Highlights of the January Sky. . .

- - - 1st - - -
First Quarter Moon

- - - 2nd - - -
PM: Jupiter is about 4° below the Moon.

- - - 4th - - -
AM: Europa & Ganymede cast shadows on Jupiter simultaneously between 1:27 and 2:27 am EST.

AM: Quadrantid meteor shower peaks (60 meteors per hour).

PM: Waxing Gibbous Moon is near the Pleiades.

Earth is at perihelion (closest to Sun)

- - - 5th - - -
PM: Moon is between the Hyades and Pleiades.

- - - 9th - - -
Full Moon

- - - 14th - - -
AM: The Moon passes 9° south of Mars.

- - - 16th - - -
Last Quarter Moon

- - - 19th - - -
DAWN: Antares is 3.5° to lower right of the crescent Moon.

- - - 22nd - - -
New Moon

- - - 25th & 26th - - -
PM: Venus is about 8° from a thin crescent Moon.

- - - 29th - - -
PM: The Moon is about 7° right of Jupiter

- - - 30th - - -
PM: The Moon is about 7° above Jupiter.

First Quarter Moon.

Prime Focus

A Publication of the Kalamazoo Astronomical Society

☆ ☆ ☆ January 2012 ☆ ☆ ☆

This Months KAS Events

General Meeting: Friday, January 6 @ 7:00 pm

Kalamazoo Area Math & Science Center - See Page 12 for Details

Board Meeting: Sunday, January 8 @ 5:00 pm

Sunnyside Church - 2800 Gull Road - All Members Welcome

***Introduction to Amateur Astronomy* Series Begins**

Portage District Library - See Page 3 for Dates & Times

Inside the Newsletter. . .

December Meeting Minutes

The KAS Annual Meeting, featuring our 13th Holiday Party, began at 6:30 pm EST on Friday, December 2, 2011. Approximately 43 members and guests were in attendance at the Kalamazoo Area Math & Science Center (KAMSC).

Dinner was served at ~6:50 pm. Our potluck hors d'oeuvre and dessert extravaganza was as good as always. These include the traditional tasty meatballs, mouth-watering Sloppy Joes (courtesy of the Sinclair's) and more desserts than one could possibly enjoy in a single evening. Our "hostess-with-the-mostess," **Jean DeMott**, supplied the soft drinks and hot wassail again and did an exceptional job with the decorations this year. Thank you, Jean!

Once dinner was complete and everyone had a chance to relax and chit chat, we played four highly competitive rounds of BINGO. Here are the lucky winners:

· **Daniel Flanagan** - *The Universe and Beyond*
- *Signed & Donated by Terence Dickinson*

· **Jean DeMott** – *Pocket Sky Atlas*
- *Donated by Sky & Telescope*

· **Rachel Dupuis** – Milky Way Panorama
- *Donated by Office Max*

· **Jon Beard & Mark Woolf** (co-winners) – Galileoscopes
- *Donated by the KAS SkyShop*

Final nominations and elections for 2012 KAS Officers and At-Large Board Members were then held once everyone reconvened in the presentation center. Thanks to Al Hanchar and Mark Miller for counting the ballots. The election results appear on page 11. Members and guests enjoyed a year-in-review slide show assembled by Richard Bell. Jack Price then gave a brief president's report. He said it's been a great year with lots of terrific guest speakers and fun outreach activities. Next year is also looking to be outstanding. It begins with the return of the *Introduction to Amateur Astronomy* lecture series and features a partial solar eclipse and the last Transit of Venus of our lifetime.

Who said no good deed ever goes unpunished? Jean DeMott won the prize she donated for the Robotic Telescope Raffle.

Richard Bell reported that the first-ever "Pre-Turkey Day Star Party" was not too successful thanks to persistent fog. Other attendees included Daniel Flanagan, Dan Morgan, Brent Sanford, and Don Stilwell. Jon Beard and family reported seeing the northern lights on October 24th. This was the first display his two young girls, Adrianna & Kaylyn, ever saw. May it be the first of many!

We then had an extended discussion on the new Mars rover, Curiosity, which was launched toward the Red Planet on November 26th. Mike Sinclair commented (at least half-a-dozen times) that the rover is about the size of a Mini Cooper. Mike Cook gave an update on the Library Telescope Project. Carol Van Dien is looking for help with a Cub Scout Astronomy Day she's organizing on January 21st.

We then held the door prize drawings. Unless noted otherwise, all prizes were donated by the KAS. Here are the lucky winners (in order):

Mike Sinclair (25mm Plössl eyepiece, donated by OPT); **Kaylyn Beard** (*Pocket Sky Atlas*, donated by *Sky & Telescope*); **Adrianna Beard** (KAS 75th Anniversary T-shirt); **Karen Sinclair** (KAS 75th Anniversary T-shirt); **Molly Williams** (signed copy of *How I Killed Pluto and Why It Had It Coming* by Dr. Mike Brown); **Brent Sanford** (one-year subscription to *Astronomy* magazine, donated by Kalmbach Publishing); **Mike Dupuis** (signed copy of *How I Killed Pluto and Why It Had It Coming* by Dr. Mike Brown); **Bill Van Dien** (Focus Knobs, donated by Orion Telescopes & Binoculars); **Tony Gurczynski** (Focus Knobs, donated by Orion Telescopes & Binoculars); **Scott Macfarlane** (Focus Knobs, donated by Orion Telescopes & Binoculars).

