

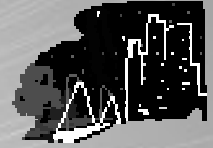


North Central Florida's
Amateur Astronomy Club
29°39' North, 82°21' West

November / December 2008



Member
Astronomical
League



Member
International
Dark-Sky Association

FirstLight
Newsletter of the Alachua Astronomy Club

2008 Holiday Party and Celebration of AAC's 21st Birthday!

When: Saturday, December 6, 2008, 6:00 p.m. EST

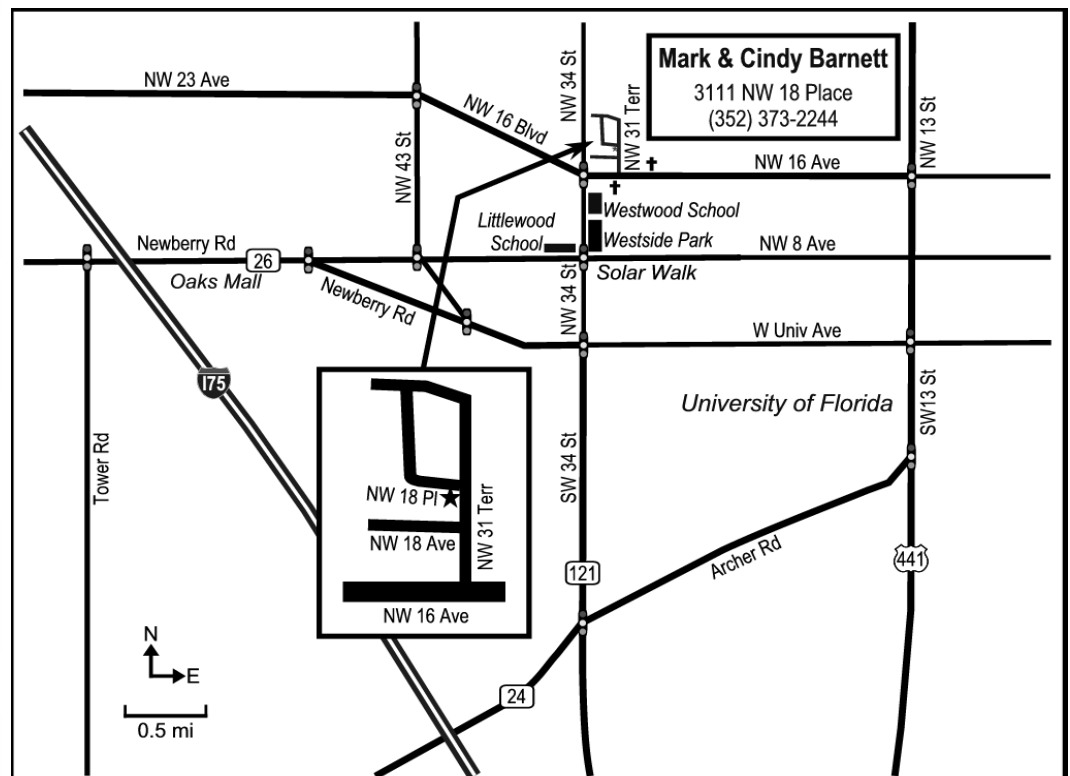
Where: Home of Mark & Cindy Barnett, 3111 NW 18th Pl., Gainesville, (352) 373-2244

What: This year we celebrate our club's 21st anniversary! Good food, games, our traditional astro slide quiz, sci-fi space music and more.

Potluck Dinner: There will be a food sign up sheet at our October and November meetings. Club will buy drinks and paper products. If you miss signing up at the October or November meetings, please send email to potluck@floridastars.org and indicate what food dish you will bring or ask for suggestions. Also, indicate the number that will attend.

Our celebration this year will feature a brief, animated astronomy lesson by Prof. Howard L. Cohen on a basic stargazing topic followed by one of his notorious and preposterous quizzes. The quiz will help teach and reinforce the star gazing lesson. Make sure you don't miss this FREE lesson (UF students used to pay big bucks to attend his lessons!).

Also - Come ready to play a game of Musical, Astronomical Trivial Pursuit conducted by Rich Russin. Teams of up to 4 players will compete in a game that will challenge your knowledge of music and astronomy. Questions will vary from Easy to Diabolical.



The modern furor over “flying saucers” began when private pilot Kenneth Arnold, on June 24, 1947, reported seeing nine mysterious high-speed objects flying “like a saucer would” near the ridge of the Cascade Mountains in Washington State. The furor heightened on July 8 that same year when the *Roswell Daily Record* newspaper reported, “RAAF Captures Flying Saucer on Ranch in Roswell Region.” (RAAF stood for Roswell Army Air Field, in New Mexico.) The Army Air Force put out a press release saying that “Flying Disks” had crashed. The next day, they retracted that story, and said that a weather balloon had crashed. They lied, and began an elaborate cover-up. What actually happened that night at Roswell? The real story is better than science fiction, and much better than the UFO theorists could concoct. I learned about it from Richard Muller’s “Physics for Future Presidents” podcasts.

