Star Gazer News

Newsletter of the Delmarva Stargazers
www.delmarvastargazers.org

Prez comments…for the last time as President of Delmarva Star Gazers

The Stargazers had 57 attendees at our star party of which 37 were members and/or families. Thanks to the efforts of many club members, the Spring Star party went almost without a hitch. We had two good nights of observing. My encoders were broken but I had not forgotten where some objects were located. Dew was a problem but most saw what they wanted and were ready for sleep when everything was soaked. Saturday night was cloudy and most left after the door prizes. Chuck Jennings did a nice job with the door prizes and David Holden (Sky Stones) donated numerous meteorites as door prizes. Doug Towner's pancake and bacon breakfast went over very well. He had pancake and bacon for anyone who wanted breakfast. Of course, all the soups were good. Jerry Truitt made a chicken soup, Don Surles' lima bean soup and Dave Wells' chili was excellent. We had many delicious cakes. As everyone can guess, we had an abundance of good eats. The small hitch was we had no fish breading. Our inventory list indicated that we had 3.5 bags of breading but it could not be found in the trailer. Let me tell you that-- pancake mix and hush puppy mix makes and excellent breading when the President blows it.

At our May meeting Don Surles discussed the previous Venus transit in 2004 and the upcoming June 5, 2012 transit. The June event is expected to last from 6:05PM until sunset at about 8:30PM. Michael Lecuyer noted that the last transit observed by the club failed to find the 'black drop effect' where Venus upon ingress and egress sports a lingering connection with the edge of the sun. This effect was not noted in the film photos exhibited and taken by Don. Perhaps digital cameras this year will be able to take enough photos to show the effect. This year the club plans to be at Woodland Beach at 5 pm to observe the transit (see this newsletter for more details).

Our annual Club elections will be held at Woodland Beach before the Transit of Venus.

Don Surles is our President-Elect candidate and at the present time we don't have a candidate for Secretary. We need to thank Michael Lecuyer for his years of service to our Club as Secretary. To make the Delmarva Stargazers succeed we all need to do what we can. Please consider putting your name in for one of these two positions.

Don also discussed the Virgo constellation. Virgo is the second largest constellation spanning nearly 4 hours of Right Ascension (60 degrees) and 34 Degrees of Declina-

(See Prez on page 6)

Special Meeting place for the June 5th meeting !

The June 5th meeting of Delmarva Stargazers will be at **Woodland Beach** (map on pg. 2)to observe the transit of Venus across the edge of the sun (Hopefully we will have clear skies). We **will not** meet at the Presbyterian Church in Smyrna, unless you receive an email from me confirming a change of location from Woodland Beach. We will set-up at 5 pm and have hotdogs and hamburgers for our members and their family. There will be scopes on site to view the transit directly. After the June 2012 transit of Venus (the last one in your lifetime), the next such alignment occurs in 2117. Don't miss this once in a lifetime transit. Transit should be completed by 8:30.

We will have officer elections at the Beach. Doug Towner will send out a press release for the local paper inviting the public to the event. Don't miss this once in a lifetime transit. The Club is thinking about creating a time capsule for the event. Don Surles is coordinating the time capsule. —Lyle

Upcoming Events:

Meeting !	**June 5th**	**5 PM**	**Woodland Beach**
Observing !	**June 22-23rd**	**Dusk**	**Eq. Cntr & BB**

Karen Jennings becomes Astronomy Foundation Vice President

David J. Eicher

On Monday, May 7, 2012, Astronomy Foundation President David J. Eicher announced that Alex Khachaturyan, vice president of the Astronomy Foundation, has stepped aside, and that Delaware amateur astronomer and activist Karen Jennings is the Foundation's new vice president. Khachaturyan will continue as a member of the Foundation and will continue providing help on the AF website with his company GammaFX.

Photo by Nate Jennings

Jennings, a dedicated amateur astronomer and town council member in Townsend, Delaware, becomes the Foundation's vice president through April 2013. She is also the Astronomy Club Committee Chair for the Foundation, and has been communicating frequently with astronomy clubs in the United States and elsewhere to solicit their participation in AF activities. She is the author of "Why Gen X and Y Should Care about Astronomy" in the February 2011 issue of Astronomy magazine. Vice President Jennings is married to amateur astronomer and telescope maker Chuck Jennings and they have two children.

