

## Highlights of the August Sky...

... 2<sup>nd</sup> ...

Dawn: Regulus just 0.6° below Mercury very low in west half hour after sunset - binoculars recommended.

PM: 6th-magnitude star 45 Capricorni near Jupiter - looks like a fifth moon (continues until 5th).

... 5<sup>th</sup> ...

Full Moon

... 9<sup>th</sup> ...

Dusk: Saturn's rings are edge-on to the Sun.

... 11<sup>th</sup> ...

AM: Perseid Meteor Shower peaks.

... 13<sup>th</sup> ...

Last Quarter Moon

... 14<sup>th</sup> ...

AM: Moon passes through Pleiades cluster starting at about 4am.

Jupiter at opposition - visible all night.

... 16<sup>th</sup> ...

Dawn: Waning Crescent Moon lower left of Mars.

... 17<sup>th</sup> ...

Dawn: Waning Crescent Moon upper right of Venus.

Dusk: Saturn is 3° to upper right of Mercury, very low in west.

... 18<sup>th</sup> ...

Dawn: Waning Crescent Moon lower left of Venus.

... 20<sup>th</sup> ...

New Moon

... 27<sup>th</sup> ...

First Quarter Moon

PM: Moon 1° to lower left of Antares.

# Prime Focus

A Publication of the Kalamazoo Astronomical Society

☆ ☆ ☆ August 2009 ☆ ☆ ☆

## This Months KAS Events

**Board Meeting: Sunday, August 9 @ 5:00 pm**

*Sunnyside Church - 2800 Gull Road - All Members Welcome*

**Perseid Potluck Picnic: Saturday, August 15 @ 6:00 pm**

*Kalamazoo Nature Center - See Page 3 for Details*

**Observing Session: Saturday, August 15 @ 8:30 pm**

*Jupiter & Perseid Meteors - Kalamazoo Nature Center*

**Observing Session: Saturday, August 29 @ 8:30 pm**

*Jupiter, Uranus, & Neptune - Kalamazoo Nature Center*

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# July Meeting Minutes

The general meeting of the Kalamazoo Astronomical Society was brought to order by President Jack Price on Friday, July 10, 2009 at 7:05 pm. Approximately 60 members and guests were in attendance in 1110 Rood Hall, located on the main campus of Western Michigan University.

Half of our guests were students (and their families) from Kellogg Elementary. Dave Woolf, who teaches music at Kellogg, invited his former third and fourth grade students to sing some astronomically themed songs (pictured below). The first was in honor of the 40th anniversary of the Apollo 11 Moon landing. The second song was called *Where No One has Gone Before* and was about past and current robotic spacecraft exploring the solar system. The final song was called *Poor Little Pluto*. The students put on an excellent performance and we're very grateful they accepted our invitation. We'd like to thank them for taking time out of their summer vacations!

We then jumped into the main theme of the July meeting; the long standing tradition called "Gadget Night". This year four KAS members brought a variety of gadgets, gizmos, and whatchamacallits to share. The first gadget was the enigmatic [Galileoscope](#), which finally showed up in a big semi-truck in front of Richard Bell's house on June 29<sup>th</sup>. Read Richard's report on this telescope kit in the [May 2009](#) issue of *Prime Focus* (page 5) for more information. Jack Price shared an Anderson Powerpole, which is a new type of power connector that is neither male nor female. Jack explained that many folks in the amateur radio community are switching over to powerpoles to have ready connectability between each other's equipment and power supplies. Bill Nigg shared some larger set screws he installed into his diagonal and similar accessories. They're easier to use with gloves than the tinier set screws that come with most imported accessories. Bill also showed a custom mounting plate he built.

The final gadget was shown by Royce Goodchild. Royce put together a beautiful model of the solar system, which he de-



scribes below (and is seen above):

*While investigating a lead on eBay for my other hobby, collecting rhinoceroses, I stumbled upon a natural tiger eye stone sphere that visually looked remarkably like the planet Jupiter. I wondered if I might be able to find the other planets among these natural semi-precious stone forms. Three and a half years later and having gone through three suns, two Mercury's, three Earth's, two Jupiter's, three Saturn's, and two Pluto's, I finally put together a model of the solar system that, for me, does justice to the solar family's beauty and scale relative to each other. The final model consists of the Sun (calcite), Mercury (agate), Venus (mookaite), Earth (sodalite), Mars (jasper), Jupiter (rhodochrosite), Saturn (calcite), Uranus (agate), Neptune (agate) and Pluto (blue tiger eye). Each stone/planet rests on a wooden candlestick which are in turn placed on a wood platform in the shape of a spiral galaxy.*

Bill Nigg then gave a demonstration on how to properly clean eyepieces. Bill passed around an instruction sheet and a list of the required items. [Contact](#) Bill if you'd like a copy. Members and guests enjoyed ice cream floats during the break. Thanks to Jean DeMott. They were delicious!

Roger Williams reported actual sunspots on this Sun! This rare sight was very welcome to some anemic solar observers. Bill Van Dien said he's been doing some sidewalk astronomy with the KAS's [Coronado PST](#) (solar telescope) recently at the Gilmore Car Museum. Jack then covered some upcoming KAS activities and events. Finally, Darren Drake talked about some of his experiences working at the YMCA [Camp Eberhart](#) near Three Rivers. Camp Eberhart has a strong astronomy education section and Darren said any KAS member would be welcome to visit or help out sometime. Darren wrote an article on his efforts at Eberhart on [Astromart](#). With that, the July meeting came to a close at 8:55 pm.



