



COLUMBUS
ASTRONOMICAL
SOCIETY

Prime Focus

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The Columbus Astronomical Society Newsletter

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Wired for Astronomy:

Tired of the same boring wallpaper (or none at all)?

Here are a few places where you can get some of the best astronomical photos and wallpapers.

NASA has a terrific collection of photos and other multimedia you can download for free use. Go to <http://www.nasa.gov/multimedia/index.html> and start having fun.

Hubble Heritage has every photo taken by the Hubble telescope that has been released to the press. Go to <http://heritage.stsci.edu/> and explore the site.

The European Space Agency maintains a multimedia archive here: <http://www.esa.int/esa-mm/mmg/mmghome.pl> If you wish to download an image, you must agree to their fair use limitations.

Most of us are familiar with the Picture of the Day (APOD), but do you know you can view and download previously highlighted images? Go to <http://apod.nasa.gov/apod/archivepix.html> for their list.

Here is a link to a list of sites that host astrophotos.: <http://www.astro.psu.edu/users/stark/links/photos.html>

Always be careful and respectful of copyright issues. While most sites allow you to download and use the photos as wallpaper, remember to give credit where credit is due.

From the President

Dear fellow stargazers:

The annual CAS picnic will start at 18:00 on the 9/12. We'll start setting up between 15:00 and 16:00. We light the fires at 17:00. Meat goes on the grill at 17:35. Feeding begins at 18:00.

I'll bring the meat, charcoal, lighter fluid etc. Everyone else should bring a side dish or dessert except Charlie, who will bring ice and soda. If you'd like to help set up tents and grills, slice tomatoes etc. let me know, and I'll put you on the list.

Get outside and enjoy the September skies. They could be the best nights we have remaining in 2009. I know the last few nights have been spectacular.

See you at the picnic...

Clear Skies!
Tom Beck
CAS, President
stargrokker@yahoo.com

What's Up Brad Hoehne

What's Near

It's hard to believe, but **autumn** begins for us northern hemispherians on September 22. Summer passes into Autumn when the sun crosses the *celestial equator*- the imaginary line in space projected outward from Earth's equator- from north to south. This event is called the *autumnal equinox*. If you were able to see stars through glare of the sun (or during a conveniently arranged solar eclipse) you would note that our home star appears against the western edge of the constellation Virgo. If you were to live a very, very long time, and made yearly note of the position that the sun is in on the first day of autumn, you would see this point slowly drift westward across the constellations- first under the belly Leo, then through the heart of Cancer, then through Gemini and, 25,700 years later, after *precessing* all the way around the sky, back into Virgo.

Astronomers in Ohio enjoy these late summer and early autumn days. There is a confluence of factors that make it an ideal time stargaze. September is, on average, the clearest, driest month in our region. Skies tend to be clear blue in late afternoon, and nights tend to be cool (but not cold), crystalline, and relatively undisturbed by biting insects. Better still, each of these clear cool nights are a few hours longer than the mosquito-cursed dark moments (a.k.a "nights") of early summer.

Also, the so-called "summer" milky-way is still high in the sky. We will get to that later. First, let's take on the Solar System.

If you could turn off the sun, **Saturn** would appear right next to it, and its rings would be nearly invisible in a scope (at least until the truncated string Saturn's reflected sunlight, in transit, passed us by).

Uranus reaches opposition on the morning of September 18th. At 1:36 a.m. on that morning it will be 47 degrees off the southern horizon in the constellation Pisces. Even though the Earth and Uranus are at their closest near this date (though exactly on it) the distant bluish orb appears only 3.7 arcseconds across in a telescope. **Neptune** rises earlier than Uranus. It only appears 2.3 arcseconds across.

