Axis. The Earth's rotation axis slowly changes its direction with a period of about 26,000 years. This causes the position of the North Celestial Pole to change relative to the stars. The Earth's axis will have shifted about 180° by the year 15,000 as shown.

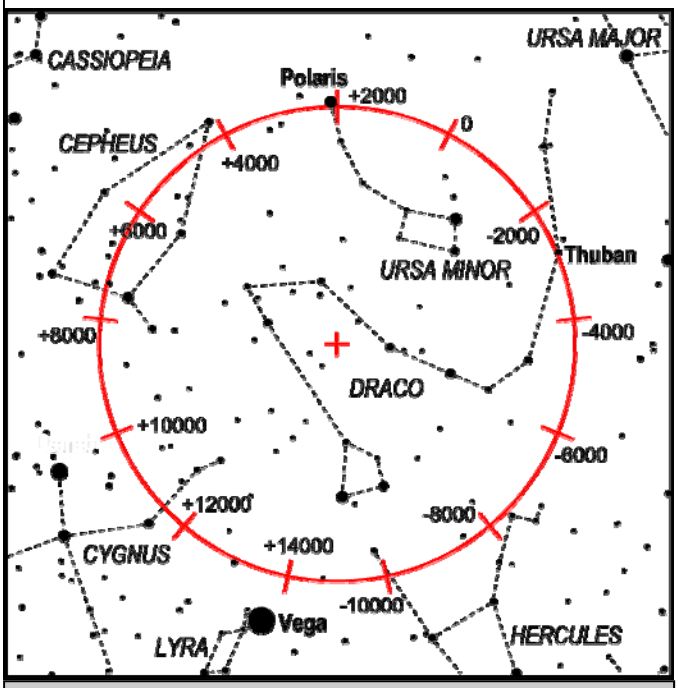


Fig. 5 The Precessional Circle About the North Ecliptic Pole. The North Celestial Pole (NCP) circles the North Ecliptic Pole (plus mark in center). Positions of the NCP (graduated circle) are shown against northern constellations at 2000 year intervals. Alpha UMi (Polaris) is presently the closest bright star to the North Celestial Pole.

5. Fine-tune the rotation of the reticle and again adjust the mount in azimuth and altitude to place 23 Delta UMi (mag. +4.3) simultaneously in gap B.

6. Similarly, for greater accuracy, simultaneously place OV Cephei in gap C if this star is visible.

(This star may not be visible since its magnitude is +5.1.)

Notes on the Alignment Reticle:

A. The positions of the three stars in the gaps depend on the year. (More on this below.) For example, the three lines at each gap in Figure 3 show positions for the years 1990, 2000 and 2010.

B. Questions and confusion have arisen about the identification of the star designated OV Cephei (Cep) in Figure 3. Some instructions describing this procedure name this star 51 Cep. This is a *Flamsteed designation* for this star. (The eighteenth century astronomer John Flamsteed catalogued stars by numbers.) Although Flamsteed numbers are still commonly used, this is an uncommon, historical designation for this star. Better to use OV Cep. This type of nomenclature using preced-

ing letters before the constellation name shows the star is variable. However, OV Cep varies only a few hundredths of a magnitude.

C. Alignment reticles usually have adjustment lines for use in the Southern Hemisphere but are omitted in Figure 3 for clarity.

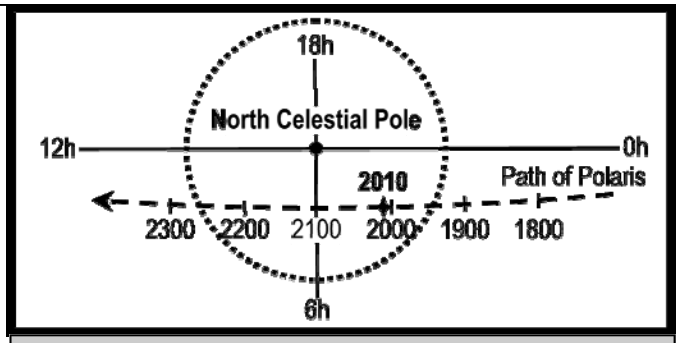


Fig. 6 The Wandering Celestial Pole. The path of Polaris with respect to the North Celestial Pole is shown at 100 year intervals. Actually it is the Pole that moves with respect to the "pole star." The circle has a radius of one degree. Lines of Right Ascension (similar to longitude on Earth) are drawn at 0, 6, 12 and 18 hours. The current position (2010) is also marked. Polaris will be closest to the pole in about 90 years. (Diagram adapted from Meeus 1997.)

