

**Highlights of the  
June Sky...**

--- 1<sup>st</sup> ---  
AM: The biggest asteroid, Ceres, is passing through the south portion of the Lagoon Nebula (M8).

--- 3<sup>rd</sup> ---  
PM: Mars is less than 2° right of Regulus.

--- 4<sup>th</sup> ---  
Last Quarter Moon

--- 6<sup>th</sup> ---  
Dawn: Jupiter and Uranus (separated by 0.5°) are 6° to lower right of the Moon.

PM: Mars and Regulus are less than 1° (50') apart.

--- 8<sup>th</sup> ---  
Dawn: Uranus is only 28' to the upper left of Jupiter.

--- 11<sup>th</sup> ---  
Dawn: Very thin crescent Moon is 7° left of Mercury.

--- 12<sup>th</sup> ---  
New Moon

--- 14<sup>th</sup> ---  
PM: Venus is 5° above a thin crescent Moon.

--- 16<sup>th</sup> ---  
PM: Moon near Mars and Regulus.

--- 18<sup>th</sup> ---  
PM: Saturn is 8.5° above the Moon.

Ceres at opposition

--- 19<sup>th</sup> ---  
First Quarter Moon

--- 19<sup>th</sup> - 20<sup>th</sup> ---  
PM: Venus less than 1° from center of Beehive Cluster (M44).

--- 21<sup>st</sup> ---  
Summer solstice (7:28 am)

--- 26<sup>th</sup> ---  
Full Moon

# Prime Focus

A Publication of the Kalamazoo Astronomical Society

☆ ☆ ☆ June 2010 ☆ ☆ ☆

## This Months KAS Events

**General Meeting: Friday, June 4 @ 7:00 pm**  
*Kalamazoo Area Math & Science Center - See Page 12 for Details*

**Observing Session: Saturday, June 5 @ 9:00 pm**  
*Grand Globular Clusters - Kalamazoo Nature Center*

**Kiwanis Star Party: Saturday, June 12 @ 9:00 pm**  
*Kiwanis Youth Conservation Area - See Page 11 for Details*

**Observing Session: Saturday, June 19 @ 9:00 pm**  
*Saturn & First Quarter Moon - Kalamazoo Nature Center*

## Inside the Newsletter...

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## May Meeting Minutes

The general meeting of the Kalamazoo Astronomical Society was brought to order by Vice President Richard Bell on Friday, May 7, 2010 at 7:15 pm EDT. Approximately 35 members and guests were in attendance at the Kalamazoo Area Math & Science Center (KAMSC).

The evening's guest speaker was our old friend Robert Miller. Robert's top notch presentations over the years has earned him the unofficial status as the favorite guest speaker of the KAS. His latest presentation was entitled *Advances in White Dwarf Star Research*. Robert makes frequent trips to McDonald Observatory in west Texas and assists colleagues from MSU with their research. The first topic covered was the position of white dwarfs on the famous Hertzsprung-Russell (HR) diagram. They're located on the lower left section of the diagram due to their high temperature and low luminosity.

There are several reasons to study white dwarfs and Robert covered a handful of them. The main reason is that most stars will end their lives as white dwarfs, so it's an important window into galactic history. White dwarfs represent a chemically stable end point of stellar evolution. They also permit us to study some exotic physics, since they hint at matter under extreme conditions. The team Robert works with studies pulsating white dwarfs. These are dynamic objects and can go under 50 - 60 pulsations in a single night!

Robert then gave a brief history of the discovery of white dwarf stars. In 1838, Friedrich W. Bessel determined through stellar parallax that Sirius must have a companion. Sirius B was discovered by Alvin Clark in 1862. The peculiar nature of Sirius B wasn't understood until 1915. Walter Adams used the new 100-inch telescope on Mt. Wilson to determine the temperatures of Sirius A & B. Sirius A had a surface temperature of 9,910 K, while Sirius B's temperature was 27,000 K. It was also determined that Sirius B had a radius 0.008% that of the Sun; more or less the size of the Earth. This meant that 1 tablespoon of Sirius B material would weigh 16 tons on the Earth!

Robert then explained how the pulsations from white dwarfs are analyzed using Fourier analysis. The telescope used to collect the data is the venerable 82-inch at McDonald Observatory. This is actually the largest telescope in the world that you can actually look through. Robert spent the last half of his talk giving a colorful tour of McDonald Observatory.

Attendees enjoyed the Astronomy Day 2010 slide show during the snack break and throughout the open discussion portion of the meeting (*see the report beginning on page 3*). Don Stilwell reported long lines at the KAS's Coronado PST (hydrogen-alpha solar scope) at the Kiwanis Conservation Day. Astronomical news mentioned included first light images from the Solar Dynamics Observatory and the upcoming rocket launch by SpaceX. The meeting concluded at 9:12 pm.



