

# CONSTELLATION

The Official Publication of the Bucks-Mont Astronomical Association, Inc

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Scott Petersen, Editor

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## President's View

### It's Cold Out There . . .

- by *Antoine Pharamond*

. . . but before we know it, it'll be warming up and we'll all be out observing again. Our starwatch program begins in March, and you might as well mark your calendars now for all the New Moon weekends from April to October. There's already at least one regional event scheduled on each of those weekends.

Starwatches, ah yes, starwatches. As I've mentioned before, starwatches are the main forum for BMAA's public outreach. They are scheduled in cooperation with local townships, parks and schools. They provide an opportunity for people of all ages to see things they have seldom, if ever, seen. But that's not all, they also provide an opportunity for us BMAA members to share our hobby and perhaps even learn more from each other. My point is, you don't have to be an 'expert' to attend a starwatch. Just come for your own benefit. Over the years, we have found it difficult to draw members in significant numbers to starwatches, and I don't understand why. It's really kind of fun. So we're going to try something a little different this year. We would like as many members as possible to 'commit' to attending one or two starwatches this year. That's just one or two evenings over nine months - so sorry, the 'I am too busy' argument just doesn't fly. Oh, and the kids, just bring them. They're not an excuse, either. Anyway, what I'm saying is you can do it, and you'll probably be glad you did. As an additional incentive, George (our VP and StarWatch Chair) will throw in an extra chance for you in the year-end drawing when you attend a starwatch you had previously committed to. George will have a sign-up sheet at the meetings, or you can let us know by email. The StarWatch Schedule is posted on the BMAA website (*and published in every issue of the CONSTELLATION [-ed]*).

I hope to see a lot of new faces this year at starwatches.

Clear Skies . . .

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- BMAA President Antoine Pharamond can be reached at [pres@bma2.org](mailto:pres@bma2.org). [-ed]

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**BMAA 2004 Calendar of Events link inside on page two**  
**'NASA Space Place' column inside on page three**  
**'Tips' column inside starting on page four**

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**Wednesday, January 7 at 8:00p - BMAA General Meeting at Peace Valley**  
**BMAA Business Meeting for January is cancelled**  
**The next BMAA General Meeting is scheduled for Wednesday, February 4 at 8:00p**

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**BMAA MESSAGELINE - 215/579-9973**  
**email: [info@bma2.org](mailto:info@bma2.org)**  
**website: [www.bma2.org](http://www.bma2.org)**

**Bucks-Mont Astronomical Association, Inc**  
**General Meeting Minutes**  
**Peace Valley Nature Center, Doylestown PA**  
**December 3 , 2003**

(BMAA meeting minutes are available to club members with passcodes)

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**Bucks-Mont Astronomical Association, Inc**  
**General Meeting Minutes**  
**Peace Valley Nature Center, Doylestown PA**  
**January 7, 2004**

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**Submission deadline for articles is the 15th of the month prior to publication.**

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**Bucks-Mont Astronomical Association, Inc**  
**2004 Calendar of Events**

**StarWatch Chairman: George Reagan, 215/741-3701 [StarWatch@bma2.org](mailto:StarWatch@bma2.org)**  
**Information Line - 215/579-9973**

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For directions to any of these sites, visit the BMAA website: <http://www.bma2.org>,  
or contact George Reagan.

Please call the information line at 215/579-9973 before you leave for any event.

# Flying in Formation

- by Patrick L Barry

You can almost see the tabloid headlines now: "Mid-west farmer spies UFO squadron flying in formation!" "First signs of imminent alien invasion," the subtitle will read.

If only this fictional farmer had been keeping up with NASA's Space Place column, he would have known better. The string of white dots moving in formation across the pre-dawn sky were satellites, not alien spaceships.

Beginning next year, a series of challenging, high-precision launches will insert four satellites into orbits with just the right altitude, position, and orbital inclination to follow in lock-step behind NASA's Aqua satellite (launched in May 2002). Scientists have dubbed this squadron of satellites the "A-Train." Along with Aqua, the celestial parade will include Cloudsat, CALIPSO, PARASOL, and Aura.

