

THE FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT
RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

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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. Thurs., Nov. 9: FRAC meeting (7:30 p.m., The Garden in Griffin); **Sat., Nov. 11:** High Falls observing (8 p.m.); **Fri.-Sat., Nov. 17-18:** JKWMA observings (at dark).

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President's Message. I know it must seem like I'm constantly preaching about dressing warm in the fall and winter, but I've seen it happen so many times: members (or visitors) coming to observings wearing

tennis shoes that get wet when the dew settles in, or wearing just a long-sleeve flannel shirt that doesn't keep them warm when the temperature drops after sunset.

I don't know everything about astronomy – I'm not a speed-reader like the guy in Bill's "Dumb Astronomy Questions" article last month – but I know this: When your hands, feet or anywhere else get cold, you'll be gone faster than you can say, "Baby, It's Cold Outside!" And it doesn't have to be that way.

Put it this way: *To enjoy cool- or cold-weather observing, the clothes you wear or bring with you are as important as your telescope or binoculars!* You may not need a sweater, jacket, gloves or a stocking cap when you leave the house, but you'll be glad you brought them if you get cold later on! So don't forget: with the weather cooling off, dress warmly from head to toe and everywhere in between.

Since this issue will come out before Oct. 31st, I want to wish you all a happy, healthy Halloween and Thanksgiving. Don't overeat. (Yeah, right.)

-Dwight Harness

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Last Month's Meeting/Activities. Twenty-two members – **Aaron Calhoun; Alan Rutter; Tom Moore; John Felbinger; Jeremy, Sarah, Emily & Delilah Milligan; Dawn Chappell & David Clay; Jon Heard; Steve Hollander; Erik & Mason Erikson; Chuck & Neila Davis; Joe Auriemma; Dwight Harness; Felix Luciano; Cindy Barton; Marla Smith;** and yr. editor – and three visitors (**Steve Hyde and Ken & Kim Harris**) attended our Oct. meeting.

Ten members – **Aaron Calhoun, Alan Pryor, Felix Luciano, Sean Neckel, Marla Smith, Steve Hollander, Jon Heard, Dwight Harness, Alan Rutter** and yr. editor – attended our Oct. JKWMA observings. As you might expect around Halloween, the sky was a treat on Fri. night, and it played tricks on us on Sat. evening.

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This 'n That. Our scheduled Sun City Peachtree indoor presentation and outdoor observing have been postponed due to unforeseen circumstances. They will be re-scheduled for sometime next year.

*In case you haven't read the Dec., 2017 issue of *Sky & Telescope*, here's **yr. editor's** letter to the editor (p. 8):

"As author **Jerry Lodriguss** points out in his excellent article on photographic plagiarism and fraud (*S&T*: Sept., 2017, p. 66), it's difficult to fool astronomers – but it happens. However, it is *very* easy to fool the general public.

"Perhaps the most blatant example is the ongoing 'Mars hoax' – the anonymous e-mail that has circulated every year since 2003. It invariably shows a doctored photo of the Moon and Mars, declaring that, on a certain date in August, those two objects will be the same size in the night sky. Every astronomer knows better, of course. But it isn't *our* gullibility that the anonymous perpetrators prey upon. Rather, every year thousands of people go outside expecting to see an event that supposedly won't happen again in 60,000 years – only to be disappointed when it does not occur." -**Bill Warren**, Griffin, Georgia.

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Upcoming Meetings/Activities. Our club meeting will be held at The Garden in Griffin at 7:30 p.m. **on Thurs., Nov. 9th**. Our program will be "Glorious Total Solar Eclipses" from the **Alex Filippenko** dvd, *Understanding the Universe*. Prof. Filippenko's talk will rekindle the excitement you felt during the Aug. 21st eclipse.

We'll conduct another observing at High Falls State Park at 8 p.m. on **Sat., Nov. 11th**. Directions can be found on our website; they will also be sent out during the week prior to the observing.

Our JKWMA observings will be on **Fri.-Sat., Nov. 17th-18th**.

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20th Century America's Greatest Astronomy Promoters

article by Bill Warren

JOHN DOBSON (1915-2014) was a Franciscan friar from Frisco – San Francisco, that is. (Actually, he was born in China, but he moved to S. F. with his parents as a child.) Dobson was also an avid amateur astronomer. In his latter role, he was responsible for not just one, but *two* innovations that revolutionized amateur astronomy and are

responsible for bringing untold thousands of people into our fascinating hobby over the years.