## Board Meeting Minutes

The KAS Board met on May 16, 2010 at Sunnyside Church. President Jack Price called the meeting to order at 5:05 pm, with all board members present (Richard Bell, Rich Mather, Jean DeMott, Dick Gillespie, Jason Hanflik, Don Stilwell, and Roger Williams). Rich gave a Treasurer's report that included a summary of the Astronomy Day cash flow. Rich also verified that he had already been filing 990-N federal income tax forms that became required for 501(c) organizations in legislation passed about 3 years ago.

Regarding the Robotic Telescope project, Richard reported that as of the last meeting on 5/15/10, opinions had been received from two lawyers knowledgeable in contract law about the proposed agreement. They found no serious problems, but both recommended that an opinion be sought from a lawyer in Arizona, since details of state laws differ.

In New Business, general meeting topics were in place for June and July. Richard had not yet confirmed availability of Rood Hall for the July meeting. Further events included the Kindleberger Festival in Parchment on July 9<sup>th</sup> and Public Observing Sessions at the Nature Center. Spooky Science Saturday in Battle Creek will also be presented again on the weekend before Halloween, since they were swamped with the response last year. The once-postponed field trip to the IMAX movie in Grand Rapids (*Hubble 3D*) was reconsidered, with Aug. 28<sup>th</sup> as the target date. An exhibit at the Science Central museum in Fort Wayne, Indiana was also considered ("Hubble Space Telescope: New Views of the Universe"), with July 17<sup>th</sup> as a suggested date. A Boy Scout 100<sup>th</sup> anniversary event at the Air Zoo Aug. 5<sup>th</sup> - 8<sup>th</sup> was mentioned, although at this point there has been no request for KAS participation. Crane Fest is set for Oct. 9<sup>th</sup> - 10<sup>th</sup>.

In further New Business, Richard requested that we start thinking about the next Astronomy Day on May 7, 2011. The theme is Mars, with suggested activities being the construction of Mars rover models and robot demonstrations. The year 2011 also marks the 75<sup>th</sup> anniversary of KAS, and it was agreed that we need to start assembling what is known about our history (Bill Nigg has much relevant material). Suggestions were made for obtaining official proclamations from city, county, and state government bodies. Richard also suggested that the general meeting programs for the year feature favorite speakers from previous years, and he invited thoughts about other events to celebrate the 75<sup>th</sup>.

Some general discussion was held about fund-raising methods, although this topic will not be considered in earnest until the robotic telescope agreement has been signed. Jean requested that a solicitation be put in the newsletter for help from anyone experienced in fundraising drawings.

The next meeting was set for June 13<sup>th</sup>, same time and place. The meeting was adjourned at 6:40 pm.



# Astronomy Day 2010 Report

by **Richard Bell**

Last year the world celebrated the International Year of Astronomy which coincided with the 400<sup>th</sup> anniversary of the first use of an astronomical telescope by Galileo. The Kalamazoo Astronomical Society's flagship event for this momentous event was Astronomy Day 2009. For our efforts, the KAS was awarded Best Event under the medium population category in *Sky & Telescope's* Astronomy Day Award.

At first I had no intention of trying to outdo last year's event, but I quickly realized that the internationally recognized date for Astronomy Day in 2010 was April 24<sup>th</sup>. That date marked the 20<sup>th</sup> anniversary of the Hubble Space Telescope's launch into orbit! In many ways, Hubble's launch was just as important as Galileo's first glimpse through a telescope. We had to do something special. After all, Hubble deserves it.

Walk up to anyone on the street and ask them to name a telescope and they'll undoubtedly mention Hubble first. The Hubble Space Telescope is one of NASA's most successful and long-lasting science missions ever. (I personally put Hubble a step above the Apollo Program.) It has beamed hundreds of thousands of images back to Earth, shedding light on many of the great mysteries of astronomy. Its gaze has helped determine the age of the universe, the identity of quasars, and the existence of dark energy. Hubble has become much more than a scientific instrument - it's become an icon that will be held in the same regard 400 years from now as Galileo's telescope is today.