We then held the drawing for the Robotic Telescope Raffle. Tickets were sold before dinner and $196 was raised toward the Robotic Telescope Project. The raffle was the idea of Jean DeMott. She donated the cost of printing and framing a beautiful Milky Way panorama created by Nick Risinger. The winner of the raffle was...**Jean DeMott**! Aside from the cost of the framed print, Jean purchased $50 worth of tickets. She deserved it after the terrific job she did with special 75th Anniversary decorations.

The meeting concluded at about 9:10 pm. Thanks to the volunteers that helped with clean-up and putting all the tables and chairs away.

BOARD Meeting Minutes

The KAS Board met on December 11, 2011 at Sunnyside Church. The meeting was called to order by Jack Price at 5:10 pm. Also present were board members Richard Bell, Joe Borrello, Scott Macfarlane, Rich Mather, Don Stilwell, and Roger Williams.

The Treasurer's Report by Rich Mather showed a healthy balance, reflecting the receipt of donations to the Robotic Telescope Project. Rich reported that he was considering transferring some of the money from CDs paying only 0.2% to a regular savings account at a different bank paying 1.25%. After a motion and second, the Board voted to authorize Rich to pursue this idea further after checking for any negative fine print.

About the only thing left for 2011 in the area of Old Business was the KAS 75th anniversary proclamation to be read at the Kalamazoo City Commission meeting at 7:00 pm on December 19th. Jack planned to be present and he invited as many members as were able to turn out wearing KAS hats and T-shirts. Rich said that he would videotape the ceremony. The Robotic Telescope update had no new developments to report, with fund-raising plans awaiting the settling of insurance issues discussed below.

In New Business, Rich reported that Mike Cook had prepared a very nice presentation of the Library Telescope concept, but that he had not yet had a response from the Portage Public Library. If nothing happened soon, he was planning to contact Oshtemo. Regarding general meeting plans for 2012, Richard reported that a two-way internet connection had been tested at KAMSC, as it will be used for Tom Field's talk at the January General Meeting, and that everything appears to be in order. For Astronomy Day, Richard reported that he has been trying to contact someone from the Kepler Mission who could be our featured speaker, but there has been no reply to date. Richard mentioned again that he will be attending NEAF (Northeast Astronomy Forum & Telescope Show) in 2012, and he invited anyone interested to consider attending what is regarded as the premier astronomy expo in the country.

Another item discussed last month was fund-raising for the Robotic Telescope Project by the sale of eclipse glasses. This was to be linked to the partial solar eclipse of May 20th and the Transit of Venus on June 5, 2012. Don Stilwell and Mike Cook had checked with the city of South Haven about the use of their beach as a viewing site for these events, and one requirement from the city was that we have liability insurance that would expressly include South Haven. In looking for insurance policies, Don had found little interest at Astronomical League, who suggested that we could probably do better locally. Don had obtained two local quotes so far, one totally unreasonable and one with a minimum $500/year charge. Don was still getting quotes. Once a satisfactory insurance solution is found, we can make specific plans for the viewing days and order the eclipse glasses. Richard said that the glasses were available for $0.65/pair in lots of 1000.

There being no further business, the meeting was adjourned at 6:00 pm. The next meeting was set for January 8, 2012, same time and place.

Respectfully submitted by Roger Williams

Introduction to Amateur Astronomy

The five-part lecture series that will help you become a star-hopping skymaster begins this month! Please remember that admission is free, but we ask that you register to ensure we have enough materials for everyone. To sign-up, send us a note through the contact page (be sure to indicate you're registering for the series).

Those participants that attend ALL FIVE parts will receive a Certificate of Completion. Only then will you be a full-fledged amateur astronomer!

Here's the topics for January:

Part 1 — January 14th:

Our Place Among the Infinities

Part 2 — January 28th:

Discovering the Night Sky

Time: **1:00 - 2:30 pm**

Location: **Portage District Library**
300 Library Lane
Portage, MI 49002
(269) 329-4544

Please visit the *Introduction to Amateur Astronomy* web page for more information on the entire series:

http://www.kasonline.org/amastro.html

Our 75th Year of Looking Up

by Richard Bell

Do you think the Kalamazoo College students that founded an astronomy club in 1936 expected it to last until its 75th anniversary? The answer is most likely no, but we'll never know for sure. The founding members have been all but forgotten. Those students took a one semester astronomy course and wanted to continue learning about the cosmos once it was over. The Kalamazoo Amateur Astronomical Association met during the fall and winter terms in its earliest years. Some of those early members probably maintained their club affiliation once they graduated, but most of them likely moved on to other things. Members from outside Kalamazoo College joined and kept the group going. It did indeed survive to see its 75th anniversary in 2011, but as the Kalamazoo Astronomical Society.