Precession or Where is Polaris Now?

Figure 3 shows different places for positioning the stars in the reticle because the phenomenon known as *precession* (or *precession of the equinoxes*) causes the locations of stars to change with respect to the celestial poles. Briefly, precession is a slow gyration of Earth's axis around the pole of the *ecliptic* (Sun's apparent path on the sky). See Figure 4. The cause of precession is primarily the gravitational pull of the Sun, Moon and other planets on Earth's equatorial bulge. Precession causes the position of the north celestial pole to circle the *north ecliptic pole* about every 26,000 years (Fig. 5).

Fortunately, we are in a period when a reasonably bright star (Polaris) is very close to the north celestial pole (Fig. 5). In fact, the gap between Polaris and the pole is closing with a minimum distance reached in 92 years, on February 2102 (Fig. 6). Then, Polaris will be less than one half degree (1,657 arc sec or 27'37") from the celestial pole (Meeus 1997). This is a separation just a bit less than the Moon's angular diameter.

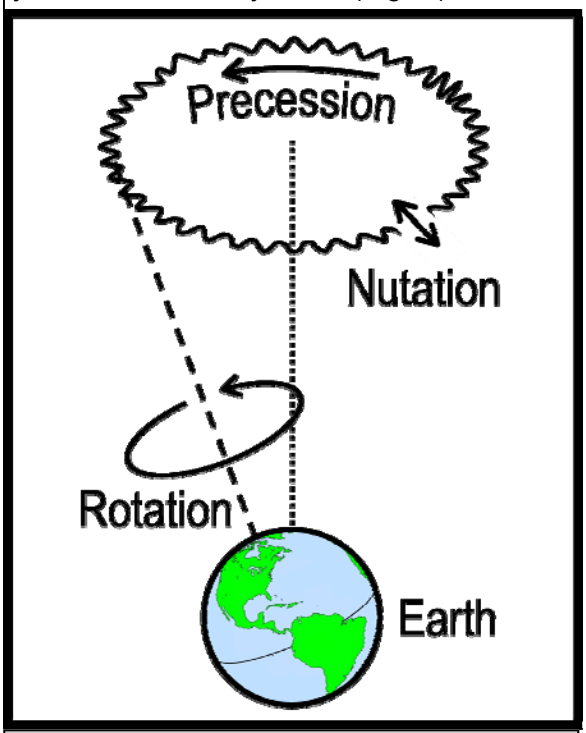


Fig. 7 Nutation. The Earth's poles precess with a slight "nodding motion" called nutation with a principal period of almost 19 years.

Not only will the declination of Polaris and therefore its polar distance slowly change over the coming years but this star's right ascension will also change. (*Right ascension* is like longitude on Earth showing the star's position east of the *vernal equinox*.) However, the small polar distance of Polaris is causing precession to produce a **very rapid increase** in right ascension. Polaris is now (2010.0) 2h43m42s east of the vernal equinox but by 2100.00 will be 5h53m29s east (Meeus 1997).

After the year 2102, Polaris will increase its distance from the celestial pole. Use Figure 5 to decide when Polaris should lose its designation as the pole star. And, which star should next be designated "Polaris"?

What about a "south polar star"? I will leave that to readers to investigate and submit articles on the southern stars.

Finally, to complicate matters, precession is not pretty. As the pole precesses it does so with a slight irregular motion or "nodding" called *nutation* with an amplitude of 9 arc sec and a period of 18.6 years. See Figure 7. This effect and the *aberration of light* due to the orbital motion of the Earth around the Sun, changes the mean position of celestial objects by a small amount. So, at any given moment, the actual (*apparent*) positions of stars deviate slightly from their mean positions for that year.