The story actually begins in WWII, with Navy pilots downed at sea. They had in their survival kits innocuous round balls they had been instructed to drop into the sea each day at sunrise. They were not told why, but to just do it. These balls were of a size and weight that they would sink to a predetermined depth, then crush with a pop. The secret was in the proper depth they were designed to reach.

A U. S. government physicist named Maurice Ewing had learned that water gets colder as it gets deeper, making sound travel slower. But it also gets denser, making sound travel faster. At a certain depth, sound travels faster both above and below that depth. It turns out that waves, whether sound or light, or water waves, always curve toward the slower part of the medium through which they travel. You can see this at the beach, where incoming waves encounter the friction of the shelving sand, and the part of the wave closest to shore slows down, with the result that waves always arrive at the shore parallel to the beach, or very nearly so. You can also see it in the mirages above hot roadways, where the light from the sky encounters the hot air just above the pavement, and bends back up through cooler air toward your eye, and looks like water on the road. Light, opposite to sound, travels faster in the hot, less dense air near the roadway, and slower in the cooler, denser air higher above.

Water creates a “sound channel” at the particular depth discovered by Ewing, and travels for a very long distance. The water above and below conducts sound faster, and always causes sound at this depth to bend back and stay in the slower sound channel. A later application of this undersea sound channel was SOSUS, for detecting and tracking Soviet submarines, very accurately depicted in Tom Clancy’s first novel, *The Hunt for Red October*. My friends at Naval Research Lab told me Clancy would have been court-martialed for revealing all this had he been in the Navy.

Back to our Navy pilot, downed at sea. He drops his little spheres in the water at the predetermined time of day, and nearby submarines are listening on sonar for the sounds as they pop at the proper depth. With several submarines listening, they can triangulate his position, and soon have a PBV Catalina seaplane on the way to search for and rescue the pilot.

Following WWII, Ewing was still working for the Department of Defense. His problem was to help discover whether the Soviets had been able to build and test an atomic bomb. He recalled the undersea sound channel, and discovered there is a similar sound channel in the atmosphere. It occurs at about 40-50,000 feet altitude. The air gets colder with altitude (Recall the Mt. Everest expeditions). If the molecules move slower, then it will take longer for them to bump into their neighbor and conduct sound. So the speed of sound slows down with altitude, but only up to about 50,000 feet. There the air has an excess of ozone, which absorbs UV radiation from the Sun, heating the air at and above this level, and making sound travel faster above this ozone layer. (You can see this layer. It’s where the tops of our towering summer thunderclouds spread out into their famous anvil shape.) Ewing reasoned that, at this altitude, there would exist a sound channel in the atmosphere, much like under the sea, and sensitive microphones, suspended from a large balloon, just might be able to “hear” the blast of a Soviet atomic bomb. Think of how, in an empty parking garage, you can hear someone drop their car keys at the far end of the garage. Another “sound channel.”

On the night of July 7, 1947, the Army Air Force was test flying Ewing’s apparatus beneath a large balloon, out of Alamoogordo Army Air Field. Called Project Mogul, it consisted of a string of microphones backed by very large parabolic metal disks, to reflect the maximum sound into the microphones. It also had metal foil “corner reflectors,” to enable easy tracking by radar. The markings on it were purposely very cryptic, as the project was highly classified. The balloon lost buoyancy, and the rig came crashing down on a ranch near Roswell. The local Roswell Army Air Force contingent was called out, and truthfully said that flying disks had crashed and were recovered. When the Project Mogul authorities found out, the story was retracted, and a false story was put forward to protect this highly classified project. Add a dark night, the recent Kenneth Arnold story, perhaps a wish for some notoriety, and a wonderful conspiracy theory was born.

On the other hand, perhaps I am One OF Them, and trying to steer you away from The Real Truth.

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 will be no monthly meeting in December.

Alachua Astronomy Club, Inc.

