

# THE FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT  
RIVER ASTRONOMY CLUB

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## THE FRAC 50 OBSERVING PROGRAM

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*(Editor's Note: What is the best deep-sky observing list ever devised for owners of small telescopes? Is it the Messier list prepared by **Charles Messier** during the latter half of the 1700s? Or maybe the Caldwell Program, the late **Sir Patrick Caldwell-Moore's** 1995 list of 109 non-Messiers?*

*In a word, the answer to both questions is **No**.*

*There are some lovely objects among Messier's 109 cometary look-alikes – but the rest are exciting only in the sense that you'll get a Messier pin if you find them all. Sir Patrick's list includes a number of memorable deep-sky objects, too – but many of them are difficult to find even in a large telescope. Only five FRAC members have ever earned a Caldwell pin.*

*The best deep-sky observing program ever created for small telescopes was done in 2003 by FRAC's **Dawn Chappell** and ex-member **Larry Fallin**. Their list, called "**The FRAC 50 Observing Program**," was created precisely to showcase 50 of the finest non-Messier deep-sky objects for small telescopes. It contains 22 Cawdwells, but the other 28 "FRAC 50" objects are so compelling as to make one wonder why Sir Patrick didn't include them on his list.*

*This Observer Special Edition first appeared in Sept., 2003. The report – but not the list of 50 observing targets – has been extensively revised in an attempt to renew interest in Dawn's and Larry's wonderful observing project. You won't get an*

*A. L. observing pin for completing the FRAC 50 – but you'll get a beautiful certificate of achievement, along with the satisfaction of finding and observing fifty of the most incredible wonders of the night sky. The only requirement set by Dawn & Larry is that all 50 must be observed independently of any A. L. observing program.*

*Give the FRAC 50 a try. You'll like it.)*

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After months of preparation, **Dawn Chappell** and **Larry Fallin** unveiled their “**FRAC 50 Observing Program**” at the August, 2003 meeting – fifty of the visually most appealing and fascinating objects for small telescopes beyond our solar system.

In compiling their list, Dawn and Larry wisely chose to include only the best objects from **Sir Patrick Caldwell-Moore’s** widely heralded but ultimately disappointing Caldwell list of 109 deep-sky objects for small telescopes that do not appear on the Messier list. Thus you’ll find in the FRAC 50 such familiar and unforgettable gems as: **NGC 457 (the Owl Cluster)** in *Cassiopeia*; **NGC 6826 (the Blinking Planetary)** in *Cygnus*; the splendid edge-on galaxy **NGC 4565 (Berenice’s Hair Clip)** in *Coma Berenices*; the aptly named **Blue Snowball** planetary nebula (**NGC 7662**) in *Andromeda*; other planetaries resembling **Jupiter (NGC 3242, the Ghost of Jupiter)** in *Hydra* and **Saturn (NGC 7009, Saturn Nebula)** in *Aquarius*; the **M31** look-alike **NGC 7331 (Little Andromeda Galaxy)** in *Pegasus*; a Christmas tree (**NGC 2264**) in *Monoceros*; the lovely **Double Cluster (NGCs 869 & 884 in Perseus; the “37” Cluster (NGC 2169) in Orion**; and eleven other Caldwell deep-sky objects.

The FRAC 50 doesn’t stop there, though: There’s also a coathanger (**Collinder 399**) in *Vulpecula* and a mini-coathanger in *Ursa Minor*; the striking YELLOW-blue color contrast of **Albireo’s** double star components in *Cygnus*; the pretty little open cluster **NGC 1502** at the SE end of **Kemble’s Cascade**, itself a well-known 2-1/2° trail of 5<sup>th</sup>- through 9<sup>th</sup>-mag. stars in *Camelopardalis*; the inverted “V” of mag. 5-6 stars called **Mel 111** (after its cataloguer, **P. J. Melotte**) that identifies the constellation *Coma Berenices*; and much, much more.

Many of the FRAC 50 are extremely easy to find. For example, if you find the mag. 5.1/8.3 double star **S Mon**, you have the base of the **Christmas Tree Cluster (NGC 2264)**. Find **Herschel’s Garnet Star** in *Cepheus*, and you have the open cluster/nebula **IC 1396** adjoining it to the south. Place mag. 3.5 **Delta Geminorum** at the ENE edge of your 4° Telrad circle, and there’s the **Eskimo, or Clown Face, Nebula (NGC 2392)**, a lovely blue planetary that you won’t forget. And so it goes.

While none of the FRAC 50 objects is best viewed via naked-eye, about a dozen of them are at least marginally visible without binoculars or a telescope. Roughly twenty more require a 6” telescope and the rest are within easy range of 7x50 binoculars. The FRAC 50 list offers an excellent range of observing possibilities.