Astronomy Day 2010 (AD2K10) out did every aspect of last year's event with only one exception - the weather. We never received the thunderstorms that were predicted for



**Story Musgrave stops signing autographs to pose with this future NASA astronaut. If you ever forget why we do Astronomy Day then look at the photo above.**



**This young astronomer is amazed by the resemblance of her new model of the Hubble Space Telescope with a photo of the real thing. Hubble models were a big hit; kids made 120 of them on Astronomy Day!**

April 24<sup>th</sup>, but the cloud cover was dense with scattered showers throughout the day. Obviously this meant that solar observing was impossible, but all of the volunteers in that area were able to help out elsewhere. Fortunately attendees didn't miss anything as the Sun was again blank. Heavy cloud cover also caused cancellation of the sidewalk astronomy session scheduled to follow the keynote presentation at the Fetzer Center. We've enjoyed many sunny days and clear nights on Astronomy Day, so perhaps the law of averages finally caught up with us.

The Kalamazoo Valley Museum again acted as host for this year's Astronomy Day and Hubble Birthday Bash. The museum is the perfect venue for our big annual event and I hope we gradually build a loyal following in the years to come at that location. After all, the museum is the perfect place for people to experience our displays. Appropriately, our main display focused on the Hubble Space Telescope. The display was updated from one used in 2007, and was complimented by a large print of Hubble's 20<sup>th</sup> anniversary image. The image, released just days before Astronomy Day, was of a small portion of the giant [Carina Nebula](#) taken with the Wide Field Camera 3 (WFC3).

Our secondary theme for Astronomy Day was the Sun, in honor of the International Year of Solar Astronomy. By lucky coincidence, we were able to use the first light images from the new [Solar Dynamics Observatory](#) that were released on April 21<sup>st</sup>. One of the most stunning images complimented our Sun display. Other displays included KAS member astrophotography and telescopes. We again used **Tim Kurtz's** 4-inch refractor and **Mike Sinclair's** 8-inch Schmidt-Cassegrain. However, this year the reflecting



**Michael Francis returned to Kalamazoo for two performances of *The Stargazer's Apprentice*. Crowd participation is an integral part of all of Michael's presentations. The children above were enlisted to help build a "fruit salad solar system". The white weather balloon represents the Sun.**

telescope category was represented by **Dan Morgan's** hand-crafted 18-inch Dobsonian.

In a repeat of last year, an amazing number of KAS members and friends volunteered for this year's celebration of astronomy. In all, 35 folks gave part of their weekend to make Astronomy Day possible. What's even more amazing is that several of our regular volunteers couldn't help out this year, however the membership stepped forward and we were able to fill every spot. I can never express how proud this makes me feel to be a KAS member and how important it is to the success of our event. We would not be able to do award-winning events like this if it wasn't for their generous support. Please let me know if I have forgotten to mention any volunteers in this report.

AD2K10 attendees were greeted by co-coordinator, **Jean DeMott**, and **Mike Sinclair** upon entering the museum in the morning. **Beverly Byle** and **Jack Roach** welcomed visitors in the afternoon. Instead of observing the Sun, **Don Stilwell** passed out the free tickets for our keynote presentation. After visiting the greeting table, visitors could help themselves to a wide variety of items at the Freebie Table. Materials were provided by *Astronomy* magazine, the Cassini Mission, Goddard Space Flight Center and NASA Space Place. The Freebie Table was staffed by KAS President **Jack Price** and **Molly Williams** in the morning and by **Tim Kurtz** and **Brenda Laukert** in the afternoon.

Next up was our Sales Table. I'm happy to report that sales were better than last year. We sold 32 copies of *Story: The Way of the Water* and all copies on hand of *Hubble: A Journey through Space and Time*. We even sold several regular items from the [SkyShop](#). This really helps offset Astronomy Day expenses. KAS Treasurer **Rich Mather** and **Frank Severance** worked the sales table in the morning and were relieved by **Scott Macfarlane** and **Dennis Stuart** in the afternoon. Nearby was **Bill Nigg** who setup his Astro-Physics refractor and fielded many questions.

I say it every year and I really do mean it, the hands-on activity volunteers are the heart and soul of Astronomy Day.

They've got the hardest job, but I think they'll agree it's fun. They were very busy this year once again. Our main activity was building models of the Hubble Space Telescope out of an 8-ounce tomato sauce and toilet paper core. It's amazing that these two common items make a near-perfect 70:1 scale HST model. There's no way to mention everyone that helped save cans and cores, so all I can do is say THANK YOU! I know it was a weird thing to request, but the kids loved it. Our volunteers helped make 120 Hubble models in all on April 24<sup>th</sup>. That's just amazing! Special thanks to the morning crew, **Ryan D'Mello** and **Dick & Jackie Gillespie**, and the afternoon crew, **Joe Borrello** and **Mike Chaffee**. Ryan is actually a Kalamazoo Area Math & Science Center student that volunteered to help out. What's amazing is that Ryan had to leave in mid-afternoon to get ready for his senior prom! All the credit for preparing the HST models goes to Jean DeMott. She really out did herself this year.