2008 Officers

President: Bill Helms
Phone: 352-542-8227
Email: president@floridastars.org

Acting Vice-President: Howard Cohen
Phone: 352-495-1811
Email: vicepresident@floridastars.org

Treasurer: Larry Friedberg
Phone: 954-290-6872
Email: treasurer@floridastars.org

Secretary: Tandy Carter
Phone: 386-546-3387
Email: sec@floridastars.org

Board of Directors

Pamela Mydock
Bob O'Connell
Fred Palgon

Chairs and Committees:

Star Parties: Mike Toomey
Phone: 352-219-0572
Email: starparty@floridastars.org

Programs: Tim Malles
Phone: 352-371-7172
Email: programs@floridastars.org

School Liaison & Outreach:
Tandy Carter
Email: outreach@floridastars.org

ATM SIG: Chuck Broward
Email: ATM@floridastars.org

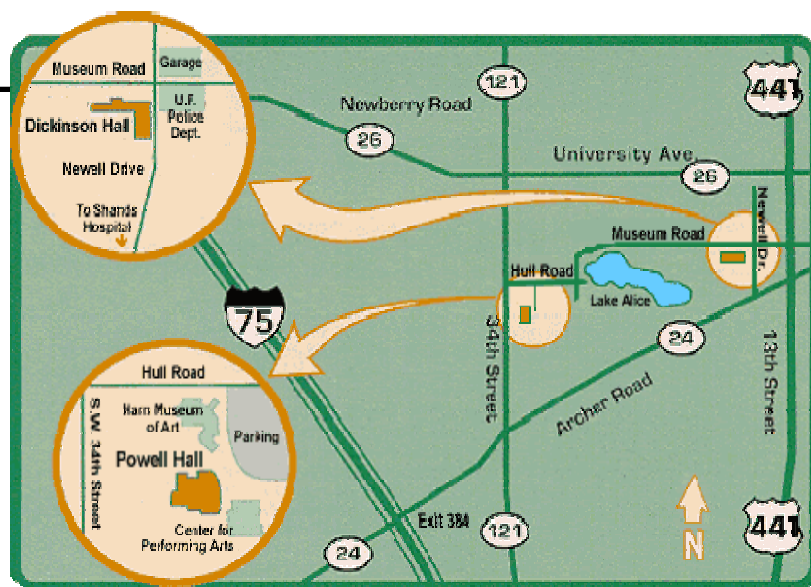
Astronomical League Correspondent:
Charles S. Broward
Phone: 352-373-7527

Telescope Custodian: Tandy Carter
Email: telescopes@floridastars.org

Lunar Observing/SIG: Bob O'Connell
Email: lunar@floridastars.org

Webmaster: Howard L. Cohen
Email: webmaster@floridastars.org

FirstLight Editor: Jackie Owens
Phone: 386-462-7366
Email: firstlight@floridastars.org



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 13744
Gainesville, FL 32604-1744 USA

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

FirstLight is the bi-monthly publication of the Alachua Astronomy Club, Inc., Gainesville, Florida. © Copyright 2008, Alachua Astronomy Club, Inc. *FirstLight* is copyright by the AAC. No part of *FirstLight* may be reproduced by any means, nor stored in retrieval systems, transmitted or otherwise copied without written permission from the AAC.

November Club Meeting

Tuesday, November 11 2008, 7:00 p.m. EST

Speaker: George F. Haddad, NASA Aerospace Engineer

Title: *NASA Science Missions I Have Known and Loved*

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



George F. Haddad
NASA Aerospace Engineer

Preview: George Haddad, from NASA Kennedy Space Center in Florida, will present an overview of NASA Science missions (Cassini, STEREO, Gravity Probe B, etc.) on which he has worked. He will describe their objectives, the instruments on board, and what has been learned from them thus far.

About the Speaker: Mr. Haddad is an Aerospace Engineer at NASA Kennedy Space Center (KSC). He started his career with NASA in 1989 as a Fluid Systems Engineer at the Glenn Research Center, in Cleveland, Ohio where he designed fluid systems for aeronautic test rigs, and for various microgravity space experiments that flew on the Space Shuttle and on the sounding rockets.

George has supported the integration and launch of many of NASA's scientific and planetary missions such as the Solar and Heliospheric Observatory (SOHO), the GOES weather satellites, the Cassini mission, the Gravity Probe B mission, and recently the STEREO mission.

He is the principal investigator for several research projects, and presently is developing the Ground Systems for the Constellation Program at KSC. He has a Master Degree in Aerospace and Mechanical Engineering from the University of Central Florida. George is fluent in French and Arabic. He lives with his wife and three boys in Melbourne, Florida.

Time to Renew Your AAC Membership!

Enclosed in this month's newsletter is a renewal form for the Alachua Astronomy Club. Please fill it out and return the form to our Treasurer whose mailing address is listed on the form. You can also download the form from our website:
floridastars.org.



Please list any activities you might be interested in volunteering for like Star Parties, Educational Outreach, the UF Observatory, etc.

Membership in the AAC entitles you to receive the bimonthly newsletter (*FirstLight*), *The Reflector*, the Astronomical League's quarterly newsletter, reduced subscriptions to *Sky & Telescope* and *Astronomy* magazines, use of club telescopes, observing sites and library materials and free classified in *FirstLight*.