Jupiter, a few degrees to the southwest of Neptune, is still the star of the evening sky. The most dynamic and famous feature on Jupiter is the Great Red Spot- though its current color and shape suggests a name more like the "great salmon oval". If you're like me, you find this feature (allegedly facing *our* way half the time) to be frustratingly elusive. The GRS can be quite difficult to spot unless it is a close to Jupiter's *central meridian*- that is, the imaginary line that right down the middle of the planet- from north to south- as seen from our point of view. When features are near the planet's *limb*- that is, at the edge as seen from our point of view- they appear thinner by foreshortening. Worse, they are made less prominent by haze in Jupiter's atmosphere.

Here is a list of the times upcoming *transits* (crossings of the central meridian) of the GRS that are favorable for us here in Ohio. The GRS may be visible at other

times, but this list only includes those appearances that involve a transit that happens when Jupiter is roughly 10 degrees or more from the horizon- times are local Ohio time:

September 8:	8:59 p.m.
September 10:	10:37 p.m.
September 12:	12:15 a.m.
September 13:	8:06 p.m.
September 14:	1:53 a.m.
September 15:	9:45 p.m.
September 17:	11:23 p.m.
September 19:	1:01 a.m.
September 20:	8:52 p.m.
September 21:	2:39 a.m.
September 22:	10:31 p.m.
September 24:	12:09 a.m.
September 25:	8:00 p.m.
September 26:	1:47 a.m.
September 27:	9:39 p.m.
September 29:	11:17 p.m.
October 1:	12:56 a.m.
October 2:	8:47 p.m.
October 4:	10:25 a.m.
October 6:	12:04 a.m.
October 8:	1:42 a.m.

These times are based on observations made of the position of the GRS back in August (which amateur astronomers assist in). By the end of the list, they could be off by several minutes. Unlike Earth, Jupiter has no known solid surface. Features that we see on it are not nailed down to any "real" rotation of the planet. Instead, they tend to slip east and west like giant sluggish bacteria though Jupiter's gaseous murk.

Alternately, one could use Sky and Telescope's online Great Red Spot Transit Calculator at: <http://www.skyandtelescope.com/observing/objects/planets/3304091.html>

Venus, dominates the morning Sky. Just before, mid month, it is 20 degrees up off the western Horizon. In a telescope, Venus appears like a gibbous moon 11 arcseconds across and is over on the other side of sun. On October 13th, one might try to use brilliant Venus to pluck the thin-ringed Saturn from the morning twilight, when the two pass a moon-width from each other. Begin looking for the pair at around 6:30 a.m. on this date.

The brightest **comet** currently visible in **W3 Christiansen**, which will be sliding along the milky-way through the constellation Aquilla during the month of September. At magnitude 8 or so, this comet can be detected in a good pair or binoculars. In a medium-sized telescope, under clear evening skies, it appears as a slightly oblong fuzz. A finder chart can be found at: http://cometchasing.skyhound.com/comets/2006_W3.gif

What's Far

Archery is immortalized in the night sky in the form of

(Continued on page 3)

(Continued from page 2)

two similarly named, but very different, constellations: **Sagitta** and **Sagittarius**. Since ancient times, the latter has been granted a giant plot of sky- 867 square degrees, about the size of a basketball held at arms length- along the southern horizon. The former gets a lot less respect, even though it flies almost directly overhead. First, it's been given one of the smallest plots of sky of any constellation by the International Astronomical Union- 79 square degrees, about the size of a passport at arm's length. (Only Equuleus and Crux are smaller) Second, while my spell-checker recognizes Sagittarius, it draws a squiggly red line under the name Sagitta. See? No respect!

Both constellation names come from the same Latin word, Sagitta, meaning "arrow." Sagittarius means "arrow user" or "archer." Given the shared etymological root, one would think that both constellations inhabit the same origin story, but this is probably not the case. Many of the names in the night sky are of uncertain or ambiguous origin. The celestial Archer, Sagittarius, is most commonly attributed to the mythical Centaur, the half-man, half horse, but, confusingly, there is another non-sporting Centaur in the night sky- the southern constellation Centaurus. Both constellations are frequently attributed to the greek god Chiron who changed himself to a horse to escape the violently jealous Rhea, his wife. Well, which one is it?