We did everything within our means to make the KAS 75th anniversary year a special one. Our first goal was to have the best line-up of general meeting speakers ever. I never thought I'd outdo the programming we had in 2009 for the International Year of Astronomy, but I think I did it. It seemed appropriate that the first meeting of the year should be about the history of our esteemed organization. Therefore, I gave a presentation entitled *Seventy-Five Years of Looking Up: A Brief History of the Kalamazoo Astronomical Society* on January 7th. The weather wasn't ideal that night, so attendance was low. That's too bad as it was a fun evening. I gave plenty of historical details, but the best part was other members sharing favorite moments from the past.

We had better luck with *Rapa Nui: Icons, Ecology and Eclipse* on February 4th. That presentation was given by Becky Csia and featured a great video assembled by Kalman Csia. I hope Beck and Kalman are planning to see the Total Solar Eclipse on November 13, 2012. Everyone would enjoy seeing another video of their adventures in Australia. Mike Sinclair talked about *Bad Science in Movies* on March 4th. That was the only meeting of the year I missed, but I'm sure it was another excellent talk from Mr. Sinclair. Mike loves to complain about ignorance in science (and in general), so I'm sure he was in full form that night! The last KAS member to give a presentation in 2011 was Dr. Kirk Korista. Kirk's presentation on April 1st was *Why is the Night Sky Dark...or is it?* The talk dealt with Olber's Paradox and was the third highest attended meeting of the year with 64 members and guests presented (just 3 less than our September meeting).

Dr. Mike Brown, discoverer of the "dwarf planet" Eris, was our Astronomy Day 2011 Keynote Speaker.

Terence Dickinson gets ready for a night of imaging in the Atacama Desert in Chile. This is one of the many images he showed during his excellent presentation at our 75th Anniversary Gala on November 4th.

One thing I wanted to do for our 75th anniversary is bring back favorite guest speakers from past meetings. The first was Dr. Fred Adams, Professor of Physics at the University of Michigan, who last spoke to us in April, 2009. Dr. Adams discussed *The Future of the Universe* at the May 13th meeting. Another favorite visitor from the past was Professor Horace Smith from Michigan State University. Horace spoke about *Pulsating Stars* on June 3rd. Horace is very well known when it comes to variable stars, but he had another reason for giving a talk on this subject. 2011 also marked the 100th anniversary of the American Association of Variable Star Observers (AAVSO).

Our final guest speaker from the past was Dr. Axel Mellinger. Axel is an assistant professor at Central Michigan College, but he's best known amongst amateur astronomers as an astrophotographer. Axel gave one of my favorite presentations of all time at the October, 2009 meeting, so I absolutely had to have him back again. The title of his

Bringing astronomy to the people is one of the most important functions of the Kalamazoo Astronomical Society. Here's our setup at the Pierce Cedar Creek Institute's 10th anniversary celebration on June 11th.

October 7th presentation was *From Backyard to Milky Way: 30 Years of Wide-Field Astrophotography*. That talk was just as good as the one two years before.

Several new guest speakers paid us a visit in 2011. The first was fellow Michigan amateur astronomer and astrophotographer Jason Blaschka. The title of Jason's July 8th talk was the *Golden Age of Amateur Astronomy*, which covered the latest and greatest astro-gadgets. His talk has renewed my desire to attend the Northeast Astronomy Forum (NEAF) at the end of April. The September 9th presentation was given by our first-ever guest from the University of Notre Dame, Dr. Grant Mathews. Dr. Mathews went over *Various Views on the Birth of the Universe & the Origin of Spacetime*. This was easily the most technical talk we've ever had, but it was well presented.

And finally, our last guest speaker of 2011 was none other than Terence Dickinson. Preparations for his appearance began back in January. I wanted to cap the 75th anniversary year off with a very special presentation by a noted amateur astronomer and he was the first that came to mind. Usually my first choice never pans out, but this time it did! Terence spoke at our 75th Anniversary Gala on November 4th with his presentation *75 Years of Amateur Astronomy and the Relentless Erosion of our Dark Skies*. And yes, it was a long presentation, as mentioned in last month's issue of *Prime Focus*, but I loved every minute of it and I hope you did to. This was a talk for amateur astronomers by an amateur astronomer. I don't know if we'll ever have the recording of his talk available, but you can read my detailed report in last month's issue. When people ask me who our best general meeting speaker of all time was, this is the meeting I'll refer to.

Boy, did we do a lot of outreach in 2011! Every year we get invited to participate in another community event. We returned to Vicksburg and Plainwell Middle School's science nights on March 1st and 31st, respectfully. The KAS was also invited to setup displays and telescopes at the Southwest Michigan Symphony's performance of Gustav Holst's *The Planets* on March 19th. That took place at Lake Michigan College. In April, we took part in the Kalamazoo Nature Center's Free Admission Day (4/16) and the "Green-a-thon" at the Portage Celery Flats (4/23). The Pierce Cedar Creek Institute in Hastings invited us to help celebrate their 10th anniversary on June 11th. We also again participated in the Kindleberger Festival in Parchment on July 9th. The weather was excellent at Cranefest on October 8th & 9th and mostly good for Spooky Science Saturday on October 22nd. We got to show hundreds and hundreds of people the Sun on those days.

