

March 2, 2010

Delmarva Stargazers Meeting –14 people present

Discussion of FASTC we feel it's a done deal with the hearings just for show. And it'll be a lot worse than claimed.

Talk of snowstorms past.

Lyle explained how driving 850 miles on bad roads is a very good way to remove soil from potted plants.

Started at 7PM

- MM10 is coming up next week on Friday 8AM
Jerry, Don, Michael. 10 or 11 people signed up 6" 16"
17.5 couple of 10's.

There will be an attempt Document mirror making start up. Just for fun.

- Solar Scope – will be purchased since the sun is growing more active. A huge CME was ejected on the far side of the sun that was caught by SOHO. The scope is a H-alpha.
- A club Paypal account is being considered for purchasing and selling club equipment and perhaps for collecting registrations.

- An online event management system will be used for the fall No Frills star party.
- We should get email addresses and send email reminders in addition to the postal mailing reminders.
- Joe Cain reported we have \$300 in pre-registration for the Star Gaze XVI Star Party.

- Stargazer Web Site: Jerry Truitt & Keith Lohmeir noted we're running out of space with our current web hosting company. Godaddy.com was picked and that's where the site is now. The move went smoothly and people have reported faster response from the site.

- New meeting room: We will be moving from the Mallard lodge for regular meetings to the new Christiana Care Center in Smyrna. It's located across from the Library 100 S Street. Modern, bright, twice the size of the Mallard lodge meeting room it offers a podium, sound system, Internet access, audience microphones and dual projectors. The old church we used to use before moving to the Mallard Lodge is not finished nor is it friendly any more – instead of welcoming back they're throwing obstacles in our way. The general feeling is that attendance will pick up if we move back to the city from the swamp.

We will get message out when we will change venues and the soonest would be in May to give the Mallard Lodge some notice.

Meetings can be held all year without a summer break. Both the Church and the Lodge use it for their own programs in July and August. The Christian Care building will not be using it in the evenings when we meet.

- Elections coming up with President-Elect and Secretary. Need nominations at the next meeting in April. The elections will be held at the June meeting.
- Upcoming presentations: Tim will do Filters, and Telescope Mounts, including the Sphinx, Losmandy, and others.
- Messier marathon – should have been earlier in the month (Ed. although the best time according <http://seds.org/Messier/xtra/marathon/marathon.html> might be the last week in March to early May for our latitude.) ‘The Reflector’ had an article on navigating through Virgo. There is a break that moves around a bit but it’s about 1AM.

Michael Borgia – presentation on ‘A brief history of the Telescope’.

- History of the telescope – we just passed the 400th year anniversary of the invention of the telescope by Galileo who found Saturn had ears, and Jupiter had orbiting companions and the Sun had spots. The inquisition was not too happy in particular Cardinal

Bellarmino. The Catholic Church finally absolved Galileo was finally absolved in 1984, 350 years later.

- The exhibit at the Franklin Institute in Philadelphia had one of the telescopes on display in 2009. It was a refractor (well stopped down from its lens size. We could look through it, but it was pointed at the ceiling).
- The modern refractor is rugged, nothing to maintain, but it has a lot of problems. Can't be made very large because the glass gets heavy and it's difficult to make (at least 4 optical surfaces). There is chromatic aberration. (Colors around bright objects). Fluorite is used to get around this problem to some degree. 5" and 6" are the maximum available commercially.
- Sir Isaac Newton developed the reflecting telescope. The first such telescope was 30mm in diameter (1 1/2").
- Reflectors are light because they are shorter. Mirrors don't have to be made of glass and started out as metal. (NASA uses stainless steel for some IR applications) Lighter implies larger. Commercial ones can be made as large as 20". Cons: must be maintained – collimation changes with temperature and vibration. They too suffer from an aberration – spherical aberration. The symptom is called coma in which stars appear as comets off the central optical axis. There are usually two mirrors involved. The bigger the mirror the bigger the problem.

- Large Dobsonians are very tall and require ladders to reach the eyepiece.
- A French priest Laurent Cassegrain, found a way to get around most of the spherical aberration problem. The reasoning behind the Cassegrain telescope is that the secondary blocks out the area where the mirror hole can be placed. The Hale telescope can be used at two different positions –Prime focus and the Cassegrain focus. The competing 6m telescope in Russia was larger but the mirror is so poor that no real research resulted.
- There are limits on how big a single mirror can be cast or they crack. Multiple Mirror Telescopes solved the problem. The complexity of building a MMT spurred spin casting mirrors, which solved the problems of weight and work grinding. The spinning of the mirror made it thinner and properly curved.
- As they got bigger they were placed up higher on mountains. Mauna Kea is probably one of the highest places. The Hawaiian earthquake of magnitude 6.7 in 2006 caused minor damage to some of the scopes.
- Although the Hubble Space Telescope's (HST) isn't the largest telescope its in orbit at 353 miles (569 k).
- An aside: The recent earthquake in Chile (mag 8.8) sped the Earth's rotation up a bit (~1.26

microseconds) and it shifted the Earth's axis a small amount. (Ed. The tsunami earthquake of 2004 shortened the day by 6.8 microseconds)