Those of you who follow the Foundation's activities know that Karen has recently produced "Sidewalk Astronomy" and "Star Party" resource guides that are available to astronomy clubs, educators, and advocates as downloadable PDFs (see http://www.astronomy.com/en/Community/Astronomy Foundation/2011/08/Astronomy Foundation Star Party models.aspx). Karen also recently established a light pollution ordinance in her town and hosts regular community outreach events such as "Astronomy in the Park." She recently represented the Foundation at the Philadelphia Science Festival and at the Northeast Astronomy Forum.

Karen began her undergraduate studies as a dance major at the University of the Arts, and was graduated from Temple University with a degree in psychology. She is currently working on outreach initiatives that include collaborations between the astronomy and arts communities; amateur telescope making; observing aid that will help those with physical and intellectual disabilities; and programming to help broaden diversity in amateur astronomy and to increase participation by Gen X and Y in the hobby.

For more information on the Astronomy Foundation, see www.astronomyfoundation.org, the Astronomy Foundation on Facebook, and http://www.astronomy.com/en/Community/Astronomy%20Foundation.aspx.

David J. Eicher is an editor for Astronomy Magazine and President of the Astronomy Foundation.

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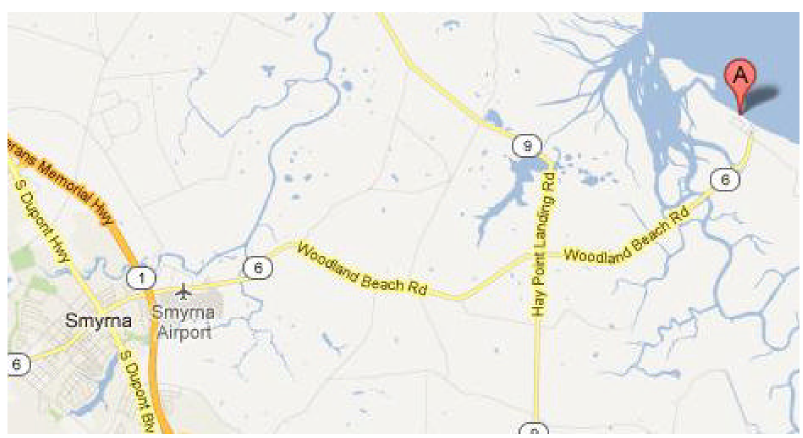

Map to woodland Beach

Transit of Venus - June 5, 2012

Don Surles

So, what is all the fuss about? Just a planet passing twixt Earth and the Sun and since the solar is 5 billion years old there must have been many other transits. That thinking is correct but Transits of Venus are very rare when compared to the typical life span of humans.

A review of the past 2000 years may be a good starting point to understand “what all the fuss is about”.

Sometime between the first and second century AD a Greek named Ptolemy assembled most of the “known” mathematical and astronomical data of the time into a collection that became known as The Almagest...or the Great Book. His basic configuration of the world held that Earth was the center of the Universe; this became known as the Geocentric model. And it became the accepted view of the world - protected by religions and governments for the next 1500 years.

During those 1500 years the world moved much more slowly than it has in the last 500 years. Sometime around 400AD all of Europe descended into what became known as the Dark Ages. The Catholic Church’s strict control, plagues, Crusades, and Inquisitions seemed to grip the peoples of Europe from 400AD thru approximately 1400 AD.

But during that timeframe there was a Golden Age of Arabia occurring in the Mediterranean area and North Africa. From approximately 750AD thru 1250AD scientists and philosophers of Arabia made many contributions to science, arts, architecture. It was through their efforts that the Almagest was translated and preserved. Specifically they created and improved trigonometry and experimented with optics (lenses and curved mirrors).

As the Golden Age of Arabia began its decline the Renaissance or Age of Enlightenment was beginning in Europe (began around 1350). Spain, Portugal, France and England began traveling by ship over greater and greater distances. Around 1450 Gutenberg perfected the printing press. And Columbus discovered the new world in 1492. But the universe was still Earth Centered...just as Ptolemy had written 1400 years earlier.

The great scientists and mathematicians of the Enlightenment all lived within a 200 year period (approx 1500-1700).