Our biggest outreach event of the year, Astronomy Day, took place on May 7th. It was a pleasure having Dr. Mike Brown (a.k.a. the Pluto Killer) as our keynote speaker. Unfortunately, we did not win Best Event for a third year-in-a-row in the Astronomy Day Award. However, we did win for Quality Event Year After Year and Best New Idea. I have no idea what we did to be awarded Best New Idea, but my guess is that it was for my version of the comet making demonstration. Please be sure to read the full report in the July 2011 issue of *Prime Focus* (page 3) and visit the Astronomy Day 2011 Gallery online. Thanks again to our 30+ volunteers for making that great day possible. We again have big plans for Astronomy Day 2012 on April 21st and we won't be able to pull it off without *your* help.

The one rough spot during our anniversary year was with the weather. Thanks to poor weather conditions, we only pulled off one-third of the scheduled events. One-third! We were shutout in both May and June, with cancellations at least once a month during the rest of the season (with the exception of October). Attendance for the good dates was not spectacular. One exceptional session was on August 27th for the Kiwanis Star Party. The sky conditions were excellent, but hardly anyone showed up! Please, pencil in observing dates for 2012 and keep your eye on the weather. Instead of stopping to

From left to right: Richard Bell, Jean DeMott, Jack Roach, Rich Mather, and Don Stilwell at Fort Zachery Taylor State Park in the Florida Keys. One of their many excursions during the 2011 Winter Star Party.

smell the roses, please take the time to stargaze with your fellow members in 2012.

We did not take any field trips in 2011, but a handful of KAS members did attend the Winter Star Party together. Please be sure to read my account of our week in the Florida Keys in the April issue of *Prime Focus* and the "Silver Hairs" account in the June issue. There's also a gallery with dozens of images online. Field trips have been nonexistent as of late. I do have one or two destinations in mind for 2012, but I'd also like to hear your suggestions.

Another noteworthy event in 2011 was the debut of our new website on August 31st. I had no plans to replace the previous website so soon; after all it wasn't even 3 years old yet. However, it just never looked right on a wide-screen monitor and the gallery wasn't easy to navigate. You had to click on images one-by-one. Plus, I'm hoping to finally take first place in the Astronomical League's Webmaster Award this year! I've already placed second place twice!

Perhaps the biggest development in 2011 was with the Robotic Telescope Project. The fund-raising stage of the project began this past September and we've already raised over $26,000! If we receive more of the extremely generous contributions we got in 2011 then we may be able to start writing grants by the summer of 2012. Other fund-raising plans are in the works (see page 11), so let's keep the momentum going.

The state of the membership brings both good and bad news. The bad news is that we didn't break the all-time high of 135 memberships set last year, but we came very close! The grand total at the end of 2011 was 134 memberships. This is the first time membership has declined since 2007, but we can't expect it to go up every year. Plus, as Terence Dickinson informed us in November, amateur astronomy as a whole has been in decline since 1999. We're still an exception to that statistic.

The past three years have been exceptional ones for the Kalamazoo Astronomical Society and 2012 shows much promise. We have some fantastic observing opportunities coming up. There's the partial solar eclipse on May 20th and the last Transit of Venus of our lifetime on June 5th. If all goes well with our plans for the Venus Transit; we'll have a crowd that'll rival or exceed what we had for the Mars opposition in 2003. We'll also have Moon-free conditions for both the Perseid meteor shower in August and the Geminid shower in December. If every year is like 2011, then I have no doubt the KAS will still be around for another 75 years.

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THE CITY OF Kalamazoo Proclamation

On the evening of December 19, 2011 the Kalamazoo City Commission presented the following proclamation to the Kalamazoo Astronomical Society in honor of its 75th anniversary:

"**WHEREAS**, The purpose of the Kalamazoo Astronomical Society is to promote the exchange of information among those with a common interest in all areas of astronomy, to educate the public about astronomical discoveries and events, and to cooperate with other amateur and professional astronomical organizations.

Kalamazoo Astronomical Society, established in 1936, is the oldest and one of the largest organizations of its kind in Michigan.

In cooperation with Kalamazoo Nature Center, Kalamazoo Astronomical Society developed and built the Owl Observatory on Kalamazoo Nature Center grounds, where regular public observing sessions are held, allowing the public to look through its telescope and to learn from club members familiar with the sky.

Kalamazoo Astronomical Society conducts outreach through its annual Astronomy Day and by participation in school and Scouting events and other local festivals, sharing the wonders of the starry sky and of the solar system.

Kalamazoo Astronomical Society offers monthly programs of speakers, including astronauts, professional astronomers, researchers, authors, and photographers to support amateur astronomy and to promote public understanding and appreciation of the universe.

Kalamazoo Astronomical Society encourages everyone to follow its motto, "*Keep Looking Up.*"

NOW, THEREFORE, ON BEHALF OF THE 48TH CITY COMMISSION, I BOBBY J. HOPEWELL, MAYOR OF THE CITY OF KALAMAZOO, recognize and congratulate the Kalamazoo Astronomical Society upon their 75th Anniversary."

President Jack Price accepted the proclamation for the KAS. He thanked Mayor Hopewell and the commissioners and commented: "The Kalamazoo Astronomical Society has been active in the community for 75 years because of the dedication of thousands of members who are passionate about the hobby and like to share it." Also present were members Jean DeMott, Mike Dupuis, Rich Mather, Scott Macfarlane, Frank Severance, and Roger & Molly Williams. Jack would like to thank Molly Williams for her help working with the City Manager's office to write the proclamation.