1. **The Dobsonian Mount.** As late as 1960, most telescopes were extremely expensive because commercial manufacturers hadn't yet figured out how to bring down the cost of production to make them affordable for the average person.

In those days, a 6-in. reflecting telescope was considered a large 'scope (few amateurs owned one), and most observatory telescopes were no larger than 10" to 12". The few mass-produced, affordable 'scopes on the market were (a) cheaply made and (b) too small to meet the needs of amateur astronomers.

All that changed when John Dobson came on the scene.

As a Franciscan monk during the 1950s-'60s, Dobson was not permitted to own anything. Everything he had belonged to the Church. So Dobson decided to build his own telescope. Having no money, he persuaded a San Francisco junk dealer to give him spare parts with which to build his telescope. He ground his mirror from the glass porthole of a ship; his optical tube was a compressed paper cylinder called Sonotube that was used in construction; and his mount was a simple lazy-Susan device composed of plywood and Teflon that permitted the 'scope to be moved up, down and sideways with minimal effort.

The net result of those innovations was an altazimuth reflector that was portable, easy to build, easy to operate – and best of all, it was affordable. Since the mirror was composed of inexpensive, lightweight glass (as opposed to, say, Pyrex) – and the mount and optical tube assembly did not require complicated parts that drove up the manufacturing cost -- for the first time in history it became possible to build affordable large aperture telescopes.

Even with such brilliantly innovative, cost-effective technology readily available for duplication, however, it took the telescope manufacturers nearly two decades to realize its potential and jump on the Dobsonian bandwagon.

Dobson believed that his so-called "Dobsonian mount" belonged to the world, not him, so he never patented it. As a result, after Coulter Optics began selling Dobsonian reflectors in 1980, other manufacturers, seeing the immense popular appeal of Dobs, began selling them too, in sizes that today range from 4" to big "light buckets" much larger

than Coulter's original 13.1" Dob. (A happy byproduct of the Dobsonian revolution was that manufacturers began to look for ways to drive down the cost of refractors and other kinds of telescopes to make them affordable, too. But even today, in terms of inch-for-inch of aperture Dobsonian reflectors offer more "bang for the bucks" than any other kind of telescope.)

A final thought about Dobsonian reflectors: their components are inexpensive, but they are not cheaply made. Depending on what you want to use them for, they are as good as any other 'scope. If you're interested in deep-sky observing, a big Dob will take you farther out in space than other kinds of telescopes.

2. **Sidewalk Astronomy.** John Dobson's other innovation was what he called "sidewalk astronomy." On clear nights, he would sneak away from the monastery and, together with other amateur astronomers, they would set up their 'scopes on San Francisco streetcorners to show passersby the wonders of the night sky. Dobson was a strong believer in "bringing astronomy to the people" – as opposed to the earlier practice of expecting people to visit an observatory or somewhere else to look through telescopes. Like the Dobsonian mount, the sidewalk astronomy concept is so simple and obvious that one wonders why no one had thought of it before.

Dobson eventually was caught sneaking out and expelled from the monastery, but he was active in public outreach to the end of his days. His Sidewalk Astronomers are still going strong in San Francisco, and astronomy outreach is practiced everywhere, introducing millions of non-astronomers to the glories of astronomy and the night sky.

(Trivia fact: FRAC's **Steven "Smitty" Smith** owns a Coulter Dob that he purchased in the '80s.)

CARL SAGAN (1934-1996) was an accomplished astronomer, astrophysicist and writer. He published more than 600 scientific papers and articles and authored more than 20 nonfiction books and novels, all of them dealing with astronomy or science.

Sagan was a highly effective communicator, whether his audience was professional or amateur astronomers, the public at large or simply readers of good books. Until his death in 1996 from

pneumonia, Carl Sagan was unquestionably the best-known living American astronomer. His immense popularity with the American public was due largely to two factors.

1. A frequent guest on the *Tonight* late-night tv show, Sagan discussed astronomical topics and current events such as eclipses, cometary appearances, etc., with host **Johnny Carson**. Sagan's manner was laid-back, smooth and urbane, like that of a cultured English gentleman (think: **Sir Patrick Caldwell-Moore**). Sagan was an astronomy professor at Cornell University, but he never talked down to Carson or his audience, nor did he talk over their heads by using complex astronomical jargon. He followed the old K.I.S.S. strategy ("Keep It Simple, Stupid"), and people who wouldn't know a *black hole* from a hole in the ground actually understood what he was saying.