## Board Meeting Minutes



The KAS Board met on July 12<sup>th</sup> at Sunnyside Church. President Jack Price called the meeting to order at 5:07 pm. Other board members in attendance included Richard Bell, Jean DeMott, Rich Mather, and Dave Woolf. KAS member Mike Patton was also in attendance.

Jack reported that he installed vents in Owl Observatory in hopes of keeping the building cooler during the hot summer days. A general cleaning session needs to be held sometime down the road. Jack then covered upcoming activities, the main one being the annual Perseid Potluck Picnic on August 15<sup>th</sup> at the Nature Center. Jim Kurtz has agreed to bring his grill AGAIN and act as our resident chef. Eric Schreur will give a report on the recent total solar eclipse after the picnic and before the Public Observing Session (*see the column to your right for more information*).

Mike Patton, who's been a member of the KAS since 1998, was invited to the meeting to discuss his proposal to the Board. Mike purchased a lot at the [Arizona Sky Village](#), a residential community located in Portal, Arizona. The ASV is a paradise for those interested in geology, archeology, birding, and (of course) stargazing. The ASV is located in the shadow of the Chiricahua Mountain Range and has some of the darkest skies in North America. Mike's house is nearly complete and he'll begin construction of a roll-off roof observatory next year. Mike has offered to give the KAS one of the four piers in the observatory. The only price is advice and guidance from KAS members. Mike also said members could stay at his place, but the telescope would be primarily controlled over the Internet. We invited Mike to give a short presentation at an upcoming general meeting to discuss this proposition with the rest of the membership.

We then briefly discussed the grand reopening of the planetarium at the Kalamazoo Valley Museum, featuring the Digistar 4, on September 19<sup>th</sup>. Richard reported that Eric Schreur is not setting anything in stone until the projector is delivered in early August. We had considered offering to give away our Galileoscopes (which FINALLY arrived on June 29<sup>th</sup>) at the reopening, but Richard had the idea of holding a writing contest for elementary students. We would give away many of the Galileoscopes to the top essays. Everyone thought this was a great idea and the rules and essay topics are being planned. We also briefly talked about plans for the Galilean Nights event being planned for October 22<sup>nd</sup> - 24<sup>th</sup>. The final Public Observing Session of the year is already scheduled for October 24<sup>th</sup>. Jean then proposed the KAS get either a credit card or debit card, so Rich Mather wouldn't have to worry about reimbursing members for event expenses. Rich said he'd check into this. The meeting concluded at 7:13 pm.

## The Fifteenth Annual Perseid Potluck Picnic

**Kalamazoo Nature Center**  
**Saturday, August 15<sup>th</sup>**  
**Arrive at 6:00 pm**  
**Dinner Begins at 7:00 pm**  
**Eclipse Report at 9:00 pm**  
**Observing Begins at 10:00 pm**

**M**ark your calendar. Hope for good weather. It's time for the big social event of the summer for the KAS. So get ready to party! Here are the details:

The KAS will provide the hot dogs, hamburgers, and veggie burgers. You will be required to bring your own beverages, table service, lawn chairs, bug spray, and a dish to pass. Condiments will be provided by the KAS.

While dinner is cooking we will have solar observing available through KAS member telescopes (weather permitting). Feel free to bring any type of outdoor games or toys to pass the time while we wait for dinner.

Gates for the Public Observing Session open at 8:30 pm. We'll have a special presentation in the Nature Center's amphitheater (directly adjacent to Owl Observatory) at about 9:00 pm. Long-time KAS member and Kalamazoo Valley Museum Planetarium Coordinator Eric Schreur will report on his trip to the July 22<sup>nd</sup> total solar eclipse. Eric observed the eclipse from the deck of the Costa *Classica* near the island Iwo Jima. Brief stops along the way included Beijing and Tinjin, China; Cheju, South Korea; Kagoshima and Kobe, Japan.

Once it gets dark stargazers can look forward to observing the Moon, Jupiter, deep sky delights of the summer Milky Way, and some left over Perseid Meteors.

This gathering will take place rain or shine, so be prepared for whatever Mother Nature throws our way!



# Moments Remembered

by Tom Koonce



June 20, 1994: My Uncle generously decided to pass along his 8-inch Schmidt-Cassegrain telescope to me and make the switch to binoculars that better fit his astronomical observing habits. That gift was what launched me into “serious” amateur astronomy...but that’s not why I remember the date so well.

Saturday night, March 23, 1996: My wife and I drove 25 miles north on I-35 out of Fort Worth to a dark, quiet country lane with open fields on either side of us. Surprisingly there were at least a hundred other cars already parked along the sides of the road with people getting ready to do exactly what we were going to do...but that’s not why I remember the date so well.

“Rocks and Ice in the Solar System” have made an indelible mark on mankind and probably on each of you too. Our recorded history is full of dramatic references to cometary visitors and falling stars. Many of history’s events have been influenced by the superstitious belief that comets were harbingers of great success or of doom. Many of us have read of Augustus Caesar ascending to Emperor of Rome as a comet hung in the sky. It was common for royal births and deaths that occurred during comet apparitions to be recorded as being related directly with the comet. As William Shakespeare said, “When beggars die there are no comets seen; the heavens themselves blaze forth the death of princes.”