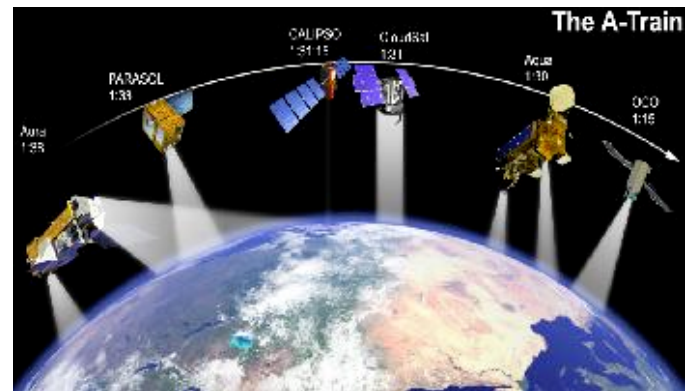
In April 2004, NASA will launch CloudSat, an Earth-observing satellite with unique cloud-measurement abilities. These measurements will fill an important role in our understanding of global climate change, making long-term climate change scenarios more accurate and dependable.

So why bother flying in formation? By passing over the same swath of land within seconds or minutes of each other, the satellites will give scientists snapshots of essentially the same scene using a total of 14 different measuring instruments. CloudSat alone carries only one: a millimeter-wavelength radar sounder.

This sounder—the first of its kind put into orbit—lets scientists see a vertical "slice" of the atmosphere that shows clouds, water, and ice between the ground and 30 km altitude, with a vertical resolution of 0.5 km. Even by itself, this instrument would provide an important and unique view of Earth's atmosphere, since the accurate portrayal of clouds is one of the glaring weaknesses with current simulations of climate change.

But this cloud data is even more valuable when combined with measurements from the other satellites in the A-Train—for example, air temperature, trace gases, and radiation into and out of the atmosphere. Scientists can then see connections between, say, temperature and the resulting behavior of clouds. A better understanding of these connections is one of the most sought-after goals of climate research, because changes to global cloud cover would, in turn, have a feedback effect on global temperatures.

The real story of this satellite squadron may not make the tabloid headlines, but at least there's evidence that the imminent threat of climate change is real, which is a lot more than you can say for alien invaders!



CloudSat, to be launched in November 2004, will take its place as part of the "A-Train" of satellites flying in formation to take closely timed snapshots of essentially the same scene using a total of 14 different measuring instruments.

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Learn more about CloudSat and the A-Train at <http://cloudsat.atmos.colostate.edu/> .

Kids (and grownups) can do interactive cloud picture scrambles and learn "Cloudspeak" (the names of different kinds of clouds) at The Space Place, [http://spaceplace.nasa.gov/cloudsat\\_puz.htm](http://spaceplace.nasa.gov/cloudsat_puz.htm) .

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

## Observing Tips

# Some Lunar Thoughts

- by *Bernie Kosher*

Ach has been busy and remiss in sending in columns for the newsletter. Unfortunately the weather has also conspired to limit observing for us this winter. So I've picked a subject which I enjoy, namely, the Moon.

Around the turn of the 20th century, your average amateur astronomer had a small, professionally made refractor. Reflectors were not nearly as common, although they were coming of age. The process of depositing silver on glass, credited to Leibzig, and the knife edge test, devised by Jean Bernard Foucault, were the impetus of the change to reflectors.

Prior to the mid 1800's, mirrors were made of speculum metal, a brittle alloy of copper and tin. The reflectivity was low and the metal was difficult to produce without strain and a granular surface. Silver on glass was much more reflective, and the glass homogeneous. However, the production of mirrors required a paraboloid on the surface, and was very difficult to produce accurately. Foucault's knife-edge test helped enormously.

However, amateurs were in the dark. Pros kept their methods secret as their income depended on sales and, as always, "knowledge is power". Not until the 1920's did amateurs start making their own, and real boom in amateur observing was on. The point of this short digression? Since the refractors were very expensive, it was rare for an amateur to possess much more than 3 or 4 inches of aperture. Deep sky observing was limited to the brighter of the objects. Messier's catalog was the standard for the faint fuzzies.

As a result, most amateurs spent their time observing the planets, our moon and double stars.

Modern amateurs seem to think the moon is more an annoyance than a target. I find this sad, as the moon is a fascinating sight in the scope and is not at all miserly with it's light.

During the times between trips to dark sky sites, one will find the moon very much a showpiece if time is taken to observe with a fair scope and moderately high powers. Even a 60mm refractor will show much detail and interesting topographic features.