Sagitta, on the other hand, has been suggested as being one of the arrows shot from the bow of Chiron. More plausibly, however, is the story that Sagitta represents an arrow that nearby Hercules used to slay **Aquila** the Eagle. Perhaps, however, given its position just off of Aquilla's head, it represents one of Hercules' near misses.

Just as the Big Dipper is but a small portion of the constellation Ursa Major, the famous **teapot asterism** is just a small part of Sagittarius. The constellation extends eastward from the center line of the milky way well out into less densely populated real-estate. It is filled with celestial treasures both in, and out, of our galaxy. Here are a few, of many hundreds, to explore:

M54, **M64**, and **M70**, are all less-well-known globulars along the base of the "teapot" asterism. All three are roughly the same brightness, however, M54 is the most distinct of the three, a glistening snowball of stars. Hovering along the southern horizon, they require clear skies (and no tall trees) to examine well. Joining them is the fainter, mainly by virtue of its size, **NGC 6652**. Make sure to search for them early in the evenings in September, as they begin to set at around midnight. The most brilliant globular cluster in Sagittarius is **M22**- a stunning, and maybe, if your aperture is big enough, colorful gem.

For such a densely populated region of the milky-way there are surprisingly few bright planetary nebulae to be seen. The most distinct of these is **NGC 6816** the "Little Gem". It lies away from the milky-way in the northeastern part of the constellation. In medium sized telescopes, it appears pale blue. The Little Gem lies just a half degree north of the large, but dim, **NGC 6822** "Barnard's Galaxy" and makes a good landmark for spotting it. This faint neighbor of the milky-way gal-

axy is a small irregular galaxy somewhat closer than the Andromeda Galaxy at about 1.8 million light years. Seeing it requires an exceptionally clear sky and a willingness to accept a subtle change in background brightness as a "sighting." Some observers have reported it easiest to spot in a large pair of binoculars. My best views, however, have all been in large telescopes at about 80X. I've heard others report that small, rich field, telescopes are best.

Much fainter than the Little Gem is the "Red Spider" nebula, **NGC 6537**, which sits in the far northwest corner of the constellation. Visible as a dim, slightly irregular, oval in large scopes, it looks nothing like the famous Hubble Space Telescope image of it. Our eyes cannot easily see the pink, glowing hydrogen that makes up most of this sight. Consider it a challenge object.

A bit smaller and easier is **NGC 6629**, about 2 degrees north of the globular **M28**. A delicate, milky, bubble, it is about magnitude 12, but the presence of strong O-III lines makes it distinct to the eye. Very hard to pluck from dense star fields is **NGC 6565**, a planetary just 9 arcseconds across. A good chart, and an O-III filter help the search. The quarry is another delicate soap bubble.

Even given its small size, **Sagitta** seems to have been short-shrifted on bright celestial targets. First of all the brightest star in the constellation, **Sham**, is a hard-to-see-from-the-suburbs magnitude 3.5. (The Babylonians called all of Sagitta "Sham." Today, that name lives on only in the name of its brightest star.)

There are less than a handful of easily bagged deep sky objects in Sagitta. The most distinct of these is **M71**, a globular cluster that looks like a dense open cluster. At roughly 9 billion years of age, M71 is considered a relatively *young* globular, which explains its high concentration of *metals*- the astronomer's term for any element other than hydrogen or helium (that is, not generated in the Big Bang.) At the eyepiece, it is reminiscent of the lovely "Caroline's Cluster" **NGC 7789** in Cassiopeia, but perhaps with a bit more variety in star brightness.

The only other distinct deep sky object within relatively easy reach is the diminutive planetary nebula, **NGC 6886**, which requires a medium sized scope to spot. At magnitude 12, and an eye-confounding 6 arcseconds in diameter, a good chart, good seeing, and persistence are need to hunt down this tiny prey. It's not difficult to see but it is difficult to *spot*.

