



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

November / December 2009

Issue 87.1/88.1



Member
Astronomical
League



Member
International
Dark-Sky Association

FirstLight

Newsletter of the Alachua Astronomy Club



Starry Night

What a wonderful way to educate and celebrate the International Year of Astronomy.

Many great pictures were taken of the event which you'll see throughout this newsletter. The evening captured so many memorable opportunities that we couldn't possibly fit them all into one volume—but we tried.

Please see page six for more information on the evening and overall attendance.

Photos this page were taken by Amanda Arner, Public Programs Assistant for the Florida Museum of Natural History.

Thank you Amanda for your expressive images.





This will be my last President's Column. We will have a new slate of officers taking over in January 2010. They have some great ideas on how to improve the Alachua Astronomy Club. I'm excited by their vision, and will cooperate in any way I can. I'm not disappearing, however. I plan to remain active in outreach activities, like Starry Night, etc. I also want to take on a new position, called Sky Mentor. I would like to be the designated person to help members, new and old, pick their first telescope, books and accessories, and learn to observe the heavens. I want to express my appreciation to all the officers, board members, chairpersons, and club members who have made my four-year tenure as president so enjoyable. I appreciate your hard work, your advice and counsel, and your friendship.

Since this is my last column, I want to leave you with a little mystery. It's called the Pioneer Anomaly. NASA JPL's John Anderson, the Principal Investigator on the Pioneer missions, discovered the anomaly. He had proposed an experiment to use the two spacecraft to study the nature of gravity. Pioneer 10 and 11 were launched in 1972 and 1973, back when dot matrix printers and floppy disks were king, and Bill Gates had not yet invented his Disc Operating System (DOS) that made him rich and famous. By 1980, the anomaly had showed up. Both spacecraft were being slowed by the Sun just a tiny bit too much. The anomaly amounts to 8.5×10^{-10} meters per second squared, or about one ten billionth the gravity exerted on you by the Earth.

John Anderson was joined in studying the anomaly by Michael Neito of Los Alamos National Lab, and later by Slava Turyshev, a young astrophysicist with a specialization in theoretical gravitational physics from Moscow State University. They have been recovering the spacecraft operations data, sometimes from weird places, like an abandoned Macdonald's restaurant at NASA Ames Research Center. After all, who cared how long thruster number three fired at 19:11:05 UT on April 26, 1979? They have received a grant from The Planetary Society to extract the latest 30 years of data and convert it to a modern, usable format. The computers have crunched away, and lo and behold, the anomaly really exists. And data from the Galileo and Ulysses spacecraft seem to confirm it. Apparently, the anomaly affects all four spacecraft!

Outside researchers have proposed a variety of explanations, ranging from expansion of the universe to Modified Newtonian Dynamics (MOND), a modification of Newtonian gravity. Before pursuing any of the more exotic theories, the NASA team wants to exhaust more prosaic explanations, like unaccounted-for thermal radiation from parts of the spacecraft to a tiny leak of on-board helium gas. Improved methods of thermal analysis have, indeed, explained a small part of the anomaly, but not nearly all of it. So stay tuned. More physics fun to come.

In closing, I'd like to wish everyone clear, dark, and steady skies. I'll see you under the stars!

Bill Helms
Alachua Astronomy Club
President@FloridaStars.org

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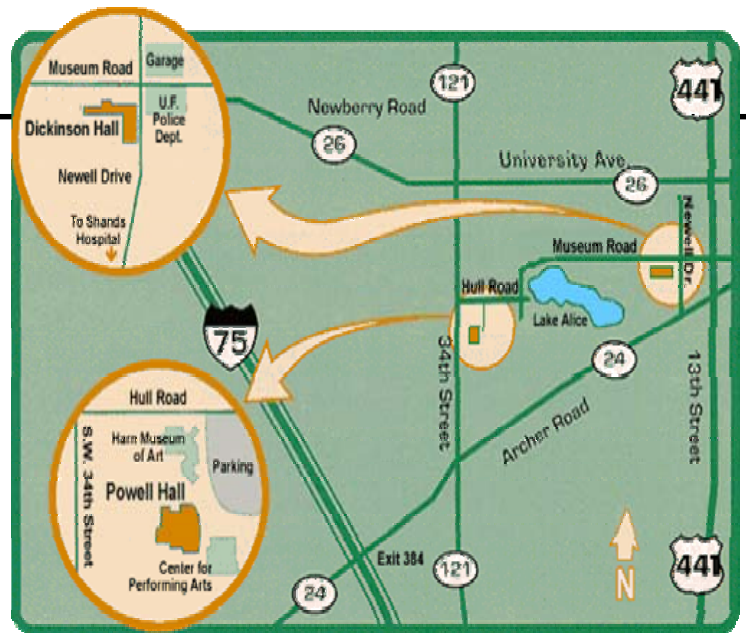
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Email: firstlight@floridastars.org

