

THE FRAC OBSERVER

NEWSLETTER OF THE FLINT
RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

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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*.

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Club Calendar. Fri.-Sat., Apr. 28-29: JKWMA observings (at dark); **Thurs., May 11:** club meeting (7:30 p.m. at The Garden in Griffin, public observing before and afterward); **Fri.-Sat., May 26-27:** JKWMA observings (at dark).

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Vice President's Message. Astronomy begins with

a paradox: When we look out into space, we're looking backward in time. We see the universe as it was, not as it is now.

There's more to it than that, though. The past is not a closed book. Just because something happened in the past doesn't mean that it is less important or valuable to us today. The world is ever-changing, but some events from the past are so meaningful and marvelous that they should never be forgotten. Part of my responsibility as newsletter editor and program chairman has been (and is) to remind you of that.

For example, consider **Carl Sagan's** best-selling book and tv series, *Cosmos: A Personal Voyage*. Written and produced by Sagan and his wife, **Ann Druyan** in the 1980s, they remain the finest statement of what astronomy is all about that has ever seen the light of day. The 2014 tv sequel, *Cosmos: A Spacetime Odyssey*, narrated by **Neil DeGrasse Tyson**, pales by comparison.

Some parts of Sagan's *Cosmos* are out-of-date (notably, the segments on **Mars** and **Venus**), but the rest is staggeringly brilliant. Using the primitive technology that was available three decades ago, Sagan nevertheless produced graphics that look as up-to-date as today's headlines.

Over the next few months, we'll revisit portions of Sagan's epic work at our meetings, starting this month with Part I, "The Shores of the Cosmic Ocean." As I've said before, watching his multi-part series is like watching bathing beauties or handsome hunks at the beach: if they're worth watching once, they're worth watching, period. And Sagan's *Cosmos* is eminently watchable.

Consider the following:

"We are the local embodiment of a Cosmos grown to self-awareness. We have begun to contemplate our origin: star stuff pondering the stars; organized assemblages of ten billion billion billion atoms considering the evolution of atoms; tracing their long journey by which, here at least, consciousness arose. We speak for Earth. Our obligation to survive is owed not just to ourselves but also to that Cosmos, ancient and vast, from which we sprung." -**Carl Sagan**, *Cosmos* (1980)

Beyond all that, I want to welcome the newest member our FRAC family, **Elaine Stachowiak** of Jackson, Ga. Please let us know what we can do to

make your time spent with us rewarding and enjoyable for you, Elaine.

-Bill Warren

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Last Month's Meeting/Activities. **Dwight Harness, Jeremy Milligan** and **Steve Hollander** attended our JKWMA observing on Mar. 24th, but the next evening was clouded out. The following weekend, **Jeremy** and **Alan Rutter** joined **Truman Boyle** at Truman's house near Barnesville for some unscheduled observing. The site was dark, and the sky clear enough for Alan to find 18 Messiers. Only 21 more to go and he'll earn his Messier pin & certificate.

A fine crowd of 20 members (including new member **Elaine Stachowiak**) attended our April meeting. Other attendees included: **Aaron Calhoun; Alan Rutter; Joe Auriemma; Steve Barton; Truman Boyle; Kenneth & Marjorie Olson; Steve Hollander; Tom Moore; Dawn Chappell; Cindy Barton; Jeremy, Sarah, Emily & Delilah Milligan; Dwight Harness; Felix Luciano; Erik Erikson;** and **yr. editor**, who used a handout & star charts to show how to find the 19 Virgo-Coma Messiers. Ken brought home-made cookies that were indescribably delicious, and he gave away a brand-new Orion StarSeek Telescope Control Cable.

Our Rock Springs Christian Academy observing on April 14th turned out to be for 40 Pre-K students and their parents. **Dwight Harness, Ken Olson, Cindy Barton** and **yrs. truly** envisioned a task not unlike managing an ant farm, but the parents stayed with their children and things went smoothly. So smoothly, in fact, that many of the parents kept their kids there until after 10 p.m. The site was excellent, the sky clear and everyone was dazzled at seeing **Mars, Jupiter, Orion Nebula** and beautiful star clusters like **M37**.

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This 'n That. Something You Already Knew... Binocular specifications feature two numbers (e.g., 6x30, 8x50, etc.) The first number refers to the magnification, and the second number to the diameter of the lenses in millimeters.

***...And Something You May Not Have Known:** Most people refer to those specifications as "ten-by-fifty," etc. – but technically, at least, that's incorrect. (Hey, we're talking about binoculars, not a mobile home or RV!) The proper pronunciation is "ten-X-fifty."

