Highlights of the March Sky. . .

- - - 1st - - -
PM: Saturn is 8° left of the Waning Gibbous Moon.

- - - 3rd - - -
Dawn: Spica is 5° above the Moon.

- - - 7th - - -
Dawn: Antares is 5° right of the Moon.

Last Quarter Moon

- - - 14th - - -
Daylight Saving Time begins at 2 am (BOO!)

- - - 15th - - -
New Moon

- - - 16th - - -
Dusk: Very thin crescent Moon 7° to lower right of Venus.

- - - 17th - - -
Dusk: Waxing Crescent Moon 10° above Venus.

- - - 20th - - -
Vernal Equinox - spring begins in northern hemisphere.

PM: Waxing Crescent Moon passes very close to the Pleiades.

- - - 21st - - -
Saturn at opposition

- - - 23th - - -
First Quarter Moon

PM: Moon passes beneath Mars, Pollux, and Castor. Continues until the 25th.

- - - 29th - - -
Full Moon

- - - 30th - - -
Dusk: Mercury is 3° to the lower right of Venus. Look low in west 30 to 45 minutes after sunset.

Prime Focus

A Publication of the Kalamazoo Astronomical Society

☆ ☆ ☆ March 2010 ☆ ☆ ☆

This Months KAS Events

General Meeting: Friday, March 5 @ 7:00 pm

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

Observing Session: Saturday, March 13 @ 7:00 pm

Messier Marathon - Kiwanis Conservation Area - See Page 4 for Details

Full Moon Theater: Saturday, March 27 @ 7:00 pm

WMU Main Campus, Rood Hall, Room 1110 - See Page 3 for Details

Inside the Newsletter. . .

February Meeting Minutes

The awards ceremony for the winners of the Galileo Writing Contest was held right before the general meeting on February 5, 2010 at the Kalamazoo Area Math & Science Center (KAMSC). Forty-four of the sixty-six winning entrants attended the event. Factoring in the student's parents, siblings, and teachers the total attendance of the ceremony was close to (and maybe even over) 200 people! Some folks actually had to stand in the aisles! The ceremony was scheduled to begin at 6:30 pm, but started about 5 minutes late because it took so long to check everyone in.

Mike Sinclair was our official host and started off by welcoming everyone to KAMSC. We then played a video address from Galileo Galilei in the year 1612. Galileo talked about his discoveries with the telescope and encourage the young scientists in attendance to rediscover them with their new Galileoscopes. The KAS would like to thank Michael Francis for providing the video. It really helped make this a special event. Richard Bell then gave a quick introduction to the Galileoscope and how to assemble it.

Finally, Dick Gillespie announced the winners one by one and KAS President Jack Price presented them with their new Galileoscope. It was then announced that the winners were also being awarded with a one-year student membership. Hopefully we'll see a field of Galileoscopes at some upcoming Public Observing Sessions! Pictures of all the winners in attendance have been posted on KAS Online.

The February General Meeting was called to order at 7:17 pm. Approximately 50 members and guests were in attendance. The featured speaker of the evening was KAS Vice President Richard Bell. Richard's latest talk was called *Orion Always Comes Up Sideways*.

Richard started off by comparing the summer Milky Way with its winter counterpart. The Milky Way is more prominent in the summer because we're looking toward the galactic center. The winter Milky Way is fainter because we're looking toward the galactic edge where less stars are found. However, the winter sky seems brighter because half of the 18 brightest stars visible at our latitude are seen at this time of year. Six of those stars are part of the Winter Hexagon, the season's dominant asterism.

KAS member Isabella Cowles was one of forty-four winners of the Galileo Writing Contest that collected their prize, a Galileoscope, on February 5, 2010.

Preparing for a winter observing session was covered. Richard started off by recommending several observing books and then talked about how to dress properly. Information on these topics was included in a hand-out provided by Richard. Please feel free to contact him if you were not in attendance, but would like a copy.

