

(Don from page 1)

Please bring a chair along with your family members. And if you would like to bring a side dish or dessert they will be enjoyed by all. See you there.

We will not hold our normal monthly meetings in July or August. Our next regular monthly meeting will be Sep 3 at First Presbyterian Church Don...

Fellowship Hall, 118 W Commerce St, Smyrna, DE 19977.

Have a great summer...please remember to volunteer your time and expertise to help make our field trips and virtual meetings realities.

Don...

Equipment Review

12x50 Leupold Binocular

First, let me say I really do like a well made binocular with bright optics and excellent collimation. My collection ranges from WWII B&L Navy versions to 10X80 German Flakenrohres and 12X60 German artillery binos to today's versions of Chinese made 10X42's thru 25X100's. For a while I even owned a JMI 6" binoscope.

Recently I purchased a Leupold Acadia BX-2 12X50 binocular to add to the collection. Leupold is an American company with headquarters in Beaverton, Oregon. This



info is from their website...

"Leupold & Stevens, Inc., is an American, family-owned, fifth-generation company that has been designing, machining, and assembling precision optical instruments and other products for 100 years. Founded in 1907, Leupold's® success has been built on our commitment to our customers' absolute satisfaction, and our commitment to building the best optics for the shooting sports, general and wildlife observation, and the military and law enforcement communities.

Present

Today, Leupold optics are renowned for their unchallenged ruggedness, absolute wa-

terproof integrity, and their vastly superior optical quality. A century of observation and optical experience has gone into every binocular and scope we produce, and we think the results are well worth the extra effort required to achieve this level of quality.

In true American style, the philosophical foundation laid in our early years served as a template for the company as we've grown and changed over the decades. In fact, the firm's founder established the clarity of purpose that we see at Leupold & Stevens today:

"We solemnly promise never to let down on quality, the customer is entitled to a square deal."

- Markus Friedrich Fred Leupold"

The Acadia BX-2 is a 12X50 roof prism style bino which means it is about half the size and 3/4's the weight of my favorite bino - the 7X50 WWII B&L. It is deceptively small - I even measured the objective to assure myself they were 50mm. Since this is an "American" company I was surprised to find they were made in the Philippines...at least they were not made in China.

Here are some more technical details about the bino - from the Leupold website...

Features

- Multicoat 4
- Waterproof/Fogproof
- Proprietary Nitrogen Fill Process
- Synergy Built
- Smooth Focusing
- Twist Up Eyecups
- Armor coated, rugged, and waterproof.
- Slim, In-Line Design
- Close focus distance of 10 feet.
- Ergonomic Design
- Phase Coated
- Dioptric Focus
- BAK 4 Prisms

So...how do they perform? First, they are well collimated. They are very bright...edge to edge and very crisp edge to edge. I cannot detect any chromatic ab-

(See Binos on page 3)

(Binoculars from page 2)

erration - that ring of color that degrades an image. For daytime use...birding, etc...they would be an excellent choice.

For night time use, they are still an excellent choice because of the contrasty, bright and crisp image. However, I would suggest a stabilizer of some sort...monopod or tripod...because at 12X the stars want to dance. The moon and planets don't suffer from the star dance...I guess that has something to do with my eyes and brain processing star light 1 photon wide vs. moonlight which is a wider beam.

I currently carry a 10X42 Brunton roof prism bino in my truck for quick looks at those views that require a closer look (eagles, ospreys, foxes...). Surprisingly, the 12X50 Leupold is only 3/4" wider and longer so it will fit the same spot in the console of my truck.

Price? Roof prism binos are more expensive than porro prism binos...

The Leupold website retail price is \$324.99.

Amazon has them listed for \$199.9 to \$258.99 (camo version).

Binoculars.com lists them for \$195-200 after rebate.

BTW currently there is a \$30 rebate that ends in June.

Also, they carry a lifetime warranty to the original purchaser...repairs or replacement are free.

The exit pupil which is calculated by dividing the objective diameter (50mm) by the power (12X) is 4.2mm and that is approx the night time diameter of my 66 year old eyes (4mm)...so that's a plus - all the bino's light is reaching the "processor". With a 7X50, the exit pupil is 7.1mm...now all of that 7.1 beam of light just can't get find its way thru a 4mm pupil so approx 66% of that light is wasted. That is important to us older folks.

Yep...I said 66%...you say, how can that be? Remember "r²"?

Here's the math...