- Comatic aberration is a problem that plagues telescope designs, some more than others. This is a form of aberration caused by the shape of the optics creating a curved field. The Ritchey-Chrétien (RC) design uses hyperbolic mirror surfaces to reduce the aberration. Newtonian telescopes use a parabolic shape. Figuring the hyperbolic shape on a mirror is quite difficult compared to figuring a parabolic or spherical shape.
- The HST's design is RC. While the mirror in space is incorrectly figured the one preserved in the Smithsonian is well figured.
- Why not make the RC design for amateurs? Small companies are building them but the cost is very high.
- The most popular design has been the Schmidt-Cassegrain Telescope (SCT) design with the same aberrations as the Newtonian but uses a thin corrector plate to reduce them. The corrector plate introduces a very small amount of chromatic aberration.
- The Schmidt telescope uses a very fast $f/1.5$ mirror and compensates for coma with a curved film/ccd plate.

- Even small CCD's (Charge Coupled Devices) need 'flat frames' as a reference to compensate for the uneven light falling on the CCD. (Often photographers only work with 'dark' frames to compensate for hot pixels and the glow of the electronics).
- The Celestron and Meade companies are not friends. Meade attempted to buy Celestron but that was cause for anti-trust litigation.
- Meade and Celestron introduced an RC-like design and sold them as RCX400/ LX200R respectively. This resulted in two lawsuits. Meade itself was sued over the false claims that it was producing the RC design.

The other involved Star Instruments and RC Optical Systems suing the Anacortes Telescope and Wild Bird, Inc. and other distributors of the telescopes for false advertising. Anacortes settled but the other distributors represented by Meade's legal department continued to defend themselves uselessly.

- Over the years Celestron and Meade have been involved in litigation each with wins, losses, and draws.
- Improvements in the SCT's have resulted in coma virtually disappearing from those telescopes.

- Other improvements – electronic collimation – the factory collimates the telescopes and saves the settings. In the field collimation may either be performed automatically or by the hand controller or if all attempts to collimate fail the factory default can be restored.
- SCT's primary mirrors are moved when focussing. This results in 'mirror flop' where the mirror is moved out of alignment while focussing. This has been pretty much eliminated by both companies by tightening tolerance. It was remarked that the early telescopes could be focussed with a light touch and now requires a fair bit of torque.
- GoTo alignment was introduced by both companies and again they were in court. It turned out that Celestron had really designed their version independently of Meade so the case was settled in Celestron's favor.
- In general Meade is ahead of Celestron mechanically but Celestron leads the way in optics.
- Astrotech's new RC astrographs have secondaries that use up to $\frac{1}{2}$ the primary mirror's size and are only useful for photography.

- Michael Borgia also pointed out a law of telescopes – for every inch larger your new telescope is there will be 2½ days of bad weather.

Don Surles Presentation - The Constellation of Cancer

- The constellation is found between Leo and Gemini.
- There is a glowing patch known as M44 or Praesepe, or the Beehive and even the Gate of Men.
- Jerry Truitt taught how averted vision works by using M44. People would look at it (not see it) and then look a bit away and it would pop right out.
- Zodiacal constellation – the name translates to ‘The Crab’. Its small and contains faint stars.
- 55 Cancri is a binary (yellow and red) that hosts a quintuple planetary system. The Titius–Bode law holds for the planets in the system. (Ed. The exponential power law for the Sun’s planet spacing predicted the positions of Ceres and Uranus but failed to predict Neptune’s orbit and Pluto’s predicted orbit was quite wrong – it has since been discredited)
There are four ‘hot’ planets and one large gas giant. The TB law predicts a planet in earth’s position but none has been found so far.

- The M 67 open cluster is much denser than M44.
- The ‘brightest’ stars have peculiar names: Acuben – the claws, Al Tarf – the end, Asellus Borealis – northern donkey, Asellus Australis – southern donkey, Tegmine – skin, Kwan Kei (Chinese), Kwan Kei - bright fire, and Nahn is Persian for nose. The cluster, Praesepe, means manger.
- The crab had a minor role in the 12 labors of Hercules – while fighting the Hydra the crab was sent to distract Hercules. Unfortunately the little fella’ was squashed and barely noticed.

Don Surles – presentation on Super Wide Eyepieces

- *Al Nagler’s "Majesty Factor" Summary:*

To illustrate the dramatic effect of combining a larger apparent field (yielding greater deep sky details) with smaller exit pupils (yielding fainter stars with darker sky background) we propose the "Majesty Factor". We define it simply as the cube of the ratio of any two different apparent field eyepieces having the same field stop diameters (same true field). Examples:

$$(100^\circ/70^\circ)^3 = 2.92 \text{ "M.F."} \quad \text{or} \quad (70^\circ/50^\circ)^3 = 2.74 \text{ "M.F."} \quad \text{or} \quad (100^\circ/50^\circ)^3 = 8 \text{ "M.F."}$$

Perhaps a marketing ploy, perhaps homespun truth.

Find a SWEP (Super Wide Eyepiece) owner and make friends with one and take a peek. If you like it buy one. You will spend more time looking at the bottom side of a casket lid than looking through your SWEP.

Super Wide EP's vary a lot in quality with Televue being about the best. Buy what you can afford.

(Ed. This is a bit incomplete because my laptop overheated and I was running out note-taking paper).

Meeting ended.