



# Observer

Newsletter of the Racine Astronomical Society

[www.rasastro.org](http://www.rasastro.org)

Summer 2012

## ~ General Meeting & Star Party~

Please come out and join us Tonight Saturday October 13<sup>st</sup> 7:30pm at the Observatory for our General Meeting and our Summer Star Party. Pizza will be provided.

## ~ Public Night ~

Our next Public night is Astronomy Day (7-10 PM) October 20<sup>th</sup> from (7:00-10:00 PM). Your help will be greatly appreciated.

## ~ News ~

The offspring of Halley's Comet are about to put on quite a show in the skies of Caledonia.

Earth will pass through a stream of debris from Halley's Comet beginning Oct. 15, which will give us the benefit of the annual Orionids meteor shower—though you probably won't see much until a bit later.

The shower should be at its peak the night of Saturday, Oct. 20, until just before dawn on Oct. 21. This year, the moon will be setting at approximately midnight, which will keep the sky darkened enough that—barring cloud cover—you should be able to see up to 15 meteors per hour.

What makes this shower so cool? First of all, c'mon—it's a show of shooting stars.

Also, though, there's no question about where to look for this one. Meteor showers get their names from the constellations in the sky where they can be spotted. And what's easier to spot than Orion the Hunter?

The stars tend to shoot from Orion's club, pierce Taurus the Bull, the Gemini twins, Leo the Lion and finally, Canis Major, home of Sirius, the brightest star we can see—well, aside from the sun.

There's also something else that's special about this show: With the second-fastest entry velocity of all the annual meteor showers, meteors from the Orionids produce yellow and green colors and occasionally produce an odd fireball. Now, that sounds cool.

## ~Update from Chuck Ruehle (Telescopes to Tanzania program)~



Recently more than 300 pounds of astronomy resources traveled from a garage in Racine Wisconsin to a mountain in East Africa. The 12 telescopes, along with mounts, eyepieces, and teaching resources will be used by the Telescopes to Tanzania program that is now in its third year of operation. Tanzania is one of the poorest countries in the world and currently the teaching capacity is limited by lack of basic resources like text books and laboratory equipment. In many schools astronomy is taught without telescopes, chemistry without labs, and geography without maps. Like STEM programs here in the US, this effort aims to build instructor and student capacity in math, chemistry, physics, and geography. The focus on telescopes and astronomy provides an exciting hands-on approach to the study of the universe that uses academic skills students need to become the future teachers, scientists, and leaders in their nation, Africa, and the world. Last year, Chuck Ruehle traveled alone for a month, sharing his love of astronomy with five secondary and two elementary schools in remote mountain villages. This year the effort includes working with 80 Secondary and Elementary teachers at the Mwangaza Partnership for Education Center in Arusha, Tanzania for two weeks. Ultimately, 500 pounds of resources, valued at almost \$5,000 will be shared with teachers from more than 25 schools. This November a four person team of amateur astronomers from Tanzania, Kenya, and the US will work in English and Swahili to provide instruction on a variety of topics. Susan Murabana is with the African Astronomical Society and Africa Hands-on Universe (GTTP); and Mponda Malozo is a national coordinator for Universe Awareness programs in Tanzania They will join Sue and Chuck Ruehle at Mwangaza to teach about:

**Astronomy Planetarium software: Celestia and Stellarium**

**Astronomy image manipulation and data analysis software**

**Telescope set-up and operation,**

**Geography: latitude, longitude, and its impact on viewing**

**Observing the night sky: constellations, sky maps and wheels, moon phases, tides, and eclipse**

**Observing the sun: solar dynamics, sun spots, solar filters, safety first practices**

**Optics and light: focal length, lenses, visible light spectrum, prisms, and spectra scopes**

**Electro-magnetic spectrum; sharing examples of radio waves, infrared, ultra-violet, x-ray and gamma ray**

- **Solar system: distance, size, orbits, and composition of the planets\**
- **Dark Sky activities: light Pollution and the October Worldwide Star Count**

**Following the workshops, Sue and Chuck Ruehle, the founders of the program from Racine will travel an additional two weeks visiting some of the schools and villages where the workshop participants work and live. Traveling most of the time by Land Rover they will often live off the grid between four thousand five hundred and eight thousand feet on Mt. Meru.**

**Telescopes to Tanzania is a project of Astronomers Without Borders. We also work with the Galileo Teacher Training Program, Global Hands on Universe, and Universe Awareness for Young Children. In addition, the program has also received support from the Office of Astronomy for Development of the International Astronomical Union, Canadian Telescope, Celestron Telescope, Yerkes Observatory,**

**Racine Rotary and Optimist Clubs, the Astronomical League, various local astronomy societies, religious groups, and countless individuals. The Ruehle's are amateur astronomers and conduct education programs in southeastern Wisconsin in the US. Chuck is also a Galileo Teacher Training Program Ambassador, and a NASA Galileo Educator Fellow.**

**To learn more about the program visit us on Facebook at Telescopetotanzania or go to**

**AstronomersWithoutBorders.org to make a contribution to support the work.**

**Solar Observing at Mulala Elementary and learning about Birika -- the Swahili word used by teachers, students, and community members to name the tea pot asterism in Sagittarius.**



~Nice Article From Gabe Shaughnessy (Member Of Our Club)~

### **Mass and the Higgs boson**

What is mass? What gives objects their heft? Last July, the Large Hadron Collider in Switzerland announced the discovery of a new particle that had never been seen before and may play a key role in our understanding these questions. All signals point to the particle being the long sought after Higgs boson. It was first postulated in the 1960s independently by several physicists, including Peter Higgs. Now discoveries of new particles are not uncommon in particle physics. In the early 50s-70s, a whole slew of new particles were discovered that helped lay

the foundations of the current model of particles, but they were not fundamental particles. So, what makes a Higgs boson discovery so special?

