

The Planetary Nebula Club objects by month

(As posted by Ted Forte on "backbayastro")

August Planetaries

As most of you know, I am the coordinator of the Astronomical League's Planetary Nebula Club. Several members of the BBAA helped me create the Planetary Nebula Club by serving on the object selection committee, serving on the rules committee, providing images, or by authoring parts of the observing manual. The Planetary Nebula Club creation was truly a BBAA effort. I think it's a shame, therefore, that more BBAA'ers haven't completed the program and earned the pin. So if you are looking for an observing program to complete, why not our very own? There was never a better time to start. More than half the list is visible right now and no less than 31 of our 110 PNe are optimally placed in August. Hence the title of this epistle. It is my intention to spark an interest in the program and suggest the objects that might be bagged in the coming weeks. Many of you have no doubt observed these objects already, so please chime in and share your impressions of them.

As is true of the entire list, our August selection contains both well-known showpieces and some seldom mentioned objects that you might not consider tracking down if not for this program. There are no less than 17 of the 31 August objects that I would describe as "stellar". I must confess that I am not the biggest fan of these tiny objects and had I been the sole arbiter of the list it would have contained far fewer of these. The up side of these stellar sized planetaries is that they are usually bright enough to see in small scopes, even in considerable light pollution. But that's not to say they are easy. The usual problem is to pick these tiny orbs out of the star field, that is, the goal here is to differentiate the planetaries from the star field. This can be a bit tricky and requires a little skill and, no doubt, some practice. The principle problem is that they are small. So small, that their disks are usually close to the resolution limit allowed by our typical seeing conditions. I include in this group a few objects as large as 10 or 11 seconds in listed diameter because when coupled to a low declination, these can actually be quite challenging.

To bag these objects, you need to master the technique of "blinking"; hold a narrow band nebular filter such as the Lumicon OIII between thumb and forefinger and move it into and out of the light path by passing it between eye and eyepiece and then moving it out of your view. As you repeat this procedure, most planetaries will seem to blink. The filter preferentially passes the specific wavelength of light at which planetary nebulae are most bright. In moments of excellent seeing, many of these objects will be distinctly non-stellar, but at other times only the subtle improvement in contrast provided by the filter can reveal the planetary. A good computer generated chart of the field is also a big advantage. In less crowded star fields, your target object might be identified even without blinking a filter. I find that once positively identified, many of these small planetaries will indeed show a disk that you can discern.

Of our 31 August planetaries I will place the following in the stellar (to small featureless disk) category and say no more about them: in Sagittarius, NGC 6537, NGC 6565, NGC 6567, NGC 6578, NGC 6620, NGC 6629, NGC 6644, IC 4732 and IC 4776, in Aquila, NGC 6741, IC 4846, NGC 6790, Minkowski 1-70, NGC 6803 and NGC 6807, in Corona Australis, IC 1297, and in Cygnus, NGC 6833.

That leaves 14 planetaries. Let's start in Lyra with perhaps the most famous planetary nebula of all. The marvelous Ring Nebula, M57 (NGC 6720) nestled midway between beta and gamma Lyrae. I doubt there is anyone on this list that hasn't seen this one. Can you detect its elongated shape and ragged edges along its long axis? How about the 15th magnitude central star? It takes superb seeing and high power to pick that out! Also in Lyra, about a degree East of M56 is NGC 6765. It is slightly elongated and a filter makes the northern end stand out. Use moderate power, a filter, and averted vision.

Our two remaining Cygnus planetaries are rather famous. NGC 6826 goes by the name of the "Blinking Planetary". This blue-green disk has a very prominent central star. Stare directly at it and the nebula seems to fade away, use averted vision and it pops back into view as if by magic. Many objects display this optical trick, but none are so noted for it as this one in the northern wing of the swan. The other Cygnus object is Campbell's Hydrogen Star (PK 64 +5.1) which some will say I should have listed with the stellar objects above. It is indeed tiny, but its high altitude gives you at least a chance of seeing its barely detectable halo. This is one of the rare planetaries that responds well to an h-beta filter. It is located about two and a half degrees north of Albireo. Just its name lends it some romance, so it gets singled out here.

Aquila is a treasure trove of planetary nebulae. Besides the stellar objects above we have five interesting objects to consider for August. First up is Sharpless 2-71. So many of the objects in the catalog of Stewart Sharpless are so challenging that you might be hesitant to attempt this one. But fear not, it is quite reachable in modest apertures. Use averted vision, moderate power and an OIII filter. The lopsided disk of nebulosity surrounds a fairly bright central star. NGC 6751 is called the Dandelion Puff Ball. See if you can detect some annularity in this greenish disk. The central star is visible and a filter will help. NGC 6778 is an oval disk. Can you see a central star? Its rather faint, but some observers have reported occasional glimpses. NGC 6781 just may be my favorite Aquila planetary. Do you see it as a ring or a filled disk? NGC 6804 is probably the easiest of our Aquila targets. You may disagree. It has an offset central star and a second star involved on one edge.

Our one Draco entry this go round is NGC 6742, which is also fairly well known as Abell 50. This small bright disk is pretty easy and can be seen with or without a filter. The central star is not visible and the disk is featureless.

NGC 6572 is a small bright disk in Ophiuchus. What color do you see? This one seems to have an identity crises – it goes by various names that evoke different shades of blue or green.

IC 1295 is a large faint disk in Scutum. I find this one to be very seeing dependent. A filter helps.

We'll end our list of August planetaries in Sagittarius. NGC 6563 is a fairly bright disk that can appear annular in larger scopes. It lies two degrees west of Kaus Australis. A filter helps but is not necessary. The final object is another favorite of mine, the Little Gem, NGC 6818. This is a small blue disk that holds magnification well and has a strong response to filters. It is in the northern part of the archer and makes an isosceles triangle with alpha and beta Capricorni. See if you can detect its faint extensions that lie along its long axis, and then check out nearby Barnard's Galaxy aka NGC 6822.