IYA2009

The International Year of Astronomy 2009 is a global effort initiated by the International Astronomical Union and UNESCO to help the citizens of the world rediscover their place in the Universe through the day- and night-time sky, and thereby engage a personal sense of wonder and discovery.

Vision

Everyone should realize the impact of astronomy and other fundamental sciences on our daily lives, and understand how scientific knowledge can contribute to a more equitable and peaceful society. IYA2009 activities will take place locally, nationally, regionally and internationally. National Nodes have been formed in each country to prepare activities for 2009. These nodes will establish collaborations between professional and amateur astronomers, science centers and science communicators to prepare activities for 2009. Already now, 129 countries are involved and well over 140 are expected to participate eventually.

To help coordinate this huge global program and to provide an important resource for the participating countries, the IAU has established a central Secretariat and an IYA2009 website (www.astronomy2009.org) as the principal IYA2009 resource for public, professionals and media alike.



The World at Night (TWAN) will create and exhibit a collection of stunning photographs and time-lapse videos of the world's most beautiful and historic sites against a night-time backdrop of stars, planets and celestial events. These images will present the night sky to the public in an accessible and understandable manner. The sky rises above all the landmarks and symbols of different nations and regions creating a bridge to understanding and friendship. When borders vanish, political and cultural differences become irrelevant. The universal nature of astronomy provides the means to connect people worldwide through this common interest. TWAN's parent organization, Astronomers without Borders, has several projects designed to work towards this goal. TWAN is an innovative new approach to expanding this global perspective.



Star Party Report

Mike Toomey



We've had a good streak of weather for stargazing, including the well-attended star party at Stargate Observatory. The skies were very transparent even though the seeing was a little bit soft. These conditions are well-suited for faint fuzzies like galaxies and nebulae but less than ideal for planets and star-splitting.

Thank you, Fred and Lucille, for graciously hosting us once again.

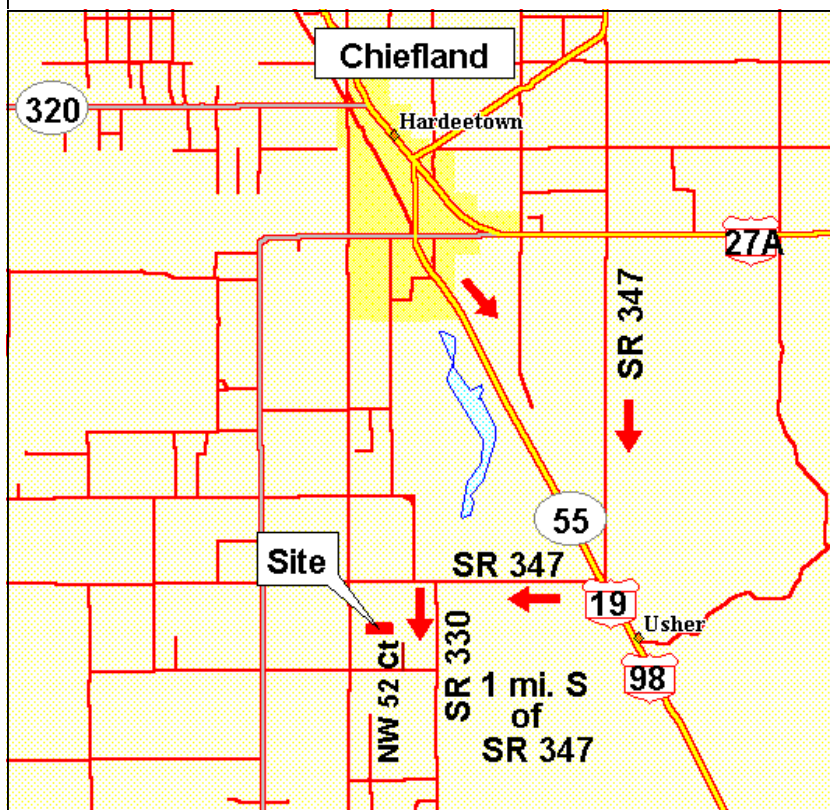
In November, we're going to try something a little different. Tom Crowley, at the Chiefland Astronomy Village, has invited us to use his field for stargazing. This field is also known as the 'alternate field' at many CAV star parties. I will set out a sign for AAC members to look for as they arrive.

Anyone attending is *strongly* encouraged to arrive at least one hour before dark. If arriving after dark, you will not be permitted to drive onto the observing field. In fact, you'll need to turn off your lights once you reach the pavement, park down the street a ways and hike a couple hundred yards – not a good plan if you have a telescope in tow.

Because we have scheduled our visit a week prior to new moon, guests *will* be permitted to drive off the field after sundown – an exception to CAV rules. However, those planning to do so will need to position their vehicles near the street. Please coordinate this with me when you arrive.