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
The Alachua Astronomy Club, Inc.
P.O. Box 141591
Gainesville, FL 32614-1591 USA

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

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Lunar Observing Group Holds 3rd Successful Session in 2009

The Alachua Astronomy Club Lunar Observing Group's third outdoor session of 2009 was hosted by member Rich Russin at his home in Jonesville on October 2nd. 13 members enjoyed two detailed lunar presentations by club member Howard Eskildsen.

Howard's first presentation addressed the pros and cons of lunar imaging systems and took participants step-by-step through the intimidating imaging process. Members were able to compare "before and after" differences in raw and processed images. The processed images were noticeably sharper with higher contrast because processing selects and stacks (combines) only the best quality frames from raw AVI video files containing hundreds of individual frames. The presentation effectively showed how processing removes most of the distorting effects of Earth's atmosphere revealing the power and utility of modern CCD technology for lunar imaging.

Next, Howard guided participants through an extensive PowerPoint tour of lunar features that would have been visible through the dormant telescopes set up for the session were it not for the "uncooperative," cloudy sky. Howard used many of his own processed lunar images for the "tour" which were taken through his six-inch Meade achromatic refractor. The presentation covered comparative lunar geology, some history on lunar cartography and many "Did You Know?" facts.

Both of Howard's presentations were well received and generated many interesting questions and exchanges among participants. The LOG would like to thank Rich Russin, Howard Eskildsen and participants for a very successful, albeit cloudy session.

The fourth and final 2009 LOG session will be held on November 28th at member Don Loftus's residence in Gainesville and will be an informal "LOG-lite" with general lunar viewing and discussion. Details to be posted soon on the LOG website: http://www.floridastars.org/LOG/log_sessions09.html

In 2010, four themed LOG sessions on lunar geology are planned. Each session will focus, in succession, on the four topics covered in the series of articles on *Lunar Geologic Processes* written by Eric Douglas as published in the Journal Selenology. The topics are craters, basins, volcanism and tectonics. Members who want to prepare for the first 2010 LOG (date to be determined) can download the first article on lunar craters from the LOG web page at this link: http://www.floridastars.org/LOG/log_main.html (scroll down to the PDF filed under "A Richer Lunar Observing Experience.") There is also an accompanying downloadable fill-in-the-blank test for this article and cheating is allowed. The LOG would like to thank Mr. Douglass and the Journal Selenology for granting permission to reprint the articles on our website.

In 2010, the LOG will also hold several informal sessions during regularly scheduled ATM meetings to introduce beginners to the Moon. A full-day lunar imaging workshop is also being considered for inclusion in the 2010 LOG schedule.

All members are encouraged to attend LOG sessions but most sessions are more formal and serious than traditional star parties. Members should be aware of this so they are not disappointed and are encouraged to read the description of a LOG beforehand. Caution: lunar observing is habit forming. Please feel free to contact me with any questions or comments.

Bob O'Connell
Chair, Lunar Observing Group



Photo Credit: Howard Cohen: Howard Eskildsen (left) and Bob O'Connell make one more attempt to catch a glimpse of the Moon through a break in the clouds after the session had ended.