Twenty-eight constellations are represented in the FRAC 50 object list -- *Cassiopeia* has the most (6) – with heavier concentrations in the Fall and Winter months (17 apiece) than in the Spring (9) and Summer (7). The list includes 22 open clusters, eleven galaxies, ten planetary nebulae, four double stars, two emission nebulae and one asterism.

So what’s missing from the above list?

Well, there are no supernova remnants or dark nebulae – but so what? The biggest surprise is the absence of any globular clusters on the FRAC 50 list. But as Larry points out, all of the best globulars visible in detail from our latitude are Messier objects. (See p. 3.)

Personally, I like the FRAC 50 just the way it is. I *like* the ten planetary nebulae because planetaries tend to offer color that you just don’t get in other non-stellar objects. And I *like* the 22 open clusters: in addition to being attractive, they bring the night sky down to understandable proportions for newcomers to astronomy.

Look at, say, M31 (Andromeda Galaxy), and you see light emanating from one large glow (albeit a glow that comes to us from 2.7 million light-years back in time); look at the open cluster **NGC 2362** in *Canis Major*, and even a small telescope will show you two dozen individual stars in a small but precisely defined equilateral triangle surrounding the 4<sup>th</sup>-mag. star **Tau Canis Majoris**. Beauty often comes in small packages.

-Bill Warren

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## AN INTERVIEW WITH DAWN AND LARRY

### **Question: Why did you decide to create a FRAC 50 Observing Program?**

**Dawn:** At the time, I was working on (and near completion of) the **Caldwells**. I became burned out with the **Caldwells** to the point where I wasn’t enjoying myself. I thought that maybe there were other people who might want to try the **Caldwells**, thinking it was a good step between the **Messiers** and the **Herschel 400s**. This, of course, could not be further from the truth. I began thinking that we needed something for beginners in the club to do that would not be as difficult as the **Caldwells**. Larry talked about creating a list of the best non-Messier

objects and I decided to throw in my two cents' worth. I spent a lot of time at work researching objects – down time is wonderful! – and putting together some ideas. Larry and I got together, each with suggestions for the list, and the FRAC 50 was the result.

**Larry:** There were several reasons why we created the FRAC 50. First and foremost was the need for a program that would appeal to beginners who were not ready to commit to larger and more difficult deep-sky observers' programs like the Herschel 400s. We hoped to give beginners the motivation and experience that would help them tackle the more advanced A. L. programs.

We wanted to create a program composed of objects that are visually interesting and do not require extensive observing skills to be enjoyed. We also wanted to give our members a good database of objects to share with people interested in astronomy who visit our observings.

**Question: How long did it take you to compile your list? Were there any special problems you encountered along the way?**

**Dawn:** I can't recall exactly how long I worked on it, but it was time-consuming because we needed to observe each object and make sure it was appropriate for beginners using small 'scopes in the 6-in. range.

**Larry:** We started the list at Peach State Star Gaze 2002, refined it at the Chiefland Star Party, and we made small changes to it during the first half of 2003. The final list given out at the August meeting was completed in June.

One reason it took as long as it did was that we wanted to make sure the list was good for our club observing site. We found that some objects that sounded good at first were difficult to observe at Cox Field. We also had to keep our egos in check, because some of our personal favorites didn't fit the criteria we used for the program.

**Question: What were the criteria you used in selecting – and rejecting – objects for your list?**

**Dawn:** The only criteria I had were (a) I wanted objects that are beautiful, and (b) I wanted some different things than what you see every night. I like the **Helix** and **Rosette Nebulas**, and wanted them to be included. I think they are two of the most beautiful objects out there.

**Larry:** Several years ago the usenet bulletin board surveyed its members, asking them to list their favorite non-Messier objects. The board moderator compiled the objects and came up with the "sci.astro.amateur 100 favorite non-Messier observing list." It was basically a list comprising 100 of the prettiest objects in the sky (except Messiers). I have been picking at this list little by little over the last few years, observing the objects that were available to northern hemisphere observers.

When discussion began about doing a FRAC 50 program, we used this list as a starting point. Then we decided to target our list to amateurs who did not have a lot of observing experience. With that, we set criteria for telescope size. We wanted a list that could be achieved with small- to medium-sized telescopes. We also decided not to include any objects that required filters. That's why the **Horsehead Nebula** is not on the list.