Be sure to record your location, aperture, magnification, date and time. Also include a description of the object in your own words that includes whether or not you see the central star, whether you needed a filter to see the object, and describe any color or structures you detect. Below is a table of the objects in the PN Club that are optimally placed in August. I hope the columns line up:

NGC 6537	Red Spider	Sgr	18h05m49.4s	-19°50'34"
NGC 6565	He 2-362	Sgr	18h12m31.2s	-28°10'36"
NGC 6572	Blue Racquetball	Oph	18h12m36.4s	+06°51'22"
NGC 6563	He 2-361	Sgr	18h12m43.4s	-33°52'02"
NGC 6567	He 2-369	Sgr	18h14m21.3s	-19°04'25"
NGC 6578	He 2-381	Sgr	18h16m53.0s	-20°26'52"
NGC 6620	He 2-394	Sgr	18h23m32.5s	-26°49'01"
NGC 6629	He 2-399	Sgr	18h26m19.7s	-23°11'52"
NGC 6644	He 2-408	Sgr	18h33m12.4s	-25°07'19"
IC 4732	He 2-410	Sgr	18h34m31.7s	-22°38'15"
IC 4776	He 2-421	Sgr	18h46m31.1s	-33°19'58"
M 57	Ring Nebula	Lyr	18h53m58.5s	+33°02'30"
IC 1295	PN G025.4-04.7	Sct	18h55m10.8s	-08°48'54"
NGC 6742	Abell 50	Dra	18h59m37.8s	+48°28'45"
SH2-71	PN G035.9-01.1	Aql	19h02m31.4s	+02°10'03"
NGC 6741	Phantom Streak	Aql	19h03m08.8s	-00°26'05"
NGC 6751	PN G029.2-05.9	Aql	19h06m28.5s	-05°58'38"
NGC 6765	M 1-68	Lyr	19h11m30.8s	+30°33'41"
IC 4846	PN G027.6-09.6	Aql	19h17m01.8s	-09°01'33"
IC 1297	He 2-431	CrA	19h18m05.8s	-39°35'43"
NGC 6778	PN G034.5-06.7	Aql	19h18m56.9s	-01°34'42"
NGC 6781	PN G041.8-02.9	Aql	19h18m58.2s	+06°33'24"
NGC 6790	PN G037.8-06.3	Aql	19h23m28.2s	+01°31'55"
M 1-70	PN G045.4-02.7	Aql	19h24m51.7s	+09°55'06"
NGC 6803	PN G046.4-04.1	Aql	19h31m45.9s	+10°04'37"
NGC 6804	PN G045.7-04.5	Aql	19h32m04.8s	+09°14'47"
NGC 6807	PN G042.9-06.9	Aql	19h35m03.9s	+05°42'20"
Campbell's Hyd. Star	He 2-438	Cyg	19h35m09.9s	+30°32'16"
NGC 6818	Little Gem	Sgr	19h44m32.5s	-14°07'46"
NGC 6826	Blinking PN	Cyg	19h45m06.0s	+50°32'53"
NGC 6833	PN G082.5+11.3	Cyg	19h50m05.3s	+48°59'07"

Good luck and let me know how you did in trying for any of these.

September Planetaries

Last month I presented a list of 31 planetary nebulae from the PN Club that were well placed for August observations. I managed to re-observe most of them over the past month. How did you do? Pick up any new ones?

The list of PNe in our Planetary Nebula Club that are optimally placed in September contains 19 objects. At least a few of them will be new to some of you. The end of summer brings earlier sunsets and cooler temperatures, so maybe it's a good time to start working on the PN program. An 8-inch telescope should be sufficient to detect the planetary nebulae on our list. Larger scopes will provide you with better views of course. For many of these objects, a narrow band filter like the Lumicon OIII (oh-three) is a must.

As I did last month, I'm going to lump all of those objects that I would call "stellar" together and say just this about them: a good chart, a filter, and a bit of practice will help you find and identify these tiny objects. These PNe have such tiny dimensions because A. they are extremely far away and thus appear very small in angular size, B. they are very young and since they have not had the time to expand to large sizes are physically small or C. Some combination of these two causes. Because they are so small, they appear star-like or have very tiny, almost un-noticeable disks. Seeing often complicates the identification of these small objects. Atmospheric scintillations can cause point sources (stars) to appear disk-like and it is hard to pick an actual small disk out from a field of poorly focused stars. A good chart can very often solve this problem, allowing you to precisely identify the object, but sometimes a filter is required. Because a narrow band filter preferentially passes the specific wavelength that these objects are brightest in while dimming all other light, they can make a planetary nebula seem to blink. Just pass the filter into and out of the light path and look for the object that seems to brighten. It's an illusion of course; everything is being dimmed by the filter, but the principle wavelength of light that the PN emits is being less dimmed than the continuous emission of the stars.

NGC 6884 (Cygnus), NGC 6879 (Sagitta), NGC 6881 (Cygnus), NGC 6886 (Sagitta), IC 4997 (Sagitta), IC 5117 (Cygnus), and PK 086-8.1 aka Hu 1-2 (Cygnus) all qualify for the stellar moniker as does Pease 1. However, I think Pease 1 is interesting enough to deserve further mention.

What makes Pease 1 particularly noteworthy is its association with the great globular in Pegasus, M15. It is not for the faint of heart, and is a real challenge to find. It's listed as 15th magnitude, with a magnitude 14.9 central star. Given its 1 arc second diameter, its light is rather concentrated and therefore its "surface brightness" is more like 14.6. Still quite faint, but reachable. The real problem is that it is well hidden among the millions of stars in the distant globular. Even Stephen James O'Meara describes the planetary as "nearly impossible to detect in backyard scopes". I disagree. It IS detectable, with luck, perseverance, a filter, and a great chart. But let not your heart be troubled if you fail in detecting it - the PNe Club allows negative observations. My log index contains a great many negative attempts on this object, but also contains six successful observations going back to October 2001.

Our September list contains some of the most famous planetaries in the sky and none are more famous than M27, The Dumbbell Nebula in Vulpecula. Kenneth Glyn Jones begins his description of it with the

declaration: "M27 is undoubtedly the finest of the planetary nebulae in the whole heavens." Many would agree. M27 adorns the Planetary Nebula Club Pin. It is easy to find, and unmistakable in the eyepiece. It was the first of its class to be discovered (Messier in 1764) and is often one of the first objects tracked down by novice observers. I doubt anyone here hasn't seen it, but if it is yet to tickle your retina you are in for a real treat.

NGC 6891 in Delphinus is a bright bluish-green disk, with a visible central star. High magnification and a filter will reveal a dim outer halo.

NGC 6894 in Cygnus is, with good seeing and sufficient aperture, clearly annular; otherwise it appears as a disk that is slightly elongated along the N-S axis.

NGC 6905 is known as the "Blue Flash Nebula" and I have no idea why. John H. Mallas may have initiated the moniker in 1963. Greg Crinklaw opines that it stems from Mallas's description of the pretty blue object twinkling and flashing among the backdrop of stars. It presents a pleasing view nestled in a rich star field and is framed by a tight triangle of stars. The disk is a bit elongated and you can see the central star.

I first observed Cygnus planetary NGC 7008 in October 1999 and it quickly became a favorite. A few years later, Eric Honeycutt would describe the object as "The Fetus Nebula" and the nickname has caught on. What a marvelous object. A kidney bean shaped dual-lobbed disk of irregular brightness, with two brighter knots in the NE and two stars of magnitude 13 and 14 superimposed. The central star is visible in the dark area directly south of the NE lobe. I have fond memories of sharing views of this object with many of my observing friends over the years including Dick Moncure—after I helped him locate this for the first time we spent close to an hour observing and discussing it one night at NWRP's south terminal.

