Smoky Mountain Astronomical Society

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S.C.R.A.P.S.

Society's **C**h**R**onological **A**stronomical **P**aper**S**

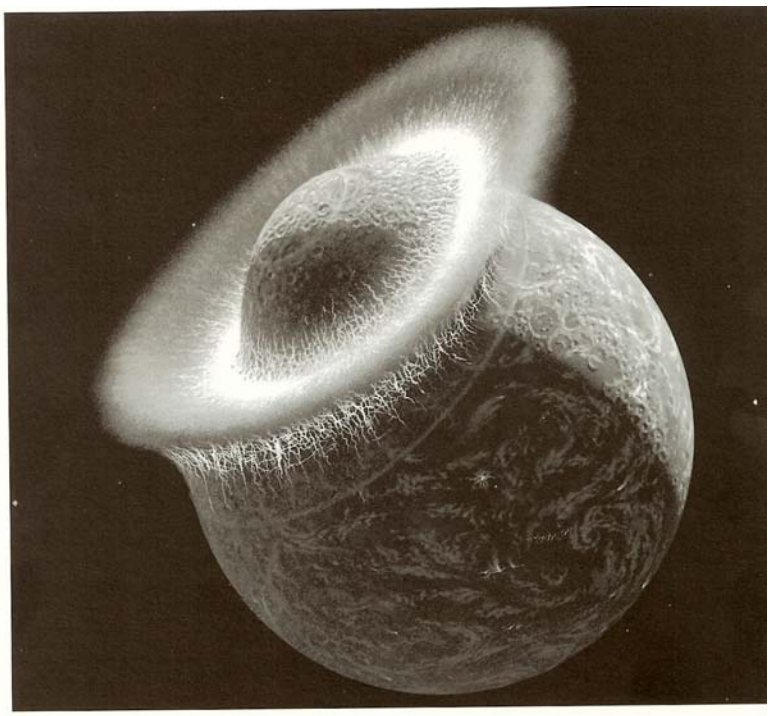
Sept. 9th SMAS MEETING

PSTCC, Main Campus,
Hardin Valley Road
7 pm, Alexander Bldg, Room 223

From The President—Mike Littleton

The Most Interesting ½ Degree in the Sky

About 4.5 billion years ago, a Mars-sized body had collided with the proto-earth. This gigantic impact blasted debris from both bodies forming a ring of material orbiting the Earth. Some of the material in the ring aggregated to form the Moon. There is compelling evidence to support this theory of lunar formation. The Earth has a large iron core, but the Moon does not. When the collision occurred, most of the Earth's iron had sunk forming the core and making it unavailable to release in the impact. Moon rocks have the same isotopic oxygen content *(1)* as rocks from the Earth. Meteorites from Mars and other parts of the Solar System have different isotopic oxygen composition. Computer simulations support the theory. Finally, the oldest lunar rocks brought back by the Apollo Astronauts have ages of about 4.4 billion years.



Don Davis's dramatic painting illustrates the collision of a giant projectile with the early Earth. Ejecta from both bodies later accreted to form the Moon.

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Surface Features: *Maria* are the darker and smoother areas on the Moon. Maria comprise 17% of the Moon's surface. Maria are formed when giant impact basins were flooded with lava from the Moon's deep interior 3 to 4 billion years ago. Maria is Latin for seas and some are called *Sinus* (bays), *Lacus* (lakes), *Palus* (marsh) or *Oceanus* (oceans). Maria are the most prominent feature to the naked eye responsible for the "Man in the Moon" (right courtesy of the Astronomy League's Lunar Club). The eyes and mouth are Mare Imbrium (Sea of Rains) and Mare Serenitatis (Sea of Serenity), and Mare Nubium (Sea of Clouds), respectively. Because of the Mare's relative smooth terrain, the first lunar landing, Apollo 11, landed in the Mare Tranquillitatis (Sea of Tranquility).

http://www.astroleague.org/al/obsclubs/lunar/lunar3.html

The brighter parts of the lunar surface are the *highlands,* which comprise 83% of the surface. The highlands are higher and rougher than the maria. The material comprising the highlands is old. Samples brought back from the highlands are more than 4 billion years old. Both maria and highlands are covered with *craters* from as large as 1000 km in diameter down to microscopic pits in rock samples. Most craters were formed early in the history of the Moon. For craters more than about 100 km in diameter, impact heat was sufficient to create lava flooding of the impact area. Prominent in the south is Crater Tycho, which has a diameter of 84 km. Radiating outward from the crater is a series of bright streaks called *rays*, which are visible during the full Moon. Rays are material ejected during the impact that formed the crater.

The well-defined elongate valleys are the *rilles*. Rilles are formed from swiftly moving lava flows or the collapse of roofs of underground lava flows. Earth has similar features on the sea floor around the Hawaiian Islands. Apollo 15 landed near Hadley Rill at the north end of the *Montes Apenninus* (Appennies Mountains).

