

THE FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT
RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

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Officers: President, **Dwight Harness** (1770 Hollonville Rd., Brooks, Ga. 30205, 770-227-9321, rdharness@yahoo.com); Vice President, **Bill Warren** (1212 Everee Inn Rd., Griffin, Ga. 30224, warren7804@bellsouth.net); Secretary, **Carlos Flores**; Treasurer, **Jeremy Milligan**.

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Club mailing address: 1212 Everee Inn Rd., Griffin, GA 30224. FRAC web site: www.flintriverastronomy.org.

Please notify **Bill Warren** promptly if you have a change of home address, telephone no. or e-mail address, or if you fail to receive your monthly *Observer* or quarterly *Reflector* from the A. L.

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Club Calendar. Sat., Dec. 9: FRAC Christmas party (6:30 p.m. at Bryan's Buffet Restaurant in Griffin).

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President's Message. Thirty years ago this month, a Miami stargazer and tv host named **Jack Horkheimer** saw something in the sky that had been there for thousands of years, but no one had ever noticed it before. We heard about it a few years ago, but we've added a lot of new members

since then. With Christmas coming I thought you'd like to hear about it again, only this time in Jack's own words. He told it on a Dec., 1996 episode of *Jack Horkheimer: Star Gazer*, his 5-min. weekly tv show. It's a wonderful story, and I think you'll like it:

"I'd like to retell a story about a fascinating cosmic coincidence I discovered back in December of '87, a story many viewers ask me to retell year after year.

"It all happened by accident as I was searching for something unusual for my Christmas week show. Strangely enough it all began, not with a constellation of winter, but with a constellation of summer, *Cygnus the Swan*, a star pattern which rises in the east just after sunset in July.

"Cygnus has always enchanted me because it looks so much like its name: a graceful swan, its tail marked by one bright star, its beak by another, a star for the tip of the left wing and a star for the tip of the right wing -- stars which, if we draw lines between them, represent a swan with outstretched wings. In my youth, I always loved to watch Cygnus rise in the east on summer evenings and climb higher and higher, until at midnight his wings were outstretched across the very roof of heaven. Then after midnight he would silently descend, gliding downward to the western horizon.

"Now, one thing that always fascinated me about Cygnus was that, as he approached the western horizon, he seemed to change his shape from a swan into a great cross, a star pattern early Christians called the **Northern Cross**. (*We still call it that. -Dwight.*) It was also interesting to me that every year during Christmas week, around 8 p.m. or so this cross stands almost upright on the northwestern horizon.

"In December of '87 as I was researching my Christmas show, the little obscure star cluster called the **Bee Hive** (*M44 in the constellation Cancer -Dwight.*) caught my attention and jogged an old memory, for I remembered that the Bee Hive's real name is **Praesepe**, which is Latin for The Manger.

"So I said to myself, *Wouldn't it be a nice coincidence if at Christmas time we could see both the Cross and the Manger at the same time?*

"Well, just for fun I picked up my star wheel and dialed in December 25th, 8 p.m. and noticed something which gave me a pleasant start. For indeed, there on the wheel at 8 p.m. on the 25th of

December, was not only the Northern Cross standing upright on the western horizon, just about to set, but directly opposite on the eastern horizon was Praesepe, the Manger, just rising.

“And they will always be there opposite each other in the heavens every year, every Christmas of our lives. How poetic. Indeed, in all my years as a star gazer I had never heard or read of this lovely coincidence.

“So as you gaze up at the night sky this Christmas week at the setting Cross and the rising Manger, may the heavens themselves remind you of a wish that should know no religious boundaries, and that is simply: Peace On Earth, Good Will Toward Men -- a hope for all mankind of all beliefs if we remind each other to **Keep Looking Up!**”

I couldn't have said it better myself. Merry Christmas and Happy New Year, everybody! Have a safe holidays, and I hope you'll be able to attend our Christmas Party on Dec. 9th.

Finally, let me offer a hearty WELCOME TO FRAC! to our newest members, **Ken Harris & Kim Shepherd** and **Ryan & Carol Force**.