November Club Meeting

Tuesday, November 10, 2009, 7:00 p.m. ET

Speaker: Dr. Howard L. Cohen, Associate Professor Emeritus,
Department of Astronomy, University of Florida

Title: *Galileo's Affair with Venus*

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



Dr. Howard L. Cohen

Preview: The 2009 International Year of Astronomy is ending, a celebration of the 400th anniversary of Galileo's first use of an astronomical telescope. This global effort to help citizens understand their place in the universe has also helped solidify this Italian scientist's designation as "the father of modern science." Unfortunately, rumors, myths and misinformation about this renaissance man and his accomplishments still remain widespread. Too many to mention, these stories, for example, involve who first invented the telescope, who first observed lunar craters, his blindness observing the Sun, the discovery of Saturn's rings, and his condemnation, torture and imprisonment by the Church.

Therefore, this presentation will focus on only one of Galileo's observations, the phases of Venus. This astronomical observation, perhaps his most important, has remained controversial and sometimes misunderstood. Did these remarkable observations of Venus doom the earth-centered model of our solar system as often portrayed, or not? Not only do some question Galileo's observations of Venus but also not everyone correctly understands their connection or meaning as related to the Copernican astronomy of Galileo. Analysis of Galileo's affair with Venus may help us better understand how this significant observational discovery interacted with and influenced solar system models of his time.

About the Speaker: Professor Howard L. Cohen has been actively pursuing astronomy for over 50 years, first as an amateur, then as a professional astronomer. He is a founding member of the Alachua Astronomy Club, Inc. and continues to serve on its board. Dr. Cohen has held many AAC chair positions, is a frequent contributor to *FirstLight* and has prepared and made numerous interesting and unusual presentations for the AAC.

Dr. Cohen is also an emeritus professor in the Department of Astronomy at the University of Florida, where he was on the faculty for nearly thirty-six years. Original research interests have included binary stars, star clusters, occultations and the Hebrew Calendar. During the mid-1960s he was a staff member and researcher at Lowell Observatory. In the 1980s he was a consultant and regional sales manager for Meade Instruments, a world leader in the design and manufacture of telescopes and accessories for amateur astronomers. Professor Cohen is an accomplished public speaker. His "down-to-earth" presentations use lively computer displays, which he has perfected through years of teaching at the University of Florida.

With his wife Marian, an independent travel contractor for Continental Capers Travel & Cruises, Dr. Cohen helps plan, organize and escort unique tours centered on astronomical themes all over the world. After a successful tour to China for the 2009 July total solar eclipse, their next tour will take them to Norway next March for a spectacular northern lights cruise to above the Arctic Circle.

Alachua Astronomy Club 2010 Officer & Board Member Candidates

The AAC Board of Directors submits the following list of candidates for Officers and Board Members of the Alachua Astronomy Club for 2010.

President: Rich Russin
Vice President: Robert Duval
Secretary: Bob Lightner
Treasurer: Larry Friedberg

Board Members: Pamela Mydock, Fred Palgon, and Howard Eskildsen

Nominations from the floor (with the nominee's permission) will be accepted at the November meeting, followed immediately by the election vote.

Starry Night a Stunning Success!

I want to thank all AAC members who contributed to the wonderful success of Starry Night. We deployed over 10 telescopes, ranging from the 40 mm PST solar telescopes to 12 inch reflectors. We were blessed with mostly clear skies, and the seeing was remarkably good. The views of the Moon and Jupiter were stunning. We also had AAC members leading Galileoscope telescope building workshops. Tim Malles had his visually stunning space art exhibit. Other members oversaw club and member equipment such as the video setup for the Astronomy PowerPoint Show while equipment owners were busy elsewhere. Some brought food and water to those operating telescopes. We stayed busy from 4 to 11 PM. The Florida Museum of Natural History informs me that our attendance topped 2600! Our previous high for Starry Night was about 650. All in all, it was just a great event, and a wonderful way for the Alachua Astronomy Club to help celebrate the International Year of Astronomy 2009, and the 400th anniversary of Galileo's first use of an astronomical telescope.

Again, thanks to all AAC members who participated in Starry Night, and to our partners, the Florida Museum of Natural History, the UF Astronomy department, the Florida Space Grant Consortium, and Santa Fe College.

Bill Helms, President, Alachua Astronomy Club



Photos by: Jackie Owens



Thanks so much to all the organizing team and volunteers for the excellent Starry Night event! I want to be specific and mention names on the areas that I was responsible.