Continued on page 10

For the perfectionist, the least apparent polar distance of Polaris will occur nearly two years before its least mean polar distance—on 2100 March 24 with a value of 27'09" (Meeus 1997).

As usual, mark your calendars. ¤

Star Trail Photograph. The above photograph is by the author showing actual star trails around the north celestial pole. The author took this picture from a location about eight miles southwest of the University of Florida campus. Image is a composite of 452 separate 30 second exposures taken 2010 February 10/11 from 8:26 p.m.–12:36 a.m. EDT for a total time of 3h50m. A Canon DSLR EOS 5D II was used with an ISO of 400 and a lens focal length of 20mm set to f/4. (Photograph is slightly cropped from original.) The bright, short trail near the center is Polaris. Numerous aircraft trails and lights also cross the picture.

References

Hirshfeld, A. and Sinnott, R. W., ed. 1985, *Sky Catalogue 2000.0*, Vol. 2, p. 159 (Sky Publ. Corp., Cambridge).

Holmes, C. N. 1916, *Pop. Astronomy*, **24**, p. 633.

Hupp, E., Weaver, D. & Aquilar, D. 2006, "There's More to the North Star than Meets the Eye," NASA Press Release 06-004, Hubble News Center, oposite.stsci.edu/pubinfo/pr/2006/02/0602n.doc.

Irion, R. 2004, *Science* (18 June), **304**, pp.1740–1741.

Kaler, J. B., *Stars*, stars.astro.illinois.edu/sow/sowlist.html.

Kelly, P., Ed. 2010, *Observer's Handbook 2010* (Royal Astron. Soc. of Canada, Toronto).

Meeus, J. 1997, *Mathematical Morsels*, pp. 305–308 (Willmann-Bell, Inc.: Richmond).

Shakespeare, W. c.1598–1599, Julius Caesar, Act III, Scene 1.

Simbad Astronomical Database, simbad.harvard.edu.

Howard L. Cohen *is an emeritus professor in the University of Florida's Department of Astronomy and a founding member of the Alachua Astronomy Club, Inc.*

All figures drawn and adapted by author unless otherwise stated.

June Club Meeting

Tuesday, June 8, 2010, 7:00 p.m. ET

Speaker: **Scott Fleming**

Title: ***The MARVELS Survey: Searching Ten Thousand Stars for Extrasolar Planets***

Location: Powell Hall, Florida Museum of Natural History (*Lucille T. Maloney Classroom*), UF Campus, Gainesville FL

Scott Fleming—University of Florida

Preview: MARVELS is a survey being led by the University of Florida and in collaboration with dozens of scientists across a dozen universities and institutions. Making use of the Doppler technique to detect extrasolar planets, MARVELS will offer the largest, homogeneous sample of stars surveyed for planets to-date. MARVELS has begun in the Fall of 2008 and our first discoveries and candidates are currently being published. In this discussion, I will explain the basic design of MARVELS, showcase the telescope, observatory, and operation of the survey, and present some of our first discoveries and science projects, including discoveries of extrasolar planets, brown dwarf companions and interesting binary star systems.

About the Speaker: Scott Fleming is in the final year of his PhD work. Born in Feeding Hills, MA he attended Vassar College in Poughkeepsie, NY where he obtained a B.A. in Astronomy, a B.A. in Physics and a Minor in Computer Science. He spent two summers as a research student at the Space Telescope Science Institute in Baltimore, MD, where he worked on a project called XO designed to detect transiting extrasolar planets (it has since found five new planets). He started PhD work at the University of Florida in the Fall of 2005 and obtained an M.Sc. in Astronomy in the Spring of 2007. His scientific interests include extrasolar planets, brown dwarfs and binary stars. He has served as a judge in the various Alachua County Science Fairs on three separate occasions, volunteers for Gainesville Pet Rescue on a weekly basis and is a member of the UF student group Gators for Gainesville Pet Rescue.