-Dwight Harness

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Last Month's Meeting/Activities. On Nov. 7th, **Dwight Harness** gave a talk on “The Cove” meteor crater site at the Pike Co. Historical Society meeting in Zebulon.

Sixteen people – including **Ken Harris & Kim Shepherd**, who joined FRAC that night – attended our Nov. meeting. Other attendees included: **Dwight Harness; Tom Moore; Elaine Stachowiak; Steve Barton; Felix Luciano; Truman Boyle; Erik Erikson; Steve Hollander; Cindy Barton; Ken & Rose Olsen; John Felbinger; Tricia Lopez; and yr. editor.** We enjoyed home-made chocolate chip cookies from Ken & Rose while we watched the **Alex Filippenko** dvd, “Glorious Total Solar Eclipses.”

From **Felix Luciano**: “We had a small but very excited audience of ten participants at our High Falls State Park public observing on Nov. 11th. We did not do any observing due to cloud cover, but **Phil Sacco** wasn't going to let a little thing like clouds stop him. He told stories about the mythology of the stars and constellations and answered a steady stream of questions and

comments from his listeners until about 10 p.m. Everyone enjoyed it very much and had a good time, and our visitors learned why we always look forward to Phil's talks.

In addition to Felix, Phil and our visitors, FRAC attendees included: **Elaine Stachowiak; Jon & Kamara Heard; and Erik Erikson.**

Jeremy Milligan, Sean Neckel, Elaine Stachowiak, Erik Erikson, Dwight Harness and **yr. editor** attended our JKWMA observing on Nov. 17th. The sky was clear but uncharacteristically humid for this time of year. Erik tried out one of his two new telescopes, a 6-in. Newtonian reflector that he paid \$100 for, and Sean tracked down Double Star Program targets and showed us **Neptune and Uranus.**

The following evening's observing was clouded out.

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This 'n That. If you're in the market for a Christmas gift for a young reader, you might want to consider the children's book *Tiny Makes a Friend*, written by FRAC member and Sun City Peachtree resident **Eva Schmidler**. “Tiny” is a mouse, and his unlikely friend is a cat; through their adventures they learn to trust and support each other.

Eva's book has received excellent reviews, and was a finalist in the 2017 International Book Awards competition. It is available at amazon.com (\$8.99 in paperback and \$3.99 in Kindle), and at on-demand bookstores.

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Upcoming Meetings/Activities. The period from Thanksgiving to New Year's is the busiest time of year, with things like visits to relatives (or vice versa), Christmas shopping and parties occupying members' attention and time. We don't conduct club or public observings in Dec., and instead of our regular meeting we have a Christmas party.

This year's party will be at 6:30 p.m. on **Sat., Dec. 9th** at Bryan's Buffet Restaurant in Griffin. We've reserved a room, and we'll have a bunch of door prizes to give out. Bring the whole family: it's an opportunity for them to meet the fine folks in your FRAC second family. We always have a lot of fun, and you'll be glad you came.

Directions to Bryan's. Coming south from, say, Hampton on U. S. Hwy. 19/41, stay on the 4-lane past the Hardee's/McDonald's stoplight in

Griffin. Go two stoplights farther and turn right. Bryan's parking lot is on the immediate left, just beyond the movie sign.

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The Sky in December. With no planets up at night this month, let's turn our attention to the **Geminids Meteor Shower**. With a maximum of 120 meteors per hour at peak, the Geminids is one of the very best annual meteor showers.

Unlike the other major meteor showers, the Geminids peak at night, not at dawn. This year, that peak will begin at sundown on **Dec. 13th** and will continue until sunrise the next morning. The waning crescent **Moon** won't rise until after 3 a.m., so you'll have an unimpeded view of the Geminids meteors as soon as it gets dark.

As you know, meteor showers are named for the constellation from which the meteors appear to be coming – in this case, *Gemini, the Twins*. Gemini will be high in the northern sky, and easily identified by its brightest stars, **Castor (Alpha Gem)** and **Pollux (Beta Gem)**. You won't see more meteors there than anywhere else in the sky, that's just the direction they will appear to be coming from.