NGC 7009 in Aquarius is known as the Saturn Nebula. Lord Rosse is the source of the name. It is famous for another naming too—Sir William Herschel described it as 'planetary' because it was round and bore magnification well. The term "planetary nebula" now applied to this class of object stems from that description. 7009 is one of the better examples of an object with "ansae"; literally "handles": they are extensions that protrude from the main body of the planetary. This is what gives it the Saturn-like appearance. The object is large and bright, pale green or bluish and elongated E-W. Magnification improves the detection of the spike-like extensions which are probably fast moving jets of expelled material.

NGC 7026 in Cygnus was nicknamed the "Cheeseburger Nebula" by Jay McNeil. A dark linear feature divides a round disk evoking the image of a burger on a bun. I have suspected the central star as an occasional twinkle. It has a bi-polar halo as well.

NGC 7027 is also in Cygnus and it seems that I observe this in tandem with 7026 about as often as I view M65 and 66 together. They just seem to go together. At low power this object is distinctly green. Kent Wallace has suggested the nicknames "Green Rectangle" and "Magic Carpet". At higher powers the nebula is more blue to my eye. There is a very faint outer shell visible with a filter.

Sh 1-89 in Cygnus is our most ghostly and ethereal September offering. A filter is a must and it needs low power. The wings extending from this almost round cloud earn it the "Moth nebula" nickname.

NGC 7048 also in Cygnus is a more typical planetary nebula. Elongated N-S and annular. There is a faint star involved to the west and the nebula appears brighter there. The central star is not visible.

Our final September target is in Pegasus. NGC 7094 is a faint disk of uniform brightness surrounding a visible central star. There is a fainter star involved to the NE as well.

Good luck with these if you try for them this month. Please post here if you want to share your own impressions (past or present.)

Dumbbell	M 27	Vul	20h00m03.2s	+22°44'52"
NGC 6884	PN G082.1+07.0	Cyg	20h10m44.0s	+46°29'21"
NGC 6879	He 2-455	Sge	20h10m54.9s	+16°57'05"
NGC 6881	He 2-456	Cyg	20h11m15.8s	+37°26'24"
NGC 6886	He 2-458	Sge	20h13m10.4s	+20°01'08"
NGC 6891	PN G054.1-12.1	Del	20h15m37.9s	+12°44'03"
NGC 6894	PN G069.4-02.6	Cyg	20h16m49.2s	+30°35'40"
IC 4997	He 2-464	Sge	20h20m37.0s	+16°45'45"
NGC 6905	He 2-466	Del	20h22m50.6s	+20°08'09"
NGC 7008	PN G093.4+05.4	Cyg	21h00m51.5s	+54°34'47"
Saturn Nebula	NGC 7009	Aqr	21h04m44.2s	-11°19'25"
Cheeseburger				
Nebula	NGC 7026	Cyg	21h06m40.0s	+47°53'21"
NGC 7027	PN G084.9-03.4	Cyg	21h07m25.2s	+42°16'26"
PN G089.8-00.6	PK 089-0.1	Cyg	21h14m29.8s	+47°48'42"
NGC 7048	PN G088.7-01.6	Cyg	21h14m37.8s	+46°19'37"
PN G065.0-27.3	PK 065-27.1	Peg	21h30m30.8s	+12°12'45"
IC 5117	PN G089.8-05.1	Cyg	21h32m54.8s	+44°38'18"
PN G086.5-08.8	PK 086-8.1	Cyg	21h33m33.3s	+39°40'40"
NGC 7094	K 1-19	Peg	21h37m22.5s	+12°49'57"

October Planetaries

Here's the third installment in my ongoing effort to encourage you to get out and take a look at some planetary nebulae and maybe even consider doing the A.L. Planetary Nebula Club.

The list of objects for October, the objects on the Planetary Nebula Club list optimally placed this month, is just six objects long.

I'll take them just the way they show up in the program, in Right Ascension order.

Our first object is in the much-ignored constellation of Lacerta. The tiny "W" asterism that makes up the lizard has been called the little Cassiopeia. How many of you, I wonder, ever bother to stop here?

Anyway, the one PN highlight of this part of the sky is the rather small bluish disk, IC 5217 that was discovered in 1904 by Williamina Fleming. I discovered it 101 years later at the DelMarVa Stargaze and I was surprised by how bright and easy it was. I noted that the object blinked profusely. That is, when stared at with direct vision the tiny disk goes away and it becomes stellar; use your averted vision and the small blue-green nebula blossoms out. It is a bit elongated along the N-S axis and has a tapered appearance toward the south. An OIII filter enhances the object, but kills the cool blink effect.

Our next object is one of the most famous showpieces in the sky. It is remarkable in that you don't need a big telescope to see it, in fact, it may be viewed in binoculars, is best in small rich-field scopes, and many large scope owners will attest that it is better seen in the finder. The Helix Nebula in Aquarius is just 700 light years away which accounts for its large size; it spans 12' x 10' of sky - more than 8 times the size of the Ring Nebula (M57). Low power and a wide field is the ticket, and this object breaks the usual rule about small scopes and narrowband filters. I think the filter helps at any aperture. As I write this, I am wondering now, why I've never tried to see the Helix naked eye - Kent? Jordan? Any luck there? Speaking of eyes - you may know the Helix as "The Eye of God" if your introduction to this object came after the release of the Hubble photo in 2003. The Helix is a ghostly, delicate wreath with a distinct hole in the center that contains not only the 13.5 magnitude central star but also several field stars. It makes a continuous annular ring when studied but is particularly brighter in the NNE and SSW.

NGC 7354 in Cepheus is located SE of the center of an imaginary line connecting Iota and Zeta Cephei. Photographs reveal an intricate morphology - a cocoon inside a bubble. Alas, the telescope view is far less revealing, but still interesting. In smaller scopes it will appear as a disk of nebular gray. In Kent's 25 I saw it as clearly annular with a darkened inner hole, and the strong impression that I could see the 16th magnitude central star. In my 18-inch, the annularity is less certain and there is no hint of the central star. At 197x, the field of view is almost exactly bisected by a line of stars with the PN anchoring the middle of the field. A pair of 10th magnitude stars just 40" apart terminates the line to the north.

Who doesn't list the magnificent bauble known as the Blue Snowball among their favorite objects? NGC 7662 in Andromeda is an unmistakable bright blue disk in the eyepiece. Too bad. If our eyes were not so overwhelmed by its 8th magnitude intensity we might see more of the convoluted structure within or the faint amorphous outer halo that surrounds it. Nevertheless, it will always elicit a response when this pretty Easter-egg blue disk comes into view. It's a must see!

In contrast to the bright objects like the snowball, our final two objects are much more challenging. Jones 1 is a large faint apparition that is indeed challenging. Located in Pegasus just north of the Great Square halfway between Alpheratz and Scheat. It usually appears as no more than two faint arcs; segments of the large (5.2 minute diameter) ring. It isn't even helped a whole lot by a nebular filter. A real toughie, so don't be discouraged if you conclude that its one of those "aint-no's".