College For Kids - Astronomy Instructor Needed

Each summer, Santa Fe College hosts College for Kids at their NW campus, for area junior-high school students. This year's College will run from July 12 - Aug 5. These dates correspond to two sessions of two weeks a piece, Monday - Thursday. Each session will have three astronomy sections, for a total of six classes. (The first class starts at 11am so bleary-eyed astronomers can sleep in!) Eligible instructors can teach all of the sections or platoon with other available instructors. This is a paid gig.

I taught this course a couple of times in the past. The students are enthusiastic and bright... most choose to enroll themselves. Activities have included visits to the Planetarium and safe solar viewing with the club's PST. In-class activities have included games and puzzles, creative exercises, debates, short lectures, etc. I still have syllabi and materials from previous years that you can employ.

If you are interested in instructing all or some of these sections, prepare a simple resume (a "who am i" introduction for now) and forward that to the coordinator, Nike Akinyode at: adenike.akinyode@sfcollege.edu

Send me a carbon if you wish, or forward any questions you may have.

Thank you for your consideration.

Mike Toomey

High Springs Community School Event
A Learning Experience

Photos right and below are of **Arne Reykowski**, a new AAC member, and **Bob Lightner** setting up their telescopes at the April 23rd Star Party Outreach event held at High Springs Community School.

The AAC set up telescopes for about 100 students to view and discover the universe. Thanks to all who participated and shared your knowledge with the kids.

STAR PARTY / OBSERVATION SCHEDULE: Upcoming Events - 2010

Star Party Event	**Date**	**Location** Check the website for directions	**Start/End Time**
Celestial Celebrations Gainesville Chamber Orchestra and Telescope Viewing by AAC	May 7th, Friday	Phillips Center for the Performing Arts	Musical Performance begins at 7:30 p.m., Sunset approx. 8:10 p.m. EDT
AAC May Star Party	May 15th, Saturday	EquiGen Equine Reproduction Center (see website for map)	Sunset approx. 8:15 pm EDT
Kanapaha Moonlight Walk	May 22nd Saturday	Kanapaha Botanical Gardens	7:00 pm to 11:00 pm EDT. (AAC members arrive by 5:30pm)
AAC June Star Party	June 12th, Saturday	Loftus Family Farm (see website for map)	Sunset approx. 8:30 pm EDT
AAC June LOG Session	June 20th, Sunday	Loftus Family Farm	Sunset approx. 8:30 pm EDT

ATM-Observers.....

Over the past few months the ATM-Observer Group has had some good and interesting meetings, and a few run-ins with poor sky.

The May meeting will be a combined LOG (Lunar Observing Group) LITE observing session focusing on the use of inexpensive web cameras to image the Moon's features. This meeting will be held the 3 rd Tuesday evening at the Ghastly Sky Observatory (Chuck's driveway) in Gainesville. See Floridastars.org for last minute info.

Future meetings will include a look at heavy duty astro imaging, comparison and selection of binoculars, modification and improvement of the classic SCT telescope, and the design and construction of eyepiece cases.

There will be no meeting in July because Chuck will be flitting about the South Pacific hoping to see a total solar eclipse. If someone wants to take the meeting that will be fine with Chuck.

Please consider getting involved with the ATM-Observer's group. We try and move AAC membership from armchair observing to getting out under the night sky.

Clear sky
Chuck

C.S. Broward, Ghastly Sky Observatory
Gainesville, Florida

WWW.Floridastars.org
ATM Coord, Alcor

May Moon Phase Calendar from the Alachua Astronomy Club website

http://www.floridastars.org

Go Online to download a full sized print out for any month of the year.

Going on Vacation? Take a copy with you to determine when your best viewing times will be and the darkest skies.

