# Pegasus
# The BCAAS Newsletter

**Berks County Amateur Astronomical Society**

## President's Message

The calendar says spring is here, so warm weather can't be far behind. It's time to brush off the cobwebs and gear up for another season of public star watches. Most of our regular events have been scheduled and are in the process of being added to our new website. Our first event is on April 17, 7:30 pm, at Nolde Forest. Dave Brown is going to give a talk, and if weather permits we will be observing afterward. I want to remind everyone (particularly new members) that these public events are for you as well. Feel free to join us – we don't require you to have a telescope or give a talk – and have some fun! I also plan on scheduling some club star watches as well.

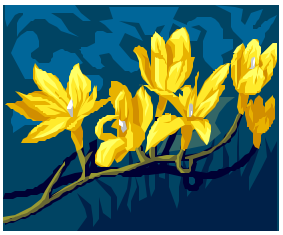
Speaking of the new website, have you checked it out yet? Dan Brown has done a terrific job of getting it up and running, although we still have some tweaks to make. If you have any suggestions for things you'd like to see on the website, please let us know. I also want to thank Mike Bashore for all of the work he did on the old website, and his continuing input on the new one.

The International Year of Astronomy is well under way. The Franklin Institute in Philadelphia will become host of the world exclusive exhibition "Galileo, the Medici and The Age of Astronomy," on April 4 thru September 7, 2009. The one-time only special exhibition features one of only two existing, original Galileo telescopes that will leave Italy for the first and only time. The exhibit will chronicle Galileo's work during the age of the Medicis, his impact on science, art and politics and show how he changed the world, forever – one discovery at a time. If anyone is interested in going, maybe we can plan a club trip.

If you haven't attended a meeting recently, please try to drop in. We have started a new 15 minute segment as a beginner/refresher course. We are currently reviewing the history of astronomy. Barry Shupp is working on getting a speaker from the Space Telescope Science Institute for May.

We have a terrific speaker lined up for our joint program with the Museum in July. Dr. Lucy McFadden, from the University of Maryland, is a planetary scientist studying the formation of the solar system and has been the Education and Public Outreach Director for NASA missions: EPOXI, Deep Impact, and Dawn. She will talk about her recent meteorite hunting expedition to Antarctica, and how it relates to the Dawn Mission to Vesta and Ceres.

I look forward to seeing you soon!
Barb Geigle



**Spring 2009**

**Volume 35, Issue 2**

### Inside this issue:

# Apollo Upgrade from NASA Space Place

The flight computer onboard the Lunar Excursion Module, which landed on the Moon during the Apollo program, had a whopping 4 kilobytes of RAM and a 74-kilobyte "hard drive." In places, the craft's outer skin was as thin as two sheets of aluminum foil.

It worked well enough for Apollo. Back then, astronauts needed to stay on the Moon for only a few days at a time. But when NASA once again sends people to the Moon starting around 2020, the plan will be much more ambitious—and the hardware is going to need a major upgrade.

"Doing all the things we want to do using systems from Apollo would be very risky and perhaps not even possible," says Frank Peri, director of NASA's Exploration Technology Development Program.

So the program is designing new, more capable hardware and software to meet the demands of NASA's plan to return humans to the moon. Instead of staying for just a few days, astronauts will be living on the Moon's surface for months on end. Protecting astronauts from harsh radiation at the Moon's surface for such a long time will require much better radiation shielding than just a few layers of foil. And rather than relying on food and water brought from Earth and jettisoning urine and other wastes, new life support systems will be needed that can recycle as much water as possible, scrub carbon dioxide from the air without depending on disposable filters, and perhaps grow a steady supply of food—far more than Apollo life-support systems could handle.

Next-generation lunar explorers will perform a much wider variety of scientific research, so they'll need vehicles that can carry them farther across the lunar surface. ETDP is building a new lunar rover that outclasses the Apollo-era moon buggy by carrying two astronauts in a pressurized cabin. "This vehicle is like our SUV for the Moon," Peri says.

The Exploration Technology Development Program is also designing robots to help astronauts maintain their lunar outpost and perform science reconnaissance. Making the robots smart enough to take simple verbal orders from the astronauts and carry out their tasks semi-autonomously requires vastly more powerful computer brains than those on Apollo; four kilobytes of RAM just won't cut it.

The list goes on: New rockets to carry a larger lunar lander, spacesuits that can cope with abrasive moon dust, techniques for converting lunar soil into building materials or breathable oxygen. NASA's ambitions for the Moon have been upgraded. By tapping into 21st century technology, this program will ensure that astronauts have the tools they need to turn those ambitions into reality.