Abell 82 in Cassiopeia is typical of the large faint planetaries cataloged by George Abell. It takes averted vision, low power and a filter to detect it. It appears small and round in smaller scopes, larger scopes will detect nebulosity further out from the 14.9 magnitude central star.

Good luck with these if you try them. I hope you'll share your observations right here. And don't forget to properly log them so that you can work toward getting that pin!

This month's objects:

IC 5217	PN G100.6-05.4	Lac	22h24m20.5s	+51°00'49"
Helix	NGC 7293	Aqr	22h30m11.7s	-20°47'05"
NGC 7354	PN G107.8+02.3	Cep	22h40m43.3s	+61°20'00"
Blue Snowball	NGC 7662	And	23h26m23.0s	+42°35'10"
Jones 1	PK 104-29.1	Peg	23h36m23.3s	+30°31'15"
Abell 82	PN G114.0-04.6	Cas	23h46m17.3s	+57°07'02"

November/December Planetaryries

Falling in the realm of better late than never, this treatise combines the five PN Club objects for November with the four objects best observed in December skies. Among these nine objects are some of my favorites, and in a sense, this list represents the top of the batting order, the beginning of the RA-sorted list.

Keeping with tradition, let's dispatch the two objects best described as stellar first. IC 351 and IC 2003 are both in Perseus and nothing short of large aperture and high magnification will reveal anything more than a star-like point of light. A thoughtful comment by the world's newest PN Club advanced award recipient recently reminded me that these challenging stellar objects are as much a part of the planetary nebula mystique as the showpieces and should not be disparaged. Still, there's not much to describe here, so let's just rejoice in the joy of the hunt, mark them off, and move on.

NGC 40 in Perseus is a favorite of most PN observers. And why not? High in the northern sky, it is accessible most of the year, and it is an impressive sight in even a modest telescope. Discovered by William Herschel it has the nicknames of The Bowtie and The Scarab Nebula. It is representative of a group of planetaryries that have a significant contrast between the bright central star and the surrounding nebula which is only half as bright and therefore seems delicate and translucent. The bow tie moniker results from features that might escape smaller scope users; wisps of looping material that form an irregular shell. Most observers see it as blue-green and some report annularity. Try an h-beta filter on this one, it will surprise you.

NGC 246 in Cetus is known as The Skull Nebula, its mottled appearance vaguely reminiscent of a human skull (to observers with overactive imaginations). It is located 6 degrees north of Beta Ceti. Its low declination is a disadvantage for viewers here in Tidewater, the faint disk can fade almost to invisibility on less transparent nights leaving just a hint of mist around the 11.8 magnitude central star and its retinue of attending bright stars arrayed in a triangle around it. But when conditions allow, it is a round mottled disk. William Herschel discovered this one in 1785.

Perseus, contains one of just four planetaryries on the Messier list. M76 is best known as the Little Dumbbell, but has a host of other names like The Cork, or The Barbell - it even earns two NGC numbers:

NGC 650 and 651 owing to its dual lobed appearance. It is far less observed than its larger cousin M27 and that is a shame, because it's a really fascinating object. In small scopes, M76 is very rectangular, but larger instruments show it as a peanut shaped object angled NE-SW. The SW lobe being significantly brighter. We may be seeing a broad ring seen edgewise, or two opposing conical outflows, but it is also very possible that it is a more spherically shaped nebula with the brightness variations due merely to the way gases of different densities obscure the light from the central star. It is interesting to note that M76 is about the same size as M27 but appears smaller because it is five times more distant.

IC 1747 in Cassiopeia was discovered by Williamina Fleming in 1905 and for most observers it may fall into the stellar category. But don't dismiss it too fast, there is a bit of structure to be gleaned and it can even show some annularity. The OIII filter and moderate to high power, in larger telescopes, will reward the patient observer.

Abell 4 in Perseus was discovered by George Abell in 1964. In large apertures, it is an easy catch - a bright round disk even without a filter. As aperture decreases, so does its ease of detection, but it remains one of the more accessible planetaries with the Abell designation. Use low power and try the OIII and UHC filters.

Louis Swift discovered IC 289 in 1888. Located in Cassiopeia, this 13th magnitude disk can appear annular in larger scopes. The 16th magnitude central star is probably not visible.

Those of you that remember Walter Scott Houston probably have memories of some object or another that he encouraged you to seek out. For me, I think of NGC 1360, the much ignored planetary in Fornax. I wonder how many of you have explored this constellation and know this planetary? The way Scotty put it was:

"Perhaps NGC 1360 is overlooked because it is in a nondescript constellation that U.S. observers subconsciously class as too far south."

That admonition resonated with me and enticed me to give it a try and I found it to be a not too difficult planetary; large and reasonably bright. A bright central star in an oval disk of nebulosity elongated NNE-SSW. Well worth the gyrations required to bring it into view. And as Scotty pointed out, it is no further south than M4.

I hope you'll give these nine objects a try at your next outing and post your results here.

NGC 40	PN G120.0+09.8	Cep	00h13m34.0s	+72°34'19"
NGC 246	PN G118.8-74.7	Cet	00h47m33.3s	-11°48'58"
Little Dumbbell	M 76	Per	01h42m56.8s	+51°37'17"
IC 1747	PN G130.2+01.3	Cas	01h58m18.0s	+63°21'57"
Abell 4	PN G144.3-15.5	Per	02h46m01.0s	+42°35'25"
IC 289	PN G138.8+02.8	Cas	03h11m05.6s	+61°21'03"
NGC 1360	M 1-3	For	03h33m39.0s	-25°50'07"
IC 351	PN G159.0-15.1	Per	03h48m10.0s	+35°04'33"
IC 2003	PN G161.2-14.8	Per	03h56m58.7s	+33°54'09"

January Planetaries

Just in case your New Year's resolution involves a promise to yourself to start the Planetary Nebula Club, I offer here the eight objects on the PNe list best placed for January evenings.

Having no bright stars of note, Camelopardalis, is a much overlooked constellation; I doubt you can immediately bring to mind the pattern of stars that make up this celestial giraffe. But there are jewels there none the less. Your finder scope will display the lovely string of 5th to 10th magnitude stars known as Kemble's Cascade that is anchored by the open cluster NGC 1502. Next door is our first target, NGC 1501 known as The Oyster Nebula or the Camel's Eye. I really envy those of you that have yet to discover this fine planetary. What a fortuitous start to the new year it would be if this was your first object observed! It is bright and large, unmistakable even in small apertures. A blue-tinted mottled disk that larger apertures will show as annular. The central star can be teased out at higher powers.

NGC 1514, in Taurus, is known as the Crystal Ball. I think, like its namesake, it can foretell the future - at least your immediate observing future. If you can make out the delicate nebula surrounding the bright central star you are in for a good night of deep sky observing. I see an unevenly lit disk that can be vaguely dumbbell shaped. Look for a bar-like structure near the 9.5 magnitude central star.