- Copernicus (1473-1543)...proposed a sun centered universe
- Tycho Brahe (1546-1601)...the astronomical observer & data collector
- Kepler (1571-1630)...the mathematician who used Tycho’s data to describe planetary motion
- Galileo (1564-1642)...used a telescope to prove Earth is not the center of the Universe
- Newton (1642-1727)...described gravity and light and the laws governing them

By the time of Sir Edmund Halley (1656-1742), man was no longer afraid of sailing off the edge of the Earth. Magellan’s round the world expedition in the early 1520’s proved Earth was not flat. Europeans were regularly making ocean trips to the East Indies around the southern tip of Africa and to the new world of North and South America. But there were still Inquisitions being carried out by the Catholic Church, Spain and Italy...even though there was ample evidence, in hindsight, to confirm Earth was not flat nor the center of the Universe.

By this time a Sun-centered universe was becoming the accepted model for the scientific community although the Church still clung to the Earth-centered model. Naturally, the learned people of Europe, armed with the Kepler’s laws of planetary motion, wanted to know the scale of the solar system. Specifically they wanted to know the distance from Earth to the Sun...the Astronomical Unit (AU). With that yardstick it would be relatively easy to complete the distances and sizes of the known planets.

Kepler had predicted transits of Venus and Mercury in the early 1600’s. For info, only the planets between Earth and the Sun can “transit” the Sun. Specifically Kepler had predicted a transit of Ve-

(See ToV on page 4)

Your 2011-2012 Officers

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nus for November 1631 - but he died in 1630...so no one saw the 1631 transit. A young Englishman named Jeremiah Horrocks (he was a 20 year old math teacher) realized in mid 1639 that Kepler had failed to predict Venus transits come in pairs approx 8 years apart. He and his friend, William Crabtree, hastily cobbled together telescopes and devised a scheme to project the sun's image onto a white sheet that was based on a published viewing of a transit of Mercury by the French priest, Pierre Gassendi. They set their instruments up at different locations to ensure a better chance of having cloud-free conditions for at least one site. Horrocks left a written description of seeing the "black dot" move across the surface of the Sun in November 1639. Sadly he died at age 22. He and Crabtree were the only people to see the 1639 transit.

Enter Sir Edmund Halley...he also observed a Mercury transit in 1677 and wrote about a method to use a transit of Venus observation data from different points on Earth to "triangulate" the distance from Earth to the Sun. The next opportunity would be 1761. Also for info, Transits of Venus occur about every 105.5-121.5 years in pairs separated by 8 years. The cycle between 105.5 and 121.5 repeats every 243 years.

So, the event skipped a generation or two...those lucky enough to be living during a ToV were excited about the possibility and responsibility of observing and recording the 1761 & 1769 ToV's. This was a period of European exploration, colonization, and unfortunately, wars. It seems the Europeans have fought more wars amongst themselves than the rest of the world combined. Approximately 100 teams from all across Europe made plans to view the 1761 transit. And a few were successful...some were not. Some of the participants did not return. Of note to Mid-Atlantic folks...our Charles Mason and Jeremiah Dixon, of Mason-Dixon Line fame, trekked to Cape Town, S Africa, to view the event and successfully recorded the data. After all the data from the returning teams was collected and reduced, the distance to the Sun was calculated to be approximately 125-155 million kilometers (77.6 - 96.3 million miles). So, most all the learned folks were disappointed at the large range for the AU...so they waited and made plans for the 1769 event so that perhaps they could close the gap a bit.

One of the most well known 1769 teams was that lead by a young lieutenant named James Cook, aka, Capt Cook of HMS Endeavour fame. And by-products of his very successful observing trip to Tahiti was a cure for the killer of long voyage sailors, scurvy, and the discovery of the lost southern continent, Australia. The cure for scurvy turned out to be sauerkraut...it provided the vitamins of fresh fruit and vegetables and could ne stored for long periods of time on board ship.

One of the tasks that every observing team had to master was establishing their location, ie, latitude and longitude. The former was fairly easily determined from observing stars with a quadrant or sextant. But establishing longitude was a very complicated and tedious process that involved observing the moons of Jupiter or our own moon. Later, a "sea chronometer"...a clock that would work at sea would replace the observation method...and of course today GPS trumps all other methods. Several teams collected substantially more reliable data than in 1761; and after several years of compiling and computing, the distance from Earth to the Sun was established at 93.7 million miles. Some of the stories of the individual teams are fascinating. Remember this was still a time of inquisitions, slavery, colonization, conquering of indigenous peoples, wood sailing ships, disease, and superstition...the Church still burned witches in 1769. Each team had a different set of circumstances to manage. The logbooks provide 20/20 insight into late 1700's society.