What's Faint

For those looking to put their skies, and their large scope, to the test, Sagitta offers up Palomar 10, a magnitude 13 globular cluster. In all but the largest telescopes (Larger than 15 inches) this object is reported to be all but impossible to see. However, given perfectly dark skies and a large scope, this faint beast has been plucked from the night sky by a number dedicated observers. I hope to take advantage of September's clear skies and, perhaps, join their club.

Carpe Noctem!

A Planet Named Easterbunny?

You know Uranus, Neptune, and Pluto. But how about their smaller cousins Eris, Ceres, Orcus, and Makemake? How about Easterbunny?

These are all names given to relatively large “planet-like” objects recently found in the outer reaches of our solar system. Some were just temporary nicknames, others are now official and permanent. Each has a unique story.

“The names we chose are important,” says Caltech astronomer Mike Brown, who had a hand in many of the discoveries. “These objects are a part of our solar system; they’re in our neighborhood. We ‘gravitate’ to them more if they have real names, instead of technical names like 2003 UB313.”

Nearby planets such as Venus and Mars have been known since antiquity and were named by the ancient Romans after their gods. In modern times, though, who gets to name newly discovered dwarf planets and other important solar-system bodies?

In short, whoever finds it names it. For example, a few days after Easter 2005, Brown and his colleagues discovered a bright dwarf planet orbiting in the Kuiper belt. The team’s informal nickname for this new object quickly became Easterbunny.

However, ever since its formation in 1919, the International Astronomical Union (IAU) ultimately decides whether to accept or reject the name suggested by an object’s discoverers. “Easterbunny” probably wouldn’t be approved.

According to IAU guidelines, comets are named after whoever discovered them—such as comet Hale-Bopp, named after its discoverers Alan Hale and Thomas Bopp. Asteroids can be named almost anything. IAU rules state that objects in the Kuiper belt should be given mythological names related to creation.

So Brown’s team started brainstorming. They considered several Easter-esque names: Eostre, the pagan mythological figure that may be Easter’s namesake; Manabozho, the Algonquin rabbit trickster god.

In the end, they settled on Makemake (pronounced MAH-kay MAH-kay), the creator of humanity in the mythology of Easter Island, so named because Europeans first arrived there on Easter 1722.

Other names have other rationales. The dwarf planet discovered in 2005 that triggered a fierce debate over Pluto’s status was named Eris, for the Greek goddess of strife and discord. Another dwarf planet with an orbit that mirrors Pluto’s was dubbed Orcus, a god in Etruscan mythology that, like Pluto, ruled the underworld.

Brown says he takes “this naming business” very seriously and probably spends too much time on it. “But I enjoy it.” More tales of discovery and naming may be found in Brown’s blog MikeBrownsPlanets.com.

Constellations have also been named after ancient gods, human figures, and animals. Kids can start to learn their constellations by making a Star Finder for this month at spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml. There you will also find a handy explanation of why astrology has no place in science.





This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Artist’s rendering of dwarf planet MakeMake, discovered around Easter 2005. Unlikely to gain acceptance their nickname Easterbunny, the discoverers named it for the god of humanity in the mythology of Easter Island.

September 2009

Columbus Astronomical Society Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4  Saturn's rings edge-on	5
6	7	8	9	10	11 	12 CAS Annual Picnic 6PM-?
13	14	15	16 Moon at perigee	17 New Vistas program Saturn a conjunction	18 	19
20	21	22 Autumnal equinox Juno at opposition (7.8 mag.)	23	24 Asteroid 20 Massalia at opposition (9.3 mag.)	25	26 
27	28 Moon at apogee	29	30 PF Articles deadline			

October 2009

Columbus Astronomical Society Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4 Mercury and Venus at perihelion 	5	6 Mercury at greatest Western elongation	7	8	9 Draconids meteor shower	10 CAS meeting 8PM
World Space Week						
11 	12	13 Jupiter stationary Moon at perigee	14	15 New Vistas program	16	17
18 	19	20	21 Orionids meteor shower	22	23	24
25 Moon at apogee 	26	27	28 PF Articles deadline	29	30	31