May 2010

Sun	Mon	Tues	Wed	Thur	Fri	Sat
						1 Moon 23:37 09:00 Sun 06:47 20:06
2 Moon ------ 09:56 Sun 06:46 20:07	3 Moon 00:25 10:53 Sun 06:45 20:07	4 Moon 01:07 11:50 Sun 06:44 20:08	5 Moon 01:44 12:45 Sun 06:44 20:09	6 Moon 02:17 13:39 Sun 06:43 20:09 Last Qtr., 00:16	7 Moon 02:47 14:32 Sun 06:42 20:10	8 Moon 03:17 15:25 Sun 06:41 20:11
9 Moon 03:45 16:18 Sun 06:40 20:11	10 Moon 04:14 17:13 Sun 06:40 20:12	11 Moon 04:46 18:10 Sun 06:39 20:12	12 Moon 05:21 19:11 Sun 06:38 20:13	13 Moon 06:01 20:12 Sun 06:38 20:14 New Moon, 21:05	14 Moon 06:46 21:15 Sun 06:37 20:14	15 Moon 07:40 22:16 Sun 06:36 20:15
16 Moon 08:39 23:13 Sun 06:36 20:16	17 Moon 09:44 ------ Sun 06:35 20:16	18 Moon 10:51 00:03 Sun 06:35 20:17	19 Moon 11:57 00:48 Sun 06:34 20:17	20 Moon 13:03 01:28 Sun 06:34 20:18 First Qtr., 19:44	21 Moon 14:07 02:05 Sun 06:33 20:19	22 Moon 15:11 02:39 Sun 06:33 20:19
23 Moon 16:14 03:14 Sun 06:32 20:20	24 Moon 17:18 03:50 Sun 06:32 20:20	25 Moon 18:22 04:28 Sun 06:31 20:21	26 Moon 19:27 05:10 Sun 06:31 20:22	27 Moon 20:28 05:57 Sun 06:31 20:22 Full Moon, 19:07	28 Moon 21:25 06:48 Sun 06:30 20:23	29 Moon 22:16 07:44 Sun 06:30 20:23
30 Moon 23:02 08:41 Sun 06:30 20:24	31 Moon 23:41 09:38 Sun 06:29 20:24					

Lunar Geology 101

By Bob O'Connell

At a recent AAC outreach event in High Springs, half a dozen members showed students and parents several deep sky objects, Mars, Saturn and the Moon. The weather was not very cooperative but the view of the Moon through my scope was good enough to solicit questions about what was in the eyepiece. Some of the questions from students and parents started me thinking about why any AAC member who participates in public outreach should have a basic understanding of lunar geology. Some of the questioned I fielded included:

"Why are there ridges on the inside of that crater?" – (terracing)
"What is that in the middle of the crater?" – (central mountain peak)
"Are those (craters) volcanoes?" (No, impact features)
"Well they sure look like volcanoes – how do you know they are not volcanoes?"
"Why is that area dark?" (mare) ". . . and that area bright?" (highlands)
"What is that squiggly thing?" (wrinkled ridge)