**The Leonid Meteor Shower increased to “storm” conditions for observers around the world in November from 1999-2001. Observer’s in west Michigan were robbed thanks to the “Leonid Fog”.**

If you’ve seen a comet and its tail, even if faintly through a telescope, you know how dramatic they appear. The brightest, most easily visible comets are called “Great Comets.” These can be seen by the naked eye by multitudes of people across the Earth while the wisps of their icy tails are blown back by the solar wind. As they stretch across the sky, they are so extraordinary that they are easily remembered for the rest of a person’s life. It seems natural that they have figured so prominently throughout history; indeed it would seem more remarkable if they had not!

The Saturday night of March 23, 1996, is fixed firmly in my memory as the night we spent watching Comet Hyakutake stretching gracefully across the northern sky. It was awe inspiring. Even though there were several hundred people on that dark road that night, only hushed voices were heard. We were casually sitting on the hoods of our cars and in lawn chairs, but everyone knew that we were witness to a very special celestial event, and there was a certain reverence to the moment.

Later, a police car came around a bend of the road and his headlights shone upon all of the cars and the people looking up at the sky. He came to a sudden stop and the officer just sat in his car for a few minutes looking at us. He must have been quite startled by the scene. I’ll never forget what happened next. He got out of his car, looked around slowly at us, started to say something, but stopped... and then he looked up. He just stood there looking for a minute then walked back to his car, turned off the headlights and shut off the car. He came back over without saying a word and watched The



**Comet Hyakutake was an awe-inspiring sight during some very cold nights in March and April of 1996.**

Great Comet of 1996 with us for a half hour or so. As I said, there was a certain reverence to the moment.

Our solar system has countless rocky asteroids, and distant icy Kuiper Belt Objects. Our Earth is struck many times each minute by particles of rice grain-sized rock. An estimated 40,000 kg of material falls daily on Earth, most of it in the form of micrometeorites that hit the upper atmosphere, and then fall to Earth. We know that these rocks from space come in many different sizes and some are even left over debris from cometary tails. I have seen great displays of meteoritic activity. Several years ago (November, 2002) a fellow amateur astronomer and I witnessed a stunning (but sadly, too short) five minute burst of Leonid meteors with an equivalent rate of over 700 per hour from a dark sky site. I'm sure we will always remember that portion of the evening and that we were the only two observers left when the meteor shower peak finally came.

Occasionally the Earth gets hit by rocks and ice that are truly impressive. The Tunguska Event in 1908 was very likely



**"The String of Pearls" - Comet Shoemaker-Levy 9 heads for its date with destiny in this composite image by Hubble.**



**The fragments from Shoemaker-Levy 9 left their mark on Jupiter for all to see in July 1994. Jupiter got nailed again in July 2009 (see next page).**

caused by a collision of rock or ice with the Earth. Several mass extinctions of life on the planet have been attributed to collisions at a much larger scale; for instance the demise of the dinosaurs 65 million years ago may have been from an asteroid approximately 4 to 9 miles across. But these events seem to lack the real-world immediacy which resulted from a chain of events that started at Mount Palomar on the night of March 24, 1993.

That night, a photograph taken by Carolyn and Eugene Shoemaker and David Levy revealed a comet which bared their names. It was soon determined that their comet was headed towards Jupiter on a collision course and it was breaking up into a "string of pearls"; a long line of cometary fragments that would hit Jupiter like slow-motion bombardment.

If we fast forward fifteen months - I received the C-8 from my Uncle on June 20<sup>th</sup>, and was learning how to use it efficiently. Exactly a month later, on July 20, 1994, I vividly remember looking through the telescope with several other amateurs as we watched the face of Jupiter turn slowly towards us to reveal the scars of massive cometary collisions the size of the entire Earth. There were a few brief cries of astonishment that the impact was so visible followed by stunned silence as we contemplated the energies involved in collisions that could have wiped the Earth clean of life. There was a certain reverence to the moment. Astronomy offers unforgettable moments like those to us.

*We do not remember days; we remember moments.*  
- Cesare Pavese

*Tom Koonce is a member of the Antelope Valley Astronomy Club in Lancaster, California.*

# Hubble Captures Rare Jupiter Collision



NASA scientists have interrupted the checkout and calibration of the Hubble Space Telescope to aim the recently refurbished observatory at a new expanding spot on the giant planet Jupiter. The spot, caused by the impact of a comet or an asteroid, is changing day to day in the planet's cloud tops.

For the past several days the world's largest telescopes have been trained on Jupiter. Not to miss the potentially new science in the unfolding drama 360 million miles away, Space Telescope Science Institute director Matt Mountain allocated discretionary time to a team of astronomers led by Heidi Hammel of the Space Science Institute in Boulder, Colorado.

The Hubble picture, taken on July 23<sup>rd</sup>, is the sharpest visible-light picture taken of the impact feature. The observations were made with Hubble's new camera, the Wide Field Camera 3 (WFC3).

"This image of the impact on Jupiter is fantastic," said U.S. Senator Barbara A. Mikulski, D-Md., chairwoman of the Commerce, Justice and Science Appropriations Subcommittee. "It tells us that our astronauts and ground crew at the Goddard Space Flight Center successfully repaired the Hubble telescope."

