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# THE RADIANT

June 2009

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Official Newsletter of the Piedmont Amateur Astronomers, Statesville, NC

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### In this Months Newsletter

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**Moon, Mars and Venus in the early morning clouds of May 22<sup>nd</sup> 2009.**

**Mars is hard to see in this reduced photo but was very nice in the original and to the eye.**

**Photo by: Charles Tilley**

### Club Officers

President: **Jim Smith**  
Vice President: **Danny Hepler**  
Secretary: **Chuck Dessert**  
Web Editor: **Dean Archie**  
Treasure: **Chuck Adams**  
Club Historian: **Chuck Dessert**  
Webmaster: **David Clark**  
Night Sky Coord: **Mark Smith**  
School Event Coord: **Charles Lail**  
Newsletter Editor: **Charles Tilley**

**Pine Lake Prep viewing  
 Mooresville, NC  
 By Patrick Fry**

Several weeks back Patrick Fry was contacted by the Pine Lake Prep school about PAA doing a star gaze for some of its students. Many things begin to come up that got in the way of this and finally Patrick went ahead and committed to the event with he and his father.

Thanks Patrick for taking care of this and give out thanks to your father as well.

/cT

\*\*\*\* Here is a message from Patrick from the night before (29 May 2009) when the Pine Lake Prep viewing was originally scheduled.

**Well, I showed up at PLP to look at clouds tonight. We sent emails to postpone the event until tomorrow night but still had about 30 people show up. We mostly went over the equipment and how it works but those who stayed a little later got to see a marvelous 1/4 moon and Saturn.**

**I'll be doing the same thing there tomorrow around nine so I'll miss LNSP. I'll have my dad to help so we have 5 scopes. Anyone is welcome to come but LNSP will probably have the greater need.**

**Patrick Fry**

**Notes from Patrick the next evening (30 May 2009):**

Charles, Danny, PAA:

Here are a few pictures from the PLP event. These are all from 5/30/2009, but we had another fair sized group the night before. Forty-five (45) students signed the roll as attending and all of them had parent's +/- siblings. That would make 100 a conservative estimate of attendees.

Only a dew problem (and light pollution) kept the night from being outstanding. We viewed Saturn with its moon Titan, the Moon, and a few of the brighter star as a comparison (eg. Arcturus). We also viewed

double stars (Mizar and a colorful double in Cygnus for those who stayed later). The students also saw Polaris and learned how to locate it. I discussed the objects of interest for the evening and astronomy as an exciting science that you can take outside of the classroom and enjoy as a hobby. My father (Gerald - in the blue cap) and I had 5 scopes.

The 6th graders were well behaved, attentive and interested. Mrs. Sims organized the event from the PLP end. She and her husband are on the far right of the last photo. I'm told that I get extra credit on my Science grade. We hope to do it again soon! PLF

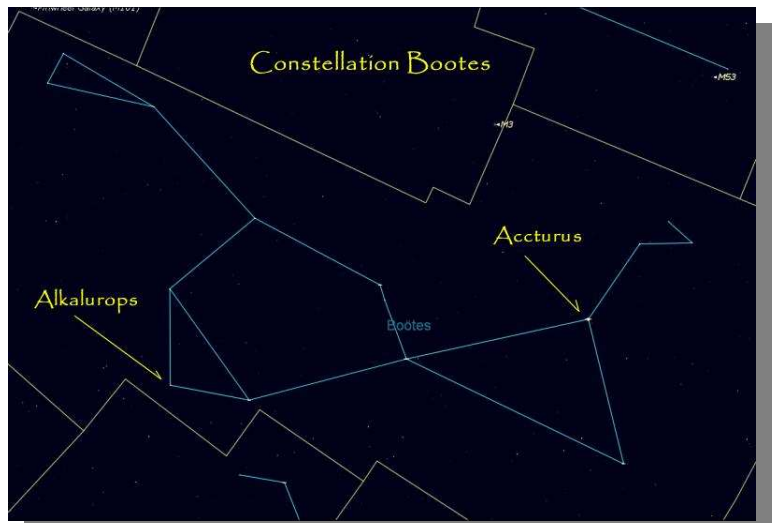




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**The constellation Bootes**