Sky Tools creator Greg Crinklaw is credited with coining the nickname "Cleopatra's Eye" for NGC 1535 in Eridanus. This is a rather intricate planetary. Plan to spend some time on it. A disk with ring structure, there are inner and outer shells to pick apart. The 12.1 magnitude central star is reachable, but not always obvious, especially in smaller apertures. Like most true planetaries, a nebular filter like the OIII or UHC will improve the contrast, but the filter is not necessary to see it. Use medium to low power.

Sharpless 2-216 in Perseus made the PNe list because it is quite possibly the closest planetary to Earth. It is one of the more challenging objects on the list primarily because it is so very large, rendering it incredibly faint. I tell many people that this object, more than any other on the list, is the justification for allowing negative observations in the program. Low power and a dark, transparent sky are the keys to detecting this one. The best anyone can do with this is to detect the subtle brightening that marks the boundary between nebula and sky while sweeping across the area. I don't recommend spending a lot of effort looking for details - I don't think there are any.

J 320 was discovered by Robert Jonckheere in 1916. Don't let the obscure designation put you off, it's not all that difficult to see. Stellar in size for the most part, high power on a night of steady seeing can reveal a tiny disk that is slightly blue. A filter helps a lot.

Interest in IC 418 was kindled both by a magnificent Hubble image that shows an intricate spiralgraph texture and by an observation by the well known amateur observer, Barbara Wilson. Barbara (among others) noted at a Texas Star Party several years ago, that IC 418 appeared pinkish, even red to some observers. Vic Menard named it "The Raspberry" nebula and its fame has spread. It is interesting that so many observers after that TSP comment on the reddish tint to this planetary and that I can't find any

mention of it before Ms. Wilson noted it. The power of suggestion perhaps. I too can find a couple of observations of IC 418 in my notes prior to reading that TSP report that describe a blue-green or grey nebula. But after looking for the red tint, I can reliably see it. It is especially fun at Christmas time given that the central star can seem green while the nebula is red. How festive.

You probably don't immediately think planetary nebulae when considering Orion the Hunter but his head contains a very fine one; an almost typical PN if there is such a thing. NGC 2022 is a fairly bright, medium sized, easily identified disk of nebulosity nestled among faint stars. The nearly 16th magnitude central star will probably elude you, but the PN itself is unmistakable. Kent Blackwell introduced me to this PN just about a decade ago – through his newly acquired 25-inch Dob. Since then it has become a familiar target.

And finally, we come to IC 2149 in another constellation not generally noted for planetary nebulae, Auriga. It was discovered in 1906 by Williamina Fleming during her work at the Harvard College Observatory. This tiny bluish disk will be stellar looking in most amateur scopes especially in less than pristine skies but it is fairly bright and responds well to filters - including the h-beta filter. It is one of just a few planetaries that respond to that filter.

So good luck in the new year, and with these eight planetaries. I hope you'll share your impressions of them here.

NGC 1501	PN G144.5+06.5	Cam	04h07m48.2s	+60°56'40"
NGC 1514	Crystal Ball Nebula	Tau	04h09m53.0s	+30°48'04"
NGC 1535	Cleopatra's Eye	Eri	04h14m42.4s	-12°42'45"
Sh 2-216	PN G158.6+00.7	Per	04h44m03.1s	+46°43'07"
Jonckheere 320	PK 190-17.1	Ori	05h06m05.8s	+10°43'14"
IC 418	Spirograph Nebula	Lep	05h27m54.3s	-12°41'13"
NGC 2022	PN G196.6-10.9	Ori	05h42m37.3s	+09°05'32"
IC 2149	PN G166.1+10.4	Aur	05h57m06.0s	+46°06'22"

February Planetaries

Most of you probably don't associate mid winter evenings with planetary nebulae observing. Prominent overhead this time of year is the brightest collection of stars in the northern hemisphere, probably the best known constellation in the sky and a host of well known showpieces, that with the exception of the Eskimo, probably doesn't include any PNe. However, eleven objects on the planetary nebula club list are optimum targets for February nights. It is an eclectic list, containing a few of the most famous as well as a few of the most obscure objects on the list. I managed to observe all of the January objects over the past few weeks and have already gotten a start on this month's list; I'm keeping my fingers crossed that I get enough eyepiece time this month to revisit the rest of them.

My guess is that IC 2165 in Canis Major is not in your log book unless you make a habit of seeking faint, tiny planetaries. In an 8-inch scope it is quite stellar looking. At twice that aperture, however, it is a

small disk that may be a bit annular. It photographs green but appears blue in the eyepiece to most observers. It owes its tiny size to its distance, probably about 2.5kpc away. Star-hoppers might imagine a line connecting Sirius with M42 and look for the planetary about a third of the way along it (closer to Sirius). It is about 39' west of a sixth magnitude star. Use high power and a filter.

Jonckheere 900 in Gemini, discovered in 1912, gets perhaps more notoriety than it merits because of its unfamiliar designation I think. It lies a little more than half way from Gamma Gem to Eta Gem and is about a degree SW of 4th magnitude 18-Gem. It is much easier to see than its obscure designation would suggest. Small, almost stellar, bright and green. Use the OIII filter and moderate power.

Minkowski 1-7 is also in Gemini but is a little more challenging. A small disk that responds well to filters, it lies about 2 degrees SW of 3rd magnitude Epsilon Gem.

NGC 2346 in Monoceros is a more interesting target. It is fairly bright, easy to locate and has some shape and structure even in smaller scopes. Its flattened edges and pinched waist earn it its "Hourglass" moniker, but it has also gotten press as "The Butterfly" after a 1999 Hubble image showed its shape to good advantage. The central star of 2346 is known to be a binary - the once widely separated pair spiraled together during the pre-planetary phases of its evolution and is now very close. The planetary is fairly close to us, just 2000 light years away or so, which makes its actual size about a half of a light year across.

The "Gemini Nebula" or "Double Bubble", NGC 2371 and NGC 2372 is one of my favorite planetaries. It is hard to make out any shape in small telescopes, but in my 18 it is marvelous - two equal sized lobes aligned NE-SW. A faint central star can be detected between the two seemingly separate objects. There are arcs of faint nebulosity, the brightest segments of an outer halo, that reveal themselves on the best of nights.

George Abell discovered the Medusa Nebula in 1955, and it is now designated Abell 21. This object will prove the worth of your OIII filter. Abell 21 is a barely noticeable, no, nearly invisible without a filter. John Raymond might remember a night at ECSP when he was trying desperately to see the Medusa when Kent and I happened along. I had an OIII filter in my pocket, and when we inserted it into John's eyepiece, we witnessed a sort of magic. The filtered view reveals a large incomplete disk of delicate tendrils and wispy clouds. Use low power.

NGC 2392 is certainly the most famous object on our February list. The Eskimo Nebula gets its name from its appearance in photos that is reminiscent of a man wearing a parka. A bright central star is surrounded by an extended halo that often appears as two concentric rings. I often show this object to guests at public events; it is so easy to see that you can be sure people can pick it out. PNe are noted for bearing up well under high magnification and the Eskimo is particularly noted for it. Mark Ost and I had a really detailed look at it one early morning in Coinjock - at 939x!