"This is just one example of what Hubble's new, state-of-the-art camera can do, thanks to the STS-125 astronauts and the entire Hubble team," said Ed Weiler, associate administrator of NASA's Science Mission Directorate. "However, the best is yet to come!"

"Hubble's truly exquisite imaging capability has revealed an astonishing wealth of detail in the 2009 impact site," said Hammel. "By combining these images with our ground-based data at other wavelengths, our Hubble data will allow a comprehensive understanding of exactly what is happening to the impact debris. My sincerest congratulations and thanks to the team who created Wide Field Camera 3 and to the astronauts who installed it!"

Co-investigator Imke de Pater of the University of California at Berkeley said: "The combination of the Hubble data with mid-infrared images from the Gemini telescope will give us an

insight into changes of the vertical structure of the atmosphere due to the impact."

Discovered by Australian amateur astronomer Anthony Wesley on Sunday, July 19<sup>th</sup>, the spot was created when a small object plunged into Jupiter's atmosphere and disintegrated. The only other time in history such a feature has been seen on Jupiter was 15 years ago.

"This is strikingly similar to the comet Shoemaker-Levy 9 that impacted Jupiter in July 1994," said team member Keith Noll of the Space Telescope Science Institute in Baltimore, Maryland.

"Since we believe this magnitude of impact is rare, we are very fortunate to see it with Hubble," added Amy Simon-

Miller of NASA's Goddard Space Flight Center in Greenbelt, Maryland. She explained that the details seen in the Hubble view shows a lumpiness to the debris plume caused by turbulence in Jupiter's atmosphere. The spot is presently twice the length of the United States.

Simon-Miller estimated that the diameter of the object that slammed into Jupiter was at least the size of several football fields. The force of the explosion on Jupiter was thousands of times more

powerful than the suspected comet or asteroid that exploded over the Tunguska River Valley in Siberia in June 1908.

The WFC3, installed by the STS-125 astronauts in May, is not yet fully calibrated. So while it is possible to obtain celestial images, the camera's full power cannot yet be realized for most observations. The WFC3 can still return meaningful science images that will complement the Jupiter pictures being taken with ground-based telescopes.

This is a natural color image of Jupiter as seen in visible light.

Credit: NASA, ESA, and Heidi Hammel (Space Science Institute, Boulder, Colorado), and the Jupiter Impact Team



# ASTRONOMY DAY 2009

by **Richard Bell**

In May 1609 the Gentleman of Florence and Professor of Mathematics at the University of Padua, Galileo Galilei, received a letter about a new device called a spyglass. This new invention could miraculously make distant objects seem as if they were nearby. Galileo used his technical skills as a mathematician and craftsman to build several of these devices, which he called a perspicillum, without ever seeing one for himself. At first Galileo used this miraculous device to make money, but he soon turned it to the night sky and changed the course of astronomy forever. One of Galileo's colleague's, Giovanni Demisiani, suggested this amazing instrument be called the telescope - a Greek term meaning "far-seeing".

Four hundred years later the world is celebrating Galileo's ground breaking discoveries with the telescope by declaring 2009 the International Year of Astronomy (IYA). In honor of Galileo's achievements and the IYA, the Kalamazoo Astronomical Society (KAS) held its biggest Astronomy Day ever on May 30<sup>th</sup>. Planning for Astronomy Day 2009 (AD2K9) started before last year's event. Right from the start we knew we wanted three things to make AD2K9 special. First, we wanted a special keynote speaker - someone to help draw a big crowd. Secondly, we wanted "Galileo" himself to make a special appearance. Finally, we wanted to give away telescopes. Not everything went according to plan, but AD2K9 was an amazing success nonetheless.

Achieving these ambitious goals required some historic fundraising. The KAS was going to have to write its first ever grant in order to pay for some of our plans. In the end our grant proposal was approved by the Irving S. Gilmore Foundation. I cannot thank **Molly Williams** enough for all her additions and suggestions to our grant proposal. It's unfortunate



**Hundreds of people, including this young astronomer, viewed the Sun through a telescope for the first time ever on Astronomy Day 2009.**

that Molly wasn't even able to attend Astronomy Day. **Frank Severance** was also a huge help in obtaining funding. He convinced the WMU Department of Physics and the Michigan Space Grant Consortium to make generous contributions to our event. Finally, I'd like to thank all those KAS members that made some very generous donations that helped us achieve the rest of our goals. You have no idea how much your contribution meant to me. It makes me proud to be a member of the KAS.

The KAS has always been fortunate when it comes to its members volunteering for Astronomy Day, but this year stood out above all the rest. Thirty-three members volunteered their time to help make sure everything ran smoothly on May 30<sup>th</sup>. Many of those members made more than one contribution, so I'll do my best to give credit where it's due. Please forgive me if I miss anything or anyone in this report.

