THE

FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

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Club Calendar. Fri.-Sat., Sept. 27-28: JKWMA observings (at dark); **Fri., Oct. 4:** Lake Horton public observing (7:30 p.m.); **Thurs., Oct. 10:** FRAC meeting (7:30 p.m., The Garden in Griffin); **Sat., Oct. 12:** High Falls State Park public observing (7:00 p.m.); **Fri.-Sat., Oct. 25-26:** JKWMA observings (at dark).

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Editor's Message. In **Pres. John F. Kennedy's** 1961 inaugural address, he exhorted Americans to "Ask not what your country can do for you; ask what you can do for your country."

So it is with FRAC. **Sean** has many exciting ideas for the club – things like field trips and purchasing clothing that will identify FRAC members at public observings and elsewhere – but to implement those plans and others, Sean cannot do all the work himself. He needs your help. Please let him know that you want to work with him to make our club all that it can be.

-Bill Warren

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Last Month's Meeting/Activities. Eight members and guests attended our JKWMA observing on Aug. 30th: **Sean Neckel; Mike Stuart; Mark Grizzaffi; Bill Honea; George Ruff;** guests **Taylor & Harper Lamb**; and JKWMA Wildlife Technician **Foster Hartman**.

Nine members attended **Dr. Richard Schmude's** talk at the Sept. meeting: **Sean Neckel; Cindy Barton; Mark Grizzaffi; Aaron Calhoun; John Felbinger; Ken Olson; Steve Hollander; Jeremy Milligan;** and **Dennis Nelson**. Sean appointed Aaron to serve as interim vice president to fill the unexpired term of office of **Bill Warren**, a move that underscores Aaron's versatility and value to the club. (It also qualifies Aaron for the unofficial title of "FRAC's Hardest-Working Member": he is presently serving as vice president, secretary, Alcor and Facebook coordinator.)

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This 'n That. Here's a trivia question for you, courtesy of **Truman Boyle:** *Who is **Roy G. Biv**?*

Answer: Roy G. Biv isn't a *who*, but a *what*: It's a mnemonic that identifies the colors of the visible spectrum and the order in which they appear. Red (**R**) is at the top of a rainbow, followed in descending order by **O**range; **Y**ellow; **G**reen; **B**lue; **I**ndigo; and **V**iolet at the bottom.

***Dr. Richard Schmude** is FRAC's crowning jewel. His many achievements and the honors he has received would be the envy of any astronomer. But one other factor renders Dr. Schmude virtually unique among professional astronomers: *He is, and always has been, a regular and ardent observer of the night sky.* On virtually every clear evening during the past quarter-century or more, Richard has gone outside at night to study variable stars, the planets and deep-sky objects, or else to show those marvelous entities to his students or other non-astronomers.

Don't all professional astronomers do that?

Well…*No*, they don't. The vast majority of professionals – especially those who use observatory telescopes – never look through a telescope at all! Instead, they stare at computer screens to gather data regarding objects that have

been found for them by graduate students or astronomers are far less capable of finding things in the night sky than we are in FRAC. They would be no more likely to find a given deep-sky object at JKWMA than we would be to find that same object in the Palomar 200-in. telescope.

Dr. Schmude is a delightful exception to that rule.

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Upcoming Meetings/Activities. Here's hoping that October finds you in good health and rarin' to go, because we have seven club activity dates scheduled between now and the end of October, beginning with JKWMA observings on **Fri.-Sat., Sept. 27th-28th.**

Then, at 7:30 p.m. on **Fri., Oct. 4th**, we'll conduct a public observing at Lake Horton in Fayette Co.

To get to Lake Horton from, say, Griffin, go 10.6 mi. toward Fayetteville on Ga. 92 from the stoplight at U. S. 19/41 and turn left at Woolsey Rd. (It's just past a gas station on the right.) Go 0.7 mi., and turn left at the stop sign at Antioch Rd. Go 0.4 mi., and continue straight toward Lake Horton at the stop sign where the main road curves to the right.

The park entrance is 1.0 mi. ahead. After passing through the gates, turn right at the black asphalt road about 50-100 yds. beyond the entrance. That winding road through the woods leads to a large parking lot; that's where we'll meet. We'll set up our 'scopes on the grassy hill between the parking lot and the main road, then park our cars on the side of the road that leads to that hill.