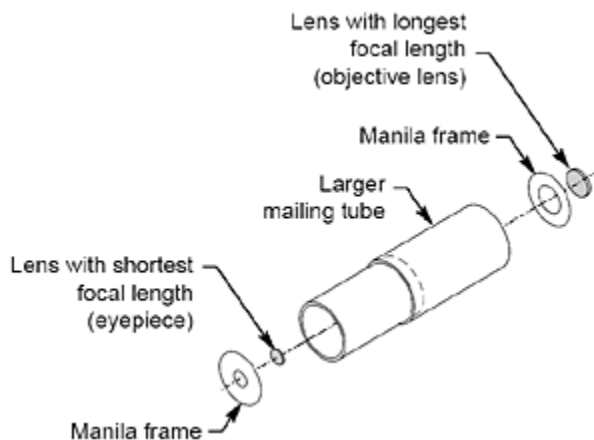
Build A Telescope

*Have you ever wanted to build a telescope?
By Tammy Plotner*

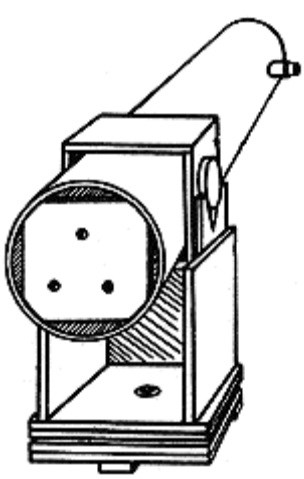
Have you ever wanted to build a telescope? How much does it cost and where do you get the parts? What types of telescopes can a amateur build easily? Are there kits available to build a telescope? Are there instructions for a science class or project? Putting together your own telescope is a fun and rewarding project that teaches you a lot about the physics behind the optics - no matter if your telescope making project is from simple, household materials or an exotic kit. In the case of amateur telescope making, there's thousands of resources to choose from, but if you have a few questions like above, then follow along as we explore how to build a telescope.

Build A Telescope From Simple Materials

Have you ever wanted to just build a telescope to see how it works? With just a few simple materials, you can do it very easily! All you need is 2 converging (convex) lenses such as you might find in different sized small toy magnifying glasses, telescoping tubes (mailing tubes, or cardboard tubes which can slide inside each other), a manila file folder, scissors, serrated knife or saw to cut the tubes, glue, and some poster board. It's as easy as 1, 2, 3. Are you ready?



1. The mailing tubes will be the body of the telescope with the smaller one sliding inside the larger one. The length of the assembled telescope will be a little longer than the sum of the focal lengths of the two lenses. To determine the focal length, have someone hold a flashlight above the lens and move it up and down until the light shining through the lens comes to a bright point and measure the distance. Add the value of the focal lengths of the short and long lens together. Divide that length by two and then add another inch. Cut both of the tubes to that length with a knife or saw.



2. Use the scissors to cut out two circles from the manila paper that are the same size as the diameter of the mailing tube. These circle frames will mount and center the lenses on the tube. With a knife, cut out circles that are slightly smaller than the diameter of the lenses in the center of the paper frame circle. Glue the lenses to the center of the frame. The shorter focal length lens will be the eyepiece. Glue that framed lens to the end of the smaller tube. Glue the other framed lens to the end of the larger tube.

3. Slide the two cardboard tubes together. You have now assembled a simple refracting telescope. Look through the eyepiece of your telescope and focus it on a distant object. Slide the two cardboard tubes in and out until you have a clear image.

Now you have made your very first refractor telescope! While this isn't as good as what can be achieved with better lenses and materials, you're well on your way to learning what it takes to build your own telescope. Take a look around on the web. Many science based companies offer kits to build your own refractor that are equal to what Galileo first used! These kits are also available in multiples for classroom work.