Finally, after 400 years in the making, over a year of planning, and months of preparation May 30<sup>th</sup> arrived. Most of our activities took place at the Kalamazoo Valley Museum from 9 am - 4 pm. One of the advantages to the museum (besides its central location) is that visitors must walk through the courtyard to enter the building. This took them right by our intrepid solar observers. This year we finally faced the cruel reality of solar minimum and only set up telescopes equipped with hydrogen alpha filters. **Jim Kurtz** shared views of the nearest star with his Tele Vue NP101 and Coronado SolarMax 40 filter. **Tim Kurtz** used my Tele Vue Pronto and SolarMax 40 filter. **Kerry Robbert** (volunteering for the first time in 6 years) setup his Coronado PST. **Roger Williams** brought his Coronado MaxScope 60 and **Dave Woolf** used the KAS's PST. Each one of our solar observers



**Visitors check out the three most common types of amateur telescopes. The light pollution display provided by the IDA is in the background**



**This young astronomer checks out the view through his newly made cardboard telescopes. We gave away over 100 telescope kits throughout the day.**

volunteered the entire day and there were some nice prominences to be seen. Mostly cloudy skies spoiled solar observing in the morning, but later gave way to mostly clear conditions.

Visitors entering the museum were greeted by fellow Astronomy Day Coordinator, **Jean DeMott**, and KAS Vice President **Mike Sinclair** in the morning. KAS President **Jack Price** joined Jean at the greeting table in the afternoon. Jean did a tremendous job on the two welcome signs that informed visitors of our exciting day of activities. Lifetime member **Phyllis Buskirk** volunteered for Astronomy Day for the first time. She helped out at the freebie table during the morning. **Beverly Byle** took over for Phyllis in the afternoon. Both did an excellent job of encouraging young and old alike to help themselves to some free goodies provided by NASA and *Astronomy* magazine.

To help cover some of our expenses we setup a sales table featuring all the merchandise from the SkyShop. We also sold copies of our keynote speaker's two critically acclaimed books, *Bad Astronomy* and *Death from the Skies*. The author was available to sign copies of his books throughout the afternoon. Sales could have been a little stronger (couldn't they always), but they did cover Phil Plait's travel expenses. That's what I was hoping for to begin with. **Mike Chaffee** and **Bill Nigg** covered the sales table in the morning. **Amie Harpe** and **Stephanie Stratton** took over for the guys in the afternoon.

Naturally, our theme for this year's event was "Galileo & the Telescope". This was reflected in two of our displays. The first was called "Galileo: The Starry Messenger" and highlighted Galileo's monumental telescopic discoveries first announced in *The Starry Messenger* in March 1610. After enjoying the display visitors could help themselves to copies of *The Starry Messenger*. Thanks to **Dick Gillespie** for copying and assembling the booklets. They turned out fabulous and even though it's 400 years old, Galileo's small treatise is still a great read today.

The other topical display was called "Meet the Telescopes". Three of the most common types of amateur telescopes were on display with a poster setup next to each showing how they work and their advantages and disadvantages. Tim Kurtz supplied the refractor and Mike Sinclair setup KAMSC's 8-inch Schmidt-Cassegrain. The Cave 8-inch Newtonian reflector on display was provided by the KVM Planetarium. I have found memories of using that telescope to observe the aftermath of Comet Shoemaker-Levy 9 crashing into Jupiter in July 1994.

Next was our brand new KAS Member Astrophotography traveling display. We've been meaning to put something like this together for quite a while and the timing seemed right this year. My deepest appreciation goes to Jim Kurtz, Bill Nigg, and Roger Williams for donating their best photographs for the display. We're going to get a lot of use out of this display in the years to come. The last display was provided by the International Dark-Sky Association and – naturally – dealt with light pollution. Let's hope at least one visitor learned something about our vanishing night skies and shielded their porch light when they got home. Jean was again invaluable with helping me add some pizzazz to all our displays. She always makes me work harder than I want to, but it's always worth it in the end.

We had some major attractions at Astronomy Day 2009, but the heart and soul of the event was still the hands-on activities. This year's event featured four activities in all. The first was the cardboard refracting telescope kits. These were the telescopes we planned to get when we first learned that 2009 would be the International Year of Astronomy. Then we heard about the marvelous Galileoscopes. I placed our order for these amazing telescope kits about an hour after the web site came online on February 20<sup>th</sup>. Unfortunately, due to production delays and the huge demand, we didn't receive



**"The Bad Astronomer" Phil Plait signs another copy of his latest book *Death from the Skies* during Astronomy Day festivities at the Kalamazoo Valley Museum. Dick Gillespie patiently waits in line to have his book signed.**

them on time. We had planned to order the old Project STAR telescope kits, but received an offer we couldn't refuse. Dr. Stephen Pompea, chair of the Galileoscope Project and the Project Director for the U.S. International Year of Astronomy, offered to send us some of these telescope kits for FREE! He saved us a tremendous amount of money and we're eternally grateful. The morning crew at the telescope table included **John Miller** and **Bill Van Dien**. **Dave Woolf** also helped in the morning when it was too cloudy for solar observing. The afternoon telescope crew consisted of **Dick Gillespie** and **Don Stilwell**. They were all very busy throughout the day and helped build over 100 kits in all.

Two other hands-on activities were KAS Planispheres and Big Dipper Clocks. It's been a while since we've done planispheres during Astronomy Day, but the newer ones are better than the previous version. **Daniell Poulsen** and **Carol Van Dien** covered the planisphere table in the afternoon. They were relieved by **Becky Csia** and **Jackie Gillespie** in the afternoon. The Big Dipper Clocks were new this year and I think they turned out pretty well. **Susan Bond** and **Norm Terry** helped kids assemble Big Dipper Clocks during the morning shift, while **Bob & Barb Havira** took over during the afternoon. The fourth hands-on activity was provided by the Kingman Museum from Battle Creek. Jennifer Sell-



One of the main attractions of Astronomy Day 2009 was Michael Francis' portrayal as Galileo Galilei in *The Starry Messenger*. Photograph courtesy of Kevin Jung.