The sundial table was staffed by **Daniial Poulsen** and **Carol Van Dien** in the morning and then by **Paul Asmus** and **Susan Bond** in the afternoon. In all, I'd say we made about



**Michael Francis sung three astronomically-themed songs during his performance of *The Stargazer's Apprentice*.**

75 sundials on Astronomy Day. Another popular activity was the Star Finder. The thing is none of us adults could quite figure out how they worked, but the kids had no problem whatsoever! The Star Finders are a NASA Space Place activity and were designed after the fortune tellers or “cootie catchers” that kids have been making for generations. Our volunteers included **Jason Hanflik** and **Norm Terry** in the morning and **Mike Cook** and **Bob Havira** in the afternoon, and they made about 100 Star Finders total. The last activity was the “Life on Mars” experiment provided by **Jennifer Sellers** from the Kingman Museum in Battle Creek (she’s also a KAS member). Lifetime member **Phyllis Buskirk** assisted Jennifer in the morning while **John Grace** helped out in the afternoon. Thanks again to all our hands-on volunteers.

One of the three main attractions of Astronomy Day at the museum was performances by [Michael Francis](#) as *The Stargazer’s Apprentice* in the museum’s Stryker Theater. Michael was outstanding as Galileo at last year’s event, so it didn’t take us long to decide to bring him back again this year. *The Stargazer’s Apprentice* is intended for children in



**Story Musgrave’s keynote presentation, *Those 35 Years of Working on that Machine*, will go down as one of the best talks in KAS history. Photo courtesy of Kevin Jung.**



**Some Astronomy Day Attendees check out our newly redesigned Hubble Space Telescope display.**

kindergarten to the third grade, but adults in attendance enjoyed the lively performance as well (myself included). Michael starts the show off by singing “Twinkle, Twinkle Little Star”. Special thanks to both **Eric Schreur** and **Dan Morgan** for providing guitars for Michael to use. Michael explains how the Sun produces energy and then enlists aide from the audience to make a “fruit salad solar system” (using pieces of fruit to show the sizes of the planets to scale). The next song is about the Milky Way and then uses a Frisbee to show the general shape of the Galaxy and the position of the Sun. Michael then introduced his assistant, the blue dwarf star puppet “Arnie”, who answers questions from the audience. Michael concluded with a modified (and corrected) version of Eric Idle’s [“Universe Song”](#) from Monty Python’s *The Meaning of Life*. I’m happy to report that both of Michael’s performances were very well attended. The 11 am show was attended by 70 people, while 69 people attended the 3 pm performance. Astronomy education with children can be a difficult thing to do, but Michael makes it fun and easy. We’ll undoubtedly have him back in the future.

The KVM made available free planetarium shows featuring the brand new Digistar 4 projector. This year they played regular canned shows instead of live constellation shows. The first show was the family program *Bear Tales and Other Grizzly Stories*. The stargazing show was an in-house program called *The Artist’s Sky*, while the feature program was *Secrets of the Sun*. The later fit in perfectly with our secondary theme. The planetarium also played a bonus show, *Hubble Vision*, in honor of Hubble’s 20<sup>th</sup> anniversary. All the shows were very well attended; especially the stargazing and bonus shows, which each had full houses. Thanks again to the museum for offering free planetarium shows.

Our main attraction for Astronomy Day was none other than retired astronaut [Story Musgrave](#). We knew we wanted to present one of the NASA astronauts that had been involved in one of the five servicing mission to Hubble when we started planning for AD2K10. We tried to get someone from the last servicing mission, but didn’t have any luck. There



The “main event” of Astronomy Day 2010 was the keynote presentation by retired NASA astronaut Story Musgrave. The presentation was held at the Fetzer Center, located on the main campus of Western Michigan University. Over 210 people were in attendance. Photo courtesy of Daniel Flanagan.

was already someone I had in the back of my mind that I never thought we’d be able to get and that was Story Musgrave. We saw him speak at the [2006 Starfest](#) in Canada and he’s one of the most engaging speakers ever. It was a privilege having him as our special guest.

Story signed autographs at the museum from about 1 – 4 pm. He signed everything – be it copies of his biography, *Story: The Way of the Water*, the *Hubble* 20<sup>th</sup> anniversary book, pictures, and clothing. It was easy to tell many of the attendees were there specifically to see Story Musgrave. I haven’t seen that many people wearing NASA shirts since my trip to the Kennedy Space Center! The highlight of the autograph session was a young boy with an orange flight suite (see page 3). Maybe we’ll be hearing about the astronaut from Kalamazoo in 20 or 30 years!