Double Feature:

Next Solar Eclipse & Last Venus Transit

by Bill Nigg

Your local star, the Sun, is the background for two major observing events in 2012. On May 20th the Moon performs an annular solar eclipse for observers in northern California and central Nevada. That is 2000 miles away driving but near the Reno airport if you can be in the neighborhood. Annular solar eclipses are not as spectacular as total ones but great practice. A solar eclipse and an once-in-a-lifetime Venus transit would make great images if your equipment and techniques are well rehearsed and confirmed. Got a new DSLR? Want to try video at 20×? Do you have solar filters for each? How about tripods with slow-motion controls for each? Can your spouse or buddy run the other one? How about bringing some solar filter eye glasses for outreach/ entertainment?

The May 20th solar eclipse central line starts in Asia, extends across the Pacific, and enters the continental United States at Klamath, California. The late afternoon time means low Sun altitude so avoiding coastal fog may be important. The mountainous North California region may be slow traveling for last minute clear weather chasing. Closer to Nevada the line parades across flatter desert north of Reno and continues towards Albuquerque at sunset time. All this type of geographical analysis will be needed for the total solar eclipse in August 2017 [the big one]. If the weather is excellent (it can happen!) you may go to any convenient spot on the line. Many daytime observing sites are available at the last minute. I have driven into a new town and asked the first local person of obvious experience in sight. Public parks and picnic areas are great. School yards, sports practice areas, even cemeteries also work well. Grassy areas are preferred to minimize daytime heat shimmers.

This scene (created in Starry Night Pro) shows what the solar eclipse looks like from West Michigan at ~8:50 pm EDT on May 20th (about 12 minutes before sunset). The ideal viewing location will be along the Lake Michigan shoreline.

Polar alignment by compass the night before if chasing weather – not needed if weather lucky at your night spot. Pretend the concentric mid-eclipse period is "totality" and shoot your cameras. Real totality will be darker; even with no filter – can you adjust exposures manually? Remember, video also records audio so watch your language and actually speak about your camera/ telescope adjustments. This helps to record the time span and visitor comments.

Set-up, equipment, and weather chasing are similar for the Transit of Venus. Several KAS members saw the last one in 2004 taking place after sunrise. This one on June 5th is near sunset time. The view will be low in the west. I will still be "out west" so my location will see the transit all afternoon. Again, weather and equipment setup is important but no unique "center-line" is involved. The view is very unique. You see a solid black "sunspot" slowly parading across the solar disk. It looks like a marble on a plate with some 3D effects. Show your kids both events. Give them a picture to take to school for show and tell. Tell them the basic and impressive facts in addition to listening to their gee -wiz comments. Nobody else in the school has seen this – your kid will be the teacher!

Plan:

1. Circle the dates on the 2012 calendar.
2. Put in for vacation.
3. Check the following websites – print the maps.
4. Get out the road atlas & Google Earth and pick your sites. Look for me there.

Websites:

- NASA's Eclipse Website
- NASA - 2012 Transit of Venus
- Eclipser - Climatology & Maps for Eclipse Chaser

Telescope Solar Filter Sources:

- Oceanside Photo & Telescope (OPT)
- Kendrick Astro Instruments

Bill Nigg is a Lifetime Member of the Kalamazoo Astronomical Society and a veteran eclipse chaser.

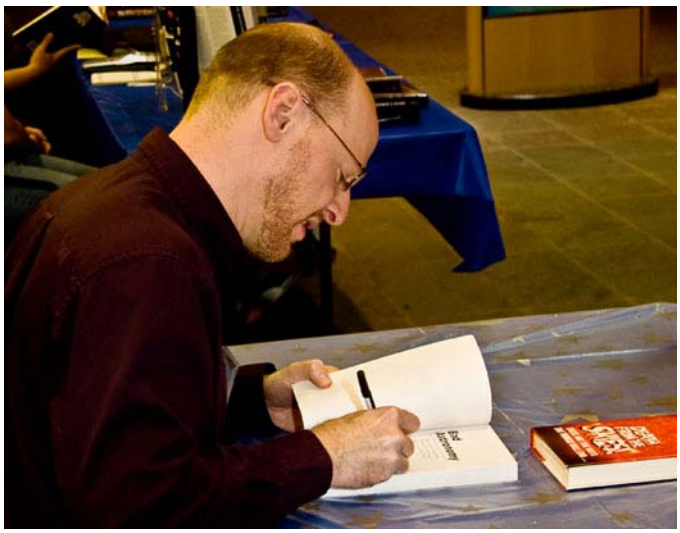
Two Books Reviewed

by Mike Dupuis

Our family has had very good luck the past two years at the KAS Holiday Party, winning multiple prizes at both bingo and at the great door prize giveaway. Part of that luck included two signed hard cover books - *Death from the Skies* by Philip Plait, and *How I Killed Pluto and Why It had It Coming* by Mike Brown. Both of these authors have been speakers at recent KAS events. What follows is a brief review of these books, both of which I have had a chance to read recently.