Sagan always wore the same outfit on those guest appearances – dark slacks, a camel-colored sport coat and a red turtle-neck sweater – which made him instantly recognizable, like an old friend dropping by for a visit. It was on Carson's show that Sagan popularized the phrase "pale blue dot" to describe the Earth as seen from space. The *Tonight* show was watched by millions of people across the U. S., and Carson always said that Carl Sagan was one of his all-time favorite guests. Carson's approval only added to Sagan's popularity.

2. As an author, Sagan earned a Pulitzer Prize for his 1977 nonfiction book *The Dragons of Eden* about the evolution of human intelligence. That alone would have cemented most other authors' claim to fame, but in 1980 Sagan co-wrote and narrated the 13-part tv series *Cosmos: A Personal Voyage*. Since its initial airing, it has been seen by more than a billion viewers worldwide. (He also published *Cosmos* in book form to accompany the series, and it quickly became a *N. Y. Times* bestseller.)

As if that were not enough, in 1985 Sagan wrote *Contact*, a popular science-fiction novel about mankind's first contact with intelligent beings on another world. In 1997 – the year after Sagan's death – the movie version of *Contact* appeared, starring **Jodie Foster**. Although derided by many astronomers as whimsical because Foster first hears the alien signal through earphones while reclining on the hood of her truck, the movie was a box-office success.

After Sagan's death, his wife **Ann Druyan** (who co-authored the original *Cosmos*) penned a sequel, the tv series *Cosmos: A Space-Time Odyssey*, narrated by **Neil deGrasse Tyson**.

JACK HORKHEIMER (1938-2010) was a prominent figure in Miami, FL astronomy for many years. In 1964, he was asked by the Fla. affiliate of the Public Broadcasting System (PBS) to create series of local 30-min. tv shows on stargazing called *Horkheimer's Heavens*. He agreed to do so, on the condition that they help him develop a weekly show devoted to naked-eye stargazing.

The 30-min. series came and went -- and on Nov. 6, 1976 the 5-min. *Jack Horkheimer: Star Hustler* tv show debuted in Miami.

For the first nine years, Horkheimer's presentations were calm and scholarly, like a professor addressing his class. The show was well received by the public -- but when, in 1985, it went national, he was asked to spice up his delivery to appeal to his larger audience. He reluctantly agreed to do so, and from the very start the public loved it! Jack's enthusiasm and love for the night sky were evident in every word he spoke.

Horkheimer faced two difficult challenges: a horrendous time slot – the show aired as late as 2:30 a.m., and never earlier than 1:30 a.m. – and he had just five minutes of air time in which to capture his audience's attention and motivate them to go outside that week and see for themselves the naked-eye wonders he talked about. He couldn't do anything about the time slot, but to engage and motivate his listeners he occasionally wore colorful, outlandishly garish outfits (think: **Stephen Ramsden's** famous "Sun suit" or **Phil Sacco's** toga and sandals), and he talked with the fervor and excitement of a used-car salesman. But Horkheimer wasn't selling cars: the product he was promoting was the night sky. No one has ever done it better.

Early on, each show began with the announcer introducing Jack by saying: "Some people hustle pool. Some people hustle cars. Then there's that man you've heard about, the man who hustles stars!" As the Internet became increasingly popular in the late '90s, however, viewers began to complain that search engines for *Jack Horkheimer: Star Hustler* were directing them to the *Hustler* magazine porn site. So in 1997 Jack changed the name of the show to *Jack Horkheimer: Star Gazer*,

and the introductory verse became: "Confused about the cosmos? Can't tell a planet from a star? Then give us just five minutes, And we'll show you what they are."

And there would be Jack Horkheimer, swinging on a trapeze with a cardboard **Moon** attached to it, saying "Greetings, greetings fellow stargazers!" and telling his viewers about an upcoming lunar eclipse; or showing and telling them how to locate stars ("From the Big Dipper's handle, Arc to **Arcturus** and Speed to **Spica!**"); or urging them animatedly to "**GO** outside **NOW** and see **Zubenelgenubi** and **Zubeneschamali!**" (*They are the two brightest stars in Libra. -Ed.*); or relating the mythical story of **Orion** and the **Pleiades** (the Seven Sisters), or explaining why *Lyra* (*the Lyre*) is in the night sky; or telling his viewers which planets to look for that week, and how to find them. Jack's closing line at the end of each weekly segment was "Keep looking up!" For his fans, it quickly became the signature statement of what Horkheimer and his little show meant to them.