Learn more about the Exploration Technology Development Program at www.nasa.gov/directorates/esmd/aboutesmd/acd/ technology_dev.html. Kids can build their own Moon habitat at spaceplace.nasa.gov/en/kids/exploration/habitat.
*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

*The Chariot Lunar Truck is one idea for a vehicle equal to the lunar terrain. Each of the six wheels pivot in any direction, and two turrets allow the astronauts to rotate 360°.*

# Night Sky Network News Submitted By Barb Geigle

We have received the newest Night Sky Network Tool Kit, "Glass and Mirrors: An Inside Look at Telescopes". I'll have the kit at the May meeting for you to see. It seems to be a great way to demonstrate how optics work.

Included in the new Glass and Mirrors Tool Kit is a special NSN exclusive screening copy of the full documentary "400 Years of the Telescope, which premiers on PBS on April 10. Here is a link to a preview (and more) of what's inside the tool kit:
http://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=368.

The National Optical Astronomy Observatory (NOAO) Galileoscopes are now shipping in late April 2009 and can be ordered at: https://www.galileoscope.org/gs/products. This is a 2 inch refractor that includes a 20mm eyepiece and 2x Barlow for $15 plus $8.95 shipping. It comes in a kit that a child (with adult assistance) can assemble. These are being distributed as part of the International Year of Astronomy.

***Upcoming NSN Teleconferences:***

Mark your calendars for these two exciting upcoming telecons in the Monthly IYA 2009 Series (all beginning at 9 PM Eastern):

Tuesday, April 21st - Our Sun with Dr. Laura Peticolas:
http://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=304

Friday, May 28th - Clusters of Stars with Dr. Steve Stahler:
http://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=305

To log into the Telecon between 8:45 - 9:00pm:

Use the toll-free conference call line: 1-888-455-9236. An operator will answer and:

- You will be asked for the passcode: NIGHT SKY NETWORK
- You will be asked to give your NAME and the CLUB you belong to, and number of people listening with you.

## New On the SciJinks Website!

Find answers to hard questions at the SciJinks Weather Laboratory. Now, students can find answers to tidal mysteries on our web site.

What causes the tides? We might remember that it has something to do with the Moon. But then why do we have two high tides each day if the Moon only rises and sets once? And why don't the tides occur at the same time every day? All is revealed in a new "How & Why" page on the middle-school-level NOAA/NASA SciJinks Weather Laboratory website, http://scijinks.gov. Click on the "How & Why" button.

Other how and why topics are listed at scijinks.gov/weather/howwhy.
Additional weather-related resources for teachers are available at scijinks.gov/en/educators.

# New on Space Place—Podcasts!

***Why is Earth's core so hot?***

***Blistering hot molten rock bursts through weak places in Earth's crust. So what is down there and why is it so hot? Earth's core may seem as mysterious and remote as outer space, but scientists actually have learned a great deal about it. Listen to a scientist explain. Visit http://spaceplace.jpl.nasa.gov/en/educators/podcast/ to subscribe to these Podcasts. Or listen now to this and the previous Podcasts on your computer or read the transcripts.***

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## NASA's LCROSS Mission is asking amateur astronomers for help.

Submitted by Lunar Mark Tillotson

Earth's closest neighbor is holding a secret. In 1999, hints of that secret were revealed in the form of concentrated hydrogen signatures detected in permanently shadowed craters at the lunar poles by NASA's Lunar Prospector. These readings may be an indication of lunar water and could have far-reaching implications as humans expand exploration past low-Earth orbit. The Lunar CRater Observing and Sensing Satellite (LCROSS) mission is seeking a definitive answer.

Mission scientists estimate that the Centaur impact plume may be visible through amateur-class telescopes with apertures as small as 10 to 12 inches. The LCROSS mission will actively solicit images of the impact from the public. These images will provide a valuable addition to the archive of data chronicling the impact and its aftermath. Prior to launch, amateurs are working with the science team in imaging potential impact target areas in order to refine telescope pointing strategies for the impact. To participate in the LCROSS Amateur Observation Campaign, visit the LCROSS_Observation group at the link below:
http://groups.google.com/group/lcross_observation?pli=1

**What is the 365 Days of Astronomy podcast?**

The 365 Days of Astronomy Podcast is a project that will publish one podcast per day, 5 to 10 minutes in duration, for all 365 days of 2009. The podcast will be made available through an RSS feed. The podcast episodes will be written, recorded and produced by people around the world. Each day will have a specific topic or theme based on The 365 Days of Astronomy Calendar, a daily calendar of astronomical events, themes and ideas created by the IYA. .Although all the episodes will have a common intro and outtro that ties into the overall theme, each episode will be completely different.

http://365daysofastronomy.org/

# Today In Astronomy by Lunar Mark Tillotson

## Giovanni Battista Riccioli
### April 17, 1598 - June 25, 1671

Giovanni Battista Riccioli was an Italian astronomer. He was a Jesuit who entered the order in 1614. He was also the first person to measure the rate of acceleration of a freely falling body.