Galileo talks about his discovery of "planets" revolving around Jupiter. These ladies (including Jean DeMott at the far left) represent three of the Galilean moons.

ers, an educator at Kingman, setup a "Life on Mars" detection activity. Thanks to KAS members **John Grace** and **Jason Hanflik** for helping Jennifer in the morning and afternoon, respectfully. Thanks again to all our hands-on volunteers.

Several years ago I received a request from an actor/educator named Michael Francis. He wanted me to add a link to his site from my "Personal Pages of Astronomers" web page. Naturally, I checked the link out and saw that Michael travels around the country putting on performances as Galileo. This looked really cool and I knew it would come in handy one day. As soon as I started putting AD2K9 together I knew the time had come to bring "Galileo" to Kalamazoo. Boy was it worth the wait! Michael put on three amazing shows at 11am, 1pm, and 3pm in the KVM's Mary Jane Stryker Theater. If you missed Michael's show then you missed something really special.

Michael used his extensive theatrical experience and science background to bring Galileo to life in an entertaining, interactive performance called *The Starry Messenger*. Adapted from Galileo's short treatise by the same name, Michael crafted a dramatic presentation (complete with 17th century costume), much like the lectures that made Galileo the toast of universities and royal courts. Using humor and audience participation, Galileo introduced his marvelous telescope, revealing his amazing discoveries first reported in *The Starry Messenger* in 1610 and inspired his audience to examine the wonders of nature.

In all about 450 people attended our activities at the Kalamazoo Valley Museum, which came to a close at 4pm. The KAS would like to thank long-time KAS member and KVM Planetarium Coordinator Eric Schreur, along with the rest of the entire museum staff, for their support. We're especially

grateful for the free planetarium programming the museum offered throughout the day. Astronomy Day took place one day after the 50<sup>th</sup> anniversary of the planetarium's debut in Kalamazoo.

The museum allowed us to leave much of our materials there overnight, so that made clean-up a little easier. Several of us then headed over to Food Dance where we had dinner with Phil Plait and Michael Francis. We were in a terrible rush to head out to the Nature Center, so a leisurely dinner with our special guests was not to be. When I arrived at the Nature Center both **Bob Cox** and **Dennis Stuart** were already collecting tickets for our keynote presentation. Jean DeMott and Roger Williams quickly setup another greeting table and welcomed our visitors.

The keynote presentation of Astronomy Day 2009 was given by "The Bad Astronomer" Dr. Phil Plait. Phil made a name for himself through his *Bad Astronomy* web site, which is devoted to airing out myths and misconceptions in astronomy and related topics. Phil turned the popular web site into a critically acclaimed book by the same name in 2002. The web site evolved into an award winning blog, which is now done through *Discover* magazine's web site. In 2008 Phil published his second book, *Death from the Skies!* and became President of the James Randi Educational Foundation, a non-profit educational foundation dedicated to promoting critical thinking.

The title of Phil's presentation was called – you guessed it – *Bad Astronomy*. He began by tackling the myth that first led him on his journey: eggs can only be setup on end during the vernal equinox. Phil had no problem standing an egg on end in front of those in attendance. Phil covered much of the background on this egg-standing myth, which is covered in detail in the first chapter of *Bad Astronomy*. The heart of the talk was pointing out the numerous scientific errors in several Hollywood movies and television shows. The first, and perhaps the worst, was *Armageddon*. Several clips from this joke-of-a-movie were played; including one scene where it was raining on the airless killer asteroid! Phil was actually pleased with the scene from *Deep Impact* where the comet crashed into the Atlantic Ocean and the deadly after effects such as a massive tsunami. Another clip that wasn't entirely wrong came from – believe it or not – *The Simpson's*. It was the episode in which Bart discovers a comet that's going to crash into Springfield (an amazing coincidence to say the least). Most

of the comet harmlessly burns up in the atmosphere and lands at Bart's feet. He picks up the slightly warm fragment and places it in his pocket. A meteorite that crashed to the earth would only be slightly warm to the touch, since it spent the past few billion years in cold space and only seconds in the atmosphere.

Phil's presentation was a great success. We had 150 seats setup in the Cooper's Glen Auditorium and all but 7 were filled. Many of those that attended the keynote presentation stayed for Phil's sky talk in the amphitheater. Phil gave a 20 minute presentation highlighting some of the objects we'd be observing during the evening and some of the science behind them. Phil was an all-around nice guy and very easy to work with. I was afraid he wouldn't be willing to give the sky talk in addition to signing books at the museum and the keynote presentation at the Nature Center. **Kirk Korista** deserves a great deal of thanks for acting as Phil's chaperon and chauffer during the weekend. I'd also

like to thank Rose Norwood and the rest of the Kalamazoo Nature Center staff for hosting our evening activities. The Nature Center has been our closest partner for several years and we're very grateful for that. Thanks also go out to new KAS member **Kevin Jung** for taking pictures throughout the day.