Jack Horkheimer educated and fascinated his late-night listeners for 34 years until his death from chronic respiratory illness in 2010. His last show aired on Aug. 30th of that year; it was his 1,708th weekly episode.

Throughout his lengthy tenure on PBS, Horkheimer encouraged teachers and amateur astronomers to download his weekly shows for educational purposes, at no cost. (You can still do it.) The show is still aired on PBS, with **James Albury** and **Chris Twigg** as hosts. You can see current episodes on YouTube at "Jack Horkheimer: Star Gazer's channel", or go to "Jack Horkheimer Star Gazer 5 Minute" on YouTube for Jack's earlier shows. (Not knowing much about YouTube, I Googled "jack horkheimer youtube" to watch episodes from the 1980s.)

I strongly urge you to watch one of Jack's shows. (It doesn't matter which one, they're all fascinating. And they're only 5 min. long, so it's not as if I'm asking you to watch *Gone With the Wind*.) If you do, you'll probably watch other episodes. They're addicting, but without the terrible side effects of drug abuse. No matter whether you're a beginning stargazer or a seasoned veteran, you'll appreciate what he has to say. The only thing about his performance that will be over your head will be the sky above you.

(A p.s. re Jack Horkheimer: The A. L. presently offers four annual Horkheimer awards for deserving young astronomers. The awards were sponsored by Horkheimer, and now by his foundation. In 2000, back when only one award was given, FRAC's **Katie Moore** won first place nationally in the "Horkheimer Award for Excellent Service to Astronomy By a Young Astronomer" competition. You can read about it in the Awards section of our website.)

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Unsung Heroes article by Bill Warren

Throughout mankind's history, heroes have been celebrated in song. For example, in England, Ireland and Scotland during the Middle Ages traveling troubadours composed songs about brave warriors, patriots and their deeds of valor. And many years later, FRAC's greatest hero, **Larry Higgins**, was immortalized with a song: "Don't Wait Up for the Shrimp Boats, Mama, 'Cause Papa's Comin' Home With the Crabs!" (Not really, but the newsletter needed some comedy relief at Larry's expense.)

Other heroes have gone largely unrecognized (i.e., "unsung") despite the magnitude of their accomplishments. Here are two of them.

Robert Goddard (1882-1945)

Around 850 a.d., the Chinese developed the world's first rockets. They used solid fuel (i.e., gunpowder) to fire projectiles – fireworks – into the air. In the late 1200s, European traders in the Orient brought back the recipe for making gunpowder; shortly thereafter cannons were invented, making it possible for humans to kill each other at longer distances than arrows and catapulted rocks could fly. For sustained flight, though, solid fuel was impractical because all of the thrust occurred in a single, violent ignition of gunpowder.

In the early 1900s an American physicist, engineer and inventor, **Robert Goddard**, conceived a better idea. In 1926, Goddard successfully launched a liquid fuel rocket that parceled out its fuel in order to sustain acceleration over distance. His rockets were small – only a few ft. long – but in 1935 he launched a rocket that achieved a velocity of 550 mph.

That same year, Goddard added a component that would eventually make space flight possible: a gyroscopic stabilization system that permitted the rocket to change trajectory in flight. In March, 1935 a Goddard-built rocket rose to an altitude of nearly a mile high, then altered its trajectory to a horizontal path for another mile. A later rocket achieved an altitude of nearly five miles.

Curiously with World War II looming, the American military paid no attention to Goddard's pioneering work in solid-fuel rocketry. The Germans were listening, though, and the result was the large and deadly V-2 rockets that rained down destruction on England in 1942.

After the war, even larger and more powerful rockets were developed, first for military purposes and later for space travel. But it all began with Robert Goddard, who built the first workable rocket engines and guidance systems.

Wernher von Braun (who developed the V-2 rocket and is heralded as "The Father of the U. S. Space Program") said of Goddard, "He was ahead of us all. My success, and the success of the U. S. space program, is due to the work of Robert Goddard."