NGC 2438 in Puppis seems to lie inside M46, the pair make a striking visual contrast. The apparent enigma of a planetary nebula which is an end of life sun-like star residing in a bright nearby open cluster which by definition is composed of young stars is resolved by the fact that the two objects do not share

the same radial velocity and are therefore not associated. In fact the cluster lies at about 5000 light years and the planetary at about 3000 light years making it a foreground object. Appearances can be deceiving in more ways than one. NGC 2438 seems to show a bright central star, but its real progenitor is a 17.5 magnitude no-show that is just behind the bright impostor. The bright open cluster might distract you, but with a little effort the PN is quite easy.

NGC 2440 in Puppis is another example of a PN with a central star impostor; a faint centrally located star that you can see with averted vision is probably not the true central star. The real central star is a candidate for the title of "hottest known white dwarf" with a surface temperature of about 200,000 Kelvin. The PN is an attractive object; an oval disk with bright knots, and in larger instruments a bi-polar halo is visible. Use a filter, averted vision, and high power.

NGC 2452 in Puppis is an annular ring when conditions are good and a small disk most other times. I see it as green, how about you? Use averted vision for this one too. See if you can detect brightness variations on the north and south edges.

Rebecca Jones and Richard Emberson are credited with discovery of an object in Lynx known as Jones-Emberson 1 in 1939. Amateur astronomers David Knisley and Rick Johnson gave it its nickname: "Headphones Nebula". OK, if they say so. Actually it does look like a set of headphones in photographs, but I can't attest to seeing anymore than a vague shape; two brighter arcs only hinting at a continuous sphere. The filter is a must for this one. Use low power and averted vision. And good luck.

The positions below are from Sky Tools:

IC 2165	PN G221.3-12.3	CMa	06h22m08.7s	-12°59'25"
J-900	PK 194-2.1	Gem	06h26m30.4s	+17°47'10"
M 1-7	PN G189.8+07.7	Gem	06h37m55.6s	+24°00'09"
NGC 2346	Hourglass	Mon	07h09m51.3s	-00°49'15"
NGC 2371	Gemini Nebula	Gem	07h26m10.4s	+29°28'20"
Abell 21	Medusa Nebula	Gem	07h29m34.5s	+13°13'41"
NGC 2392	Eskimo Nebula	Gem	07h29m44.3s	+20°53'35"
NGC 2438	PN G231.8+04.1	Pup	07h42m17.1s	-14°45'14"
NGC 2440	PN G234.8+02.4	Pup	07h42m20.3s	-18°13'50"
NGC 2452	He 2-4	Pup	07h47m48.9s	-27°21'31"
JnEr 1	PK 164-31.1	Lyn	07h58m35.3s	+53°23'48"

March Planetaries

Even though the list of planetary nebula club targets optimally placed for March contains just three objects, I should point out that there are many more than that visible. For instance, if you come out to Skywatch this month, you could conceivably observe 40 program PNe or more before the session ends at midnight. The three objects I describe here reach their highest transit this month, making now the best time to try for them, but they are actually visible from January through May.

First up is NGC 2610 in Hydra. What I find most pleasing about this planetary is the 12th magnitude star nearly embedded in its NE edge. You'll need great seeing and high power to tell that the star is not a knot in the planetary. Examinations by the HST show NGC 2610 to be smooth and symmetrical, probably classically spherical. It is fairly bright and easy to see. It is located just three and half minutes SW of a 6th magnitude star and 2 degrees west of 4.8 magnitude 9 Hydrae. The filters don't help at all with this one and the fact that they dim the embedded star is a detriment - the view is much more pleasing without the filter. Use medium power.

Minkowski 3-6 was discovered by Rudolph Minkowski in 1948. Its tiny disk is listed as 8" in size; in typical seeing, it will be stellar or nearly so. It responds well to the OIII filter and is fairly bright. It is low in our sky, however, and located in what to most of us is an obscure constellation - Pyxis. It lies about 1 degree NW of Alpha Pyx.

Once you find Pyxis to locate M3-6, you can make the effort payoff by bagging the more exciting NGC 2818. The number refers to both an open cluster and the planetary, with the PN sometimes referred to as NGC 2818A. The cluster is unimpressive and not well detached from the background. The PN lies in the NW quadrant of the group that may show from 12 to 40 stars. The 35" disk is divided by a darker streak with the more southerly half appearing a bit brighter. There is a star-like knot there, perhaps an embedded star, or a morphological feature in the nebula. Filters work well to enhance the object. The central star (magnitude 18.5) is not visible. You might want to try this one from Florida - it is one of the farthest southern objects on the list and is always a challenge from Tidewater.

Planetaries for March:

NGC 2610	PN G239.6+13.9	Hya	08h33m49.2s	-16°10'56"
M 3-6	He 2-12	Pyx	08h41m02.5s	-32°24'38"
NGC 2818	He 2-23	Pyx	09h16m23.9s	-36°40'08"

April Planetaries

Just like last month, only three planetary nebulae reach their best position of the year in April. With the arrival of spring, an astronomer's fancy should turn to galaxies. That doesn't mean, however, that PNe are absent from the April sky. There are 63 objects from the Planetary Nebula Club above the horizon on the night of our April Skywatch, and 89 on the night of our Mt. Trashmore Star Party. Plenty to keep you busy, but in keeping with the premise that we will observe the objects only at their very best, the three you want to check off this month are offered here.

The nickname "Eight Burst Nebula" was applied to NGC 3132 in Vela due to the multiple outbursts of its central star described in a 1940 paper by Harlow Shapley and J.S. Paraskevopoulos. More inviting is its other moniker: "The Southern Ring Nebula". It's unfortunate for us here in Tidewater that this object is at such low elevation, because it is an extremely interesting and intricate object; multiple layers of gaseous shells that evidence the sporadic upheavals of its formation, are layered upon a binary star system to create a marvelous telescopic target. NGC 3132 reaches its highest altitude at the end of

April, but with full moon falling on the 28th this year, you might have to settle for an earlier attempt. It is a bright disk with an obvious ring structure, elongated a bit SE-NW and has a faint outer shell. Most observers report a bright central star, but it is the much fainter (about 16th magnitude) companion that is responsible for the nebula. Filters help a good deal, especially the OIII filter. Add this one to your observing list if you are going to the DelMarVa Stargaze - it will be best placed about 8:30 P.M. those evenings.