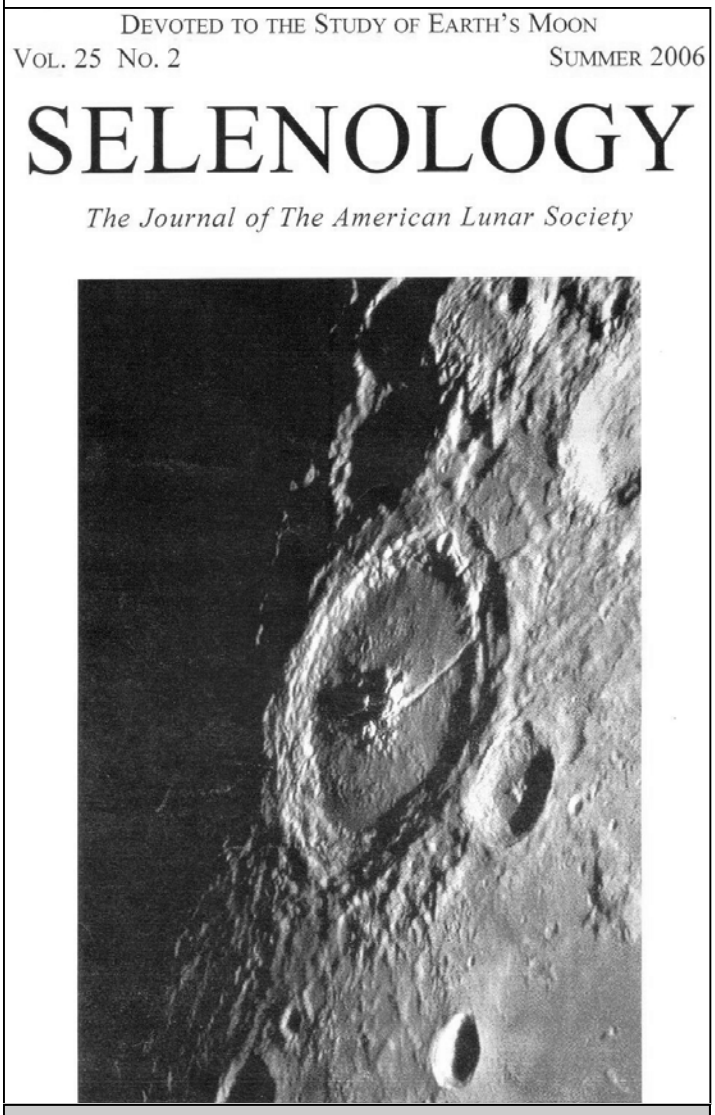


Figure 1.

Even if you are a deep sky fan and spurn the Moon, it would serve you well to know enough about basic lunar geology so you can explain a little bit about what people are seeing though the eyepiece and be able to answer questions like the ones I answered at the High Springs event. I was in a position not only to tell the folks what they were looking at, but how it formed and approximately how long ago.

On June 20th, the AAC Lunar Observing Group (LOG) is going to hold the first of four 2010 observing events focusing on lunar geology. These are going to be basic, outdoor introductory Power Point presentations on the geologic processes that formed the four types of features we show the public any time the Moon is visible at an event – craters, impact basins, volcanic features and tectonic features.

All members are invited to attend these LOGs and can participate from simply sitting in a lawn chair and watching the presentation in the Moonlight to actively following along with the presentation through a telescope.

These LOG sessions are based on a series of four articles written by Eric Douglas that ap-

Study Guide based on:
GEOLOGIC PROCESSES ON THE MOON (I of IV)
From *Selenology*, Vol. 25, No.2 – Summer 2006
By Bob O'Connell, based on the article by ***Eric Douglass***

I INTRODUCTION

Three major processes formed the features we see on the moon. These geologic processes are:

[1] the formation of _____, [2] _____ activity and [3] _____activity.

II CRATERING ON THE MOON -- Introduction

The surface of the moon is generally divided into two types of terrain: [4] _____, or "heavily _____ "terrain [5] and _____ (Fig 1).

Although the maria appear to have relatively few [6]_____, from earth-based telescopic observation, this is not the case with higher-resolution spacecraft imagery. Indeed, when the [7] _____ series spacecraft imaged the moon, it was seen to have craters throughout (Fig 2). Yet, while the maria are covered with small craters, they are relatively lacking in craters large enough to be seen through earth-based telescopes. This is because larger impacts occurred relatively [8] early/late in the moon's history (over the