(To counter the argument that Goddard should not be regarded as a hero because his invention led to death, destruction and the ever-present threat of future nuclear war, I offer the following: (a) **Albert Einstein's** famous equation, $E=mc^2$, led indirectly to the development of the atomic bomb; does that make Einstein a villain or an anti-hero?; (b) It was **Wilbur & Orville Wright**, not Goddard, whose invention was used to drop atomic bombs on two Japanese cities in Aug., 1945; and (c) Goddard's rockets offer hope for mankind's future survival when it becomes necessary for us to mine asteroids to replace depleted mineral resources, or to colonize other worlds if any of the myriad problems facing humanity threaten our continued existence on Earth.)

For better or worse, Robert Goddard let the genie out of the bottle, and there is no way of putting it back. But we can and will use Goddard's achievements to ensure the survival of our species.

Fred Whipple (1906-2004)

Whipple, an American astronomer, was a pioneer in comet research.

As late as 67 years ago, relatively little was known about comets because astronomers couldn't see them for what they are. All they could see was a tiny, circular cloud of gases, perhaps with one or more tails extending away from it. But that didn't stop Fred Whipple.

In 1950, Whipple proposed a remarkably accurate model of comets' composition. He described them as "dirty snowballs" – large lumps of ice (the nucleus) composed of chemical compounds—mainly water, carbon dioxide and carbon monoxide – and dust. Whipple suggested that what we saw was a cloud of gases and dust (the *coma*) surrounding an unseen nucleus.

As a comet draws within heating distance of the **Sun**, Whipple correctly surmised, solar radiation warms the comet's nucleus, releasing gases and dust particles that previously had been frozen in place. A combination of radiation and the solar wind pushes some of those gases and dust away from the comet, forming gas tails that always point away from the Sun and dust tails that form arcs as they scatter and follow the comet around the Sun. We can see them, Whipple said, because the gases glow by ionization and the dust reflects sunlight.

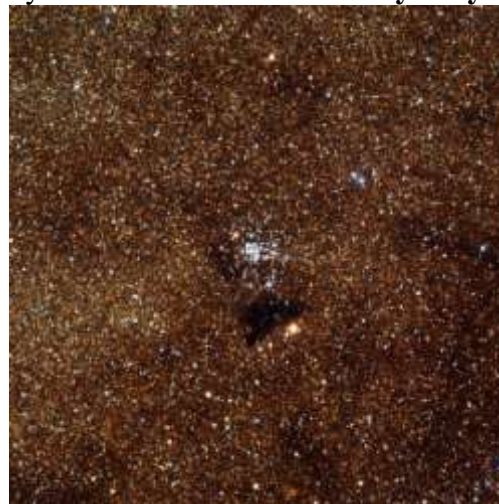
Whipple was wrong in one respect: Spacecrafts sent to study comets have shown that their nuclei are rocky, although ice usually is present. But Whipple was correct in other important respects: the release of gases is not uniform, nor is it predictable except in broad terms; it affects comets' trajectories; and it does not occur only when that portion of the comet is facing the Sun. Those facts, Whipple said, explain why periodic comets' orbits change slightly every time they return.

As with Goddard, whether you consider Whipple worthy of hero status is debatable, depending on how you define the term. But the importance of his pioneering contributions to comet research, and the conditions under which they were achieved without fanfare, cannot possibly be overstated.

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Upper Right Corner: NGC 6520 and the **Ink Spot**, an open cluster and dark nebula in *Sagittarius*. Located in the aptly named **Great Sagittarius Star Cloud**, NGC 6520 is an open cluster of about 30 stars adjacent to the "Ink Spot" (B86), an equally small dark nebula at the center of

Alan Pryor's photo. The entire complex is located slightly N of the center of the **Milky Way**.



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Above: NGC 6302 (Butterfly Nebula) in *Scorpius*. The photo is by **Alan Pryor**, who says, "The lobed structure is interesting and quite complex. The star that created this planetary nebula is not visible to ordinary telescopes. That star has a temperature of 200,000^o K. At that temperature, most of the star's radiation is in and above the ultraviolet band. However, the UV gives plenty of energy to excite the nebula's gases. Evidence exists that the star has ceased its nuclear reactions and is now cooling off."

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If a galaxy were the size of Earth, its central black hole would be the size of a penny.

-**Camille Carlisle**

Sky & Telescope (Feb., 2017), p. 23

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