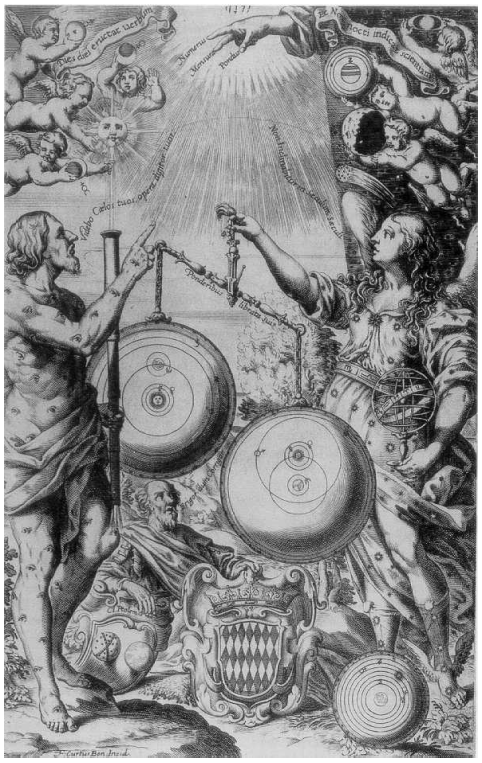
Riccioli was born in Ferrara, Italy. He devoted his career to the study of astronomy, often working with Francesco Maria Grimaldi. He wrote the important work *Almagestum novum* in 1651. By necessity, he opposed the Copernican heliocentric theory though praising its value as a simple hypothesis.

He and Grimaldi extensively studied the Moon, of which Grimaldi drew a map. Much of the nomenclature of lunar features still in use today is due to him and Grimaldi. He also observed Saturn, and was one of the first Europeans to note that Mizar was a double star.

Other books he wrote were: *Geographiae et hydrographiae reformatae libri* (1661), *Astronomia reformata* (1665), *Chronologia reformata* (1669) and *Tabula latitudinum et longitudinum* (published in 1689).

Despite his stated opposition to Copernicus's theory he named the prominent lunar crater Copernicus after him, and other important craters were named after other proponents of the theory Kepler, Galileo and Lansbergius. Craters that he and Grimaldi named after themselves are in the same general vicinity, while some other Jesuit astronomers have craters named after them in a different part of the Moon, near Tycho. This is sometimes considered to be tacit sympathy for Copernican theory, which as a Jesuit he could not publicly express.

Between 1644 and 1656, he was occupied by topographical measurements, working with Grimaldi, determining values for the circumference of Earth and the ratio of water to land. Defects of method, however, gave a less accurate value for degrees of the meridian than Snellius had achieved a few years earlier. Snellius had been mistaken by approximately 4,000 meters; but Riccioli was more than 10,000 meters in error [Hoefer, 1873].



**G.B. Riccioli, Almagestum Novum (1651). The image portrays Urania, the muse of astronomy, weighing up the rival systems of Copernicus, in which the earth moves round the sun, and Riccioli himself, in which the earth remains stationary at the center of the universe. The older system of Ptolemy has already been discarded and lies on the ground alongside.**

l be past BCAAS member Ryan M. Hannahoe from Montana State University's Space Public present a lecture entitled, "Listening to the Universe."

**Berks County Amateur Astronomical Society**

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Hotline: 610-921-0173
Call us for all the latest event details!

Visit us today at www.berksastronomy.org

## 2009 Events Calendar

**Friday, April 17 7:30 pm**
**Talk and star watch at Nolde Forest**

**Sunday, April 19 12 – 5 pm**
**Earth Day at Riverfront Park in Reading**

**Tuesday, April 21 9 pm**
**Night Sky Network Teleconference**

**Friday, May 1 8pm**
**Star watch at Wyomissing Hills Elementary School**

**Saturday, May 2 8 pm**
**Talk and star watch at the Berks County Heritage Center ( Rain or cloud date is May 9)**

**Thursday, May 28 9 pm**
**Night Sky Network Teleconference**

**Friday, May 30 8 pm**
**Talk and star watch at Blue Marsh Lake, Dry Brooks Day Use Area**

**Saturday, August 22 8 pm**
**Talk and star watch at Kaercher Creek Park (Rain or cloud date is August 28)**

**Sunday, August 29 8 pm**
**Talk and star watch at Blue Marsh Lake, Dry Brooks Day Use Area**

**Saturday, September 26 7:30 pm**
**Talk and star watch at Nolde Forest**

**Sunday, September 27 2 pm**
**Talk and solar observing at Berks County Heritage Center**

**New events are added frequently, so check our website or call our hotline for schedule updates!**