Thanks so much to Veronica for coordinating, synchronizing the activities and keeping the team together and focus in one direction. Also for organizing and visiting the area school which attracted many students to the workshop. Thanks so much to Jaydeep and Sreela and the GE foundation for providing the Galileoscopes.

Galileoscope Workshop: Thanks so much to Howard Cohen for leading so successful the first two session and for developing the Power Point presentation for the workshop. Thanks to the volunteers that helped in the workshop; some of you like Alison and Stefan remained there for most of the sessions, but several others did the same:

- | | |
|----------------------|--------------------|
| Alison Klesman | Stefan O'Dougherty |
| Tzu Yu (Jimmy) Lin | Robert Morehead |
| Jackie Owens | Jeff Sims |
| Pengcheng Guo | Knicole Colon |
| Dan Capellupo | Dan Gettings |
| Estefania Concepcion | Jesse Masterson |
| Shane Dugas | Karen Vyverberg |
| Izaskun San Roman | Nestor Lasso |
| Roberto Sanchez | Hali Jakeman |
| Evan Tilton | |

Plus a couple more "substitutes", I didn't get their names.

UF/ASTRO telescopes: Some of you came for a 3 hour shift and stayed for about 6 hours until the end. Thanks to Soung-Chul for captivating the public with view of the Moon and Jupiter with the \$20 Galileoscope which got more attention than the 8" Meade!

- | | |
|-----------------|---------------|
| Rikki Seguin | Enrique Lopez |
| Jesus Martinez | Yichen Zhang |
| Soung-Chul Yang | Eric Deleew |

Radio JOVE: You guys did you best to show the "invisible Universe" but clearly you were very visible last night!

- | | |
|--------------|---------------|
| Wes Greenman | Masafumi Imai |
|--------------|---------------|

Thanks so much to Amanda and Kendra and the museum volunteers for the organization of the event, the publicity and of course the food and drinks. These was a real team work! One normally sees something like this "without your participation, this event could not have been possible". But here this is what really happens!

Francisco Reyes, University of Florida, Department of Astronomy



Yes, Virginia, the Moon Can Be Blue!

— Howard L. Cohen

The year 2009 ends with a “blue moon.” However, contrary to popular belief, a “blue moon” is not necessarily the second Full Moon in a calendar month.

In fact, historical research shows this is wrong.

But most important, the Moon, in fact, can truly be tinged blue!

During WCJB-TV Channel 20's local evening news broadcast Tuesday, 2009' October 6, chief meteorologist Bill Quinlin asked a weather question as he often does. Although I do not remember Quinlin's exact words, his question that evening asked if a “blue moon” was caused by atmospheric particles? Possible answers were either “True or False.”

Quinlin replied the correct choice was “False.” He then concluded by saying a blue moon was the second Full Moon in a calendar month.

I shared this question at the Alachua Astronomy Club's board meeting later the same evening. Most present at the meeting acknowledged that the correct answer was obviously the choice “False” as Quinlin had asserted.

“Not quite right,” I said. “The correct answer is True.”

Skeptical eyes stared at me.

Can the Moon Really Be Blue?

I then replied that the term “blue moon” can, in fact, refer to a Moon actually tinged blue, a real though uncommon phenomenon. This rare effect results from atmospheric particles as fine dust from a volcanic eruption or forest fire. If these particles are just the right size to scatter red light, then this particulate matter acts as a filter so only bluish light passes.

I mentioned to the board that I have seen photographs of this rare event although I have not seen this sight myself except on a few occasions when the Moon was tinged blue during a total lunar eclipse.

Figure 1 shows a photograph of a blue colored Moon taken by Tom King of Watauga, Texas 2003 October 30. This photograph and stories about blue moon sightings can be found at spaceweather.com/glossary/bluemoonstories.html.



Figure 1. A blue colored Moon. On rare occasions the Moon can appear with a bluish color. (See note in text if image not in color.) Credit Tom King, Watauga, TX, 2003 Oct. 30.

Note: If reading this article from *FirstLight's* mailed print copy for 2009 Nov/Dec (printed in black and white), the Figure 1 image will obviously not be in color. To view this image in color, members of AAC can view the color pdf version of *FirstLight* at floridastars.org/firstltonline.html. Otherwise, see this image at spaceweather.com/glossary/images2004/bluemoon/King2.jpg.