Our Astronomy Day activities at the museum ended at 4 pm. Now it was time (after a brief dinner break) to head over the Fetzer Center at Western Michigan University for Story Musgrave’s keynote presentation. **Phyllis Buskirk** greeted visitors, while **Roger Williams** and **Jean DeMott** sold more copies of Story’s biography. Our ticket collectors were **Paul Asmus** and **Gary Leadley**. Story titled his keynote presentation “*Those 35 Years of Working on that Machine.*” Naturally, “that machine” refers to the Hubble Space Telescope. Not only was Story the payload commander/lead spacewalker on the first and most important Hubble Servicing Mission in 1993, but he was also involved in developing the Hubble Space Telescope.

Doing a write-up of Story’s presentation wouldn’t do it justice. Plus, after all the hard work it was time for me to sit back, relax and enjoy the presentation. Fortunately Rich Mather recorded the entire lecture and we hope to make it available on DVD at some point in the future. Needless to

say it was an extraordinary talk and the visuals were stunning. After Story’s talk I presented him with a copy of *Hubble: A Journey through Space and Time* signed by all KAS members in attendance at Astronomy Day. Thanks also go out to both **Daniel Flanagan** and **Kevin Jung** for taking photographs of the keynote presentation. The total attendance for the talk was at least 210 people. That’s amazing considering the limited time we had to publicize the talk, as we didn’t secure Story as our keynote speaker until mid-March.

I again need to thank **Bob Havira**, **Mike Sinclair**, **Rich Mather** and **Dan Morgan**. Mike picked Story up at the airport, while Dan did a terrific job of chauffeuring Michael Francis and Story around on Astronomy Day and acting as their gopher. Bob woke up extra early on Sunday morning to take Story to breakfast and the airport. Rich picked up Michael at the airport on Friday and ended up having to drive him to the airport in Detroit on Sunday afternoon, as apparently no crew was available in Kalamazoo. Not sure what that was all about, but at least Michael managed to get on the plane back to Boston on time.

Astronomy Day 2010 out did last year’s event in every respect. Total attendance for the day was approximately 700 people; up 100 from last year. Michael Francis’ performances were better attended and the museum had bigger crowds for the planetarium shows. We also had about 70 more people attend this year’s keynote presentation. At the end of the day people kept asking me the same question: “How are you going to outperform this year?” I have no idea, but we’re going to try. After all, 2011 marks the Kalamazoo Astronomical Society’s 75<sup>th</sup> anniversary. Let’s start coming up with some ideas and get to work!



# Return of the Prodigal Telescope

A Story by: **Jack Roach**

**Foreword:** *I am deeply indebted to Don Stilwell and Richard Gillespie for their part in returning a particular telescope to me. Without their keen eyes and thoughtfulness this story would never have happened.*

*Thanks to both of you!*  
Jack

★ ★ ★

When I received an email from fellow Kalamazoo Astronomical Society member Don Stilwell that he and club member Richard Gillespie had recently picked up two telescopes from Kingman Museum (Battle Creek, MI) and that they looked “eerily similar” in design to the one that I have trotted around to club viewing sessions, my curiosity increased. The email went on to say, “Our questions to you are, what do you know of these scopes and do you want them? At present they are in Richard’s garage, but have a very limited shelf life there.”

“What were these telescopes?” I asked myself. “Could they have been “left over’s” from part of a telescope building class that I helped teach with a friend (Kevin Hotton) at Kingman Museum over 25 years ago?”

Don’s email then went on to say, “One, I’ll guess, is a 4” f/8 Newtonian equatorial of wood, PVC pipe and sono-tube and all manual.” “Yup, sure sounds like the scopes that we built in the telescope classes”, I said to myself.

But when I read the next part of the email my heart skipped a



**Don Stilwell and Richard Gillespie pose with the 4” and 6” Newtonian telescope built (in-part) by Jack Roach at the Kingman Museum telescope making classes in the mid-1980’s.**



**Here’s Jack Roach with his 6” Newtonian reflector on its distinctive equatorial mounting.**

beat. “The other is a little more sophisticated, I’ll guess again, a 6” f/5 Newtonian equatorial of wood and PVC with an adjustable latitude and a short period clock drive similar to yours.” The description of the second telescope did not sound at all like any of the telescopes that were built as part of the class.

There was only one telescope that Kevin and I built that had a latitude adjustment and that scope was custom made for a local school teacher and avid amateur astronomer (Anne Downing). This equatorial telescope mounting was truly a one-of-a-kind. It was custom built from 7 layer laminated birch plywood complete with a hand built clock drive and latitude adjustment.