By the time of the next pair of transits, 1874 and 1882, the Revolutionary War, War of 1812, Civil War, and the Indian wars were fought and won...even Custer had made his last stand in 1876. Railroads and telegraphs had made the world smaller. And entirely new countries participated...the USA and Australia specifically. Photography had been introduced in the 1850's and perfected on the Civil War battlefields and the documentation of the disappearance of the western frontier. Europe, especially France, had made great strides in producing better and longer lasting images.

So, with new nations, new instruments, new communication means, and new means of travel the world set out to observe and record, photographically, the Transits of Venus in 1874 & 1882. And again, each team had interesting sets of

(More Tov on page 6)

Trades, Technology and Second Guessing...

Don Surles

Several years ago...before Delmarva Star Gazers and an abundance of telescopes made their trek to my garage...I made a couple of trades with folks I met via The Starry Messenger (for info, The Starry Messenger was the pre-internet monthly paper version of Astromart and CloudyNights).

The first item I traded for was a set of WWII German artillery binos, aka, Mule Ear binos. I think I traded a 6" Edmund reflector telescope for the artillery bino. They were "all there" but certainly left plenty of room for optical quality...and as "they" say, the bino was a "collectible". Soon, the "new" wore off that mule ear bino.

Then one weekend a friend and I attended a "scientific instrument" show in DC and I took the mule ear bino along to see if someone was interested. Sure enough I found a person who was willing, and eager, to trade a 15X80 WWII Japanese battleship bino for my German mule ear artillery bino. And we traded.

That old battleship bino was built like a battleship; it must have weighed 35 pounds with the mount. It was made by the pre curser of Nikon...Nikko Kogaku...and after a while the new wore off it too.

About that time the author of a book on WWII German optics entitled "Eyes of the Wehrmacht" contacted me with an offer to buy my battleship bino. I had learned that Japanese battleship binos are very scarce for two reasons...first, there just weren't that many Japanese battleships and second, most of them were sunk with the binos attached. So, when the person offered $2500 for that monstrosity that had taken root in our dining room I knew we could make a deal. He and I decided that a Hasselblad "Man on the Moon" commemorative medium format camera with 80MM Zeiss lens and a Nikon F3HP camera with 24mm, 35mm, 50mm, 80mm, 100mm and a 500mm mirror lenses would be a better deal for both of us. I had ALWAYS wanted a Hassy and to have the motorized version just like the one Buzz Aldrin had used on the moon was a deal sweetener. Beside that, the Nikon F3HP was a nice state of the art professional camera and those Nikkor lenses were the best 35mm SLR lenses available. This was around 1995. Notice I said the Nikkors were the "best 35mm SLR lenses available"...the best 35mm rangefinder lenses are made by Leica...and that's another story.

Just as time and the inevitable march of technology rendered the mule ear and battleship binos obsolete, the Hassy medium format and Nikon 35mm camera gear that was once worth around six or seven thousand dollars have also become obsolete with the perfection of today's digital film-less cameras we enjoy.

The only problem with my Hassy and Nikon cameras is that they are more plentiful than the WWII bino relics and their abundance has made them very inexpensive "collectibles". Oh, I should tell you that the motorized Hassy used a rechargeable 6VDC battery...a replacement was around $100.00...and there was two battery compartments! Technology and tinkering has rendered the $100.00 battery obsolete...today we use a 9vdc in one of the battery compartments attached to a dummy battery with terminals (35mm film cannister) in the other compartment.

Fast forward to this past weekend and our Delmarva Star Gaze Star Party...I made another trade with a dubious future. I can't believe it but I actually traded a 10" Celestron dob telescope for a rock. That's right...a ROCK! The rock happens to be a Campo Del Cielo iron/nickel 20 pound meteorite. I rationalized I have more telescopes than 20 pound meteorites...and I hope the meteorite is a bit less ubiquitous than Celestron dobs. Time will tell...but I don't think technology should play a factor in the future value of either.

Since Argentina has banned the export of Campo meteorites...do you suppose one could corner the market on those already "exported" to the rest of the world and drive prices up for existing Campos in the USA?