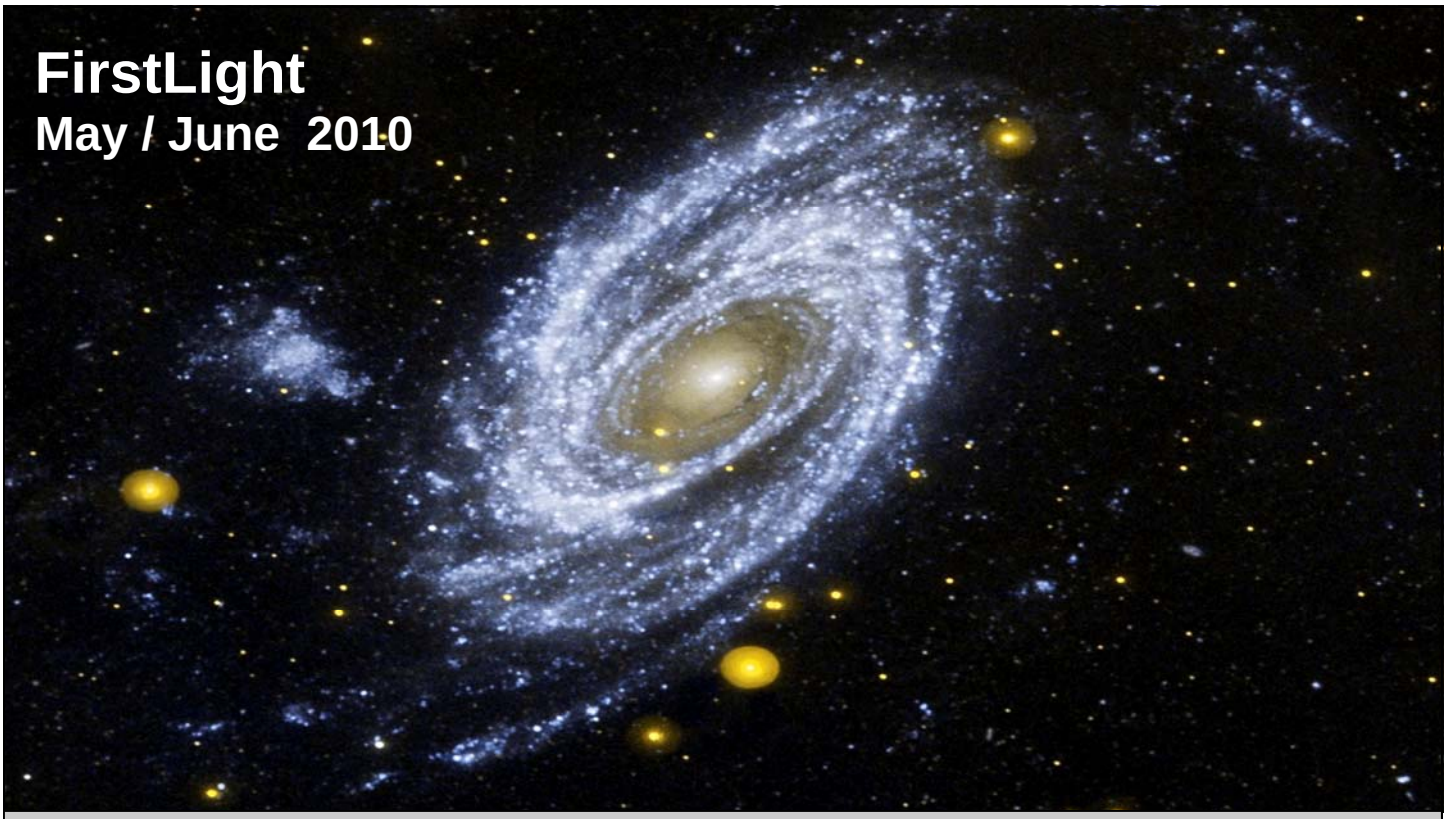
Figure 2. Portion of the first fill-in-the-blank self test of the material to be covered in the Jun 20, 2010 LOG session.

peared in the *Journal Selenology* (Fig. 1) which has given the AAC permission to post them on the LOG webpage. The first article is already on the LOG page along with a fill-in-the blank self test (Fig. 2) and answer key. The other articles will be posted closer to the LOG for that topic.

So, even if you choose not to attend LOG sessions, you can still bone up on your Lunar Geology 101 by reading the articles and taking the self tests. With a little effort, you will be a more informed tour guide of our nearest neighbor at future public events. Please see the AAC LOG web page for additional details on the lunar geology sessions.

Bob O'Connell has served the AAC as Board Member and now as Chair of the Lunar Observing Group (LOG). Bob is a Registered Nurse and resides in Keystone Heights with his wife Jane and cats Kitty, Crater and Aristarchus. Bob can be contacted at: thestardoggedmoon@gmail.com *See the LOG website for further info and photos:*
http://www.floridastars.org/LOG/log_sessions09.html

FirstLight
May / June 2010



Our eyes can not easily detect any kind of photons except visible light photons. Luckily, the Galaxy Evolution Explorer (GALEX) telescope can. This GALEX image in ultraviolet light shows beautiful spiral galaxy M81. M81 is about the same size and brightness as our own Milky Way Galaxy. Go online and play "Photon Pile-up" with the Galaxy Evolution Explorer telescope at http://spaceplace.nasa.gov/en/kids/galex/photon. Photo Credit: NASA

FirstLight
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