We did, however, include objects that can be enhanced through filters. We also wanted to include a few binocular objects as well. This left us with a rough list of about 75-80 objects. Then we eliminated some objects based on low declination or low visual magnitude. We wanted to make the list favorable for Cox Field observers. We further refined it by adding objects that interested us and were common favorites among FRAC members. While we did this, we observed the objects we weren't familiar with. Some of them looked terrible under Ga. skies, so we did further refining. This was the hardest part of the process. Dawn and I spent hours digging through books and verifying through 'scopes the final few objects that completed the list.

**Question: Of your FRAC 50 objects, ten are planetary nebulae and 22 are open clusters, yet there are no globular clusters on the FRAC 50 list. Why not?**

**Larry:** We made a small effort to include different types of objects on the list, but frankly, the objects we enjoy observing the most are open clusters. We didn't want to sacrifice any favorites just for the sake of adding a different type of object. The original sci.astro.amateur list contained a few globular clusters; all but one of them were small, faint targets with more appeal for advanced observers than for beginners.

Anyway, in my opinion – and Dawn's as well – the Messier program contains the best globulars you can see from the northern hemisphere. NGC 5139 (Omega Centauri) is beautiful, but it doesn't show up well at our latitude. It was a tough call to drop it from our list, but we wanted the list to be customized for our latitude.

The other southern sky objects we've included in the FRAC 50 offer a better appearance and can be quite stunning on a dry, clear night.

Besides, every observing program needs a few challenging objects. **Sir Patrick Caldwell-Moore** obviously didn't understand the concept of having a *few* challenging objects.

**Question: What do you plan to do with the FRAC 50?**

**Dawn:** I want our club members to use and enjoy the list, and I hope it will spur them to come up with observations and programs of their own. Most of the things I've done within the club have been to try and spur activity out of our members. We have a wonderful group of members, many of them so wonderfully talented beyond what they think of themselves as observers, and I would like to see more activity and participation out of them. I mean, honestly, if a person like me who didn't even like science until a few years ago can create an observing program, anybody can do it.

**Larry:** Well, for any interested FRAC members, we will give a certificate for completing the FRAC 50 list. The FRAC 50 lends itself naturally to a mini-marathon in mid-March. It can also be used as a competitive observing list for star parties. The FRAC 50 will always be a good resource of objects to show people who are new to astronomy. I hope every member participates in this program, and has fun doing so.