Moreover, in 1883 and in the following several years after the Indonesian volcano Krakatoa exploded, people around the world saw the Moon turn blue. And, in September 1950, Robert Wilson, an astronomer of the Royal Observatory, saw

the Moon go blue from Edinburgh, Scotland. Apparently particulates from a forest fire in Alberta, Canada blowing across the Atlantic Ocean may have been the cause.

I also said to AAC board members that I had reported this rare but real spectacle in a previous *FirstLight* article (April/May 2007, "Double Full Moons," at floridastars.org/firstltonline.html). I originally wrote this article because May 2007 was to have two Full Moons for the USA.

So, yes, Virginia, the Moon can be truly blue.

A Blue Moon Has Many Meanings



Figure 2. Blue Moon Beer. This is a Belgian-Style Beer with an orange-amber color and cloudy appearance because it is unfiltered. It has a more noticeable orange taste compared with other similarly styled beers.

Nevertheless, my 2007 *FirstLight* story went on to explain that the term "blue moon" has multiple meanings. These meanings include **(1)** moons actually tinted blue by our atmosphere as already noted, **(2)** *Blue Moon*, a Belgian-Style white beer (Figure 2) from the Molson Coors Brewing Company, and **(3)** the feeling of being sad, lonely, depressed, gloomy, etc., as expressed in many songs. Also included is **(4)** an early reference apparently connecting blue with "absurd" through a 1528 proverb that states, "If they say the moon is blue, then we must believe that it is true." And, of course, we have the popular phrase **(5)** "once in a blue moon," meaning infrequent, hardly ever, rare or now and then.

But I discussed still another meaning that relates to a modern tradition, **(6)** **the second Full Moon in a calendar month is a "blue moon."**

How the popular phrase, "once in a blue moon," connects to actual lunar events is unclear since second Full Moons in a month are common, occurring every few years (averaging once every nineteen months or so). In fact, three occur from 2009 to 2015: 2009 December 31, 2012 August 31 and 2015 July 31.

Nevertheless, the thrust of my article pointed out that this trendy definition of a "blue moon" as the second Full Moon in a month is historically a mistake! So, really, we have a seventh meaning to the term "blue moon."

The Historical Blue Moon

Modern research interprets "blue moons" otherwise. Historically, **(7)** *calendrical blue moons* represented the *third Full Moon* in a quarter of the year that has four Full Moons! (Usually a quarter year has only three Full Moons.) Folklorist Philip Hiscock (*Sky & Telescope*, March 1999) had traced the original calendrical

meaning of the term "Blue Moon" back to the *Maine Farmers' Almanac* for 1937. See my original article for more details.

This traditional meaning is complex because it can depend on the length of the year and when the year begins. For example, the *Maine Almanac* used the tropical not a calendar year to mark the seasons starting with the winter solstice. Moreover, traditional or old style Blue Moons, since set by the seasons, occur about a month before equinoxes and solstices, in February, May, August, or November.

Note: A *tropical year* is the time for the Sun to return to a fixed point along its path on the sky (the *ecliptic*) such as from vernal equinox to vernal equinox.

The rationale for the traditional meaning given in the *Maine Almanac* ensures that other named Full Moons fall at their proper places during the year such as the "Moon before Yule" or the "Easter Moon" just before Easter, etc.

So, the original answer given by WCJB-TV could be considered wrong for two reasons. If one takes into account the original meaning of a calendrical blue moon, a calendrical blue moon is not necessarily the second Full Moon in a calendar month.

Rather, a blue moon is the third Full Moon in a quarter year with four Full Moons.

But more important, the original question asked on WCJB-TV did not specify a “calendrical blue moon,” only a “blue moon.”

Therefore, a blue moon, as already noted, could really be a Moon with a blue appearing disk under unusual and special circumstances when our atmosphere has particles just the right size to scatter red light.

Making Up Origins

Lastly, making up origins is sometimes easy although not necessarily true as noted in my April/May 2007 *FirstLight* article. I suggested in 1991, for example, a hypothetical, farcical connection between lunar events and the idea that blue relates to unlucky. A second Full Moon in a calendar month or four in one season gives thirteen full Moons in a calendar year. Since some consider the number thirteen unlucky, people might view the occurrence of this “extra” full Moon in a year with displeasure or gloom. Therefore, because people often connect the word “blue” with hopelessness, melancholy or despair, it is possible that this extra full Moon became associated with the color blue. Believe it (or not)!