GPS coordinates: 33.331841, -84.421897.

Our FRAC meeting will be held at The Garden in Griffin at 7:30 p.m. on **Thurs., Oct. 10th**. Our speaker will be long-time favorite **Phil Sacco**, who will talk on "My 25 Years in Astronomy." Given Phil's wild ride through astronomy over the past quarter-century, his presentation should be one of the most entertaining programs we've ever had. We hope you'll make every effort to attend.

Two days later, at 7:00 p.m. on **Sat., Oct. 12th**, we'll have a public observing at High Falls State Park. Take I-75 South to Exit 198 (High Falls Rd.). Turn left onto High Falls Rd., and the park's Day Use Area will be 1.7 mi. ahead on the left, beyond the main entrance to the park across the bridge. Turn left into the Day Use Area, pass the pay station and the observing site will be in the parking lot near the pool. See http://goo.gl/maps/RQFN3gmvgTA2.

Finally, we'll wind up October with JKWMA observings on **Fri.-Sat., Oct. 25th-26th**.

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The Planets in October. All eight planets will be visible in varying degrees of splendor in October. **Mercury** will be bright at mag. 0 near the SW horizon after sunset. **Venus**, shining at mag. -3.8, will set shortly after sunset, too. **Jupiter** (mag. -1.9) will also be in the SW sky in *Ophiuchus*, higher than Mercury or Venus. **Saturn** (mag. 0.6) will be higher still, in *Sagittarius* near the **Teapot**. **Uranus** (mag. 5.7) will be up all night in *Aries*, and **Neptune** (mag. 8.0) will be in *Aquarius*.

Mars (mag. 1.8) will be a morning star rising in the E nearly an hour before sunrise.

You can see **Earth** by looking down at night, in the morning or any other time. (Here we envision **Tom Moore** saying, "Not if I'm standing in a closet with the door closed and the lights off.")

The **Orionids meteor shower**, remnants of **Halley's Comet**, will reach its peak after midnight on Oct. 22nd, but a **Waning Crescent Moon** that rises around that time will limit your viewing of this productive shower to around 10 meteors an hour before moonrise.

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A Beginner's Guide to Equipment, Accessories, and the Necessity of Prioritizing Your Purchases

by Bill Warren

(*Note: All of the opinions herein expressed are mine. They may not apply to your particular situation in every case, but they have served me well since I became an astronomer in 1993. -Bill)*

The Importance of Priorities

Let's say that you've just bought your first telescope. Regardless of what kind of scope it is, it came equipped with the basics that make observing possible (i.e., tripod, mount, tube, mirrors/lenses, finderscope and at least one eyepiece), and probably a few additional accessories. But consider: *Everything else you might want or need that didn't come with the scope will have to be purchased later*

on. In making those purchases, you need to understand that a vast difference may exist between what you **need** and what you'd *like to have*, and prioritize your purchases accordingly. If you base your purchases on what you'd like to have, you're likely to wind up with items that you don't need and seldom use, possibly at the expense of other, more important items you could have bought. I've made that mistake before, and I've always regretted those decisions. (For example, I once bought a 32mm eyepiece and used it three times before I realized that I'd wasted my money. I thought it would make finding things easier, but it didn't.)

So how does a beginner know what he or she needs and doesn't need? FRAC members can tell you what equipment and accessories you need to get started, but what you'd like to have and how much importance you place on it is strictly up to you.

Decisions, Decisions

After buying your first telescope, then, your next step should be to make a wish list of equipment or accessories you need, and prioritize that list in terms of how much you need them. (You should limit your spending initially to inexpensive items until you know how to operate your telescope and navigate the night sky. Once you've mastered those basics, you can purchase additional equipment that will enhance your newfound skills.)

Here are some of the items you might consider purchasing later on, and suggestions regarding their use:

***Binoculars.** Most newcomers to astronomy already have binoculars when they join the club; if they don't, what they need will depend on how often they think they will use them.

The vast majority of astronomers I've known use binocs occasionally, not regularly. (**Dr. Schmude** is a notable exception.) If you're in that category, an inexpensive pair no larger than 10x50 is all you need. (The "10x" refers to magnification, and the "50" is the diameter of the lenses in millimeters.) The guy who created the A. L.'s Binocular Messier and Deep Sky Binocular observing programs used 7x35 binocs from WalMart; if they were good enough for him, they'll be good enough for you.