One more disclaimer – no green lasers at this star party. Thank you!

In lieu of a star party in December, the Barnett's will host our annual holiday party. In January, we have another new site at the Newberry Sports Complex. This will be our first trial at a site that may hold long-term possibilities. I do not expect pristine skies but the amenities may be first class – with a reasonably short drive as well. Details will be published in the next *FirstLight*.



At Right: Map to the Chiefland Astronomy Village

The CAV is one of the premier dark-sky observing sites in the Eastern United States. It was formed to provide a convenient dark-sky observing facility for members and guests.

Latitude 29° 24.492' North
Longitude 82° 51.642' West

STAR PARTY SCHEDULE: Upcoming Events - 2008 - 2009

Star Party	Date 2008	Location Check the website for di- rections and map	Start/End Time
AAC November Lunar Observing Group Star Party	Nov. 8, 2008 Saturday	Rich Russin's Residence - Newberry	Setup Time: 5:00 p.m. EST Start Time: 6:00 p.m. EST Sunset: 5:38 p.m. EST
AAC November Star Party	Nov. 22, 2008 Saturday	Chiefland Astronomy Village	Sunset 5:31 pm EST
AAC Holiday Party	Dec. 6th, 2008	Barnett Residence	Party Starts: 6:00 p.m. EST Sunset 5:30 pm. EST
AAC January Star Party	To Be Announced	Newberry Sports Complex	To Be Announced
Southern Cross Astronomical Society Winter Star Party	Feb. 21 - 28, 2009	Florida Keys	See website for reservations: www.scas.org/wsp.html Prior reservations required

Star Party Report (continued)

As most of you already know, I plan to step down as Star Party Coordinator at the end of this year. I hope I can recruit a replacement by then. Co-chairs would be welcomed as well. The position is not difficult – and you do not need to be an expert astronomer. The task is in 3 parts: scheduling, promotion and hosting.

- ◆ I have already mapped out all of 2009. The following year's calendar can be modeled after that. I have recorded all the necessary contacts and other relevant information about each site. A reminder should be sent to each site host at least 2 weeks prior.
- ◆ Promotion is at your discretion but I recommend, at the least, an article to each issue of *FirstLight* (6 issues per year). Also, reminder emails to the club's listserv are a must.
- ◆ Hosting a star party is a simple errand since many of our star parties are held at member residences'. What's important here is to keep an eye out for newcomers and to be certain they feel welcome. A substitute host can be appointed if you cannot attend a particular star party.

Please contact me if you would like to know more about this opportunity.

Mike Toomey

Mike Toomey has served the AAC in many capacities since 1998, including President, Secretary, FirstLight editor and Star Party Coordinator. He won the AAC's Service Award in 2000. Mike resides in Gainesville with his wife Heidi.

A Brief Column for the Beginning Stargazer Introducing New Astronomical Terms

Astronomy is rich with terminology. This column originally began about ten years ago (January 1999). Its intent was to help beginning stargazers ease into the world of astronomy by introducing a new basic astronomical term (word, acronym or abbreviation) each month.

However, other duties prevented the author from contributing monthly “Å to ZZ” columns since January 2002. Consequently, this column appeared only twice since then (April 2002 and Feb/Mar 2005).

This month I will add one additional term to this column, although I cannot promise when the next installment will occur!

In any case, “Astronomy from Å to ZZ” originally started with the letter *a* (for *apparent magnitude*) and is alphabetical using successive letters for each column’s entry. The Feb/Mar 2005 column ended with *m* (for *meridian*), half way through a second cycle of twenty-six terms.

(Following this article is an index of all terms that have appeared in this column.)

Therefore, our next entry should start with the letter *n*. A good choice for this letter is **NGC**, a common abbreviation associated with **deep-sky objects** (*non-stellar* objects not members of the Solar System).

Note: The name of this column, **Å to ZZ**, starts not with the letter A but with **Å**, the symbol for ångström (after Anders J. Ångström), a very small unit of length (0.1 nano meters or 10^{-10} m).

WORD OF THE MONTH FOR NOV/DEC 2008

NGC An abbreviation for the **New General Catalog**, actually the **New General Catalog of Nebulae and Clusters of Stars**, and one of the most comprehensive lists of deep-sky objects. Although published 120 years ago, this catalog contains a numbering system for deep-sky objects that has stood the test of time (Dreyer, J.L.E., 1888, *Memoirs of the Royal Astronomical Society*, Vol. 49, pp. 1–237).