NGC 3242 is best known as the Ghost of Jupiter. David Knisley lists William Tyler Olcott as the source of that popular nickname. It has others; The CBS Eye or Just The Eye, and the Diamond, for instance. NGC 3242 lies in Hydra, in fact it is arguably that huge constellation's best deep sky object. It was discovered by William Herschel in 1785. It is a favorite of observers because it can stand up to outrageous magnifications and shows more and more structure to larger and larger scopes. Attack Jupiter's Ghost on a night of good seeing and pump up that power and you'll become hooked on this planetary too. Filters can enhance some of the detail, but are not required to see the object, or even to see some of the intricate inner structure. It has some color, you'll see pale blue or a faint green. Try for the central star, I wonder how large a scope it takes to see it? Even in tiny scopes, NGC 3242 is a bright oval that is visible from an urban backyard.

Our understanding of planetary nebulae is changing from year to year. Theories of how they achieve the shapes and structures we see in the eyepiece keep evolving. What is becoming more and more obvious is the role of binary stars in the creation of the more intricate morphologies they exhibit. The "Binary Hypothesis" of planetary nebula formation is a hot subject today. Models suggest that PNe with internal bubbles like NGC 3587 might require a very wide binary star - where the period of the secondary's orbit is longer than the lifetime of the planetary nebula. You know NGC 3587 better as M97 or "The Owl Nebula" in Ursa Major. And whether its two dark bubbles are due to the action of a binary star system or not, they are surely the object's most notable features. They form the eyes that make this puff ball remind us of an owl's face. One of just four planetaries on Messier's famous list, it was actually discovered by Pierre Mechain. In poor skies you might need a filter like the OIII to catch sight of the Owl, but I've detected it easily enough in 8-inch aperture, under city lights, without one. It's a matter of knowing what to expect. From our latitude, the Owl is circumpolar and is visible all year, but its best position is attained on April 17 and this year occurs in a moonless sky. No excuses will be accepted for not taking a peek, even if you are concentrating on galaxies this spring - it lies just one telescope field from the fine edge-on galaxy M108 just outside of the dipper's bowl.

Good hunting!

Planetaries for April:

Eight Burst	NGC 3132	Vel	10h07m25.2s	-40°29'09"
Ghost of Jupiter	NGC 3242	Hya	10h25m13.5s	-18°41'33"
Owl Nebula	M 97	UMa	11h15m20.9s	+54°58'12"

May Planetaries

This month's installment on the running list of PN Club objects by month contains four targets. Add these to CJ's observing list to round out your ECSP objectives, but don't forget that almost all of the PN club objects will rise above the horizon sometime during the night during mid May.

First up is NGC 4361 in Corvus, and it's a good place to start if you are new to observing planetary nebulae because it's rather obvious even in smaller scopes. . An easy central star surrounded by a bright circular nebula. Some, however, say that it is easily mistaken for a galaxy. The outer regions of the disk are fainter but contain exquisite detail for those willing to spend the time studying it. The object was discovered by William Herschel. It is estimated to lie about 2500 light years away, but any distance estimates for this object are suspect; this is a rather unusual planetary in terms of its chemical makeup and the standard assumptions applied in distance measurements are probably inadequate in this case.

Tiny by comparison, is IC 3568 in Camelopardalis. Jay McNeil nicknamed this little jewel the "Baby Eskimo" and one look at a detailed photograph will reveal the source of its other handle - "The Lemon Slice". But don't hold out too much hope of seeing much detail in this small disk, the professional astronomer community (Balick *et al*) proclaim IC 3568 as one of the morphologically simplest planetary nebulae in the sky. First try to catch the central star, and then pop in the OIII filter for a good look at the small nebula. You can decide for yourself if there is structure to be gleaned.

The next two planetaries were discovered by George Abell in the 50's and 60's through examination of Palomar Sky Survey photographic plates. Most famous for his catalog of galaxy clusters, Abell published his catalog of planetary nebulae in 1966. Most, if not all of the PNe in his catalog were unknown before then and are understandably challenging for backyard telescopes.

Abell 35 in Hydra is known as "The Bow Shock" nebula (another McNeil moniker) and images show a very pronounced bow-shock shape. It has been described on the web as "one of the most bizarre looking nebulae in the sky". I see just a large irregular patch of faint nebulosity that requires a filter to be seen at all.

Abell 36 is the "Bat Symbol" nebula (yup, Jay McNeil again). Seeing the bat symbol within this faint disk may require chemical enhancement in addition to a narrowband filter. Try averted vision, low power and a clean OIII filter and who knows? The cedars of Coinjock just might echo with cries of "holy ionization, Batman, I SEE it!"

May Planetaries:

NGC 4361	PN G294.1+43.6	Crv	12h25m01.1s	-18°50'25"
IC 3568	Baby Eskimo	Cam	12h33m22.8s	+82°30'54"
Abell 35	PN G303.6+40.0	Hya	12h54m04.1s	-22°55'40"
Abell 36	Bat Symbol	Vir	13h41m13.7s	-19°56'00"

June Planetaries

Actually, only one object from the planetary nebula club culminates in June so I decided to borrow a few objects from next month for this offering. July's installment will complete our list, so we are getting down to the final few objects. If you had started with me last August, you'd be close to completing the program now. If you haven't been keeping up, no worries - you can start anytime. Start now and hit all the objects best placed for each month and you'll be more than half way through by the end of September.

Rising to its highest point in our sky on June 2nd, NGC 5873 is in our skies for about 7 hours each night in June. This tiny 11th magnitude object was discovered in 1883 by Ralph Copeland. It lies in Lupus and makes the apex of a west pointing triangle just a little more than 1.5 degrees tall whose base is defined by Delta and Phi Lupi. It is stellar; you'll have to use an OIII filter to confirm this one.

NGC 6026 is also in Lupus. John Herschel added this object to the General Catalog in 1837. The nebula is a bit difficult - I needed to see it in Kent's 25-inch before I could pick it out in the 18. Some observers have spied it in 6-inches of aperture though so don't despair. The central star stands out and is easily seen in modest aperture and is now thought to be binary based on the periodic variability of the star that is consistent with a hot primary irradiating a cooler secondary star. The main difficulty is its low altitude and very mild response to filters. It lies almost due north (3 degrees 50 minutes) of Eta Lupi and 2 degrees 20 minutes ESE of Chi Lupi.

NGC 6058 in Hercules will be perfectly placed during July's new moon but is a good target for June as well. You should detect a central star surrounded by a small disk. Use an OIII or UHC filter to best see the nebula. It is located in Hercules, but you can use the line of stars anchored by Arcturus to locate it; walk from Arcturus NE through Epsilon and Delta Bootis and extend the line about 12 degrees to the PN. It makes the point of a triangle with Sigma and Tau Herculis.

IC 4593 is called the White Eyed Pea, a nickname coined by John H. Mallas (co-author of The Messier Album). While small, it is rather bright and obvious, although easily mistaken for a star in a small scope. It responds well to the OIII filter. If your scope is large enough to see it as a disk, try making it "blink" - stare at the object and the nebula disappears leaving just the central star, use averted vision and the disk is visible. Look for it on the Hercules-Serpens border about 10 degrees SW of Beta Herculis. Williamina Fleming discovered the object in 1907.