The heart of the presentation was a guided tour of the Winter Hexagon; highlighting its prominent stars, constellations, and deep sky objects. A lot of stargazing tips, science, and beautiful imagery were provided along the way. Deep sky objects highlighted include: **NGC 2362** - The Tau Canis Majoris Cluster & **M41** (Canis Major), **NGC 2237** - The Rossette Nebula & **NGC 2261** - Hubble's Variable Nebula (Monoceros), **NGC 2392** - the Eskimo Nebula & **M35** (Gemini), **M37** & **M38** (Auriga), **Melotte 25** - The Hyades, **M45** - The Pleiades, & **M1** - The Crab Nebula (Taurus), and lastly **Collinder 70** - Orion's Belt & **M42/43** - The Orion Nebula (Orion). Star charts showing the position of each deep sky object were provided along with the other notes.

Jack Price gave his President's Report after the snack break. He said he enjoyed seeing *2010: The Year We Make Contact* at Full Moon Theater on January 30th. He found the scene with Roy Scheider on the beach working on a bulky looking 1980's version of a laptop particularly hilarious. At least they predicted computers would become more portable! Jack also mentioned seeing the biggest Full Moon of 2010, also on January 30th. Jack encouraged members to check out the new streaming video of the International Space Station available on NASA's website. Lastly, Jack held up a check for $150. This is our prize money for winning the Astronomy Day Award!

Both Bill Nigg and Don Stilwell reported successful observations of Mars near opposition. The seeing was less-than-ideal at times though. There were also more reports of sunspots - increasing hopes that the dreadful century-low solar minimum is drawing to a close.

A meteorite crashed into a dentist's office in Lorton, Virginia at about 5:45 pm on Monday, January 18th. It reportedly narrowly missed hitting patients and staff. There's now a controversy brewing over who owns the mango-sized meteorite; the dentist or the owner of the building. It has been sent to the Smithsonian Institution for analysis. The Hubble Space Telescope imaged the apparent asteroid collision in the main belt. The collision was discovered by the Lincoln Near-Earth Asteroid Research (LINEAR) sky survey on January 6th. A new image of Pluto was also recently released by the HST. It was taken in 2002 and will be our best view until New Horizons arrives in 2015. The meeting concluded at 9:26 pm, but not after watching the video by Galileo one more time!

Board Meeting Minutes

The KAS Board met on February 21, 2010. Because President Jack Price was not able to be present due to recent surgery, the venue was moved to Panera Bread at 5627 Gull Road, and Richard Bell chaired the meeting. Others present were Dick Gillespie, Rich Mather, Don Stilwell, and Roger Williams. The meeting was called to order at 5:15 pm, and Rich presented the Treasurer's report. Cash flow since January 1st was dominated by dues receipts, interestingly $471 by the "conventional" route and $257 via the website. There was also a second $50 commission from Orion, earned as members make Orion orders beginning with our website link. In a related treasury matter, Richard asked about disposition of the Galileoscopes not awarded in the writing contest. After a motion by Don, the Board voted to offer them for sale at $40, initially to KAS members and later, if still available, to others.

A summary of coming events included the March General Meeting, with Mike Sinclair scheduled to make the featured presentation. With the Messier Marathon scheduled for March 13th at 7 pm, Dick agreed to see if arrangements could be made for a modest amount of snow plowing in the Kiwanis Conservation Area, in the event that winter is still in force on that date. The next Full Moon Theater will be held on March 27th (details to your right). In further follow-up to previous topics, Richard reported that he was scheduled to appear on Family Saturday (April 17th) from 1 – 4 pm at the Parchment Community Library, with a talk on amateur astronomy at 1:30 pm. He also mentioned that the winners of Galileoscopes had all been given student memberships, and an attempt is being made to get address or e-mail details where those are currently missing.

Future events mentioned under the category of new business included Science Night at Vicksburg Middle School and Plainwell Middle School (see page 4 for more information). The suggested field trip to see the *Hubble 3D* movie at the IMAX theater in Grand Rapids was discussed again. After a motion by Rich, the Board voted to plan the trip for May 8th. Richard showed a proposed observing calendar for 2010, but some details are still being worked out.