This year's Geminids light show should be one of the best in recent memory. As **S. N. Johnson-Roehr** (*Sky & Telescope*, Dec., 2017, p. 49) put it, "You (won't) have to be particularly lucky to see a few Geminids if you spend even a half hour outside."

Observing Tips. 1. Dress warmly. 2. Sit under a blanket in a comfortable chair (preferably a reclining lawn chair). 3. Don't crane your neck upward; just sit back, choose an area of open, dark sky and relax your gaze. You'll spot most of the meteors in your peripheral vision. 4. Don't give up if you don't see a meteor in the first five min. or so. The good things in life are worth waiting for.

Finally: If you're working on the Messier, Double Star, Caldwell or Herschel 400 observing programs, our website has an article, "FRAC Monthly Objects List," by **Larry Fallin** that tells which objects in those programs are best observed each month. For example, the Dec. Messiers are **M77** in *Cetus* and **M34 & M76** in *Perseus*, and the Double Stars are **Gamma & Lambda Aries**; **Gamma Cetus**; **32 & 55 Eridanus**; and **Eta Perseus** and **Struve 331** (also in *Perseus*).

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Five Astronomers With A. L. Observing Programs Named After Them
by Bill Warren

"When looked at closely enough, every galaxy is peculiar."

-Halton C. Arp

1. The Arp Peculiar Galaxies Program

Halton C. Arp (1927-2013) did not discover any of the galaxies in the A. L. observing program that bears his name. Rather, over a period spanning several decades spent working at the observatories on Mts. Wilson and Palomar, Arp compiled a photographic atlas of galaxies that display unusual characteristics not found in "normal" galaxies. His *Atlas of Peculiar Galaxies*, published in 1966, contains images of 338 irregular galaxies located in the northern hemisphere. That book, together with its two companion volumes published in 1987 that cover peculiar galaxies in the southern hemisphere, is recognized today as the most important source of information regarding ways that galaxies interact and merge.

Arp's books are more than that, though. Under six broad headings and 39 subheadings, he showed all of the other ways that spiral, elliptical and other types of galaxies can differ from the norm (e.g., having one [or three] spiral arms; displaying rings, jets, counter tails, filaments or loops; and even a "Miscellaneous" category for six galaxies that don't fit any of the other groupings).

Later, Arp fell into disfavor with his professional peers resulting from his work with quasars (shorthand for quasi-stellar objects).

Quasars are integral to the Big Bang theory. They are some of the most luminous known objects in the universe. Their spectra show enormous redshifts, which indicates to most astronomers that they are among the oldest and most distant objects in the visible universe. The existence of quasars is regarded as proof that the universe is expanding. (Without a Big Bang to set it in motion, the universe would be in a steady state, not expanding.)

Arp disagreed. His research indicated that not all quasars are located at the outer fringes of the observable universe: Some of them, Arp said, are associated with the unusually bright cores of peculiar galaxies. Therefore, redshift does not measure distance, but is due to some as-yet

unknown process; the universe is not expanding; and the Big Bang theory is questionable at best.

In 1998, Arp published a book, *Seeing Red*, that detailed his opposition to the redshift theory. It was not – and is not – a popular viewpoint. To most astronomers, questioning the validity of the Big Bang theory is like saying that the Earth is flat.

Arp spent the rest of his life in astronomical limbo, ignored by most of his peers except for his 3-vol. *Atlas of Peculiar Galaxies*. And that's a shame, too, because those books remain the definitive work on irregular, interacting and merging galaxies. Even his most outspoken critics cannot deny the value of Arp's contributions to galactic research.

None of that matters to the A. L., however. To earn an Arp Peculiar Galaxies pin, you need to observe (or image) any 100 of the Arps. GoTo is acceptable.

Eleven Messier galaxies appear in the Arp list: M32, M49, M51, M60, M65-66, M77, M82, M87, M90 and M101.