Bootes is riding high in the sky and despite a full Moon there are some wonderful double stars residing in the constellation. Be sure to zero in on the triple star Mu Bootes, aka Alkalurops. The primary is 4th magnitude and the secondary is 107" away at 7.2 magnitude. But take a closer look at the secondary. It's double again, at nearly the same magnitude with a separation of only 2.5". It split nicely in my 80mm f/8 and 100mm f/8 refractors. /cT



## Lake Norman State Park Star Gaze

Notes and photos by Ronnie Sherrill 30 May 2009

Seem like the more the year go on the more I end up missing these star gazing events. Lake Norman has been a challenge to say the least for our club for some years. As results from a visit down to Lake Norman by Jesse Jackson and me the club had once more scheduled a trip down in hopes of solving this dilemma once and for all. Would we have a decent star gaze or would it be the same old mess with us setting up the telescopes and no one to show them too?

Here are some notes and photos sent in by Ronnie Sherrill:

**Here are some pictures from the gaze at Lake Norman. We counted about 65 to 70 people in attendance. Had a great night, hate you missed it.**

**Ronnie**





From the photos it appears all went well with this event. I am sure we will have a long discussion on this at the meeting this Thursday evening.

Thanks to all who participated with this event.

/cT

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During the following months until around February 2010 Mars will move closer and closer until it is finally as: Large as the Full Moon.



We all know this is not true but this story will continue to make its way around the globe for many years to come. However, Mars is moving closer as the year progresses. At present it is only 4.6 arc sec across but by February 2010 it will be about 14-arc sec across and close enough to see some nice details.

## The Special Project: Observing mutual phenomena of the Galilean satellites of Jupiter

May 7, 2009

In 2009, the equinox will occur on the planet Jupiter (a once every six year event), allowing observation from Earth of mutual occultation's and eclipses between the Galilean satellites. We will take the opportunity of the International Year of Astronomy 2009 to encourage everyone to look at these satellites and to make astronomical observations.

The satellites are very easy to observe and the mutual phenomena are accessible to amateur astronomers, students, and anyone using even a small telescope.

These phenomena are not only spectacular and easy to see, they are also rich in scientific information, improving our knowledge of the Galilean satellites of Jupiter. These include objects as large as the planets Mercury or Mars, Io and its volcanoes, Europa and its ice crust, Ganymede, and Callisto.

As well as observing for fun, we request scientific observations to be made according to some simple but rigorous rules, to be followed by observers who possess materials and the ability to record such events. The data will be gathered and used for scientific purposes.

Since the phenomena occur only from April to December 2009, we need a large worldwide network of observers to catch as many events as possible. We intend to include all the participating observers sending valuable data into a final publication in an international journal, as has been done in the past after previous campaigns of observations with amateur astronomers.

More information is available at:

[http://www.imcce.fr/hosted\\_sites/ama09/phemu09\\_en.html](http://www.imcce.fr/hosted_sites/ama09/phemu09_en.html)

### I have a list for several occultations's to observe. /cT

- 1) 6 June – time = 2:51 AM when the Moon Ganymede partially occults the Moon Europa.

While looking at this you can look over about three degrees to the left for 8 magnitude Comet Kopff.

- 2) 17 June – time = 3:15 AM when the Moon Europa occults part of Io. As this occurs continue to observe Io as it is in the process of moving into Jupiter's shadow.

- 3) 29 June – time = 1:38 AM when the Moon Io occults the Moon Europa

- 4) 30 June - time = 3:07 AM when Ganymede will occult part of Europa

These are a few that are visible to us in the morning sky as Jupiter continues to rise higher in the eastern sky during the month.