A Blue Moon New Year

Still, for those who insist that “blue moons” (of the calendrical type) are the second Full Moons in calendar months, be aware that December 2009 has such a Full Moon.

And this “blue calendrical moon” of 2009 is extra special.

Two Full Moons occur for us (in the USA and many other places) during the last month of the year, **December 2** and **December 31**. (I say “us” since dates of Moon phases are time zone dependent.)

Therefore, 2009 will end with a “blue moon special,” a real treat for New Year Eve partygoers!

Party poopers, nonetheless, will say, using the *Farmer's Almanac* definition of a blue moon (third Full Moon in a quarter year with four Full Moons), the next will not occur until 2010 November 21 and then not again until 2013 August 2.

Still, I am willing to concede, that we should still be sure to have Blue Moon Beer on hand to welcome the New Year.

And don't forget to sing the “**Astronomer's Drinking Song.**” Yes, Virginia, astronomers have a drinking song! (You can find it on the AAC web site at floridastars.org/drinksng.html along with the “tune” itself.)

Of course, please drink responsibly.

☐

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

AAC Holiday Party

SATURDAY, DECEMBER 12, 2009, 6:00 p.m. ET — Dinner Served 6:30 p.m.

Speaker: None but lots of fun!

Title: "Holiday Party" and Celebration of AAC's 22nd Birthday!

Location: Home of Mark & Cindy Barnett, 3111 NW 18th Place, Gainesville, Florida,
(352) 373-2244

Maps to Barnett Residence: See our website for maps (floridastars.org - look under Club Meetings for this date. It will take you to a hyperlink.

Preview: AAC will hold its annual December holiday party — a **potluck dinner**. (There will be no regular Tuesday meeting in December.) Club will buy drinks and paper products. There will be a food sign up sheet at our October and November meetings — see below.

Food to Bring: If you miss signing up at the November meeting, please e-mail to **potluck (at) floridastars.org** and indicate what food dish you will bring:

- Wings, ham rolls, cheese & crackers, finger sandwiches, taco salad w/chips, dessert or other (please designate)
- Also indicate the number of adults and children (give ages) who will attend.

This year we celebrate our club's 22nd anniversary! Good food, games, our traditional astro slide quiz, sci-fi space music and more.

Begins approximately at sunset. Lasts till whenever.

STAR PARTY / OBSERVATION SCHEDULE: Upcoming Events - 2009

<u>Star Party Event</u>	<u>Date</u>	<u>Location</u> Check the website for directions	<u>Start/End Time</u>
AAC November Star Party	November 14th, Saturday	Loftus Family Farm	Sunset approx. 5:34 pm EST
Starry Starry Night at The Villages	November 21st, Saturday	The Villages, Ocala	Sunset approx. 5:32 pm EST
December Holiday Party	December 12th, Saturday	Mark and Cindy Barnett's House	Starts at 6:00 pm



**Starry Night Photos by
Amanda Arner**





Alachua Astronomy Club, Inc.
A Not For Profit Organization



2010 Membership Form

Date ____/____/____ (Please CHECK one) **New Membership?** ____ or **Renewal?** ____

Name (Primary Applicant) _____

Address _____

City _____ **State** _____ **Zip** _____ **Country** _____

Telephone(s) Home (____) _____ **Business** (____) _____ **Cell** (____) _____

E-mail _____ **NOTE: Please fill in all information since we are updating our records.**

Astronomy Level (CHECK one) **Beginner** **Intermediate** **Advanced**

Own Telescope(s)? (CHECK one) **No** **Yes** **Type(s)** _____

How Long Interested in Astronomy? _____

If new member, how did you learn about us? **Web** **Newspaper** **Word of Mouth** **Other (specify)** _____

Special Interests/Abilities _____

Any Club Duties Would Like to Volunteer For? _____

Dues Categories: AAC membership allows voting rights and election to club offices for the primary applicant and each included Associate membership.