“In astronomy, amateurs have always played a major part, and they still do. Amateurs do things that professional astronomers don't want to do, haven't time to do, or can't do. And the average astronomer knows the sky a great deal better than the average professional. So amateurs discover comets, novae and so on.”

-**Sir Patrick Caldwell-Moore** (2008)

2. The Caldwell Program

Sir Patrick Caldwell-Moore (1923-2012) was an English amateur astronomer. He never attended college, yet he became one of the most influential figures in 20th Century astronomy. Although self-educated in astronomy, Caldwell-Moore wrote more than 70 books, and during the 55 years from 1957-2012 he hosted the immensely popular weekly BBC-TV series, “The Sky At Night.” Those activities introduced countless thousands of readers and viewers to astronomy, and inspired many of them to become astronomers. All of today's leading British amateur and professional astronomers got their start by reading Patrick Caldwell-Moore's books or watching his highly motivational tv series. As a result, he received numerous honorary doctorates, was named an Honorary Fellow in the Royal Astronomical

Society, and in 2001 he was knighted by **Queen Elizabeth II**.

In 1995, having noted that the Messier Catalog does not include many of the brightest and most fascinating objects that are visible to small telescopes (or bright objects located in the southern hemisphere), Patrick created the Caldwell Catalog. He called his 109 objects “Caldwells” because the letter **M** was already used to identify the Messiers. In 1995, the A. L. added a Caldwell Program to its observing pin list.

Since the Caldells include deep-sky objects in both hemispheres – at our latitude we can see 77 of them – to earn a Caldwell certificate and pin you need to find and observe any 70. The Caldells are identified by the letter **C** and, like the Messiers, by numbers ranging from 1 to 109. Unlike the Messiers, they are listed in order of their right ascension and declination coordinates.

“ The Sun, with all those planets revolving around it and dependent on it, can still ripen grapes as if it had nothing else in the universe to do.”

-**Galileo**

3. The Galileo Binocular (or Telescopic) Program

When **Galileo Galilei** (1564-1642) aimed his newly built little telescope's quarter-sized aperture at the night sky for the first time in late 1609, he changed astronomy forever. His original eyepiece offered just 8x or 9x magnification, but with it he saw things like craters on the **Moon**, the phases of **Venus**, sunspots, and four tiny moons circling **Jupiter**. Later, he built eyepieces that gave him up to 20x magnification.

To honor Galileo's historic achievement, the A. L. initiated a Galileo Observing Program. To earn a pin, you must repeat 13 of Galileo's observations, two of which – aurora and supernova -- are optional; another involves observing sunspots.

You can earn a Galileo pin by using binoculars and your unaided eyes (in which case you will receive a Galileo Binocular Program certificate), or by using those instruments and a telescope to receive a Galileo Telescopic Program certificate and pin. GoTo is allowed, but the magnification cannot exceed 20x.

4. The Herschel 400 and Herschel II Programs

Friedrich William Herschel (1738-1822) was born in Germany, but as a young man he moved to England with his father and his sister **Caroline**.

A talented musician, William became a professional organist, music teacher and composer. But all that changed after he and Caroline took up astronomy as a hobby. William became highly skilled at building telescopes and fashioning his own eyepieces.

In 1776, while American patriots were declaring their independence from England, William Herschel built a 12-in. reflecting telescope. Seven years later, he built a 20-ft.-long, 18-in. reflector that he used for what would become his life's work. (He observed while standing on a ladder, with Caroline recording his observations.) With that 'scope, Herschel cataloged 848 double stars and discovered two of **Saturn's** moons, **Enceladus** and **Mimas**.

While using the 12-in. telescope in 1781, Herschel discovered the planet **Uranus**. (He later discovered two uranian moons, **Titania** and **Oberon**.)

Uranus was the first planet to be discovered since antiquity, so Herschel's achievement brought him instant, lasting fame. It also resulted in his being knighted by **King George III** and earned him a lifetime pension as "The King's Astronomer." Sir William was thus able to devote himself full-time to astronomy.