Does anyone know what one should do with a 20 pound iron/nickel rock?

(More ToV from page 4)

events to master. The teams in Japan and China and Australia provide great insight into those societies.

Then in 2004, we, the current ToV Observers, were treated to some celestial geometry on June 8. That black dot made its way across the Sun's surface just as it had done for our ancestors. Needless to say every observer has his own story of the observation of Venus marching across the surface of the Sun.

Remember, neither you, your children, or grandchildren will be alive when the next ToV occurs in 2117...so we have something in common with our ancestors of the 1760's and 1880's...we are alive at the time of the ToV.

We will again have the opportunity to see the black dot move across the Sun on June 5, 2012, 6:00PM until sunset. Where will you be? I will be at Woodland Beach...

Venus Transit 2004

Kent Blackwell

I hope everyone gets to see the Venus transit June 5, 2012. You'll have to live another 111 years or so for another opportunity.

I don't know how many of you saw the June, 2004 transit visible at sunrise from the East Coast but it was quite beautiful. I had a trip planned to Europe for that one but a snag in my passport STOPPED me in my tracks, literally, at the Norfolk Airport!

All was not lost. Although it was cloudy and foggy that early morning I managed to see it in a bit of clearing (with fog) on the Virginia Beach boardwalk. Here's the picture I shot through my 20x120 Big Eyes binoculars.

(Prez from page 1)

tion. It is known by its brightest star Spica (from the mnemonic Arc to Arcturus, Spike to Spica referencing the curve of the Big Dipper's handle). Its other bright star is Porrima. The constellation is home to the Virgo Cluster of galaxies, which our Local Group is a participant. and is part of the Virgo Supercluster which has upwards of 1,300 galaxies including **M49** (elliptical), **M58** (spiral), **M59** (elliptical), **M60** (elliptical), **M61** (spiral), **M84** (lenticular) , 86(lenticular), 87 (elliptical & radio source), 89 (elliptical), and **M90** (spiral). **NGC 4639** is a face-on barred spiral galaxy. Also contains the optically brightest quasar **3C 273** at magnitude 12.9.

Cal Estrada presentation on Astrophotography as Michael Lecuyer stated in his minutes was largely visual and quite engrossing. Cal's pictures were very beautiful and the technical information presented was incorporated into photographs. He said that he would be back for a future presentation on the processing program and some of the more technical aspects of staking his 90 sec exposures. For those interested in astrophotography, if you were not at the meeting you missed a good one!

Heliometer is an instrument originally designed for measuring the variation of the sun's diameter at different seasons of the year, but applied now to the modern form of the instrument which is capable of much wider use.

The basic concept is to introduce a split element into a telescope's optical path so as to produce a double image. If one element is moved using a screw micrometer, precise angle measurements can be made. The simplest arrangement is to split the object lens in half; with one half fixed and the other attached to the micrometer screw and slid along the cut diameter. To measure the diameter of the sun, for example, the micrometer is adjusted so that the two images of the solar disk just touch each other. Similarly, a precise measurement of the apparent separation between two nearby stars, A and B, is made by adjusting the double image so that A in one image touches B in the other.

The **transit telescope** is an instrument for observing the time of stars passing the meridian, at the same time measuring its angular distance from the zenith. The idea of having an instrument (quadrant) fixed in the plane of the meridian occurred even to the ancient astronomers and is mentioned by Ptolemy, but it was not carried into practice until Tycho Brahe constructed a large meridian quadrant.

They are a special purpose telescope mounted so as to allow it to be pointed only at objects in the sky crossing the local meridian, an event known as a transit. These telescopes rely on the rotation of the Earth to bring objects into their field of view and are fixed on a east-west axis.

Gleaned from

HISTORY OF ASTRONOMY BY GEORGE FORBES, M.A., F.R.S., M. INST. C. E., 1909

On March 13th, 1781, Sir William Herschel was, as usual, engaged on examining some small stars, and, noticing that one of them appeared to be larger than the fixed stars, suspected that it might be a comet. To test this he increased his magnifying power from 227 to 460 and 932, finding that, unlike the fixed stars near it, its definition was impaired and its size increased. This convinced him that the object was a comet, and he was not surprised to find on succeeding nights that the position was changed, the motion being in the ecliptic. He gave the observations of five weeks to the Royal Society without a suspicion that the object was a new planet.