Build A Telescope From Plans or a Kit

A simple refractor telescope is easy to construct from paper and lenses, but a reflector takes a lot more work. There are many books, videos and websites devoted to nothing but the art of building your own telescope! Building a telescope isn't difficult, but it is much easier if you have a good set of instructions and a list of parts which you will need like the tube, mirror cell, diagonal mirror, the spider vane and diagonal mirror mount. You can either choose to grind your own mirror from a mirror blank or buy the mirror ready made. The choices are infinite.

If you decide to build a telescope from plans, where do you get the plans and the parts? As you may have already discovered, the internet is one of the most reliable sources for finding what you need and most companies which supply ready made telescopes also supply the necessary parts to create your own telescope as well. Once you have your plans in hand, it is usually a matter of choosing your cabinet style and woodworking. Afterwards, you begin the optical tube assembly. Perhaps you may even choose to use an old telescope and give it a new look! Building your own telescope from plans and purchased parts can be relatively inexpensive - from a couple of hundred dollars up to what you want to invest. There are even simple telescope plans made from plastic plumbing parts available, too.



Are you interested in building a reflector telescope from a kit? Those are also available, too. These kits can be as simple as the cardboard tube style which we have just explored, to elaborate models which replicate antique historical telescopes. Just as with amateur telescope making - referred to as ATM - there are myriad resources to choose from.



One of the best and most reliable internet sites to start your quest from is [Amateur Telescope Maker](#). Here you will find most of the resources you need to begin to build your own telescope!

Build A Telescope For Classrooms or Groups

If you can't get enough project materials easily, there's another project you can try using aluminum foil and one lens - such as you find in a magnifying glass. In this case, your arms will become the telescope and the lens will act as the telescope's objective lens. Now, poke a hole in a tiny piece of foil. This will act as an "eyepiece". Move the lens back and forth at different distances to try and achieve focus. (You can do it without any extra help, but you have to cross your eyes with one closed to do it!) Now hold the pinhole eyepiece in front of the lens. Believe it or not, the tiny hole in the foil removes the blur. It will also make it very dim, but try using it outdoors where the scene is brightly lit. (But never look at the Sun!)

To make a more precise pinhole, try layering the foil when puncturing it. Then choose the one layer with the best, round hole. Small holes usually produce the best image, but experiment with them all and note your results with each size and shape. Begin by holding your pinhole eyepiece against your eye and look at a brightly lit scene. Now, put the magnifying lens against it and move slowly outward. You'll know when it's working! Try different distances and see where the image appears rightside up - or upside down. It's hard to believe a telescope could be made so simply, but it's true. The pinhole projector, minus the lens, has been in use for centuries and was the basis for one of the very first solar telescopes. However, remember your simple science principles and what happens when you focus the sun's rays through a magnifying glass. Your retina will burn far more quickly than any piece of paper! Never focus any kind of optical aid towards the Sun without a proper solar safety filter.

So, you see, building a simple telescope can range from a few cents worth of materials to hundreds of dollars. The main point is to enjoy your experiments and you'll learn much more about the physics of optics and how telescopes work!

Article provided by Universe Today

Columbus Astronomical Society
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The Prime Focus is the monthly newsletter of the Columbus Astronomical Society, a not for profit group of amateur astronomers interested in the night sky. Information can be obtained by writing to the address below. Society members build telescopes, observe the splendors of the universe, contribute to scientific research and educate the public at public programs around the city and at Perkins Observatory.
 CAS web site - <http://www.the-CAS.org/>.
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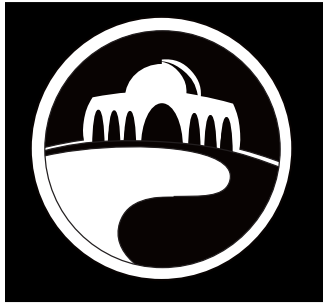
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NIGHTTIMES

The Newsletter of Perkins Observatory Sept. 2009

The Clear Skies of September

Friday night Guest Nights return to their regular 8 P.M. starting time in September.