The Danish astronomer, John Louis Emil Dreyer (1852–1926) of the Ammagh Observatory, Ireland, compiled this catalog based on previous work by John F.W. Herschel (1792–1871). John Herschel had published his own catalog in 1864, *the General Catalog of Nebulae*, based on his own discoveries and that of his famous father, Friedrich (Frederick) William Herschel (1738–1822), the discoverer of Uranus. William Herschel was one of the earliest deep-sky observers and maker of hundreds of reflecting telescopes including his great 49-1/2 inch (126 cm) diameter speculum reflector with a 40-foot (12 m) focal length.

The NGC contains a list of 7,840 non-stellar objects including *galactic nebulae*, *star clusters* and *galaxies*. However, the latter are not included in its title since nineteenth century observers did not know the latter as *galaxies*. These vast star systems simply appeared as extended nebulous objects in their premodern telescopes that could not resolve their galactic stellar components.

Dreyer, extended this catalog in two supplements, the first and second **Index Catalogs (IC I and IC II)** published in 1895 and 1908 respectively. This added 1,529 and 3,857 objects or a total of 5,386 additional deep-sky objects. This brings the grand total in all three catalogs to 13,226 objects found over the entire sky!

Although deep-sky objects may also have other catalog designations, NGC and IC numbers remain widely used to identify deep-sky objects. Consequently, most astronomical, non-stellar objects amateur astronomers will likely observe are in the full NGC Catalog.

The *NGC Catalog* numbers objects by increasing *right ascension*, a common method, along with positional information and a brief description.

Right ascension, including *declination*, are celestial coordinates analogous to longitude and latitude on Earth. Right ascension is measured eastward along the *celestial equator* from the *vernal equinox*. Therefore, NGC numbers help show position on the sky. This is a common practice in many deep-sky catalogs

The abbreviation NGC appears in some *Star Trek* episodes. However, *Star Trek NGC objects* do not usually correspond to real NGC deep-sky bodies. For example, *Star Trek* calls NGC 321 a star cluster and NGC 667 a planet, but both are actually galaxies.

The *NGC Catalog* is now available on the web including *The Interactive NGC Catalog Online* at seds.org/~spider/ngc/ngc.html, *the Revised New General Catalogue and Index Catalogue* at www.klima-luft.de/steinicke/ngcic/rev2000/Explan.htm, the *Whole NGC* at www.astrosurf.com/benoit/ngc.html, and *The NGC/IC Project* at www.ngcic.org. The latter, an excellent web site, attempts to correct many errors in the original NGC.

The NGC/IC Project Home Page states:

“The NGC/IC Project is a collaborative effort between professional and amateur astronomers to correctly identify all of the original NGC and IC objects, starting with the original discoverer's notes and working forward in time to encompass the work of contemporary astronomers, both professional and amateur.”

OTHER COMMON DEEP SKY CATALOGS

The Messier Catalog

Amateur and professional astronomers are also familiar with other deep-sky lists especially *Messier* catalog numbers (abbreviated *M*). Charles J. Messier (1730–1817), a French astronomer and devoted observer, compiled a list of about 100 bright nebulous looking objects so he would not confuse them with comets. He published his final list of 103 objects in 1781, a list later slightly extended by others to 110.

Among the faintest in his list, at apparent magnitude +11, are the *Little Dumbbell* and *Owl Nebulae*, planetary nebulae designated M76 and M97 or NGC 650/651 and NGC 3587 respectively. However, do not look for the brightest Messier object in the NGC, the *Pleiades Open Star Cluster* (M45). This breathtaking cluster has no NGC/IC number because it is an easy naked eye object with an integrated apparent magnitude of +1.2.

Since Messier used small telescopes (effective apertures of about 4-inches or less), all Messier objects can be viewed in small scopes. (Messier did

not discover all objects in his list.) In fact, a modern 4-inch refractor would surpass Messier's instruments.

Therefore, Messier objects are typically the largest and brightest deep-sky objects. His catalog represents a “first choice” list of deep-sky objects since amateurs can see all in a 4-inch telescope. But, to view most NGC/IC objects requires a 16-inch or larger telescope.

Thus, although Messier objects also carry NGC numbers, Messier designations are more often used than their NGC designations. A notable exception is the bright, spectacular *Double Cluster* h & Chi Persei, mysteriously not listed by Messier. The reason is unclear although Graun (2005) has written about this mystery. Consequently, the *Double Cluster* remains an NGC but not Messier object numbered NGC 869 and NGC 884. (Graun has suggested adding these clusters as M111 and M112.)

The Caldwell Catalog

The *Caldwell Catalog* (1995), compiled by the legendary British amateur Patrick Moore (1923–), is a modern complement to the Messier Catalog adding 109 additional bright, deep-sky objects for amateurs. The brightest is C41, the *Hyades* (an open star cluster), which has no Messier or NGC/IC number because of its large size filled with many bright naked eye stars.