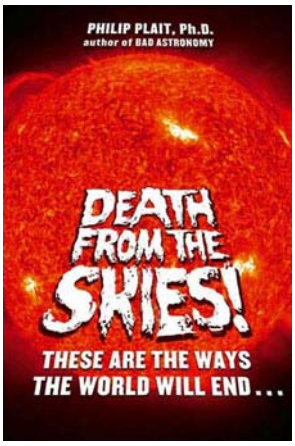
Death from the Skies reads more like a textbook than anything else, as the author lays out in great detail how many ways the grim reaper could possibly come from above, be it from local concerns such as asteroid impacts and/or solar radiation, or more distant phenomenon such as gamma ray bursts, rogue black holes, and a hostile alien invasion (based on mankind's penchant for conquering, why would we think there be any other kind?). The book is a great educational resource if you want to know anything about star formation, how the Sun will age, how black holes are created and develop, etc.

Each of the mechanisms of our possible demise (there are 9 all together) are painstakingly chronicled, and at the end of the book there is a summary chapter on the odds of each one happening. As you can probably guess, most of the odds are close to zero but still finite. While the chapters are thorough and well documented, like I said above, it reads more like a textbook than a narrative. My overall impression of this book was positive, but a little tedious and on the dry side.



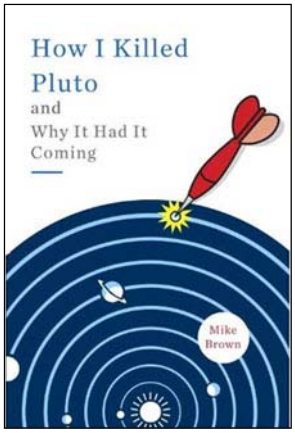
As described in the article, both Phil Plait and Mike Brown have been keynote speakers at recent Astronomy Day events. Here's Dr. Plait signing a copy of his book at Astronomy Day 2009 on May 30th. Photo courtesy of Kevin Jung.

In contrast, Mike Brown's book *How I killed Pluto and Why It Had It Coming*, does read like a narrative, and for me, seemed much more engaging. He takes us on a journey of not only his professional career, but also his personal life, although a bit too much of that at times, especially the baby stuff.



Being involved in the research process myself, I can say that Mike Brown gives a very accurate summary and first person viewpoint of the life of a researcher: the exciting beginning of getting a project off the ground and running, the long days and weeks with nothing positive to show, the endless questions that come to mind about the project and the approach taken, the thrill of an actual discovery and validation of the approach that almost no one believed would work, and finally having your work almost stolen by unscrupulous characters before you get a chance to tell the story. Folks, it's the same whether it's astronomy, biochemistry or planetary science, and if anyone is contemplating a life as a researcher, this is as good a book as any to get a feel for how it works.

The story of the discovery of objects bigger than Pluto in the outer reaches of the solar system is compelling and completely reinvigorated the study of this part of the solar system. At the same time, it asked uncomfortable and necessary questions about what we want to call a planet. This is important not only for our own solar system, but also for the classification of the many hundreds of objects that are being discovered around distant stars. Of course, it was this aspect of Mike Brown's research that lead to great controversy, wailing, and gnashing of teeth in the ensuing year after his discoveries, with Pluto finally being put into its rightful place in the solar system. I thought there was a bit too much detail on the nuances of the proceedings at the IAU meetings later in the book, but overall, I really enjoyed this book and would recommend it, both for astronomy buffs and readers interested in a good story.



Dawn Takes a Closer Look

by Dr. Marc Rayman

Dawn is the first space mission with an itinerary that includes orbiting two separate solar system destinations. It is also the only spacecraft ever to orbit an object in the main asteroid belt between Mars and Jupiter. The spacecraft accomplishes this feat using ion propulsion, a technology first proven in space on the highly successful Deep Space 1 mission, part of NASA's New Millennium program.

Launched in September 2007, Dawn arrived at protoplanet Vesta in July 2011. It will orbit and study Vesta until July 2012, when it will leave orbit for dwarf planet Ceres, also in the asteroid belt.

Dawn can maneuver to the orbit best suited for conducting each of its scientific observations. After months mapping this alien world from higher altitudes, Dawn spiraled closer to Vesta to attain a low altitude orbit, the better to study Vesta's composition and map its complicated gravity field.

Changing and refining Dawn's orbit of this massive, irregular, heterogeneous body is one of the most complicated parts of the mission. In addition, to meet all the scientific objectives, the orientation of this orbit needs to change.

These differing orientations are a crucial element of the strategy for gathering the most scientifically valuable data on

This full view of the giant asteroid Vesta was taken by NASA's Dawn spacecraft, as part of a rotation characterization sequence on July 24, 2011, at a distance of 5,200 kilometers (3,200 miles). Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

Vesta. It generally requires a great deal of maneuvering to change the plane of a spacecraft's orbit. The ion propulsion system allows the probe to fly from one orbit to another without the penalty of carrying a massive supply of propellant. Indeed, one of the reasons that traveling from Earth to Vesta (and later Ceres) requires ion propulsion is the challenge of tilting the orbit around the sun.