/cT

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Don't forget this is the International Year of Astronomy and lots of events will be planned all over the world during the coming year.

If you have an idea let other club members know about it.

## Scoring More Energy from Less Sunlight



For spacecraft, power is everything. Without electrical power, satellites and robotic probes might as well be chunks of cold rock tumbling through space. Hundreds to millions of miles from the nearest power outlet, these spacecraft must somehow eke enough power from ambient sunlight to stay alive.

That's no problem for large satellites that can carry immense solar panels and heavy batteries. But in recent years, NASA has been developing technologies for much smaller microsatellites, which are lighter and far less expensive to launch. Often less than 10 feet across, these small spacecraft have little room to spare for solar panels or batteries, yet must still somehow power their onboard computers, scientific



instruments, and navigation and communication systems.

Space Technology 5 was a mission that proved, among other technologies, new concepts of power generation and storage for spacecraft.

"We tested high efficiency solar cells on ST-5 that produce almost 60 percent more power than typical solar cells. We also tested batteries that hold three times the energy of standard spacecraft batteries of the same size," says Christopher Stevens, manager of NASA's New Millennium Program. This program flight tests cutting-edge spacecraft technologies so that they can be used safely on mission-critical satellites and probes.

"This more efficient power supply allows you to build a science-grade spacecraft on a miniature scale," Stevens says.

Solar cells typically used on satellites can convert only about 18 percent of the available energy in sunlight into electrical current. ST-5 tested experimental cells that capture up to 29 percent of this solar energy. These new solar cells, developed in collaboration with the Air Force Research Laboratory in Ohio, performed flawlessly on ST-5, and they've already been swooped up and used on NASA's svelte MESSENGER probe, which will make a flyby of Mercury later this year.

Like modern laptop batteries, the high-capacity batteries on ST-5 use lithium-ion technology. As a string of exploding laptop batteries in recent years shows, fire safety can be an issue with this battery type.

"The challenge was to take these batteries and put in a power management circuit that protects against internal overcharge," Stevens explains. So NASA contracted with ABSL Power Solutions to develop spacecraft batteries with design control circuits to prevent power spikes that can lead to fires. "It worked like a charm."

Now that ST-5 has demonstrated the safety of this battery design, it is flying on NASA's THEMIS mission (for Time History of Events and Macroscale Interactions during Substorms) and is slated to fly aboard the Lunar Reconnaissance Orbiter and the Solar Dynamics Observatory, both of which are scheduled to launch later this year.

Thanks to ST-5, a little sunlight can go a really long way.

Find out about other advanced technologies validated in space and now being used on new missions of exploration at [nmp.nasa.gov/TECHNOLOGY/scorecard](http://nmp.nasa.gov/TECHNOLOGY/scorecard). Kids can calculate out how old they would be before having to replace lithium-ion batteries in a handheld game at [spaceplace.nasa.gov/en/kids/st5\\_bats.shtml](http://spaceplace.nasa.gov/en/kids/st5_bats.shtml).

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

### Caption:

*Helen Johnson, a spacecraft technician at NASA's Goddard Space Flight Center, works on one of the three tiny Space Technology 5 spacecraft in preparation for its technology validation mission.*

# Our Moon

## Luna Events for June 2009

**06<sup>th</sup> June** – Antares 0.6 degrees south from Moon. Look for the Moon to occult Antares around 10:20 PM

**20 June** – look for thin crescent Moon less than 5 degrees from the Pleiades (M45) in early morning hours.

## Luna Phases for June 2009

**07<sup>th</sup>** – Full Moon

**15<sup>th</sup>** – Last Quarter

**22<sup>nd</sup>** = New Moon

**29<sup>th</sup>** = First Quarter



## The Moon is A Very Strange Object

Greek authors Aristotle and Plutarch, and Roman authors Apollonius Rhodius and Ovid all wrote of a group of people called the Proselenes who lived in the central mountainous area of Greece called Arcadia. The Proselenes claimed title to this area because their forebears were there "before there was a moon in the heavens." This claim is substantiated by symbols on the wall of the Courtyard of Kalasasaya, near the city of Tiahuanaco, Bolivia, which record that the moon came into orbit around the Earth between 11,500 and 13,000 years ago, long before recorded history.