However, C41 also carries the catalog designations Melotte 25 and Collinder 50 (an open cluster catalog). The faintest looking (apparent magnitude +11.9) is probably C24 (NGC 1275), or *Perseus A*, an elliptical galaxy dominating the huge *Perseus Cluster of Galaxies*.

Both Messier and Caldwell objects are now available on quick-reference, 9x12 in., laminated sky charts from Sky Publishing Corp. at www.skyandtelescope.com (\$5.95 each.) These charts also tabulate NGC numbers, positions, sizes, and magnitudes on the back.

Nevertheless, the NGC remains one of the most extensive and widely used catalogs of deep-sky objects although published more than a century ago. □

EXAMPLES OF COMMON NGC OBJECTS

NGC *	M45	Pleiades	Open Cluster
NGC 104		47 Tucanae	Globular Cluster
NGC 224	M31	Andromeda Galaxy	Spiral Galaxy
NGC 869	M111†	h Persei	Open Cluster
NGC 884	M112†	Chi Persei	Open Cluster
NGC 598	M33	Pinwheel Galaxy	Spiral Galaxy
NGC 1652	M1	Crab Nebula	Supernova Remnant
NGC 1976	M42	Orion Nebula	Diffuse Nebula
NGC 2237		Rosette Nebula	Diffuse Nebula
NGC 2632	M44	Praesepe	Open Cluster
NGC 3372		Eta Carina Nebula	Diffuse Nebula
NGC 4755		Jewel Box	Open Cluster
NGC 5128		Centaurus A	Elliptical Galaxy
NGC 5139		Omega Centauri	Globular Cluster
NGC 5194	M51	Whirlpool Galaxy	Spiral Galaxy
NGC 6205	M13	Hercules Cluster	Globular Cluster
NGC 6514	M20	Trifid Nebula	Nebula + Cluster
NGC 6523	M8	Lagoon Nebula	Diffuse Nebula
NGC 6720	M57	Ring Nebula	Planetary Nebula
NGC 6853	M27	Dumbbell Nebula	Planetary Nebula
NGC 7000		N. American Nebula	Diffuse Nebula

*Dreyer did not list the *Pleiades* (or *Hyades*) open star clusters because their large sizes make them easy naked eye objects.

†Not "official." Suggested by K. Graun (2005).

References

- Graun, K. 2005, *The Next Step: Finding and Viewing Messier's Objects* (Ken Press Book).
Interactive NGC Catalog Online at seds.org/~spider/ngc/ngc.html .
 Illingworth, V. & Clark J.O.E. 2000, *The Facts on File Dictionary of Astronomy*, 4th Ed. (Checkmark Books).
Memory Alpha (a *Star Trek* on-line encyclopedia) at memory-alpha.org .
Memory Beta (a *Star Trek* data base) at startrek.wikia.com .
 Mitton, J. 1991 *Concise Dictionary of Astronomy* (Oxford Univ. Press).
NGC/IC Project at www.ngcic.org .
Revised New General Catalogue and Index Catalogue at www.klima-luft.de/steinicke/ngcic/rev2000/Explan.htm .
 Ridpath, I. 1997, *A Dictionary of Astronomy* (Oxford Univ. Press).
Whole NGC at www.astrosurf.com/benoit/ngc.html .

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. He also currently serves as acting AAC Vice President.

Astronomy From Å to ZZ — Index

Year	FirstLight Issue	Word or Term
1999	January	absolute magnitude
	February	Bayer letter
	March	conjunction (inferior & superior)
	April	deep sky or deep sky object
	May	elongation
	June	full Moon
	July	gibbous Moon
	August	Huygens eyepiece
	September	inferior planet
	October	Julian Date (Julian Day Number)
	November	kelvin (Kelvin scale)
	December	leap year
2000	January	month
	February	nebula
	March	open cluster (originally galactic cluster)
	April	parsec
	May	quadrature
	June	retrograde
	July	spectral class
	August	transit (culmination)
	September	Universal Time
	October	visual binary
	November	Wolf sunspot number (incl. sunspots)
	December	X-rays
2001	January	year
	February	zenith, zenith distance
	March	altazimuth mounting
	April	bolide
	May	Charon
	June	Dawes' limit
	July	early-type star, late-type star
	August	Flamsteed numbers
	September	Greenwich Civil (Mean) Time
	October	Harvest & Hunter's Moons
	November	impact crater
	December	Jovian planet
2002	January	Keplerian Telescope
	April	libration
2005	Feb./Mar.	meridian (celestial)
2008	Nov./Dec.	NGC (New General Catalog)

Executive Council Meeting Minutes

Due to space limitations in the Firstlight newsletter , the Executive Council Meeting minutes will soon be available online. AAC members will be able to access the approved minutes at our website floridas-tars.org.

Be sure to sign up for the AAC-L list to receive emails of upcoming announcements and events.