The equatorial mounting was a special astro-graphic type, meaning that one could take photographs thru the telescope in any position. It also sported a custom built one-of-a-kind quick change camera adapter/eyepiece focuser device. The two of us enjoyed building this telescope for Anne as much as she enjoyed using it with her students.

Tragically, Anne was killed in a car accident just a few years after the telescope was delivered. I assumed that it had been passed on to another family member. Or did it? I had to find out.

The next day, I arrived at Richard’s home to “look over” the scopes that he and Don had picked up at the request of the museum. Richard greeted me at the door and we then walked into his garage where he had them stored.

“What would they look like?” I asked myself. “Were they going to be in good shape or all banged up from years of use and or abuse?” “Was the one with the latitude adjustment truly the one that I had helped custom build for Anne some 25 years ago?” My heart started to race and my stomach became a little queasy.

They then came into view. The one in front was a 4” f/10 that was built in the very first telescope class that I taught at Kingman. It was in surprisingly good shape for being as old as it was. A smile came over my face as I reminisced back to that earlier time. Now my attention moved to the scope in the back.

There it was!

After 25 years it looked almost exactly as it did the last time I had touched it. It was Anne Downing’s old telescope, and other than a little dust and a piece of loose laminate it was in almost perfect condition!

I had always wondered what became of this telescope. Like thinking back to your youth and wondering what happened



**The Prodigal Telescope, a 6”Newtonian built by Kevin Hotton and Jack Roach for local school teach and amateur astronomer Anne Downing.**



**Jack describes the Prodigal Telescope as one of a kind due to its latitude adjustment and hand-made clock drive.**

to a special friend. Are they ok? Did their life turn out happy?

The answer in this story is, “Yes, they’re ok” and “they will make many more people happy.” They will live on by giving splendid views of the Heavens to many others before getting passed on again.

This article was written in the memory of Anne Downing. She was dedicated to her love of amateur astronomy and to teaching. She inspired her students thru her enthusiasm of the Heavens and thru the use of her telescope.

Now that Anne’s “Prodigal Telescope” has returned, it will be used at many future star parties to inspire young and old as Anne would have liked.

*Jack Roach first joined the KAS in 1982. He became interested in telescope building after taking an astronomy class in college. He’s won several awards in telescope making. Be sure to check out his entry on the [Member Profile](#) page on KAS Online for more.*



# Ancient Supernova Riddle, Solved

by Dr. Tony Phillips

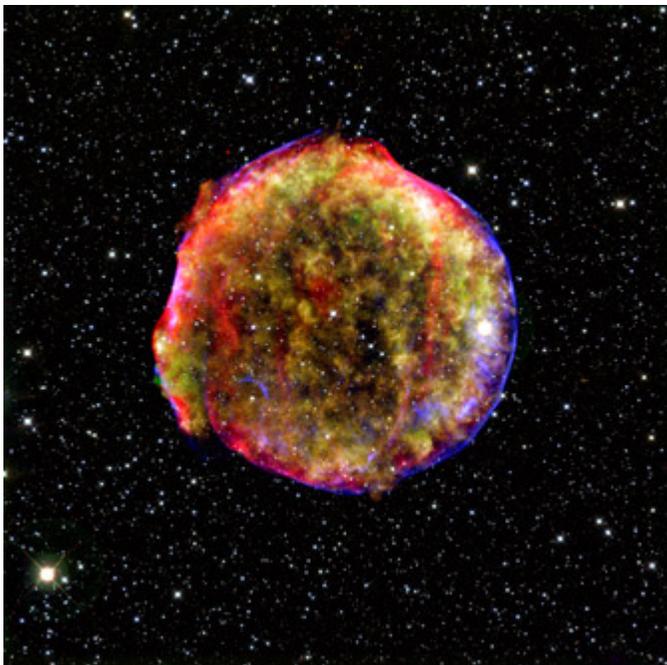
*Australopithecus* squinted at the blue African sky. He had never seen a star in broad daylight before, but he could see one today. Was it dangerous? He stared for a long time, puzzled, but nothing happened, and after a while he strode across the savanna unconcerned.

Millions of years later, we know better.

That star was a supernova, one of many that exploded in our corner of the Milky Way around the Pliocene era of pre-humans. *Australopithecus* left no records; we know the explosions happened because their debris is still around. The Solar System and everything else within about 300 light-years is surrounded by supernova exhaust — a haze of million-degree gas that permeates all of local space.

Supernovas are dangerous things, and when one appears in the daytime sky, it is cause for alarm. How did Earth survive? Modern astronomers believe the blasts were too far away (albeit not by much) to zap our planet with lethal amounts of radiation. Also, the sun's magnetic field has done a good job holding the hot gas at bay. In other words, we lucked out.