One other thought: If you plan to use your binoculars regularly – or if you think you need big binocs like, say, 20x80s – you might want to consider adding an inexpensive **tripod** to your wish list. Without a tripod to steady the view, **Jupiter's** Galilean moons will literally "dance with the stars" around them.

***Eyepieces.** There are as many kinds of eyepieces as there are telescopes. Personally, I prefer super plossls because I used them exclusively during my first decade of observing. I earned my Master Observer pin with Meade Super Plossls, but I hesitate to recommend them because they are a bit more expensive than the eyepiece(s) that come with starter scopes. Orion Telescopes's Sirius Plossl series sells for $35-$45 per eyepiece; they are more than sufficient for the needs of any beginning astronomer.

Whatever you use, be sure they are *parfocal* – that is, you don't need to re-focus every time you change eyepieces. The best way to ensure that they are parfocal is to buy eyepieces in the same series from the same manufacturer.

I've always believed that an observer needs three basic eyepieces: low magnification (say, 21mm to 26mm) to find things; medium magnification (e.g., 10mm to 15mm) to see more detail; and high magnification (6mm to 7mm) for really close-up views. The most glaring oversight I've seen in observers over the years is failing to change eyepieces to see which one gives the best view of what they are observing. Sure, it's easier to use just one eyepiece – but if all you use is low-power, you won't see many of the features that medium- or high-power eyepieces reveal.

Over the years, I've used low magnification 99% of the time to find objects. For observing those objects, though, medium magnification has proven best about 75% of the time, followed by high magnification (15%) and low magnification (10%). (The latter works best for large objects that won't fit into a medium- or high-magnification field of view.)

Re low magnification: Anything larger than 26mm – say, 32mm or 40mm – will give you a wider field of view (fov), but it will also render faint objects so small that they can be easily overlooked when searching for them.

Re high magnification: Anything smaller than 6mm will reduce the contrast between the object and the sky around it so much that you may not recognize or understand what you're seeing. The

effect will be like looking at a photo or reading a newspaper from an inch away. (And unless you're using a motor-driven scope, you'll have to re-center the object every 5 seconds or so to keep it in your fov.)

There are two alternatives to my three-eyepiece concept. First, you can buy a **Barlow lens** (or a Shorty Barlow) that, when added to your eyepiece holder, will double, or even triple, the magnification of any eyepiece. (However, they won't improve image clarity or detail as well as, say, switching from a 12mm eyepiece to 6mm.)

Second, you can purchase a **zoom (variable) eyepiece** that can be dialed to various magnifications. But as with Barlows, image quality in a zoom eyepiece is not as good as that afforded by separate eyepieces. If it were otherwise, you'd see more zoom eyepieces advertised in astronomy catalogs.

A final suggestion about eyepieces: *Don't buy a 2" eyepiece.* They're good – but they also tend to be more expensive than 1-1/4" eyepieces. And unless your other eyepieces are 2" you'll also have to purchase a 2" adapter to switch in and out every time you change eyepieces.

Before leaving eyepieces, I should mention an important accessory that you won't get with a starter scope: **an eyepiece case**. Telescope manufacturers offer eyepiece cases in prices ranging from about $40 to $100 or more -- but you can make your own case at far less expense by buying a foam-lined case at WalMart and customizing it for your eyepieces.

***Filters**. For most observers, the most often-used filter is a **Moon filter** that reduces the Moon's fierce brightness. They cost about $20.

Next in importance probably is a filter that will bring out detail in nebulae. **O-III filters** are excellent, but **a narrowband light pollution filter** -- also sometimes referred to as a nebula filter -- will do as well. (Of course, a narrowband filter is also extremely useful if you're observing in a light-polluted area.)

Less important (in my view, at least) are the **color filters** that enhance planetary features and details. They're useful if you understand the features they are intended to highlight – but they aren't necessary unless you plan to spend more time observing the planets than most of our members do.

Regarding **solar filters**: Unless you are capable of making your own white-light solar filter out of Mylar, you have two options: You can buy a solar telescope – they are very good, but also *very* expensive – or you can buy an **h-alpha solar filter** or a **white-light solar filter** for your scope. An h-alpha filter is more impressive and will show you more, but most beginners opt for a far less expensive white-light filter that shows sunspots.