But why observe the moon? You may ask. After all, most of its surface has been mapped to a high degree of resolution not remotely approachable from Earth. The only answer I can make is "Why observe anything in the sky, since you cannot match the HST or ground based monster scopes?" I observe because it's enjoyable, and just to be out under the stars. I do not record observations, or even keep a log book. I won't be contributing to the advancement of science, or discovering new worlds; nor will I become nationally famous. I just like the pretty things in the sky.

Any observing handbook will walk you through the sights to be seen at various stages of the moon's phases. You can learn all the craters, mountains and maria. In the 40 years I've been doing this, I still only know a couple of each.

But I do have some favorites, which I will bore you with.

Be prepared for the same difficulties observing the moon as in any other high-resolution work. The seeing is critical to catching a glimpse of the finest detail. Clean optics and high quality eyepieces help. Naturally, the better the scope's optics the crisper and more contrasty the view will be. Follow the same precautions as in setting up for a night of planetary observing. Avoid houses and such in the line of sight. Avoid your body heat wafting across the open end of the tube. Give yourself time for the eye to become accustomed to the overwhelming brightness.

The early phases of the moon occur very near sunset. (I love stating the obvious). Needless to say, this is not conducive to fine seeing as the low altitude puts the moon in the part of the sky with the worst conditions.

So, when the moon gets to about 5 days old, it's showing a pretty good sized crescent. Just coming into view are some of my favorite lunar features, to wit the rilles (rilles are also called clefts, sometimes called valleys, though that is a stretch, and the sometimes the older term *arima*). Apparently, the rilles are formed by slumping of the surface. During the time of great impacts, the moon's surface was tortured by constant bombardment of rock and iron fragments left over from the solar system's formation. Thus formed the craters. Some areas were overflowed with lava from the interior, which contracted as it cooled, cracking the surface. Further reading on the subject is recommended, as this is not an in depth note on solar system geological history.

Rilles are difficult to see at first, as they are thin and kind of hide out in the mass of other detail. However, once seen they are obvious. The area at this time of the lunar month features the fantastic rille system running along and through the craters Hyginus, Triesnecker and Ariadeus. No, Virginia, I won't tell you where they are, I will say that they are much easier to see when the illumination is at a sharp angle, that is, when the target is near the terminator. The terminator is the line of demarcation between the light and dark side. Since these rilles are narrow, a low sun angle will show them as being filled with shadow and the surroundings bright, increasing the contrast. Under a high sun the rilles appear as bright lines.

- continued, next page -

- Tips, continued -

Also coming into view are numerous domes'. Small swellings which are very low contrast and really only visible when the sun angle is very low.

So a few days later, just after the half phase, the area of Plato comes into view. This crater itself is one of the darkest places on the moon, said to be due to the contrast, but also the floor may be intrinsically darker. The floor of Plato is peppered with craterlets. If you are able to see any of these, drop me a line. The Alpine Valley is near Plato, and is interesting in itself.

On the other side, the south, is the wonderful Straight Wall, called also Rupes Rectus, but we won't go there. Adjacent to the wall is a small crater (Birt) with a fairly straight rille running parallel to the Straight Wall. Once again, if you see it let me know.

While cruising around, check out the giant crater, just south of the area, with its wealth of detail on the floor and in it's walls. Figure out which one and let me know.

Not far from the center is Aristoteles with terraced walls and a fantastic spray of radiating craterlets.

When the moon is about 2/3 full, check out the environs of Gassendi, and to the north is the Cobra Head, part of Shroter's valley, an area famous, or perhaps infamous for TLP's (transient lunar phenomena) including reports of blurring and glittering points due to volcanic activity, and red glows. Decide for yourself if these are real.

When the moon is just short of full, find Wargentín, a crater filled to the brim with lava from an ancient flow. I suppose you noticed I followed no real sequence, and did not describe locations in detail. I'll leave that up to you.

Let me know if you try, and if you enjoyed the trip.

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- BMAA member Bernie Kosher provides the monthly 'Tips' column. He can be reached at [tips@bma2.org](mailto:tips@bma2.org). [-ed]

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**Bucks-Mont Astronomical Association, Inc**  
**Membership Application**

- photocopy as needed -

Name and address

Renewal

New Member

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Renewal Dues are \$25.00 /year and are due starting in November

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Dues for new members are:

\_\_\_\_\_

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March	\$21.00
April	\$19.00
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BMAA Website <http://www.bma2.org>

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