The final act of Astronomy Day 2009 was the Public Observing Session. Attendance was very high, since many that attended Phil's talks hung around to enjoy the night sky. This is exactly what we had hoped would happen. Skies started out partly cloudy, but

cleared as the sky became fully dark. We were able to easily handle the large crowd since we had lots of telescopes setup around Owl Observatory. Thanks to Bob Havira, Jim Kurtz, Tim Kurtz, John Miller, Kerry Robbert, Mike Sinclair, Don Stilwell, Roger Williams, Dave Wolf, and anyone else I missed for setting up their telescopes and sharing views of the heavens above. It's what we do best.

Jean and I have coordinated a lot of Astronomy Day events and this one by far was the most challenging, but it was worth it. The quality of our event far exceeded the efforts of anything most museums and planetariums across the country could put together. I'm very happy with the attendance (600+ in all) and how everything worked out. We had visitors from all across lower Michigan and northern Indiana. Again, I can't thank all our volunteers and sponsors enough. On May 30<sup>th</sup>, I think we proved we're the best astronomical organization in Michigan.



**Phil Plait tips his brand new KAS SkyCap, presented to him by Astronomy Day coordinator Richard Bell, after his excellent keynote presentation.**



# SARSAT to the Rescue

If a plane crashes in the woods and nobody hears it, does it make a sound?

Never mind contemplating this scenario as a philosophical riddle. This can be a real life or death question. And the answer most of the time is that, even if no people are nearby, *something* is indeed listening high above.

That something is a network of satellites orbiting about 450 miles overhead. The “sound” they hear isn’t the crash itself, but a distress signal from a radio beacon carried by many modern ships, aircraft, and even individual people venturing into remote wildernesses.

In the last 25 years, more than 25,000 lives have been saved using the satellite response system called Search and Rescue Satellite-aided Tracking (SARSAT). So what *are* these life-saving superhero satellites?

Why they are mild-mannered weather satellites.

“These satellites do double duty,” says Mickey Fitzmaurice, a National Oceanic and Atmospheric Administration (NOAA) systems engineer for SARSAT. “Their primary purpose is to gather continuous weather data, of course. But while they’re up there, they might as well be listening for distress signals too.”



**NOAA's polar-orbiting and geostationary satellites, along with Russia's Cospas spacecraft, are part of the sophisticated, international Search and Rescue Satellite-Aided Tracking System.**

In February, NASA launched the newest of these Polar-orbiting Operational Environmental Satellites (or POES) into orbit. This new satellite, called N-Prime at launch and now dubbed NOAA-19, prevents a gap in this satellite network as another, aging NOAA satellite reached the end of its operational life.

“The launch of N-Prime was a big deal for us,” Fitzmaurice says. With N-Prime/NOAA-19 in place, there are now six satellites in this network. Amongst them, they pass over every place on Earth, on average, about once an hour.

To pinpoint the location of an injured explorer, a sinking ship, or a downed plane, POES use the same Doppler effect that causes a car horn to sound higher-pitched when the car is moving toward you than it sounds after it passes by.

In a similar way, POES “hear” a higher frequency when they’re moving toward the source of the distress signal, and a lower frequency when they’ve already passed overhead. It takes only three distress-signal bursts — each about 50 seconds apart — to determine the source’s location.

Complementing the POES are the Geostationary Operational Environmental Satellites (GOES), which, besides providing weather data, continuously monitor the Western Hemisphere for distress signals. Since their geostationary orbit leaves them motionless with respect to Earth below, there is no Doppler effect to pinpoint location. However, they do provide near instantaneous notification of distress signals.

In the future, the network will be expanded by putting receivers on new Global Positioning System (GPS) satellites, Fitzmaurice says. “We want to be able to locate you after just one burst.” With GPS, GOES will also be able to provide the location of the transmitter.

Philosophers beware: SARSAT is making “silent crashes” a thing of the past.

Download a two-page summary of NOAA-19 at:

[http://www.osd.noaa.gov/POES/NOAA-NP\\_Fact\\_Sheet.pdf](http://www.osd.noaa.gov/POES/NOAA-NP_Fact_Sheet.pdf)

The Space Place gives kids a chance to rescue stranded skiers using their emergency rescue beacons. The Wild Weather Adventure game awaits them at:

<http://spaceplace.nasa.gov/en/kids/goes/wwa/>

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

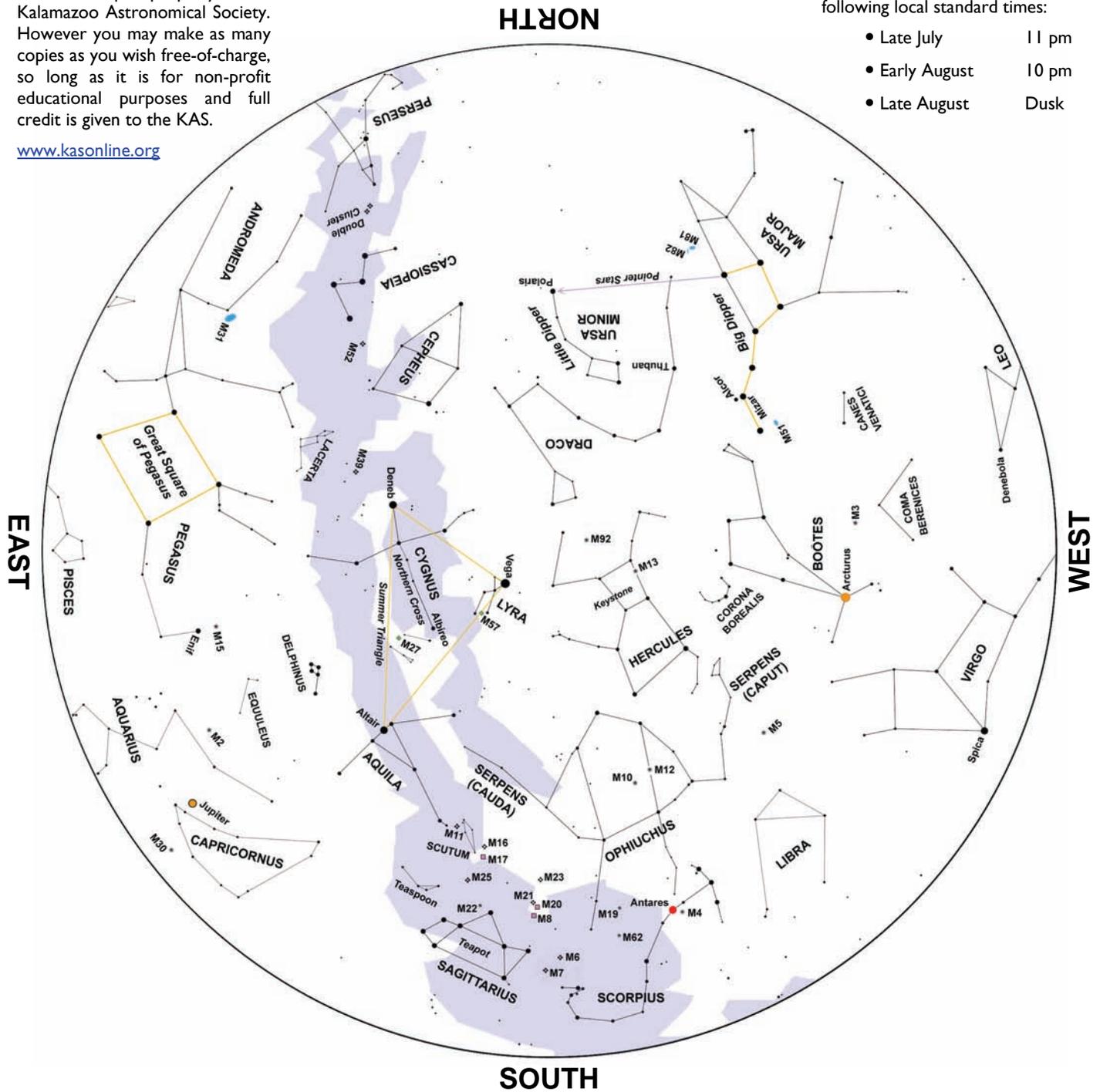
# August Night Sky.....

This star map is property of the Kalamazoo Astronomical Society. However you may make as many copies as you wish free-of-charge, so long as it is for non-profit educational purposes and full credit is given to the KAS.

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

This map represents the sky at the following local standard times:

- Late July 11 pm
- Early August 10 pm
- Late August Dusk



**P** rime viewing for the annual Perseid Meteor shower takes place between August 11<sup>th</sup> & 13<sup>th</sup>. The actual peak of the shower takes place during the early afternoon on August 12<sup>th</sup>. The Waning Gibbous Moon will also cause interference for all but the brightest of

meteors. The Perseids are well worth the effort though.

Two minor showers, the Delta Aquarids and Kappa Cygnids, will be active during the same time as the Perseid. Check out Gary Kronk's [web site](#) for

information on the Perseids and virtually every other known meteor shower.

The shadows of Europa and Ganymede fall on Jupiter simultaneously on August 26<sup>th</sup>. Begin observing the giant planet at about 10:20 pm EDT.

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# Follow the on



Read about the latest news and activities of the Kalamazoo Astronomical Society. Stay informed about upcoming events in the night sky.

*All this and more in 140 characters or less!*

<http://twitter.com/kzooastro/>

## Moving?

If you have a change of **home and/or e-mail address** please contact one of the following KAS Board Members by phone or e-mail:

[Richard Bell](#)

373-8942

[Roger Williams](#)

375-4867



If you are moving out of town before your membership expires please contact us anyway. You paid for a years worth of newsletters and that's what you'll get!

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### AUGUST STARGAZING DATES

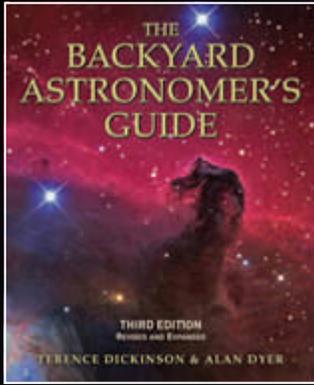
*Kalamazoo Nature Center • 7000 N. Westnedge Ave.*

**Saturday, August 15 @ 8:30 pm**  
*Jupiter & Perseid Meteors*

**Saturday, August 29 @ 8:30 pm**  
*Jupiter, Uranus, & Neptune*



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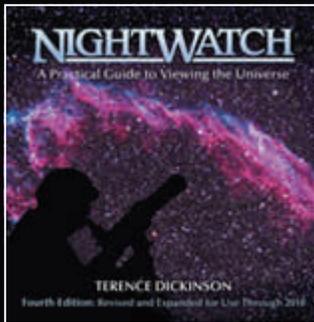
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