On a cloudy night, we'll show you how to find all those glorious objects using a pair of binoculars from your own back yard and give you a tour of the "O." We also might be persuaded to tell the famous (or infamous, depending on your point of view) Perkins ghost story. Yes, even cloudy nights can be enlightening and entertaining the "O." So come on down. September tends to be a busy month, so please reserve your tickets soon by calling (740) 363-1257.

On a clear night, we should be able to give you wondrous views of such summer objects as Jupiter, the Ring Nebula, the blue and gold double star called Albireo, and the Great Globular Cluster in Hercules. Stick around, and we'll observe the best objects of autumn: the Wild Duck star cluster, the Andromeda Galaxy, the Double Cluster in Perseus, and the globular cluster M15 in Pegasus. Really, folks. September is the right time to come to Perkins.

As always, members of the Friends of Perkins Observatory are admitted free. Please call ahead to make sure that spaces are available on any given night.

Ways You Can Help

We're always looking for late-model computers to replace the aging computers we use for our exhibit area in the library. Let's face it. The display computers were old and well used when they were donated in the first place, and many of them have gone to the great computer heaven in the sky lately.

The very Mac I am writing this newsletter with has, shall we say, seen many, many better days.

Thus, if you have a computer, Mac or PC, that runs at one gigahertz or better and you're planning on replacing it (or even if you're not), you can help us quite a lot by donating it to the "O" and letting the next generation of young people experience the digital universe.

The striking thing about such a gift is the immediate impact it will have. This summer, we did a lot of field trips for low-cost daycamps. It was immediately apparent to us that many of these children had never used a computer before, that some of them were clicking a mouse for the very first time. It was our joy to introduce them to that world, and it can be yours too if you'll help us with your kind gift.

Another Way You Can Help

Starting in November, the cost of mailing this newsletter to you will increase dramatically. You can help us meet our budget and provide more funding to continue our public activities at Perkins by receiving NightTimes by email. Just send an email to <perkinsw@owu.edu> (note the "w" after "perkins") and we'll email you a copy of the newsletter every month. Not only will you get it faster, but you'll help to preserve Ohio's premier public venue for stargazing and astronomy.

Observatory Angels

The following folks joined or renewed memberships in the Friends of Perkins:

Carol Sullivan of Westerville, \$50 individual membership.

Janis Snowball of Westerville, \$100 sponsorship.

Terry & Patty Higerd, also of Westerville, \$100 sponsorship. Many thanks to Westerville.

Jim Pace made his ongoing \$40 monthly gifts to the Endowment and the Operating Fund.

Everyone should consider benefiting from his example. If we had a few dozen people like him, the future of the "O" would be secure, and we wouldn't have to keep asking you for help so much!

Thanks to Bill Ryder, who contributed yet another enormous round of books, mostly about space colonization, and equipment, including a weather balloon radiosonde and various civil-defense radiation detectors.

Thanks to all. Keep those cards and letters coming in, folks.

Taurus The Bulletin Board

Nighttime Programs Return to Perkins Observatory.

Teachers, now is the time to schedule those autumn field trips.

- ★September 4 (Friday) 8 P.M. Guest Night. Tickets available.
- ★September 11 (Friday) 8 P.M. Guest Night. Tickets available.
- ★September 12 (Saturday) 2 P.M. Annual CAS Picnic.
- ★September 17 (Thursday) 4 P.M. at Perinatal Convention, Courtyard Marriot.
- ★September 17 (Thursday) 8 P.M. New Vistas in Astronomy featuring Marc Pinsonneault on (prepare yourself) "Looking Inside Stars: Helioseismology and Asteroseismology."
- ★September 18 (Friday) 8 P.M. Guest Night. Tickets available.
- ★September 19 (Saturday) 12 P.M. CAS Amateur Telescope Making SIG.
- ★September 22 (Tuesday) 9:30 A.M. at Hilliard middle school to give our classic "Nickel Tour of the Universe."
- ★September 23 (Wednesday) 7:20 P.M. at 1st - 5th grade cub scout seeing for talk and telescopes.
- ★September 25 (Friday) 8 P.M. Guest Night. Tickets available.
- ★September 26 (Saturday) 12 P.M. CAS Amateur Telescope Making SIG.
- ★October 2 (Friday) 8 P.M. Guest Night. Tickets available.
- ★October 3 (Saturday) 12 P.M. CAS Amateur Telescope Making SIG.
- ★October 9 (Friday) 8 P.M. Guest Night. Tickets available.
- ★October 10 (Saturday) 12 P.M. CAS Amateur Telescope Making SIG.
- ★October 10 (Saturday) 8 P.M. Monthly meeting of the Columbus Astronomical Society.
- ★October 15 (Thursday) 8 P.M. New Vistas in Astronomy featuring Kris Stanek on "Gamma Ray Bursts: The Biggest Explosions Since the Big Bang."
- ★October 16 (Friday) 8 P.M. Guest Night. Tickets available.
- ★October 17 (Saturday) 12 P.M. CAS Amateur Telescope Making SIG.