The "r" of the Leupold is (50/12)/2 = 2.1...so r square = 4.4

The "r" of the 7X50 is (50/7)/2 = 3.6 so r square = 13

And (13-4.4) = 8.6 and 13/8.6 = .66 or 66% of available light that can't find its way to my pupil.

Bottom line...this is a top quality bino. Would I buy it again? I think I would opt for the 10X50 instead to avoid the dancing stars.

Don...

The Delmarva Stargazers' Club Picnic

will be **July 6th** at Don and Karen Surles home starting at 1 PM. The address is 514 Marilyn Rd., Smyrna DE. If you need help call 302-653-9445.

You are welcome to bring a covered dish or desert but it is not a requirement for attendance. You are also welcome to bring family, friends or anybody who would like to meet us.

We'll supply burgers and dogs, corn-on-the-cob, condiments, soda and water.

Please join us as we celebrate another successful year of the Delmarva Stargazers Amateur Astronomy Club and the great country we live in.

Please bring chairs. A tent will be available if the sky is not blue.



Your 2012-2013 Officers

Office	Officer	Phone	email
President	Don Surles	302-653-9445	don.surles@verizon.net
President-elect	Lyle Jones	302-736-9842	worm1647@comcast.net
Secretary	Cal Estrada		
Treasurer	Kathy Sheldon	302-422-4695	memomsheldon@comcast.net
Past President	Chuck Jennings	302-449-3330	chuckjennings33@yahoo.com

High-energy Spy

By Dr. Martin C. Weisskopf

The idea for the Chandra X-Ray Observatory was born only one year after Riccardo Giacconi discovered the first celestial X-ray source other than the Sun. In 1962, he used a sounding rocket to place the experiment above the atmosphere for a few minutes. The sounding rocket was necessary because the atmosphere blocks X-rays. If you want to look at X-ray emissions from objects like stars, galaxies, and clusters of galaxies, your instrument must get above the atmosphere.

Giacconi's idea was to launch a large diameter (about 1 meter) telescope to bring X-rays to a focus. He wanted to investigate the hazy glow of X-rays that could be seen from all directions throughout the sounding rocket flight. He wanted to find out whether this glow was, in fact, made up of many point-like objects. That is, was the glow actually from millions of X-ray sources in the Universe. Except for the brightest sources from nearby neighbors, the rocket instrument could not distinguish objects within the glow.

Giacconi's vision and the promise and importance of X-ray astronomy was borne out by many sounding rocket flights and, later satellite experiments, all of which provided years-, as opposed to minutes-, worth of data.

By 1980, we knew that X-ray sources exist within all classes of astronomical objects. In many cases, this discovery was completely unexpected. For example, that first source turned out to be a very small star in a binary system with a more normal star. The vast amount of energy needed to produce the X-rays was provided by gravity, which, because of the small star's mass (about equal to the Sun's) and compactness (about 10 km in diameter) would accelerate particles transferred from the normal star to X-ray emitting energies. In 1962, who knew such compact stars (in this case a neutron star) even existed, much less this energy transfer mechanism?

X-ray astronomy grew in importance to the fields of astronomy and astrophysics. The National Academy of Sciences, as part of its "Decadal Survey" released in 1981, recommended as its number one priority for large missions an X-ray observatory along the lines that Giacconi outlined in 1963. This observatory was eventually realized as the Chandra X-Ray Observatory, which launched in 1999.

The Chandra Project is built around a high-resolution X-ray telescope capable of sharply focusing X-rays onto two different X-ray-sensitive cameras. The focusing ability is of the caliber such that one could resolve an X-ray emitting dime at a distance of about 5 kilometers!

The building of this major scientific observatory has many stories.

Learn more about Chandra at www.science.nasa.gov/missions/chandra. Take kids on a "Trip to the Land of the Magic Windows" and see the universe in X-rays and other invisible wavelengths of light at spaceplace.nasa.gov/magic-windows.

Dr. Weisskopf is project scientist for NASA's Chandra X-ray Observatory. This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Composite image of DEM L50, a so-called superbubble found in the Large Magellanic Cloud. X-ray data from Chandra is pink, while optical data is red, green, and blue. Superbubbles are created by winds from massive stars and the shock waves produced when the stars explode as supernovas.



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LECTURES ON ASTRONOMY

BY JOHN PHOENIX

Introductory

The following pages were originally prepared in the form of a course of Lectures to be delivered before the Lowell Institute, of Boston, Mass., but, owing to the unexpected circumstance of the author's receiving no invitation to lecture before that institution, they were laid aside shortly after their completion.