The debris from those old explosions has the compelling



Left-over cloud from the Tycho supernova, witnessed by Tycho Brahe and other astronomers over 400 years ago. This image combines infrared light captured by the Spitzer Space Telescope with x-rays captured by the Chandra X-ray Observatory, plus visible light from the Calar Alto Observatory in Spain.

power of a train wreck; astronomers have trouble tearing their eyes away. Over the years, they've thoroughly surveyed the wreckage and therein found a mystery — clouds of hydrogen and helium apparently too fragile to have survived the blasts. One of them, whimsically called "the Local Fluff," is on the doorstep of the Solar System.

"The observed temperature and density of the Fluff do not provide enough pressure to resist the crushing action of the hot supernova gas around it," says astronomer Merav Opher of George Mason University. "It makes us wonder, how can such a cloud exist?"

NASA's Voyager spacecraft may have found the answer.

NASA's two Voyager probes have been racing out of the solar system for more than 30 years. They are now beyond the orbit of Pluto and on the verge of entering interstellar space.

"The Voyagers are not actually inside the Local Fluff," explains Opher. "But they are getting close and can sense what the cloud is like as they approach it."

And the answer is....

"Magnetism," says Opher. "Voyager data show that the Fluff is strongly magnetized with a field strength between 4 and 5 microgauss. This magnetic field can provide the pressure required to resist destruction."

If fluffy clouds of hydrogen can survive a supernova blast, maybe it's not so surprising that we did, too. "Indeed, this is helping us understand how supernovas interact with their environment — and how destructive the blasts actually are," says Opher.

Maybe *Australopithecus* was on to something after all.

Opher's original research describing Voyager's discovery of the magnetic field in the Local Fluff may be found in *Nature*, **462**, 1036-1038 (24 December 2009).

The Space Place has a new Amazing Fact page about the Voyagers' Golden Record, with sample images and sounds of Earth.

After all, just in case one of the Voyager's ever meets up with ET, we will want to introduce ourselves.

Visit:

<http://spaceplace.nasa.gov/en/kids/voyager/>

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

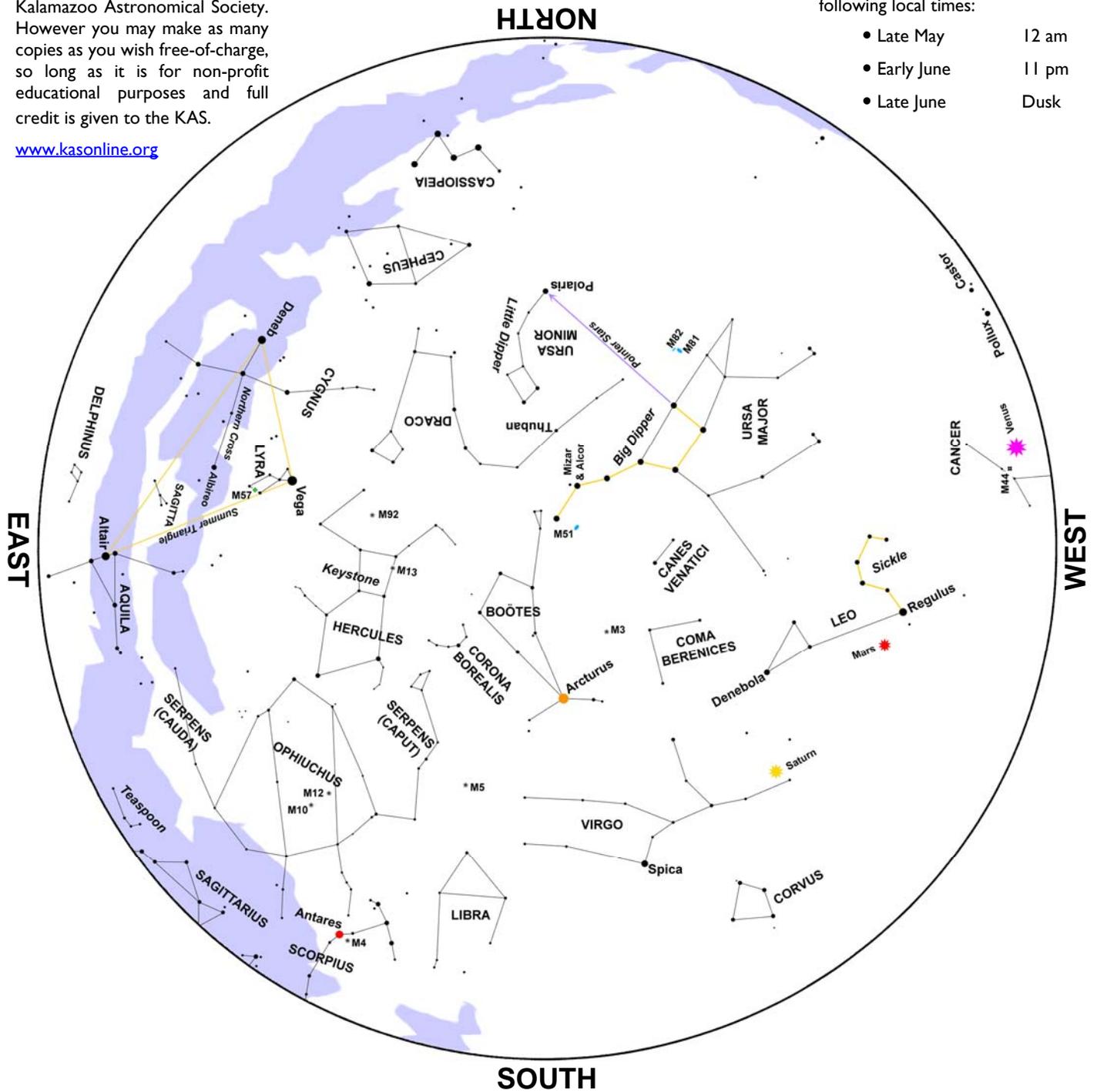
# June Night Sky.....