Solar filters carry three important caveats:

1. *Don't ever buy (or use) a solar filter that attaches to your eyepiece*. The **Sun's** magnified heat and brightness would burn right through it, leaving you staring at the Sun through your unprotected eyepiece.
2. *The filter should fit snugly over the front end of your scope's tube*. In buying one, be sure that it is the same diameter as your tube. (You don't want it to fall off while you're looking at the Sun.)
3. *When using a solar filter, be sure to cover (or remove) your finderscope, so neither you nor anyone else will be tempted to look at the Sun through it.*

If all you want to do is look at (or show people) the unmagnified Sun safely, you can purchase (a) a pair of **solar sunglasses** for $5 or less, or (b) a pane of **#14 welder's glass** that sells for about $25 at any welder's supply store. As FRAC's astronomy guru, **Larry Higgins**, has pointed out, *Kids are more impressed when they see the Sun through solar sunglasses or welder's glass than when you show it to them in your telescope, because they are finding it themselves.*

Finally, if you have an uncontrollable desire to see the **Horsehead Nebula** or study other dark nebulae, you'll need an **h-beta filter**. (You won't see the Horsehead at all without one. All you'll see is black-on-black.) But since to my knowledge only two or three FRAC members have ever purchased an h-beta filter, it probably shouldn't rank high on your priority list.)

Other Equipment and Accessories

*__Collimating tool__. If you own a Newtonian or Dobsonian reflector, you'll need to collimate it at least occasionally in order to align the optics.

There are several kinds of collimating tools on the market, among them the **cheshire eyepiece** (also called a catseye) and **laser collimators,** both of which sell for upwards of $50. But I recommend a much simpler (and far less expensive) type, a **collimation cap**. Orion Telescopes and some other manufacturers include a collimation cap when you buy one of their reflecting telescopes, but you can purchase one separately for less than $10. It fits snugly into the eyepiece holder and features a small hole in its center. If your reflector has the center of the primary mirror marked – as it should – a collimation cap works just as well as a cheshire, laser collimator or any other kind, and at just a tiny fraction of the cost.

*__Telrads, Rigel QwikFinders__ and **red-dot finders** are popular among many FRAC observers as an alternative to traditional finderscopes that magnify what you see in them. All three are zero-magnification; that is, they simply feature a red dot or concentric red circles superimposed on the sky beyond them. (That preference, which is not universal in FRAC, is based on the facts that (a) regular finderscopes invert images, so if you aren't careful you'll move the scope in the wrong direction; and (b) magnification moves objects away from where you centered the finderscope fov.

*__Green laser pointer__. Orion Telescopes offers a bracket for attaching your laser pointer to a telescope to use as a finderscope for $30.

*__Red-beam flashlight__. The red light preserves your dark-adapted night vision. There are two kinds, hand-held and the ones you wear on your head like a coal miner or attach to a cap to keep your hands free. Most observers prefer hand-held because they are easier to operate – they don't feature a confusing white-light option – and they are useful in helping locate things quickly when you drop them after dark in the grass at JKWMA.

*__Battery(ies).__ You'll need an ongoing supply of low-power disposable batteries for things like your red-beam flashlight, laser pointer, an illuminated finder and/or a hand-held PushTo controller – but you'll need a larger, more powerful battery to power a motorized tracking system. Some GoTo scopes will take disposable batteries, but they don't last over a few hours. An alternative is to use a heavy-duty rechargeable battery such as a car jump-starter. Nearly all tracking systems will work on 12-volt DC, and will last many evenings on a single charge. Many astrophotographers use a car battery.

*__Observing chair__. These chairs, which are adjustable in height, are based on the practical notion that *If you're going to spend a lot of time looking through your telescope, you may as well do it comfortably.* Adjusted downward, you can sit while observing objects that are low in the sky – but at any other level your eyes will remain at eyepiece level while you observe an object, sketch it or log your observation.

Commercially available observing chairs range in price from about $40 to upwards of $170, based on features such as weight limits, durability and whether the seat is padded. But if you possess handyman skills, you can go to the Internet for plans and build your own.