## Fact or Fiction?

## Meteor Shower for June 2009

The **next meteor shower** is the June Bootids; this is the first summer shower. The Bootids **meteor shower** starts June 22nd and peaks on June 27th and ends July 2nd. The shower's parent comet orbits our Sun once about every six years or so; the Comet 7P/Pons-Winnecke reached a point closest to our Sun in September of 2008 (known as the perihelion when a planet, comet or asteroid is closest to the Sun in its orbit). The meteor shower peaks in the morning of June 27th with a waxing crescent moon in the sky; this means less moonlight will be present and the shower's radiant will be relatively high in the sky after midnight due west.

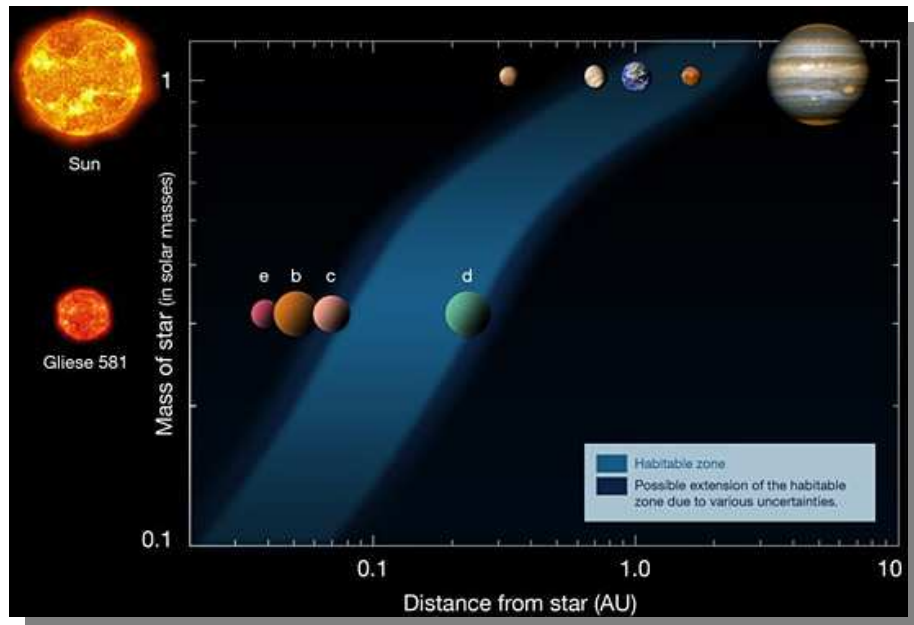
This has been a very good shower in past years with as many as 100 meteors per hour. However this is usually not the case so do not get your hopes too high.

## Earth-like planet discovered

By Charlie White

Several [gigantic gaseous planets have been spotted](#) orbiting distant stars, but Planet Gliese 581 e could be the lightest planet outside our Solar System ever detected. Located 20.5 light years away from us, it's 1.9 times the mass of Earth, indicating there are probably billions of Earth-sized planets revolving around stars throughout the universe.

The only problem with this planet is that it's so close to its star it would be uninhabitable. However, three other planets revolve around that same star, and scientists say a large and deep ocean could cover one of them,



Gliese 581 d. It's situated far enough away from its star to be habitable. The catch with that one: it's seven times more massive than the earth, which would make human explorers feel awfully sluggish.

These are remarkable discoveries. Now we're getting somewhere. While none of these newly discovered planets are quite right for human habitation, this is exciting news

because it shows the likelihood of spotting a planet that's very much like our own. Now all we need to do is solve that pesky problem of traveling the speed of light to get to any of these places. At the speed of today's fastest space probe, to get to Gliese 581 d would take about 350,000 years.