Lunar Landing Sites

Apollo 11: Southwestern extreme of Mare Tranquilitatis
Apollo 12:Northern extreme of Mare Cognitum
Apollo 14: North of Crater Fra Mauro
Apollo 15: Northern extreme of Montes Apenninus
Apollo 16: Between Craters Theophilus and Hipparchus]
Apollo 17: Southern extreme of Montes Taurus

Next night with Moon bright, try finding the lunar landing sites. It is a great way to learn the lunar features. There is an excellent lunar map, at the website, http://www.oarval.org/MoonMapen.htm. Also at the website is a high-resolution lunar map for PCs and a version for Palm handheld computers. Another resource is the Astronomy League's Lunar Club at the web address below the Man in the Moon drawing.

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(1) Isotopic oxygen content: The ratio of the different isotopes of oxygen. Isotopes of a particular element have the same number of protons, but different number of neutrons in their nuclei.

Sasquatch Progress Report – August 27—Bob Arr

Here's a rundown on Sas's major components, some of which are actually beginning to look like they are supposed to look:

The secondary cage rings and posts are cut and assembled, but the spider is still being fabricated by Brent Holt. Staining is complete, but varnishing continues. In all, there are 2 layers of prestain, then 1 layer of actual stain. Finally, 5 layers of polyurethane varnish. All require at least a day of drying.

The mirror box is assembled, glued and stained, and being varnished just like the secondary cage. The mirror box has all its connectors for the truss poles, altitude bearings and mirror cell installed. The altitude bearings and mirror cell have been tested in place, and fit properly (phew!) The inside of the mirror box will eventually be painted black, but not until the outside is fully cured.

The altitude bearings have traditional cut outs (only window dressing, but Hey! We're going first class, right?) The bearings required several screws to hold them tightly together while they were being laminated (each bearing is a 1.5" plywood sandwich). The screws have been removed, and the screw holes are now being filled. Once the filler is dry, the bearings will be ready for painting black.

Joe Baldwin has delivered the brand-new Astrosystems secondary dew heater that he donated. It is currently at Brent's, as Brent is fabricating the secondary holder to go with the new spider.

The 1.25" aluminum tubing, which Michael McCulloch donated for the truss poles, is in hand. Brent used some to cut the four 12.5 inch tubes that act

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as the struts for the secondary cage.

The rocker box walls and floor are awaiting assembly. All pieces have been cut to their final dimensions, but actual gluing has to wait on the mirror box, because the mirror box is itself the jig for the rocker box.

I'd like to mention something about the finish. I chose a very rich, dark cherry stain. Not to put too fine an edge on it, but I wanted something distinguished and distinctive. In my view, the finish on most large dobs looks hopelessly alike, and I felt Sasquatch represents a unique testimony, both as a 25-year tradition, and as a current effort.

I know the finish will get scuffed up, but the more it gets used the better. And 25 years from now, maybe some future SMASers might decide to fix it up again, seeing that the old club really cared.

The Wiz

Dear Wiz,

Here are a couple of power point collections of images. These are really GREAT, and family friendly. Hope you like them as much as I did.

Bill Dittus

Dear Bill,

It is a departure for me to shift the focus of this column from the firmament to terra firma, but today I do so with pleasure. While astronomy opens the door to a usually-hidden aspect of life that is stunning, your PowerPoint presentations do the same for earthly scenes.

I have taken the liberty of loading them onto our website, so that our members may go to www.smokymtnastro.org and click on Scenes of Life on the Home page. There are two presentations, "Fantastic Photographs" and "NASA". (You should get full-screen pictures. If the program displays Thumbnails instead, just press F5. Go forward or backward with the up/down arrows. Allow 5-6 minutes of download time for dial-up.)

Both presentations are celebrations of life to be cherished. Thanks, Bill.

Da Wiz

2005 Picnic Pictures

September Brainteaser—Erik Iverson

Every amateur astronomer has seen, heard, or read something in "popular culture" that makes them stop and say "that's not right...." I had one of those moments while watching the movie "Heartbreakers". It had nothing to do with the plot, but at one point a character shows another character the Crab Nebula. Leaving aside the fact that the "picture" shown was clearly not of the Crab Nebula, the thing that struck me was that the two characters next look at M13, the "Great Globular in Hercules," with only a small motion of the telescope.

So, for this month's brainteaser; is it possible to see M13 and M1 at the same time? Put another way, will both objects be above the horizon at the same time? For the sake of argument, assume that an object is visible if it's above the horizon. Please be ready to explain how you determined the answer to the question, and whether there are any "limitations" on the answer (for example, yes they are visible, but only on two days per year).

Please bring your favorite examples of astronomical "oopses" from popular culture to the next SMAS meeting on September 9th, and we'll share horror stories!

2005-2006 SMAS Officers

Michael Littleton	*President*	Erik Iverson	*Vice President*
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September 2005

SUN	MON	TUE	WED	THU	FRI	SAT
	UTK—roof of Neilson Physics Building on The Hill at UT 1st & 3rd Fridays TAO —Tamke-Allan Observatory Public Stargaze Watts Bar Lake, Roane County 1st & 3rd Saturdays			1 Venus & Jupiter 1-1/4° Apart in the Early Evening	2 UTK	3 **SMAS Star Party Unicoi Crest** *New Moon* **TAO**
4	5	6	7	8	9 **SMAS Meeting PSTCC Rm 223 7 pm**	10 **SMAS Star Party Look Rock #4**
11	12	13	14	15	16 UTK	17 TAO
18 *Full Moon*	19	20	21	22	23	24
25	26	27	28	29	30	