Although the ion propulsion system accomplishes the majority of the orbit change, Dawn's navigators are enlisting Vesta itself. Some of the ion thrusting was designed in part to put the spacecraft in certain locations from which Vesta would twist its orbit toward the target angle for the low-altitude orbit. As Dawn rotates and the world underneath it revolves, the spacecraft feels a changing pull. There is always a tug downward, but because of Vesta's heterogeneous interior structure, sometimes there is also a slight force to one side or another. With their knowledge of the gravity field, the mission team plotted a course that took advantage of these variations to get a free ride.

The flight plan is a complex affair of carefully timed thrusting and coasting. Very far from home, the spacecraft is making excellent progress in its expedition at a fascinating world that, until a few months ago, had never seen a probe from Earth.

Keep up with Dawn's progress by following the Chief Engineer's (yours truly) journal at:

http://dawn.jpl.nasa.gov/mission/journal.asp

And check out the illustrated story in verse of "Professor Starr's Dream Trip: Or, how a little technology goes a long way," at:

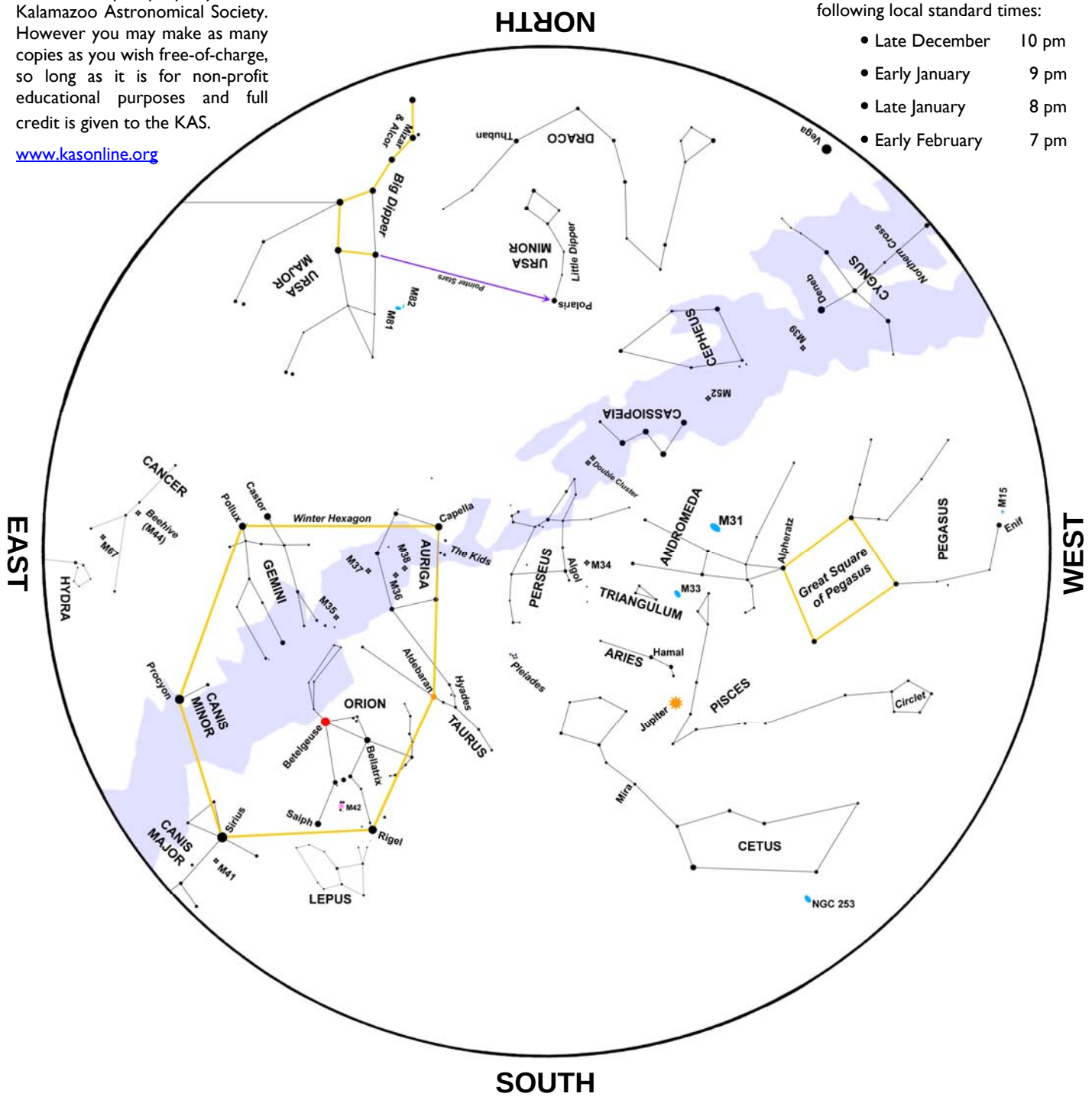
http://spaceplace.nasa.gov/story-prof-starr/

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

January Night Sky.....

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

- Late December 10 pm
- Early January 9 pm
- Late January 8 pm
- Early February 7 pm



If the weather cooperates, January 4th will be a great day for skywatchers. Point your telescope at Jupiter between 1:27 and 2:27 am EST. Galilean moons Europa and Ganymede will cast simultaneous shadows on the gas giant planet. Jupiter will be low in the western sky (with a gibbous Moon 15° above), so be sure to enjoy the view before Jupiter dives behind the trees.