CHECK ONE dues category under either **A. Individual** or **B. Dual/Family** (includes one Associate membership). CHECK **Additional Associates** under **C. Other** if you want other family members to have voting rights.

A. Individual ¹		B. Dual/Family ^{1,2}		C. Other	
<input type="checkbox"/> Member	\$28.00	<input type="checkbox"/> Member	\$40.00	<input type="checkbox"/> Additional Associates	\$12.00 each
<input type="checkbox"/> Senior ³	\$20.00	<input type="checkbox"/> Senior ³	\$32.00		
<input type="checkbox"/> Full-time Student ⁴	\$12.00				
<input type="checkbox"/> Supporter ⁵	\$60.00	<input type="checkbox"/> Supporter ⁵	\$72.00		
<input type="checkbox"/> Benefactor ⁵	\$100.00	<input type="checkbox"/> Benefactor ⁵	\$112.00		

New member proration: Remit 50% dues between July 1 – Sept. 30. Remit full dues after Oct. 1 (will be applied toward following year).

¹ Membership includes Astronomical League membership (including one subscription to *Reflector Magazine*) and one subscription to *FirstLight* newsletter. The AAC is a member of the International Dark-Sky Association; please consider individual enrollment.

² Includes one Associate membership with voting privileges.

³ Eligible seniors are 62 years or older. (Seniors can still select regular membership!)

⁴ Student membership includes electronic subscription to *FirstLight* newsletter only.

⁵ The AAC is exempt from federal income tax (IRS Code, Sect. 501). Contributions to the AAC may be tax deductible. See your tax advisor.

Membership in the AAC (CHECK ONE category from Column A or Column B (above)) \$ _____

Additional Associate Memberships at \$12.00 each (CHECK Col. C) No. of Assoc. Memberships: _____ x \$12.00 = \$ _____

Names of ALL Associate Members _____

NOTE: AAC Mailing Address Has Changed from Previous Years

Make check out for total amount of dues to the:

Alachua Astronomy Club, Inc.

Total Amount Due \$ _____

Send *completed form* and *check* for club dues to:

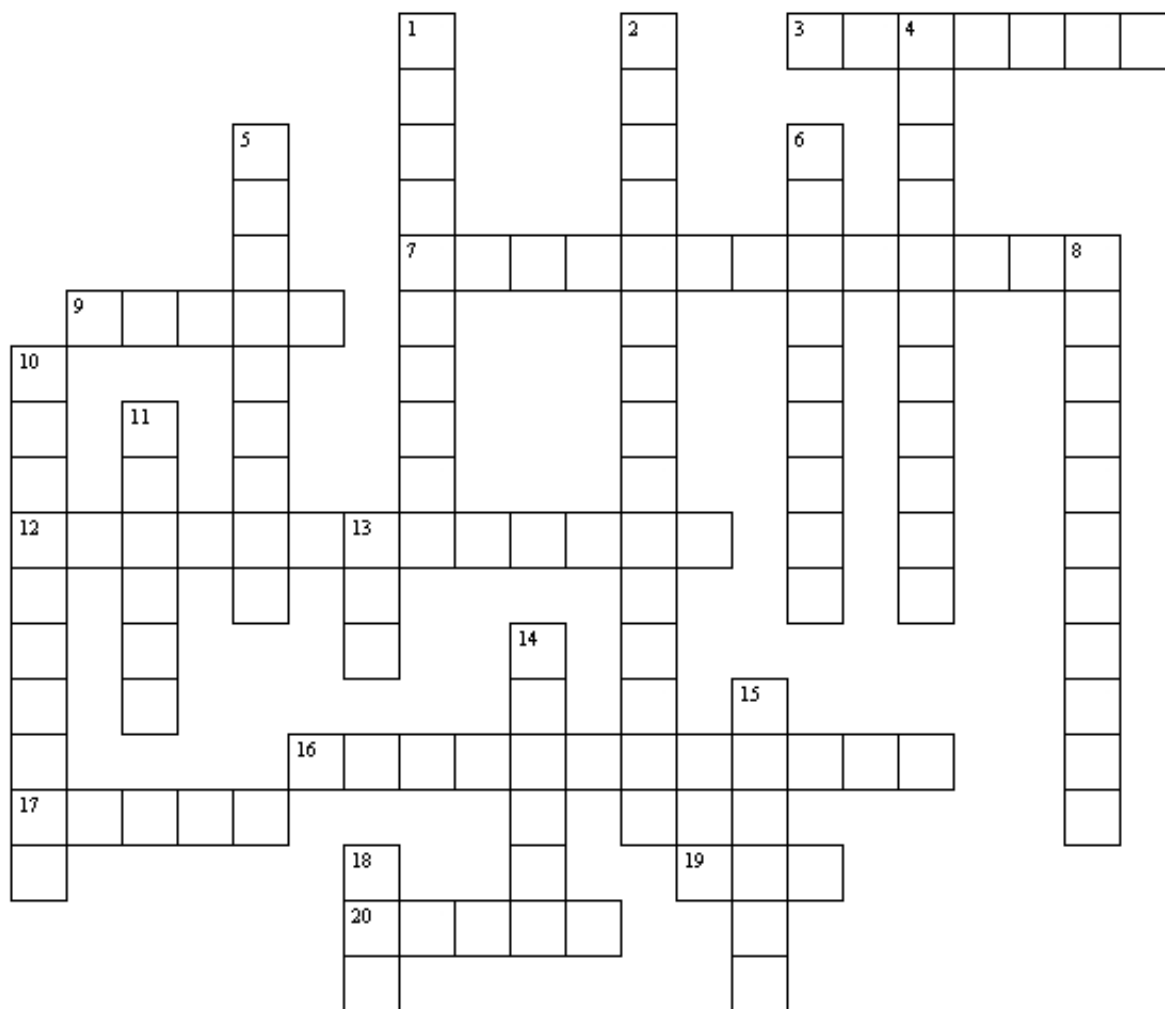
**Treasurer
Alachua Astronomy Club, Inc.**