Okay, we're splitting hairs here, like debating whether **Betelgeuse** should be pronounced "BET ul jooz," "BAYT ul jooz" or "Beetlejuice." (As if it matters. However you want to pronounce binocular specifications, Betelgeuse or anything else in astronomy is correct.)

*In the April issue of *Astonomy* (p. 8), editor **David Eicher** lists the ingredients found in the ordinary house dust that we see floating in sunlight or coating our furniture. Some of them may surprise and disgust you: "Pollen, dead skin cells, human and animal hairs, mineral particles from outdoor soil, animal dander, insect waste, and textile and paper fibers." But there's one other interesting ingredient: "interplanetary dust particles...that have floated down gently through Earth's atmosphere without burning up."

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Upcoming Meetings/Activities. Our next JKWMA club observings will be on **Fri.-Sat., April 28th-29th**.

Our club meeting will be held at The Garden in Griffin at 7:30 p.m. on **Thurs., May 11th**, with public lunar & planetary before and afterward. Our program will be **Carl Sagan's *Cosmos*, Part I: "The Shores of the Cosmic Ocean."**

We'll wind up the month with observings at JKWMA on **Fri.-Sat., May 26th-27th**.

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The Sky in May. After sunset in early May, you'll see two orange "stars" low in the W sky. The brighter one will be a star – **Aldebaran, *Taurus the Bull's*** right eye as it faces us; the fainter one (mag. 1.6) will be **Mars**. Aldebaran drops from our view in early May, but Mars will hang around all month (but not all night). It may not be bright enough to reveal surface features – for example, we couldn't see the polar ice caps at Rocks Springs C. A. – because Mars is farther away from us than usual in its orbital path. But it is *Mars*, so you'll see its ruddy orange disk.

Jupiter (mag. -2.4) will be up all month, gliding slowly across the sky every night from SE-SW. It will be the brightest “star” in the evening sky, but that brightness will fade considerably as the month progresses.

In observing Jupiter telescopically or in binoculars, you – like **Galileo** before you – will see its four brightest moons; if you see less than that, it’s because one or more of them is passing in front of or behind the planet. Wait a couple of hours or less and they’ll reappear.

Beyond that, Jupiter’s most observable features are the dark *belts* and the bright *zones* that lie between them. The most prominent ones, the North and South Equatorial Belts and Zones, are visible on any night that is clear enough to see Jupiter. The other (temperate) belts and zones may require better transparency and seeing conditions.

Saturn (mag. 0.2) rises around midnight early in May. By the end of the month, it will be rising around 9:30 p.m. Saturn and Jupiter respond very well to high magnification. (All of the planets do.)

Another point about Jupiter, Saturn and the other planets: Because their brightness is contained in disks, they do not suffer as much from haze or light pollution that renders deep-sky objects unobservable.

Morning observers can see **Mercury, Venus & Uranus** in the E; **Neptune** in the SE; and Saturn in the SW. (You’ll need binocs or a telescope to see Neptune or Uranus.) *Be very careful when looking for or observing any of them when they are near the horizon: You do NOT want the Sun to enter your field of view while you’re observing them!*

We told you last month about **Comet 41P/Tuttle-Giacobini-Kresak**; well, it will be up all night in May, shining brightly as it travels between *Lyra* and *Hercules*. It should be lovely in binoculars and telescopes. A chart on p. 42 of *Astronomy* (May, 2017) shows where to look for it.

Another excellent mag. 6 comet, **C/2015 V2 (Johnson)**, will be visible in *Bootes* all month. It sports a prominent, wedge-shaped tail that is expected to lengthen considerably as the month progresses.

Finally, a third comet, 7th-mag. **PANSTARRS (C2015 ER61)**, will be visible low in the pre-dawn E sky near Venus. (As before, watch out for the Sun when searching for the comet.)

For finder charts for the latter two comets, Google their names.

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Six Unforgettable Deep-Sky Wonders by Bill Warren

The night sky holds many observing pleasures, but I’ve always been partial to the deep-sky objects that lie beyond our solar system – galaxies, nebulae and clusters (open & globular).

Most of the approximately 1,400 objects I observed during my Master Observer quest have blurred over the years into a single forgotten entity. However, six of the non-Messiers are as vivid in my memory now as when I first saw them.

*The “**37” Cluster**” (NGC 2169) in *Orion*. (Note to beginning observers: No, this is NOT **M37**, the magnificent open cluster in *Auriga*!) This delightful little open cluster lies about 8° NNW of **Betelgeuse**, where it forms an equilateral triangle with (and below) the 4th mag. stars **Xi** and **Nu Orion**.)