In 1783, Herschel found his niche in astronomy: the study of deep-sky objects, which at the time were lumped together as "nebulae" because no one knew what they were. Together with Caroline (who was also a highly skilled observer), he set out to find, observe and catalog the nebulae that were visible from northern latitudes.

Were they successful? Put it this way: **Charles Messier's** catalog contains 109 objects; the Herschel catalog included 2,478 nebulae, or deep-sky objects. (Herschel's telescopes were much larger than the ones Messier used.)

Later, William's son **John** and another English astronomer, **J. L. E. Dreyer**, added to the Herschel list, which today is known as the New General Catalog (NGC) and numbers 7,840 objects.

The A. L.'s Herschel 400 and Herschel II observing programs each feature 400 of Herschel's deep-sky objects. Earning a H400 pin is required by the A.L. in order to earn a Master Observer pin. A Herschel II pin is not required; as might be

expected, the H II program is far more difficult. Both programs permit the use of GoTo devices.

There are 15 Messier objects in the H400 list (M20, M33, M47-48, M61, M76, M82, M91, M102 and M104-109), and none in the Herschel II list.

"What caused me to undertake the (Messier) catalog was the nebula (**M1, Crab Nebula**. -Ed.) I discovered above the southern horn of *Taurus* on Sept. 12, 1758 while observing the comet of that year... This nebula had such a resemblance to a comet, in its form and brightness, that I endeavored to find others, so that astronomers would not confuse these same nebulae with comets just beginning to shine. I observed further with the proper refractors for the search of comets, and this is the purpose I had in forming the catalog."

-**Charles Messier**

5. The Messier Program

Charles Messier (1730-1817) was a French comet hunter. The telescopes he used had effective apertures measuring from 2-1/2" to 4-1/2" in today's terms.

Messier published his first list of 45 objects in 1781. Because it contained many beautifully compelling objects, it became an instant sensation among astronomers. Working with his colleague **Pierre Mechain**, he added two later installments, bringing the Messier Catalog total to 102 objects.

Much later, in 1947, the American astronomer **Helen Sawyer Hogg** added seven more objects gathered from Messier's unpublished observing notes.

Messier discovered 38 of the objects in his catalog, and Mechain 28. They re-discovered the other 43, which were first seen by other astronomers.

The Messier Program was the first A. L. observing program, and it is by far the most popular. To earn a Messier certificate and pin, you have to find and observe all 109 of the Messiers. All of them must be found manually, and GoTo is not allowed. Because Messiers are found in all four seasons, it usually takes a year or more to earn a Messier pin.

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Above: The International Space Station (ISS) transiting the Sun. (Photo by **Stephen Ramsden**.)

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Above: NGC 672 and IC 1727, an interacting galaxy pair in *Triangulum*. (Photo by **Alan Pryor**.) These galaxies are 18 million light years away, and about 88,000 light years apart.

NGC 672, the larger and brighter of the two, is a Herschel II target. **Yr. editor** saw it at 142x as “cigar-shaped or rectangular and measuring about 3.5’ x 1.5’, with rough, diffuse borders, esp. along the S edge.”

Smaller and fainter than 672 and lying 8’ away to the SW, **IC 1727** was unseen during the two evenings when yr. editor observed 672. Sometimes ya see ‘em, sometimes ya don’t.

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Upper Right: Menzel 3 (Ant Nebula), a bipolar planetary nebula in *Norma, the Level*. (Norma lies

too far S to be seen from here; **Alan Pryor** imaged the **Ant** via long distance last summer, using a 20-in. telescope located in Siding Spring, Australia.)

When the central star expelled its outer layers of gases, it did so along axes that were perpendicular to us, producing twin lobes similar to those of the larger (in our view) planetary nebula **M27 (Dumbbell Nebula)**.

M57 (Ring Nebula) is similarly constructed, the visual difference being that we see the Ring face-on to us.

Mezel 3’s nickname derives from its resemblance to the head and thorax of an ant. Alan writes, “It really does look line an ant! Faint extensions (antennae and legs) can be seen at the ends of the lobes.”



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Below: Reverse-image Moon taken by cell phone by new member **Ryan Force**.



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