For a long time people could not compute a satisfactory orbit for the supposed comet, because it seemed to be near the perihelion, and no comet had ever been observed with a perihelion distance from the sun greater than four times the earth's distance. Lexell was the first to suspect that this was a new planet eighteen times as far from the sun as the earth is. In January, 1783, Laplace published the elliptic elements. The discoverer of a planet has a right to name it, so Herschel called it Georgium Sidus, after the king. But Lalande urged the adoption of the name Herschel. Bode suggested Uranus, and this was adopted. The new planet was found to rank in size next to Jupiter and Saturn, being 4.3 times the diameter of the earth.

In 1787 Herschel discovered two satellites, both revolving in nearly the same plane, inclined 80° to the ecliptic, and the motion of both was retrograde.

In 1772, before Herschel's discovery, Bode had discovered a curious arbitrary law of planetary distances. Opposite each planet's name write the figure 4; and, in succession, add the numbers 0, 3, 6, 12, 24, 48, 96, *etc*., to the 4, always doubling the last numbers. You then get the planetary distances.

Mercury,	dist.--	4	4	+	0	=	4
Venus	"	7	4	+	3	=	7
Earth	"	10	4	+	6	=	10
Mars	"	15	4	+	12	=	16
--			4	+	24	=	28
Jupiter	dist.	52	4	+	48	=	52
Saturn	"	95	4	+	96	=	100
(Uranus)	"	192	4	+	192	=	196
--			4	+	384	=	388

All the five planets, and the earth, fitted this rule, except that there was a blank between Mars and Jupiter. When Uranus was discovered, also fitting the rule, the conclusion was irresistible that there is probably a planet between Mars and Jupiter. An association of twenty-four astronomers was now formed in Germany to search for the planet. Almost immediately afterwards the planet was discovered, not by any member of the association, but by Piazzi, when engaged upon his great catalogue of stars. On January 1st, 1801, he observed a star which had changed its place the next night. Its motion was retrograde till January 11th, direct after the 13th. Piazzi fell ill before he had enough observations for computing the orbit with certainty, and the planet disappeared in the sun's rays. Gauss published an approximate ephemeris of probable positions when the planet should emerge from the sun's light. There was an exciting hunt, and on December 31st (the day before its birthday) De Zach captured the truant, and Piazzi christened it Ceres.

The mean distance from the sun was found to be 2.767, agreeing with the 2.8 given by Bode's law. Its orbit was found to be inclined over 10° to the ecliptic, and its diameter was only 161 miles.

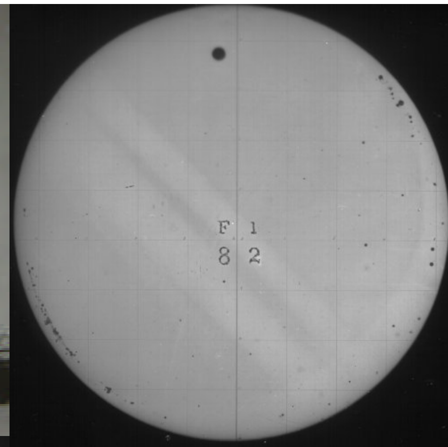
On March 28th, 1802, Olbers discovered a new seventh magnitude star, which turned out to be a planet resembling Ceres. It was called Pallas. Gauss found its orbit to be inclined 35° to the ecliptic, and to cut the orbit of Ceres; whence Olbers considered that these might be fragments of a broken-up planet. He then commenced a search for other fragments. In 1804 Harding discovered Juno, and in 1807 Olbers found Vesta. The next one was not discovered until 1845, from which date asteroids, or minor planets (as these small planets are called), have been found almost every year. They now number about 700.