## What's Going On With the Planets this Month?

**Mercury:** Mercury is at greatest elongation west (23 degrees) on the 13<sup>th</sup>. For the first week the planet is rather faint. It passes 3 degrees north of Aldebaran on the 22<sup>nd</sup>.

**Venus:** Venus is at greatest elongation west (46 degrees) on the 5<sup>th</sup> when, at latitude 30 degrees south it rises more than two hours before twilight.

**Mars:** Mars is in Ares this month and remains a morning planet. On the 19<sup>th</sup> Venus passes 2 degrees south of Mars and chases Mars all of May about 6 degrees behind.

**Jupiter:** Jupiter rises in around 2:00 AM on June 1<sup>st</sup> and by the 30<sup>th</sup> it rises around mid-night. It transits on the 15<sup>th</sup> and at the same time begins its retrograde loop.

**Saturn:** Saturn transits during the late afternoon at mid-month and northern observers watch is set near local midnight.

**Uranus and Neptune:** Both planets are morning planets with Neptune rising around 2: PM and sitting just one half degree above Jupiter. Uranus rises around 3:00 AM

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## Where other clubs are in June?

Forsyth Astronomical Society June 18

9: 30 PM "Astronomy Night Event" at Fieldcrest Cannon Baseball Park in Kannapolis, N.C. 9:30 p.m. (Rain Date-June 19th, 2009)

### A few things to look for with Jupiter in June

Jupiter and Neptune are less than one degree apart all month. This is a good time to look for Neptune if you have never seen it before by using Jupiter as a guide.

See Page 6 for more events with the largest planet in our solar system.

### Comets now visible for June 2009

On June 1<sup>st</sup> Comet Kopff (22P) is just 2.5 degrees above Jupiter and at magnitude 8.12 it should be an easy target.

As June progresses Comet Kopff (22P) has moved 6 degrees to the left of Jupiter and is at magnitude 8.05.

By months end Comet Kopff (22P) is 11 degrees to the left of Jupiter and at magnitude 8.08.

Comet Kopff (22P) should be visible on past July.

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With all the evening thunderstorms keep and eye open for nice cloud formations and rainbows.



Late Evening Rainbow



Old tree limbs reaching for the crescent Moon

## Club News

Thanks to all who contributed material this month.

When submitting articles/photos please include the source. For photos please give specs such as camera, speed, f#, lens, conditions and place.

Send newsletter articles/correspondence/photos to:

**Charles Tilley (editor)**  
[ctvideo@yadtel.net](mailto:ctvideo@yadtel.net)  
PH: (704) 546-2686

### What's Up for 2009

**June**, Kevin Chapman,  
**July**, Al Banner,  
**August**, Chuck Dessert,  
**September**, Chuck Adams  
**October**, David Clark,  
**November**, Dean Archie

### Club Events For June 2009

**04 June – Club Meeting**  
**12-13-14 June – Hanging Rock State Park**

**Additional club events will be announced by e-mail as they are scheduled.**

### Where and when do we meet?

We meet on the first Thursday of each month in the conference room of the Iredell County Rescue Squad Building. Our meetings start at 19:30 hrs (7:30 PM) and last up to two hours. Each meeting covers club business, observing reports and upcoming observing events. We also have an educational or entertaining presentation from a club member or guest speaker with observing afterwards (weather permitting).

**If you have an interest in astronomy please feel free to stop by and check us out.**  
**You just may want to join.**

### Programs for 2009

**June**, Chuck Dessert,  
**July**, Jack T. Webb  
**August-----OPEN**  
**September**, Ronnie Sherrill  
**November**, Jim Smith

**Club members who sent in material for this month's newsletter are:**

**Ronnie Sherrill and Patrick Fry**

**Thanks to all the members who came out and supported club events.**

**/cT - Editor**