Our other Hercules planetary for this month is The Turtle. NGC 6210 is a very interesting planetary that grows in complexity as your aperture increases. With a small scope it is bright and stellar. A larger instrument shows a disk of blue or green with a central star that is sometimes visible (13.7 magnitude). The largest instruments can detect the faint outer halo. Famed double star observer Friedrich Struve discovered the object in 1827. Extend a line SE through Pi and Epsilon Herculis about 8 degrees to locate it.

Our last two entries for this month lie in Scorpius.

NGC 6072 and NGC 6153 are seen as disks without a visible central star. Both respond well to the OIII filter, and both would be much more impressive from more southern latitudes. At -36 and -40 degrees

declination, they hug our horizon from here in Tidewater. NGC 6153 is the brighter of the two, but 6072 is a bit more interesting. If you find yourself in Florida this summer be sure to give them a long look. From here, I recommend you check them off and move on.

Good hunting.

Planetaries for June:

NGC 5873	He 2-121	Lup	15h13m29.7s	-38°09'57"
NGC 6026	He 2-144	Lup	16h02m00.1s	-34°34'24"
NGC 6058	PN G064.6+48.2	Her	16h04m48.2s	+40°39'29"
IC 4593	White Eyed Pea	Her	16h12m13.3s	+12°02'49"
NGC 6072	PN G342.1+10.8	Sco	16h13m38.0s	-36°15'25"
NGC 6153	He 2-167	Sco	16h32m12.6s	-40°16'39"
NGC 6210	Turtle Nebula	Her	16h44m55.5s	+23°46'59"

July Planetaries

The nine planetaries below complete the list of the required PN Club objects so this will be my last attempt to persuade you to try the program. This month's list contains some really fascinating objects, so if I haven't grabbed your attention before now, these just might do the trick! As a final bit of encouragement, I would like to report that the most recent observer to complete the advanced program did so with an 8-inch dob from a suburban location near York PA. He needed resort to only two negative observations! So what's stopping you? I predict that if you give these nine objects the ole college try, by August you'll be a planetary nebula fan.

We'll start our July tour in the Snake Holder, Ophiuchus. We have four objects to check off here. IC 4634 is an almost stellar planetary that can be a challenge to find. Imagine it as the apex of a triangle pointing toward Sigma Scorpii whose base is Eta and Theta Ophiuchi. The height of the triangle is one fourth the distance to Sigma Scorpii. Use a filter to blink the object and distinguish it from the surrounding stars. It is fairly bright, but challenging in an 8-inch scope.

Minkowski 2-9 is known as Minkowski's Butterfly and is arguably the most famous object in Rudolph Minkowski's PN catalog. It will be a challenge to see in an 8-inch scope, you'll need steady seeing and the darkest sky you can find just to detect it with averted vision. Larger scopes will detect an elongated object. If conditions allow however, you might be treated to a magnificent view of a bi-polar planetary - two opposing lobes extending north and south of a 14th magnitude central star. It lies 5 degrees, 42 minutes NNW of Eta Ophiuchi and 8 degrees east of Zeta Ophiuchi almost making a right triangle.

NGC 6309 is elongated in such a way as to appear somewhat rectangular, leading to its nickname of The Box nebula. It is fairly large and reasonably bright; in good conditions, it should be easy to detect in an 8-inch scope. An OIII filter helps a great deal. Take the filter out to try and detect the vaguely green hue. Pump up the power and the central star should be visible. The Box is near Eta Ophiuchi. Extend a

line through the 4th magnitude stars Omicron and Nu Serpentis about one and a half degrees to locate it.

NGC 6369 is known as The Little Ghost. As with most of our objects this month, you'll have to wait until about 2am for your best view. August will allow for a more reasonable time to catch it, but it will be a good deal lower in our sky then. It is detectable in an 8-inch. The 18-inch shows a remarkable object, a fine disk with a darkened center making the object annular. It lies in the foot of Ophiuchus about two degrees NE of 3rd magnitude Theta.

The scorpion holds two of our July objects. NGC 6302 is known as The Bug Nebula. What a great object this one is. It gets its name from the two wispy extensions that look like ragged wings. I recently viewed this in Jordan Bramble's 10-inch and could make out its bi-polar nature, a very definite waist between opposite bright lobes. It responds well to the OIII filter. The bug lies between Shaula and Mu Scorpii in the scorpion's tail.

NGC 6337 is called The Cheerio Nebula. As you might guess, it can appear as an annular ring. The seeing has to be good to see a ring though - there are several stars involved that can blur into an extended object. This one might be difficult in an 8-inch, but certainly worth the effort. It too, lies in the scorpion's tail not far to the SE of The Bug.

NGC 6545 lies just across the border in Sagittarius, almost exactly half way between Lamda Sagittarii and Eta Scorpii. It has a fairly low surface brightness making it a bit of a challenge. It is an elongated annular object with an outer halo that appears as a haze through the OIII filter.

Tiny IC 4670 will test your skills. This stellar sized planetary is not only difficult to find in the sky, it is difficult to find in the literature. Sky Tools users will have to remember the object as Henize 2-305. The best known name for this object is probably Hubble 6. Kent Wallace, a well-known amateur and PN aficionado discovered the equivalence of Hubble 6 and IC 4670. As is often the case, objects can be rediscovered after earlier discoveries are lost or ignored and that is what happen here evidently. You'll need to use a filter to identify the planetary.

The last object of this treatise is more than a worthy note to end on. The Cat's Eye Nebula, NGC 6543 in Draco is certainly one of the best loved planetaries in the sky. And for good reason! It seems to have everything necessary to qualify as an exceptional example of a planetary nebula including a magnificent Hubble Telescope image. Through the eyepiece, it has color, detail, and character; a bright central star, and a complex morphology that adds layers of visibility as the aperture of the scope used increases. An annular disk is surrounded by a crown of looping nebulosity embedded in an extended halo. In fact I'm so sure that this is one of the coolest PNe in the sky, if July is your starting point for the program, let me suggest that you start with the Cat's Eye. If this fine planetary doesn't do it for you, there is little point in pursuing planetary nebulae at all. NGC 6543 is circumpolar; it is constantly above our horizon and therefore visible all year. It makes the apex of a squat triangle pointing away from the bowl of the Little Dipper with Chi and Zeta Draconis. It is obvious in a 4-inch telescope.

Here are the objects I recommend for July:

IC 4634	Oph	17h02m10.1s	-21°50'28"
M 2-9	Oph	17h06m11.6s	-10°09'24"
NGC 6302	Sco	17h14m25.6s	-37°07'03"
NGC 6309	Oph	17h14m38.7s	-12°55'21"
NGC 6337	Sco	17h22m57.7s	-38°29'44"
NGC 6369	Oph	17h29m57.7s	-23°46'06"
NGC 6445	Sgr	17h49m51.4s	-20°00'47"
IC 4670	Sgr	17h55m43.8s	-21°44'48"
NGC 6543	Dra	17h58m36.4s	+66°38'00"