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 times:

- Late May 12 am
- Early June 11 pm
- Late June Dusk



June is a good month for asteroid observers. Ceres, the largest asteroid, passes through the outskirts of the Lagoon Nebula (M8) during the early morning hours of June 1<sup>st</sup>. Ceres is at opposition on June 18<sup>th</sup> and at its brightest for 2010.

Jupiter and Uranus spend the first half of the month within 1° of each other. Closest approach occurs before dawn on June 8<sup>th</sup>. Only 26' will separate them; making the pair easy to spot in the same field-of-view of most telescopes. Uranus will be the faint blue dot above Jupiter.

Venus will appear 5° above a thin Waxing Crescent Moon on June 14<sup>th</sup>; making for another photogenic scene. Venus will be less than 1° from the center of the Beehive Cluster (M44) between June 19<sup>th</sup> and 20<sup>th</sup>. Should be a swell site in binoculars.

## KAS BOARD

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June 2010

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# Kiwanis Star Party



The KAS and Battle Creek Kiwanis Club of will co-host a public star party on Saturday, June 12<sup>th</sup>. Gates open at 9:00 pm. It'll be held at the Kiwanis Youth Conservation Area on 15th Avenue, 3.6 miles north of Turkeyville in Calhoun County. Admission is FREE. For more information or to volunteer your time and telescope, contact [Dick Gillespie](#) (269-966-9653).

## Kalamazoo Valley Museum Planetarium Show Schedule

### *Bear Tales*

Weekdays, 11am; Saturdays; 1pm; Sundays, 2pm

### *The Artist's Sky*

Saturdays at 2:00 pm

### *Secrets of the Sun*

Everyday at 3:00 pm



Planetarium admission is \$3.00 per person. The Kalamazoo Valley Museum is located at 230 North Rose Street in downtown Kalamazoo. For more information please call (269) 373-7990 or visit us on the web at [www.kalamazoomuseum.org](http://www.kalamazoomuseum.org)

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## JUNE STARGAZING DATES

Kalamazoo Nature Center • 7000 N. Westnedge Ave.

**Saturday, June 5 @ 9:00 pm**  
*Grand Globular Clusters*

**Saturday, June 19 @ 9:00 pm**  
*Saturn & First Quarter Moon*



with the **Kalamazoo Astronomical Society**

## General Meeting Preview

# *3D Imaging of the Sun's Corona*



presented by **Dr. Richard Frazin**

*University of Michigan*

**W**hile the Sun is familiar to us all and has been studied in far more detail than any other star, it presents many long-standing mysteries fundamental to astrophysics and our understanding of the Universe. In the modern era, solar storms threaten Man's technological systems, making the understanding of solar phenomena of practical interest. Dr. Frazin's research uses the latest satellite imagery at extreme ultraviolet (EUV) wavelengths to determine the 3D structure of the outermost layer of the Sun's atmosphere, called the corona, which is key to the formation and propagation of solar storms.

**Friday, June 4 @ 7:00 pm**

*Kalamazoo Area Math & Science Center  
600 West Vine, Suite 400 • Use Dutton St. Entrance*

Kalamazoo Astronomical Society  
c/o KAMSC  
600 West Vine, Suite 400  
Kalamazoo, MI 49008

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