*If you use a telescope at public observings, visitors at your scope will appreciate your buying an inexpensive **2-step ladder** for children to stand on.

*__Astrophotography__. Knowing next to nothing about the subject, I won't presume to tell you what you need to know about the equipment and accessories you need to get started in astrophotography. My only advice here is, *If you are not an experienced observer or photographer, stay away from astrophotography while you're learning how to use your telescope*. The initial learning curves in observing and astrophotography are so great that, if you try to learn both at once, you'll probably fail to master either of them.

Conclusion

More than a dozen years ago, a young man we'll call Freddy joined FRAC. There's nothing unusual about that, but read on.

Although new to astronomy, Freddy was fascinated with observing from the start. He attended our club observings, examined the scopes, equipment and accessories we were using, and he couldn't wait to get started.

A few months later, he became an astronomy dropout. Here's how it happened:

Freddy was 20 yrs. old and lived with his parents on a farm near Griffin. He had never had a credit card before, but shortly after joining FRAC he applied for several cards, was accepted, and immediately went on a spending spree.

Not content with buying a telescope and a few basic accessories, Freddy proceeded to buy everything he saw us using that he liked. We begged him to slow down and consider his choices, but he wouldn't listen. Before you could blink twice, Freddy maxxed out his credit cards. His parents blamed us for it, made Freddy quit the club, and his father sold the farm and moved the family away from Griffin to get him away from our evil influence.

Admittedly, Freddy's case was rather bizarre – it has never happened to anyone else before or since -- but it could have been avoided if he had used common sense in building his store of astronomy gear. But he couldn't do as we had done and build his collection of equipment one item at a time over several years: he wanted it all, *right now!,* and he literally paid the price for his mistake.

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Above Right: NGC 7635 (Bubble Nebula, a.k.a. **Sharpless 162**), an emission nebula in *Cassiopeia*. (Photo by **Venci Krumov**.) This extremely faint H-II region of ionized gas surrounding an 8th-mag. star is striking in photos but notoriously difficult to see visually, which explains its presence in the notoriously difficult Herschel 2 observing program. (NGC 7635 is also #11 in the late **Sir Patrick Caldwell-Moore's** catalog of deep-sky objects, which explains why some FRAC observers dislike the Caldwell program. Sir Patrick's list contains 110 objects that **Charles Messier** missed when compiling his catalog; according to Sir Patrick, all of the Caldwells are bright and easy to see in a 3-in. telescope. But he was wrong: at least 15 of the Caldwells – including Bubble Nebula – are difficult for any telescope smaller than 14 in.)

NGC 7635 is located less than 1° SW of **M52**.

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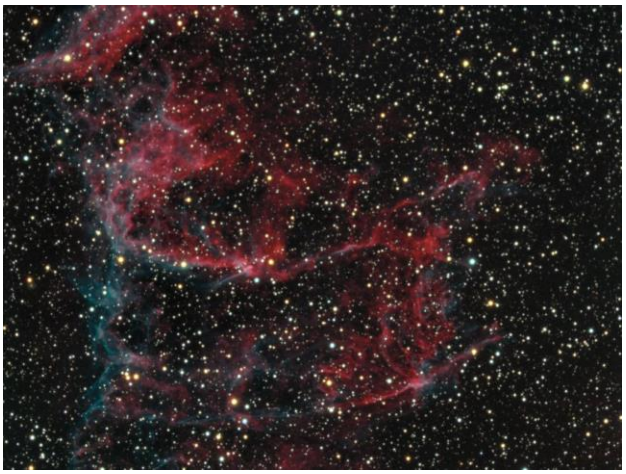
Below: A portion of **Veil Nebula (NGCs 6960** and **6992-95,** a supernova remnant in *Cygnus***.** (Photo by **Alan Pryor.)** Alan writes, "On Aug. 30th, I photographed a small part of the **Veil Nebula.** It's what remains of a supernova that occurred 8,000 years ago. The star that caused it was 1,400 light-years away -- slightly closer than **Betelgeuse** -- when it blew up.

"Veil Nebula is faint, and best seen with an O-III or nebula filter that brings out details in the nebulosity. Even then, though, you can only view parts of it at a time because it covers a section of the sky that is 3° wide. (By comparison, the **Moon** is 1/2° wide.)"



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