FirstLight

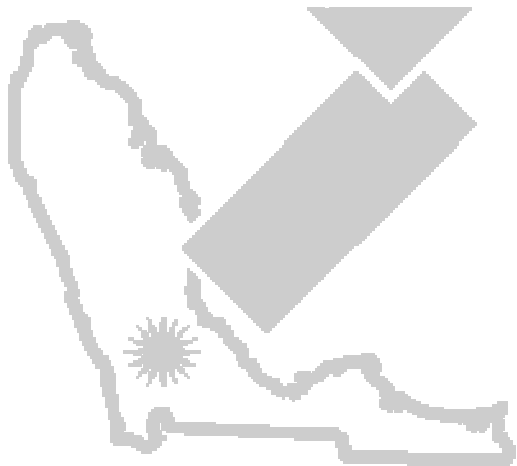
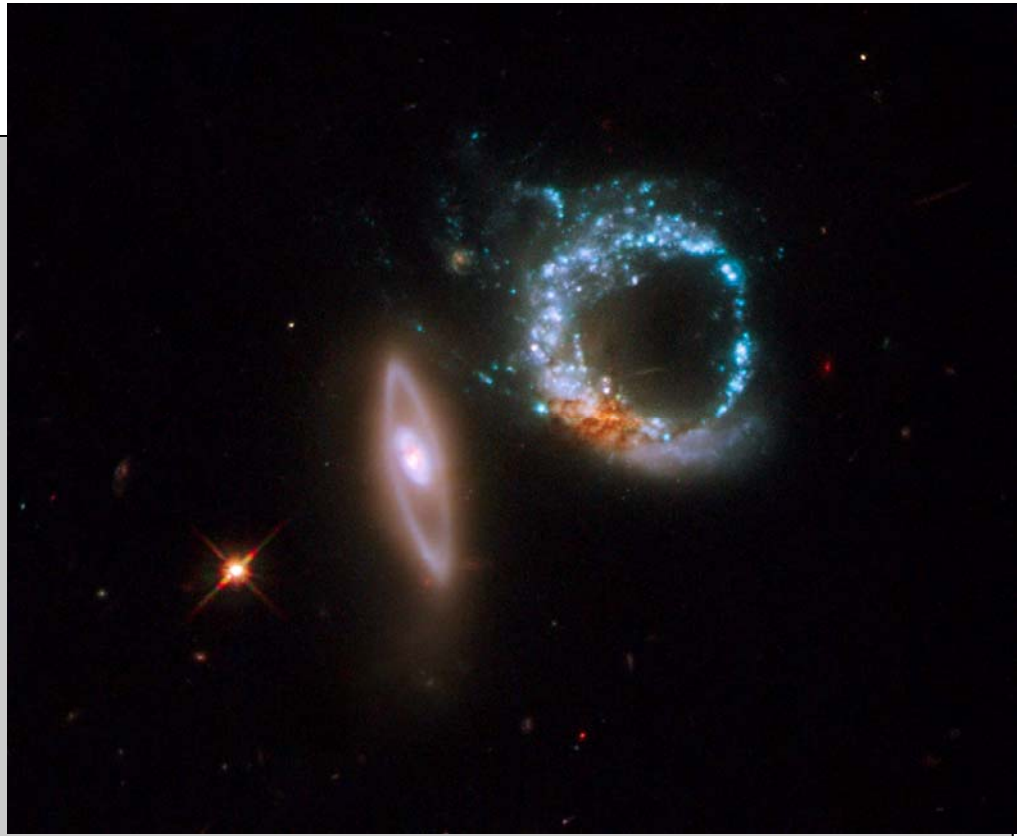
November / December
2008

The Double Ring Galaxies of Arp 147 from Hubble

Credit: M Livio et al. (STScI), ESA, NASA

Explanation: How could a galaxy become shaped like a ring? Even more strange: how could two? The rim of the blue galaxy pictured on the right shows an immense ring-like structure 30,000 light years in diameter composed of newly formed, extremely bright, massive stars. This blue galaxy is part of the interacting galaxy system known as Arp 147, and shows a ring because it has recently collided with the other galaxy in the frame, the red galaxy on the left. Unusually, even this red galaxy shows a ring like band, although it is seen nearly edge-on. When galaxies collide, they pass through each other -- their individual stars rarely come

into contact. Clouds of interstellar gas and dust become condensed, causing a wave of star formation to move out from the impact point like a ripple across the surface of a pond. The above image was taken last week by NASA's Hubble Space Telescope to demonstrate the ability of its Wide Field Planetary Camera 2 after some recent technical difficulties.



FirstLight

Newsletter of the Alachua Astronomy Club, Inc.

P.O. Box 13744

Gainesville, Florida 32604-1744

Web: www.floridastars.org

Email: firstlight@floridastars.org