Receiving an invitation from the trustees of the Vallecetos Literary and Scientific Institute, during the present summer, to deliver a course of Lectures on any popular subject, the author withdrew his manuscript from the dusty shelf on which it had long lain neglected, and, having somewhat revised and enlarged it, to suit the capacity of the eminent scholars before whom it was to be displayed, repaired to Vallecetos. But, on arriving at that place, he learned with deep regret, that the only inhabitant had left a few days previous, having availed himself of the opportunity presented by a passing emigrant's horse,—and that, in consequence, the opening of the Institute was indefinitely postponed. Under these circumstances, and yielding with reluctance to the earnest solicitations of many eminent scientific friends, he has been induced to place the Lectures before the public in their present form. Should they meet with that success which his sanguine friends prognosticate, the author may be induced subsequently to publish them in the form of a text-book, for the use of the higher schools and universities; it being his greatest ambition to render himself useful in his day and generation by widely disseminating the information he has acquired among those who, less fortunate, are yet willing to receive instruction.

JOHN PHOENIX.

SAN DIEGO OBSERVATORY, September 1, 1854.

LECTURES ON ASTRONOMY

The term Astronomy is derived from two Latin words,—Astra, a star, and onomy, a science; and literally means the science of the stars. "It is a science," to quote our friend Dick (who was no relation at all of Big Dick, though the latter occasionally

caused individuals to see stars), "which has, in all ages, engaged the attention of the poet, the philosopher, and the divine, and been the subject of their study and admiration."

By the wondrous discoveries of the improved telescopes of modern times, we ascertain that upward of several hundred millions of stars exist, that are invisible to the naked eye—the nearest of which is millions of millions of miles from the Earth; and as we have every reason to suppose that every one of this inconceivable number of worlds is peopled like our own, a consideration of this fact—and that we are undoubtedly as superior to these beings as we are to the rest of mankind—is calculated to fill the mind of the American with a due sense of his own importance in the scale of animated creation.

It is supposed that each of the stars we see in the Heavens in a cloudless night is a sun shining upon its own curvilinear, with light of its own manufacture; and as it would be absurd to suppose its light and heat were made to be diffused for nothing, it is presumed farther, that each sun, like an old hen, is provided with a parcel of little chickens, in the way of planets, which, shining but feebly by its reflected light, are to us invisible. To this opinion we are led, also, by reasoning from analogy, on considering our own Solar System.

THE SOLAR SYSTEM is so called, not because we believe it to be the sole system of the kind in existence, but from its principal body, the Sun, the Latin name of which is Sol. (Thus we read of Sol Smith, literally meaning the son of Old Smith.) On a close examination of the Heavens we perceive numerous brilliant stars which shine with a steady light (differing from those which surround them, which are always twinkling like a dewdrop on a cucumber-vine), and which, moreover, do not preserve constantly the same relative distance from the stars near which they are first discovered.

These are the planets of the SOLAR SYSTEM, which have no light of their own—of which the Earth, on which we reside, is one—which shine by light reflected from the Sun—and which regularly move around that body at different intervals of time and through different ranges in space. Up to the time of a gentleman named Copernicus, who flourished about the middle of the Fifteenth Century, it was supposed by our stupid ancestors that the Earth was the center of all creation, being a large, flat body resting on a rock which rested on another rock, and so on "all the way down"; and

that the Sun, planets and immovable stars all revolved about it once in twenty-four hours.

This reminds us of the simplicity of a child we once saw in a railroad-car, who fancied itself perfectly stationary, and thought the fences, houses and fields were tearing past it at the rate of thirty miles an hour;—and poking out its head, to see where on earth they went to, had its hat—a very nice one with pink ribbons—knocked off and irrecoverably lost. But Copernicus (who was a son of Daniel Pernicus, of the firm of Pernicus & Co., wool-dealers, and who was named Co. Pernicus, out of respect to his father's partners) soon set this matter to rights, and started the idea of the present Solar System, which, greatly improved since his day, is occasionally called the Copernican system. By this system we learn that the Sun is stationed at one focus (not hocus, as it is rendered, without authority by the philosopher Partington) of an ellipse, where it slowly grinds on for ever about its own axis, while the planets, turning about their axes, revolve in elliptical orbits of various dimensions and different planes of inclination around it.