Throughout nature, there are symmetries. Some symmetry is macroscopic, like the spiral of a conch shell or the orbits of planets around stars. Other symmetries are fundamental, like those in particle physics. These fundamental symmetries give rise to things like the behavior light, protons, neutrons, radioactivity, etc. One of the profound discoveries Peter Higgs made was that if a particular type of these fundamental symmetries were disrupted in a specific way, mass can be generated for all particles the Higgs field interacts with.

In essence, the Higgs field slows down particles that would normally be traveling at the speed of light. As an analogy, imagine a banquet room full of mingling amateur astronomers when suddenly Neil DeGrass Tyson walks into the room. Everyone gathers quickly around him shaking his hand and asking him questions. These interactions slow him down considerably as he walks across the room. Next, imagine a waiter enters the room. With no one really interested in him, he does not get much attention and walks across the room unimpeded. Now, imagine a rumor of a new planet discovery is started in one corner of the room. People quickly get toward that corner to talk about it. In this example, the famous astronomer is a particle with large mass, the waiter has little to no mass, and the rumor is the excited Higgs field forming a Higgs boson.

The Higgs boson is a missing piece of our understanding of nature and its discovery is a profound step in our understanding of the universe. More work must be done to verify without a doubt the new particle observed is the Higgs boson. If it is confirmed to be the Higgs boson, it will no doubt deserve a Nobel Prize and mark one of the most important scientific achievements in history.

#### ~The night sky this month (October)~

**Jupiter** – It's the first bright planet to rise during October nights. It comes up around 10 P.M. local daylight time in early October and two hours earlier by month's end. Still, give it another hour or two to get well clear of your eastern horizon obstructions and low-altitude haze. The giant planet stays nearly stationary with respect to the background stars all month, while Earth hurtles almost straight toward it. Already brighter than any star, Jupiter brightens slightly from magnitude -2.5 to magnitude -2.7 during October as we approach it, and it presents telescopes with a globe that swells from 43" to 47" in apparent diameter. Jupiter will continue to brighten and enlarge a bit for one more month until its December 2 opposition.

**Venus** – A very gorgeous Morning Star, far outshining all other planets and stars with its brightness of magnitude -4.1. Look for it blazing in the east during and after morning twilight. If you watch carefully from week to week, you will notice that Venus is losing a little height in October. By month's end it rises around 4:30 A.M. local daylight time, only 90 minutes before twilight commences. The planet is certainly worth a look in a telescope - hunt it down as late as you can in the bright twilight or even daylight, when it is very high. The best telescopic views of Venus are in a bright sky.

#### ~The Deep Sky~

**NGC 891** is one of the most striking examples of a spiral galaxy seen exactly edge-on. This ghostly spindle of light is located about midway between Gamma Andromedae and the open star cluster M34 in Perseus.

Although NGC 891 is a generous 14' by 3', it suffers from low surface brightness. On nights with poor seeing, NGC 891 is a wavering apparition suspended in a bowl of glittering stars. However, if your sky is dark and steady the big galaxy takes magnification surprisingly well. NGC 891's signature feature is a prominent equatorial dust lane. The dark band clearly bisects the galaxy in 8-inch telescopes at 150x. Using averted vision note the mottled extensions of the galaxy, and even a central bulge of sorts. NGC 891 has an optical diameter of about one hundred thousand light years and the dust lane has a width of about 1.5 thousand light years. Professional telescopic studies indicate that the galaxy is not perfectly edge-on, but instead the eastern side is inclined just slightly toward us and the western side just slightly away from us (the rotation axis is inclined at an angle of 89° from our line-of-sight; 90° would be exactly edge-on).



## ~2012 Event Calendar~

### March

24 - Spring Star Party

### April

7 - Work Party (9 AM))  
14 - Work Party (Rain Date)  
21 - General Meeting (7:30 PM)  
28 - Astronomy Day (8-11 PM)

### May

11 - Public Night (8-11 PM)

### June

5 - Venus Transit Day (5 - 8:30 PM)  
15 - Public Night (8:30-11:30 PM)

### July

21 - Summer Star Party  
21 - General Meeting (7:30 PM)  
27 - Public Night (8:30-11:30 PM)

### August

10 - Public Night (8-11 PM)  
18 - Member Night (8-11 PM)

### September

15 - Picnic (4 PM)  
22 - Public Night (8-11 PM)  
(Observe the Moon Night)

### October

13 - Fall Star Party  
13 - General Meeting (7 PM)  
20 - Astronomy Day (7-10 PM)  
27 - Work Party (9 AM)

### November

10 - Work Party (Rain Date)  
17 - Member Night (7-10 PM)

### December

15 - Christmas Party (7:30 PM)

### ~ From the Editor~

If you have submissions for the newsletter, questions, comments, or ideas, please send me an e-mail.

***Also, if you are still receiving you're newsletters via postal mail and have access to e-mail you can opt to receive them in a PDF format via e-mail instead. You'll get them a little faster and save the RAS a few bucks. Club updates and reminders are sent out on regular basis via e-mail. If you would like to change you're delivery method please let me know.***

**Timothy Tadysak**

The free Adobe Acrobat reader can be downloaded here:

<http://get.adobe.com/reader/>

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