I’m an ex-coach, so it was love at first sight when I saw this remarkable little asterism on Dec. 19, 1997. To me, it has always looked like part of a scoreboard in which one team has scored 37 pts. Nine stars form the “3”, five form the “7”, and a bulb at the bottom of the “3” has burned out. It is best observed at medium magnification.

I love to show “37” at public observings. People are fascinated by it after they realize that it is oriented diagonally upside-down in the eyepiece. It’s included in four A. L. observing programs: Deep Sky Binocular, Open Cluster, Urban and Universe Sampler.

***Hubble’s Variable Nebula (NGC 2261)**, a Herschel II and Caldwell target (#46) in *Monoceros*. When I saw this triangular little nebula for the first time on Feb. 27, 2000 I wrote, “It looks just like **Comet Hale-Bopp!**” Its bright “nucleus” – actually, the variable star **R Mon** – is at the S end, with brightness fanning out to the N. It’s small, but that doesn’t make it any less compelling or unforgettable. Hale-Bopp was small, too.

William Herschel discovered this little celestial gem in 1783, but in 1916 **Edwin Hubble** discovered that the nebula varies in brightness over

a period of months, independent of changes in the brightness of R Mon. So the nickname refers to Hubble, not Herschel.

It's a pity that **Charles Messier** didn't find **Hubble's Variable Nebula**, because it looks more like a comet than anything on his list.

As a beginning observer, I didn't like galaxies. I appreciated that what I was seeing represented the combined light of billions or trillions of stars whose distance from us staggers the imagination. But with a few memorable exceptions such as **Andromeda Galaxy (M31)**, **Whirlpool Galaxy (M51)** in *Canes Venatici* and **Sombrero Galaxy (M104)** in *Virgo*, most of the others were small, faint fuzzies, and eminently forgettable over time.

Eventually I grew to love galaxies as much as the other kinds of deep-sky objects – and it's a good thing, too, because 231 of the Herschel 400s and 323 of the Herschel 2s are galaxies!

Of all the galaxies I've observed over the years, four great non-Messiers (and one dreadful one) stand out in my memory, far beyond the rest. They were so different, and so striking, that I've always been grateful for the opportunities I've had to enjoy them. If you take the time to find and observe them, you'll see what I mean. You'll go back to them often, whether to enjoy their timeless appeal again or to show them to others. These are *not* your run-of-the-mill, garden variety galaxies!

As for the fifth one – well, it's special to me in a different way.



*NGC 4565 (Needle Galaxy) in *Coma Berenices*. (Photo by Alan Pryor.) This unforgettable H400

and Caldwell (#38) target is arguably the finest edge-on galaxy in the sky; certainly it is the longest – about two thumb-widths in a medium-power eyepiece -- and one of the brightest. I saw it for the first time at 4:40 a.m. on Jan. 28, 1997.

Needle Galaxy is located 1° E of 5th-mag. **17 Com**. As its nickname suggests, the Needle is extremely thin and elongated. Its core is brightly prominent, and a dust lane bisects much of its width. NGC 4565's actual brightness is 11 billion times greater than the **Sun's**.



*NGCs 4038/4039 (**The Antennae**) in *Corvus*. (Photo by Alan Pryor.) Seen best under clear, dark skies, this incredible H400, Caldwell (#s 60-61) and Two In the View galaxy – actually, it's two interacting galaxies -- lies a thumb-width SSE of a mag. 9 star in your eyepiece field of view.

NGCs 4038/4039 appears in small 'scopes as a single, shrimp-shaped galaxy. The northern, curving portion (NGC 4038) is larger and brighter than the rest, with a dark notch of dust on the SW side that almost separates the two galaxies in large 'scopes.

You won't see the long, extremely faint arcs of light that curl away from the ends of 4038 & 4039 that lend them their other nickname, **The Antennae**. But aren't they lovely in Alan's long-exposure photo?

The Antennae is located 1° N of 5th-mag. **31 Corvus**. I first saw it on Mar. 22, 1998. It's bright and easy to find, and I go back to it often.

*NGC 5128 (**Centaurus A**, a.k.a. **Caldwell 77** and **Arp 153**). Nothing you've ever seen before in a

telescope can prepare you for your first view of this unbelievable peculiar galaxy! Large and bright, **NGC 5128** resembles a fast-food hamburger encased in a flat bun on the N side and a larger, brighter round-topped bun on the S side. All that is missing is a side order of fries.