The demonstration of this system in all its perfection was left to Isaac Newton, an English Philosopher, who, seeing an apple tumble down from a tree, was led to think thereon with such gravity, that he finally discovered the attraction of gravi-

tation, which proved to be the great law of Nature that keeps everything in its place. Thus we see that as an apple originally brought sin and ignorance into the world, the same fruit proved thereafter the cause of vast knowledge and enlightenment;—and indeed we may doubt whether any other fruit but an apple, and a sour one at that, would have produced these great results;—for, had the fallen fruit been a pear, an orange, or a peach, there is little doubt that Newton would have eaten it up and thought no more on the subject.

As in this world you will hardly ever find a man so small but that he has someone else smaller than he, to look up to and revolve around him, so in the Solar System we find that the majority of the planets have one or more smaller planets revolving about them. These small bodies are termed secondaries, moons or satellites—the planets themselves being called primaries.

We know at present of eighteen primaries, viz.: Mercury, Venus, the Earth, Mars, Flora, Vesta, Iris, Metis, Hebe, Astrea, Juno, Ceres, Pallas, Hygeia, Jupiter, Saturn, Herschel, Neptune, and another, yet unnamed. There are distributed among these, nineteen secondaries, all of which, except our Moon, are invisible to the naked eye.

(ed. Note) The rapidly expanding list of planets prompted their reclassification as asteroids by astronomers, and this was widely accepted by 1854.

The nitrogen in our DNA, the calcium in our teeth, the iron in our blood, the carbon in our apple pies were made in the interiors of collapsing stars. We are made of starstuff. Carl Sagan, *Cosmos* (1980).

Quod est ante pedes nemo spectat: cœli scrutantur plagas.

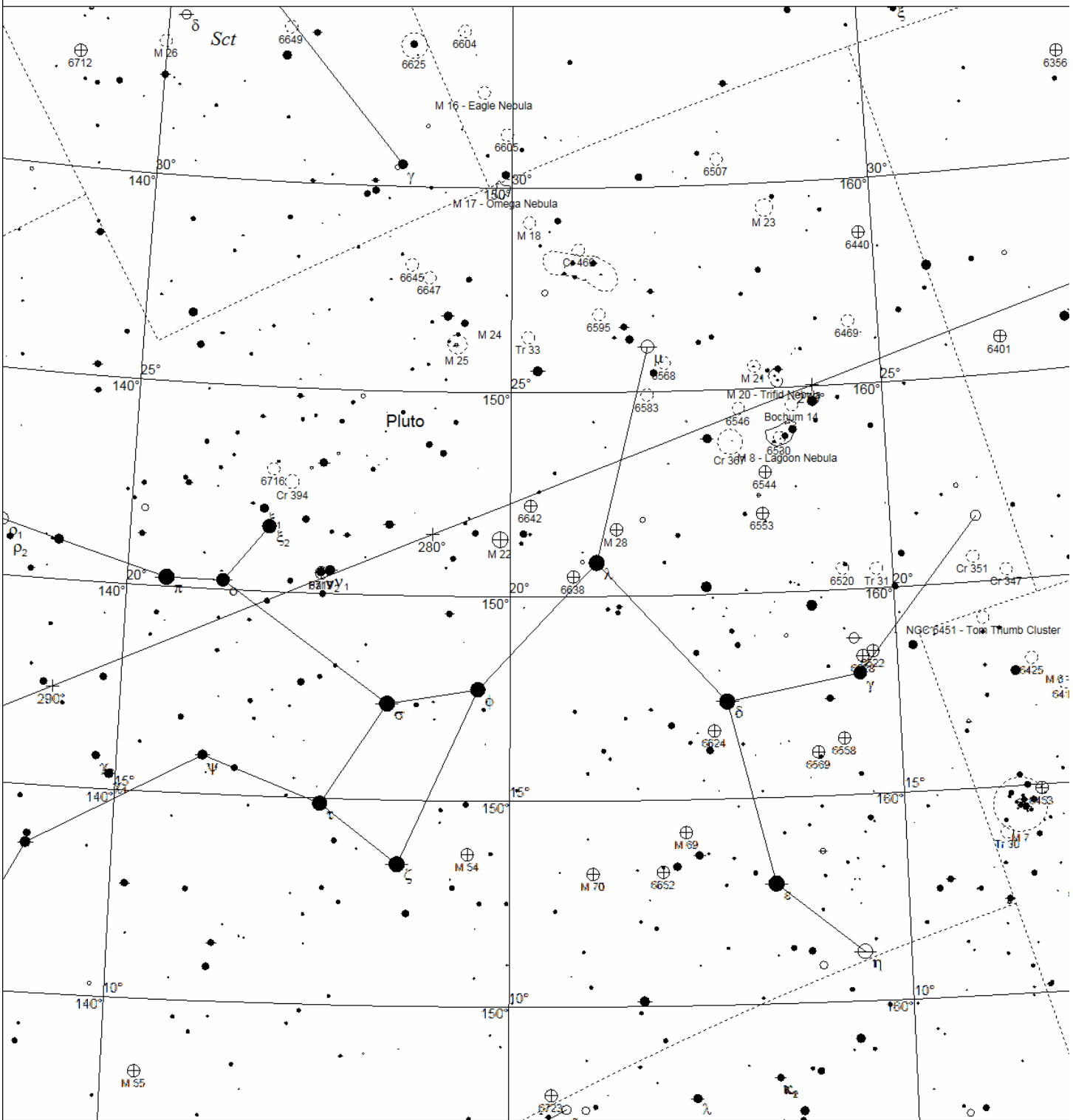
(No one sees what is before his feet: we all gaze at the stars.)