2,000 Points of Light Perkins Observatory Needs Your Help

On any given night of the year from a dark, rural location, 2,000 stars light up the sky.

You can light up the sky over Perkins Observatory in the same way. Rising costs have made it increasingly difficult for its small but dedicated staff to engage in its public mission: to show the people of Central Ohio the wonder and majesty of the universe they live in.

Over the years, we have reduced our staff to the bare bones. With the switch of our Building Superintendent to part-time status, Perkins no longer has a single full-time employee. Despite those reductions, we have managed to increase our public activities and the number of people, especially children, we serve.

Those of you who love the night sky have been extraordinarily generous with both your time and financial help, and we thank you. Now, we need your help one more time.

If 2,000 people, 2,000 Points of Light, will contribute \$200 each, we can continue our mission unimpaired.

Half of your gift will go into the Perkins Endowment, the interest on which will keep us open for decades to come. The other \$100 will be used to make building repairs (including much-needed repairs to our roof), build new exhibits and displays, and help with ongoing costs.

To show our gratitude, we will associate your name (or the name of any honoree you pick) with one of the over 2,000 stars on our large, publicly-displayed star map. (Sorry, we get to pick the star). We will also send you a certificate honoring your help, mention your contribution in this newsletter, and add you to the monthly newsletter mailing list at your request.

Families, corporations, and fraternal organizations need not limit themselves to a single Point of Light. Why not honor several -- or many -- members of your group by making them a "star" on our map?

You can mail your contribution by using the handy form on the back or by writing 2KPL and the name of your honoree on the memo line of your check. Please mail to

Perkins Observatory 2KPL
PO Box 449
Delaware, OH 43015

Or give us a call at (740) 363-1257 and schedule a trip to one of our weekend public programs. We'd be honored to receive your gift in person.

Please don't lay this newsletter aside. We need you help today. If you become a Point of Light, Perkins can continue its public stargazing sessions for many years to come.

Friends of Perkins Observatory

Membership in FOPO entitles you to attend any or all of our weekend public programs.

Yes, I want to be a member of the Friends of Perkins Observatory. Enroll me at the level of sponsorship checked below:

Individual (\$50) Sponsor (\$100) Family (\$90) Family Sponsor (\$200) Corporate (\$300)

Name _____

Names of family members (for family memberships) _____

Address _____

City _____ State _____ Zip Code _____ Phone: _____

(Please mail to Perkins Observatory, P. O. Box 449, Delaware, OH 43015. Make checks payable to "Perkins Memorial Observatory.")

Yes, I want to be a Point of Light (@ \$200 per "Point"). Amount enclosed: _____

Yes, I want to donate to the Perkins Endowment. Amount enclosed: _____

Yes, I want to donate to the Operating Fund. Amount enclosed: _____

Name _____

Honoree(s) for "2,000 Points of Light" _____

Address _____

City _____ State _____ Zip Code _____ Phone: _____

(Please mail to Perkins Observatory, P. O. Box 449, Delaware, OH 43015. Make checks payable to "Perkins Memorial Observatory.")