Don't head off to bed just yet! The Quadrantid meteor shower peaks before dawn on January 4th. That bright Moon will wash out the faint meteors, but it sets at about 4am, leaving over 2 hours to observe under a dark sky. This shower can produce anywhere from 60 to 200 meteors per hour.

Venus will be about 8° away from a thin crescent Moon after sunset on January 25th and 26th. That's always a stunning site to behold!

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ORDER YOUR ECLIPSE SHADES TODAY!

Prepare yourself for the Partial Solar Eclipse on **May 20th** and the last Transit of Venus of our lifetime on **June 5th**.

These handy glasses will allow you to safely view both events. Buy a pair for yourself, friends, family, and co-workers! All proceeds go toward the Robotic Telescope Project.

Send your orders to: **kas@kasonline.org**

A *minimum* of $3.00 each!

Kalamazoo Valley Museum

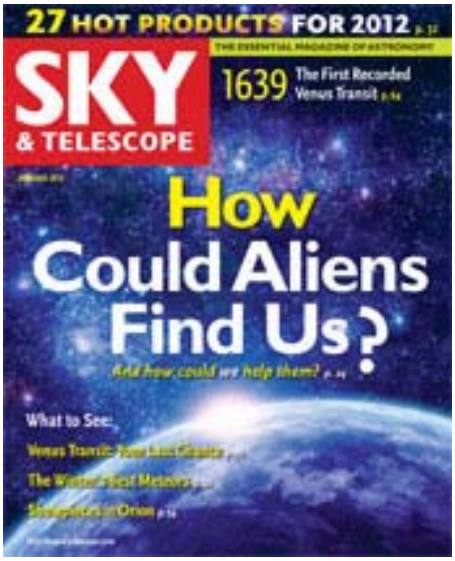
Planetarium Show Schedule

Sky Legends of the Three Fires
Weekdays @ 11am; Sat. @ 1pm; Sun. @ 2pm

Winter Nights
Tues. & Thurs. @ 3pm; Sat. @ 2pm

Invaders of Mars
Mon., Wed., Fri., Sat. & Sun. @ 3pm

*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*

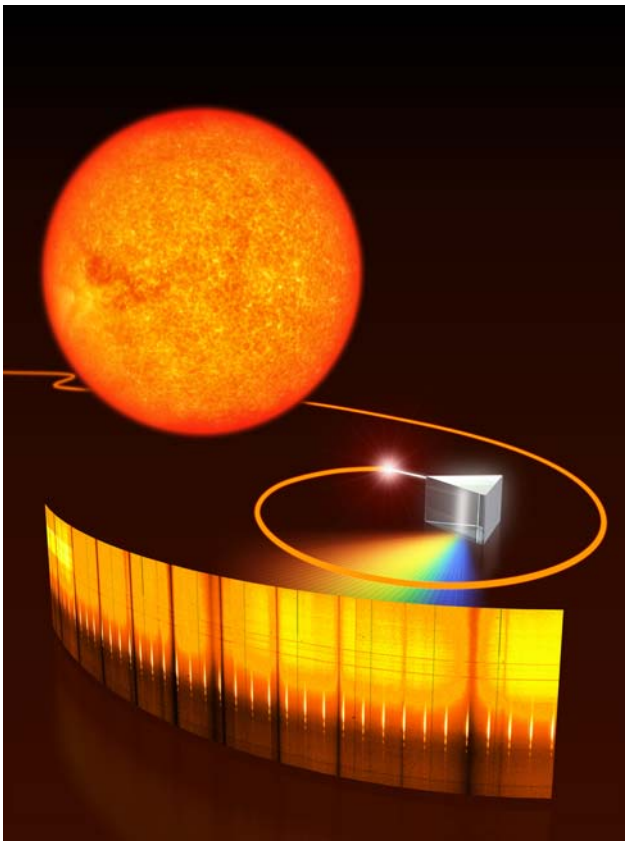


S&T Subscription Discount

One of the many benefits of KAS membership is a **$10 discount** on a one year subscription to the premiere astronomical magazine, *Sky & Telescope*. A regular one year subscription costs $42.95; you pay only **$32.95**. It's like receiving two free issues!

To take advantage, bring a check (made payable to Sky Publishing) to the next general meeting or contact KAS Treasurer **Rich Mather** (629-5312) for more information. First-time subscribers must pay through the KAS to receive the discount.

General Meeting Preview



Spectroscopy *for* Everyone!

presented live via the web by **Tom Field**

Spectroscopy is the art of analyzing the colorful rainbow spectrum that a device like a prism produces. Spectroscopy is the primary research tool used in modern astronomical research. However, until the last few years, spectroscopy has been too expensive and difficult for all but a few amateurs. Today, though, new tools make spectroscopy accessible to almost all of us. You no longer need a PhD, dark skies, long exposures, or enormous aperture! With your current telescope and camera (or even a simple web cam) you can now easily capture exciting spectra, including the atmosphere on Uranus or the red shift a quasar. This talk, with lots of interesting examples, will show you what it's all about, and how you can get started.

Friday, January 6 @ 7:00 pm

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

- Dutton Entrance Locked by 7:10 pm -

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

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