Cicero,

Many a night I saw the Pleiads, rising thro' the mellow shade, Glitter like a swarm of fire-flies tangled in a silver braid.

Alfred Tennyson

Sagittarius



STARS		SYMBOLS		
● <3	● >8	● Multiple star	☐ Dark nebula	△ Radio source
● 4		○ Variable star	⊕ Globular cluster	× X-ray source
● 5		☄ Comet	○ Open cluster	○ Other object
● 6		☄ Galaxy	◇ Planetary nebula	
● 7		☐ Bright nebula	⊗ Quasar	

Local Time: 22:00:00 15-Jul-2013
 Location: 38° 19' 48" N 75° 40' 12" W

UTC: 02:00:00 16-Jul-2013
 RA: 18h34m49s Dec: -24° 47' Field: 27.2°

Sidereal Time: 16:33:38
 Julian Day: 2456489.5833

HYMN TO THE NORTH STAR.

WILLIAM CULLEN BRYANT

1794-1878

The sad and solemn night
Hath yet her multitude of cheerful fires;
The glorious host of light
Walk the dark hemisphere till she retires;
All through her silent watches, gliding slow,
Her constellations come, and climb the heavens, and go.

Day, too, hath many a star
To grace his gorgeous reign, as bright as they:
Through the blue fields afar,
Unseen, they follow in his flaming way:
Many a bright lingerer, as the eve grows dim,
Tells what a radiant troop arose and set with him.

And thou dost see them rise,
Star of the Pole! and thou dost see them set.
Alone, in thy cold skies,
Thou keep'st thy old unmoving station yet,
Nor join'st the dances of that glittering train,
75Nor dipp'st thy virgin orb in the blue western main.

There, at morn's rosy birth,
Thou lookest meekly through the kindling air,
And eve, that round the earth
Chases the day, beholds thee watching there;
There noontide finds thee, and the hour that calls
The shapes of polar flame to scale heaven's azure walls.

Alike, beneath thine eye,
The deeds of darkness and of light are gone;
High toward the starlit sky
Towns blaze, the smoke of battle blots the sun,
The night storm on a thousand hills is loud,
And the strong wind of day doth mingle sea and cloud.

On thy unaltering blaze
The half-wrecked mariner, his compass lost,
Fixes his steady gaze,
And steers, undoubting, to the friendly coast;
And they who stray in perilous wastes, by night,
Are glad when thou dost shine to guide their footsteps right.

And, therefore, bards of old,
Sages and hermits of the solemn wood,
Did in thy beams behold
A beauteous type of that unchanging good,
That bright eternal beacon, by whose ray
The voyager of time should shape his heedful way.

How to Join the Delmarva Stargazers: Anyone with an interest in any aspect of astronomy is welcome

NAME _____ New (y/n) _____ Renew (y/n) _____

ADDRESS _____

CITY, STATE & ZIP _____

E-MAIL ADDRESS (If any) _____

Do you need the newsletter snail mailed to you (Y/N)? _____

Please attach a check for \$15 made payable to Delmarva Stargazers and mail to Kathy Sheldon, 20985
Fleatown Rd, Lincoln, DE 19960. Call club President Don Surles at 302-653-9445 for more information.