Check Number _____

(We cannot accept dues without completed dues form)

**P.O. Box 141591
Gainesville FL 32614-1591 USA**

AAC Crosswords



ACROSS

- 3 Annual prize given by the AAC.
- 7 We love these lunar blackouts.
- 9 One of our club's founding fathers.
- 12 The Sun gets "covered" by the Moon.
- 16 SFC Planetarium.
- 17 Our president.
- 19 Amateur Telescope Making.
- 20 Our club's newsletter editor.

DOWN

- 1 Where we hold our monthly meetings.
- 2 A neat place on NW 8th Avenue.
- 4 Special events by the AAC.
- 5 Our club's Treasurer.
- 6 A device for looking at the stars.
- 8 A large event in Gainesville.
- 10 Our club's newsletter.
- 11 A super local artist and club member.
- 13 UF Campus Teaching Observatory.
- 14 Our club's Vice-President.
- 15 Our club's Secretary.
- 18 Lunar Observing Group.

Bob Lightner has provided us with this entertaining AAC Astronomy Crossword Puzzle. See if you can solve the puzzle.

The answers will be given at the AAC Holiday Party (with a reprint in the next newsletter). Thanks Bob! I hope you'll keep them coming for future issues.

Public Night at UF Observatory

The University of Florida, Department of Astronomy and Dr. Francisco Reyes hosts an on-campus Teaching Observatory for educational and public programs. These events are free to the public. The observatory is open Friday evenings, from 8:30 to 10:00, whenever UF classes are in session.

The Upcoming schedule features:

- Nov 6 Jupiter, Uranus, Neptune, Ring Nebula, Andromeda galaxy, Pleiades cluster
- Nov 13 Jupiter, Uranus, Neptune, Moon, Ring Nebula, Andromeda galaxy, Pleiades cluster
- Nov 20 Jupiter and Neptune (early) Uranus, Ring Nebula, Andromeda galaxy, Globular clusters, Orion Nebula
- Nov 27 No Public Night - Thanksgiving Holiday

- Dec 4 Moon (late) Uranus, Orion nebula, Pleiades cluster, Globular clusters, Andromeda galaxy
- Dec 11 Uranus, Orion nebula, Pleiades cluster, Globular cluster, Andromeda galaxy
- Dec 18 No Public Night—School break
- Dec 25 No Public Night—School break