5128 is a lenticular (i.e., disk-shaped) galaxy. It would appear round to us except for an abnormally thick belt of obscuring dust – the burger – that divides the galaxy’s visible portion with an emphasis that no other galaxy comes close to matching. I saw it for the first time on April 7, 2000 at the Peach State Star Gaze star party.

NGC 5128’s nickname, **Centaurus A**, refers to the galaxy’s status as one of the most powerful radio sources in the universe.



Above: NGC 5128. Photo by Alan Pryor.

Centaurus the Centaur lies low in the S sky in springtime. But both NGC 5128 and **NGC 5139 – Omega Centauri**, the largest globular cluster in the sky – can be seen easily at JKWMA, hovering 15° and 10°, respectively, above the S treeline. If you’re a dedicated observer, you owe it to yourself to track down these two magnificent celestial masterpieces. (Alan Pryor’s splendid photo of 5128 will appear in the May *Observer*.)

To add to your spring observing delight, after finding NGC 5128 move your ‘scope N to **M13, The Great Cluster** in *Hercules*. It’s exciting to think that you can see two of the three brightest globular clusters in the sky on the same night. (And if you wait a couple of hours for *Sagittarius* to rise, you can see **M22**, the fourth-best globular. [The 3rd-brightest, **47 Tucanae**, is too low in the sky to be seen at our latitude.])

*Finally, there is **NGC 5523**, a Herschel 2 Program spiral galaxy in *Bootes*.

I remember **NGC 5523** for a different reason than the others: finding it took part of 26 observing sessions spread out over 34 months! It was especially frustrating for me because I knew exactly where to look. NGC 5523 is located on an imaginary line between two naked-eye stars, **12** and **Epsilon Bootes**; it was just 3/4° from another galaxy, **NGC 5548**, that wasn’t nearly as hard to find; and it was mag. 12.8 in brightness, whereas many of the other Herschel 2 galaxies I had already found were much fainter than that. So 5523 should have been easy. But it wasn’t, not by a long shot. There’s no telling how many times I scanned right over it without seeing it before I finally found it on May 12, 2005.

To find it, I used averted vision at 161x magnification. Even today, 5523 remains one of just a handful of targets I’ve ever found at medium power. (I did it that way because I had run out of ways to find it at low power.) 5523 is located about a pinky-width SSW of a mag. 10 star and a thumb-width NE of a 9th-mag. star. Their brightnesses hid the faint little 2’ x 1/2’ galaxy from my direct view at low power. (Another reason for my difficulty in finding 5523 is that *Bootes* is an early spring constellation, and springtime is when the dew is at its worst.)

As any long-time observer knows, this list of unforgettable deep-sky objects is woefully incomplete. But these are my favorites. They’re not my *only* favorites, but I had to start somewhere.

What are *your* favorite non-Messier objects? Let me know, and we’ll explore them.

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Next Page, Upper Left Corner: The Pleiades (M45), a huge – nearly 2° in dia. – open cluster in *Taurus*. North is at the left edge of **Vencislav Krumov’s** photo.

Easily visible to the naked eye as a tiny “Little Dipper” look-alike and a splendid binocular target, the brightest Pleiades stars – known as the “**Seven Sisters**” – are wreathed in nebosity that can best be seen using a nebula or O-III filter.

The Pleiades were first recorded by the ancient Babylonians around 2000 b.c.



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than 14” in dia. Even then, the slightest bit of haze in the air can render it invisible.



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Above: Keyhole Nebula in the southern constellation *Carina*. Photo by **Alan Pryor**.

Keyhole Nebula is a small, dark, dusty region in the vastly larger **Eta Carinae Nebula**. Its nickname derives from an astronomer’s 1873 description of it as “resembling a keyhole.”

At 9,000 light-years away, both Eta Carina and the Keyhole can be seen even in small telescopes from locations in the southern hemisphere. (Road trip, anyone?)

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Above: Sharpless 2-224, a supernova remnant in *Taurus*. Photographing this extremely elusive target was challenging for **Felix Luciano**, who captured it using a hydrogen-alpha filter. The supernova is thought to have occurred just 81,000 years ago.

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Upper Right Corner: M33 (Pinwheel Galaxy) in *Triangulum*. Although indescribably lovely in **Vencislav Krumov’s** photo, **M33**, like all face-on spiral galaxies, is seen visually as little more than a large, extremely faint oval glow in ‘scopes of less

I would be very ashamed of our civilization if we did not try to find out if there is life in outer space.

-Carl Sagan

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