Astrophotos by Members and Friends

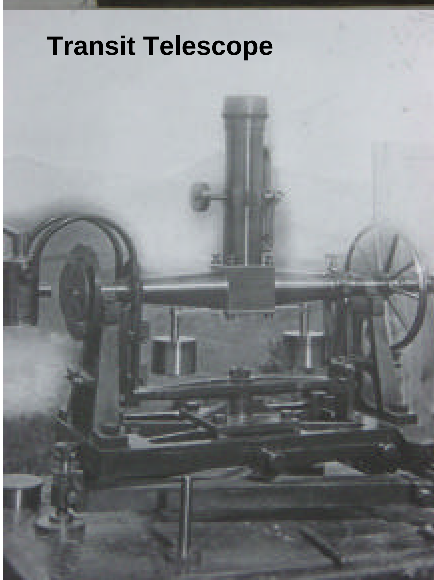
The 1882 USNO Expedition to Observe the Transit of Venus

See pg. 6 for descriptions of the instruments

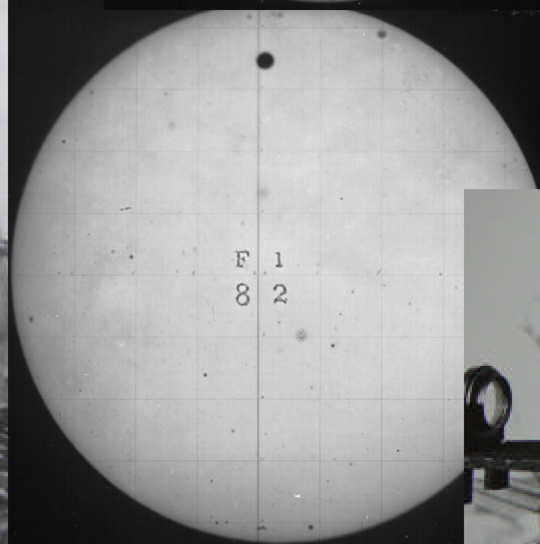
Standard transportation of the time

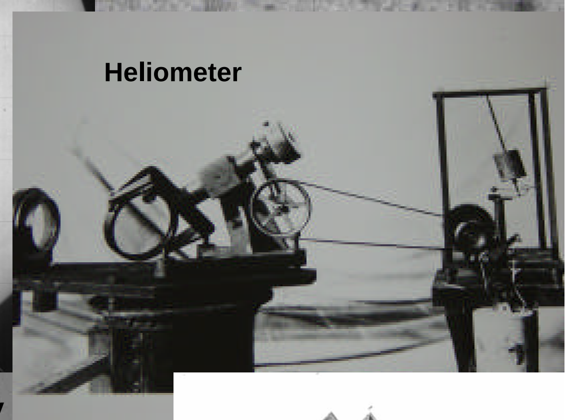


Don—The early Years

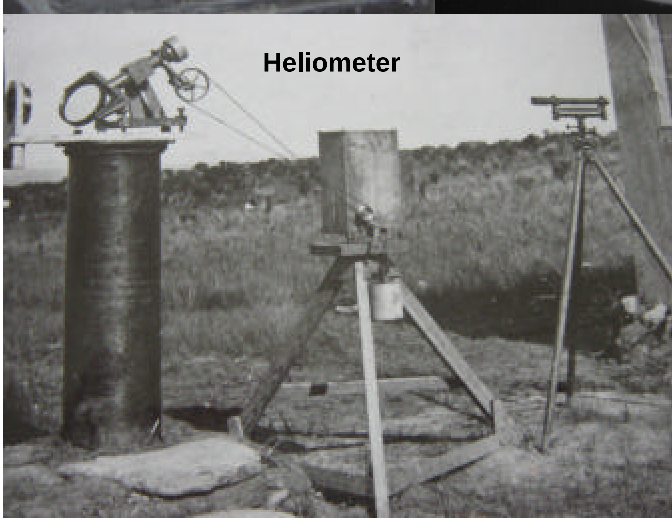


Transit Telescope

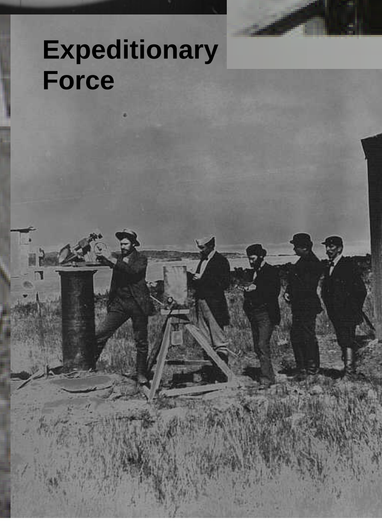




Heliometer



Heliometer



Expeditionary Force

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

NAME____New (y/n)____Renew (y/n)______

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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 Lyle Jones at 302-736-9842 for more information.