## FRAC 50 Observing Program

Object	Type	Con	VMag	Size	RA	Dec	Pop. Name	Notes
NGC 7662	PN	And	8.6	17.0"x14.0"	23h 25m 57s	+42° 32' 44"	Blue Snowball Nebula	
NGC 7009	PN	Aqr	8.3	28.0"x23.0"	21h 04m 15s	-11° 21' 49"	Saturn Nebula	
NGC 7293	PN	Aqr	6.3	16.0"x12.0'	22h 29m 40s	-20° 47' 23"	Helical Nebula	Filter Helps
NGC 1907	OC	Aur	8.2	7.0'	05h 28m 00s	+35° 18' 53"		
NGC 1502	OC	Cam	6.9	8.0'	04h 07m 45s	+62° 19' 49"		near SE end of Kemble's Cascade
NGC 2403	Gal	Cam	8.5	17.8'	07h 36m 55s	+65° 35' 42"		
NGC 225	OC	Cas	7.0	12.0'	00h 43m 28s	+61° 47' 06"		
NGC 457	OC	Cas	6.4	13.0'	01h 19m 10s	+58° 20' 02"	Owl Cluster	
NGC 654	OC	Cas	6.5	5.0'	01h 44m 10s	+61° 53' 00"		
NGC 659	OC	Cas	7.9	5.0'	01h 44m 16s	+60° 42' 00"		
NGC 663	OC	Cas	7.1	16.0'	01h 46m 04s	+61° 15' 00"		
NGC 7789	OC	Cas	6.7	16.0'	23h 57m 04s	+56° 44' 09"		
NGC 247	Gal	Cet	9.1	20.0"x7.0'	00h 47m 11s	-20° 45' 21"		Under 8" Difficult
NGC 2360	OC	CMa	7.2	13.0'	07h 17m 48s	-15° 36' 53"		
NGC 2362	OC	CMa	4.1	8.0'	07h 18m 48s	-24° 56' 51"		
Mel 111	OC	Com	1.8	275.0'	12h 25m 00s	+26° 00' 07"	Coma Star Cluster	Binocular Target
NGC 4565	Gal	Com	9.6	15.5"x1.9'	12h 36m 20s	+25° 59' 23"	Bernice's Hair Clip	classic edge-on spiral with dust lane
NGC 4361	PN	Crv	11.0	81.0"	12h 24m 05s	-18° 48' 00"		
NGC 4631	Gal	CVn	9.2	17.0"x3.5'	12h 42m 11s	+32° 32' 42"		same LP field as companion galaxy NGC 4627 & NGC 4656
Beta Cygnus	Star	Cyg	3.1		19h 30m 45s	+27° 57' 55"	Albireo	superb double star; blue-white/yellow
NGC 6819	OC	Cyg	7.3	5.0'	19h 41m 20s	+40° 11' 22"		
NGC 6826	PN	Cyg	8.8	27.0"x24.0"	19h 44m 53s	+50° 31' 42"	Blinking Planetary	
31 Cygnus	Star	Cyg	3.8		20h 13m 06s	+46° 44' 00"		
NGC 6543	PN	Dra	8.3	22.0"x16.0"	17h 58m 36s	+66° 38' 17"	Cat's Eye Nebula	
NGC 2158	OC	Gem	8.6	5.0'	06h 07m 33s	+24° 05' 56"		
NGC 2392	PN	Gem	8.6	47.0"x43.0"	07h 29m 10s	+20° 54' 42"	Eskimo Nebula; Clown	
NGC 6210	PN	Her	9.7	20.0"x13.0"	16h 44m 30s	+23° 48' 46"		
NGC 3242	PN	Hya	8.6	40.0"x35.0"	10h 24m 48s	-18° 38' 14"	Ghost of Jupiter	
NGC 2903	Gal	Leo	9.0	13.3"x6.0'	09h 32m 10s	+21° 29' 58"		
Epsilon Lyra	Star	Lyr	5.0		18h 44m 03s	+39° 40' 00"		First Split Req'd second split bonus.
NGC 2237	BN	Mon	5.5	70.0"x80.0'	06h 32m 19s	+04° 59' 03"	Rosette Nebula	OC NGC 2244 embedded in nebula
NGC 2244	OC	Mon	4.8	24.0'	06h 32m 25s	+04° 52' 03"		involved with Rosette Neb. (NGC 2237)
NGC 2264	OC	Mon	3.9	30.0"x60.0'	06h 40m 58s	+09° 53' 42"	Christmas Tree Cluster; Cone Nebula	includes naked-eye S Mon (15 Mon) Good Bino Target
NGC 2301	OC	Mon	6.0	12.0'	06h 51m 49s	+00° 28' 04"		
NGC 6572	PN	Oph	9.0	15.0"x12.0"	18h 12m 09s	+06° 51' 01"		
NGC 6633	OC	Oph	4.6	27.0'	18h 27m 43s	+06° 34' 14"		
Zeta Orion	Star	Ori	1.9		05h 40m 08s	-01° 57' 00"		
NGC 2169	OC	Ori	5.9	7.0'	06h 08m 27s	+13° 56' 59"	"37" Cluster	
NGC 7331	Gal	Peg	9.5	11.4"x4.0'	22h 37m 08s	+34° 25' 27"	Little Andromeda Gal	
NGC 869	OC	Per	5.3	30.0'	02h 19m 03s	+57° 08' 58"	Double Cluster	w/NGC 884 Good Bino Target
NGC 884	OC	Per	6.1	30.0'	02h 22m 27s	+57° 06' 57"	Double Cluster	w/NGC 869 Good Bino Target
NGC 1023	Gal	Per	9.4	9.0"x4.0'	02h 40m 27s	+39° 03' 47"		
NGC 1528	OC	Per	6.4	24.0'	04h 15m 24s	+51° 13' 49"		
NGC 253	Gal	Scl	7.2	25.0"x7.0'	00h 47m 35s	-25° 17' 01"		edge-on spiral
NGC 3115	Gal	Sex	8.9	8.3"x3.2'	10h 05m 14s	-07° 43' 06"	Spindle Gal	
NGC 2841	Gal	Uma	9.2	7.4"x3.5'	09h 22m 01s	+50° 58' 21"		
WA 1 (Whiting's Asterism)	Asterism	Umi	9.0	18"x9'	16h 31m 00s	+80 13' 00"	Mini Coathanger	telescopic cousin to Cr 399
NGC 4526	Gal	Vir	9.7	7.0"x2.7'	12h 34m 03s	+07° 42' 03"	Lost Gal	
Cr 399	Asterism	Vul	3.6	60.0'	19h 25m 26s	+20° 11' 18"	Brocchi's Cluster; The Coathanger	once assumed to be a OC; data from Hipparcos spacecraft shows it to be a chance alignment of stars
NGC 6885	OC	Vul	8.1	7.0'	20h 12m 02s	+26° 29' 20"		w/ NGC 6882