Plans for Astronomy Day 2010 include repeats of the Sun display and telescopes exhibit, along with solar observing and hands-on projects. Michael Francis has been contracted to return with his *Stargazer's Apprentice* program. All attempts at inviting an astronaut as our keynote speaker have been unsuccessful and it's looking very unlikely at this point.

In further business, Richard reported that progress has been made by the Robotic Telescope Task Force in formalizing an agreement. When this is done, the fund-raising phase can begin in earnest.

In the absence of Jack Price, a date for the next board meeting was not set, but March 14th at Sunnyside will be suggested. The meeting was adjourned at 6:00 pm.

Join us for our next

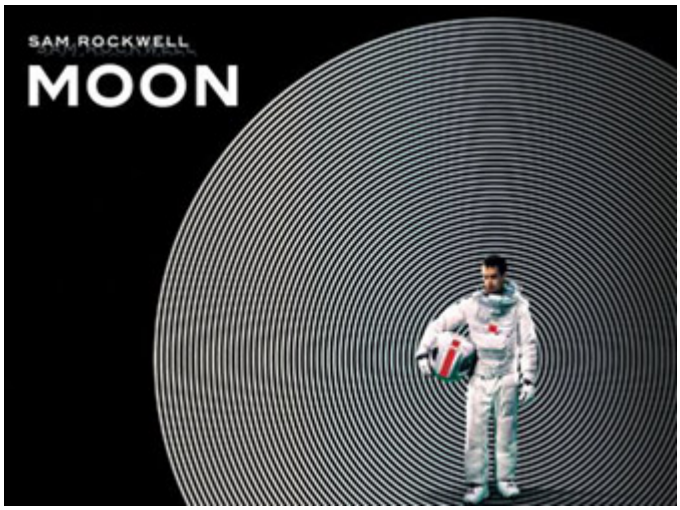
Full Moon Theater

Saturday, March 27 @ 7:00 pm

WMU Main Campus - Rood Hall - Room 1110

Looking for a little free astronomical entertainment? Then join us for the next installment of Full Moon Theater. The KAS will provide the popcorn and the soft drinks. You just need to show up and have a great time!

Our feature presentation...



Sam Bell (Sam Rockwell) is nearing the completion of his 3-year-long contract with Lunar Industries, mining Earth's primary source of energy on the dark side of the moon. Alone with only the base's vigilant computer Gerty (voiced by Oscar-Winner Kevin Spacey, 1999 Best Actor, *American Beauty*) as his sole companion, Bell's extended isolation has taken its toll. His only link to the outside world comes from satellite messages from his wife and young daughter. He longs to return home, but a terrible accident on the lunar surface leads to a disturbing discovery that contributes to his growing sense of paranoia and dislocation so many miles away from home. *Moon* is an engrossing, intelligent sci-fi thriller that ranks with genre classics like *2001: A Space Odyssey*.

Directions to Rood Hall

Head north up the Howard Street hill from the intersection of Howard and Stadium Drive. Turn right onto W. Michigan Avenue and then go left at the round-a-bout. Turn right into the employee/student parking lot. **Parking is perfectly safe and free for *anyone* all day on Saturday.** Rood Hall is located just past Everett Tower. For further directions please visit KAS Online.

Every year the KAS is asked to participate in Science Night activities at various schools across the area. So far, we've been invited to two and we could use a little help:

Wednesday, March 10, 6 - 8 pm:

Vicksburg Middle School
348 East Prairie Street

Tuesday, March 16, 5 - 7 pm:

Plainwell Middle School
720 Brigham Street (49080)

Members are needed to help setup and take down displays, hand out KAS literature, run a hands-on table, and answer questions from students and parents. Set-up begins an hour before the start of each event.

This year Science Night at Vicksburg Middle School takes place before the end of Daylight Saving Time, so we can actually get some observing in before the event is over (weather permitting). Therefore we could use a couple of people to setup telescopes outside.

Please **contact us** through the web site if you'd like to help bring astronomy *directly* to the people!

Saturday, March 13 @ 7:00 pm

Kiwanis Conservation Area

The work of comet-hunter and nebulae cataloger Charles Messier comes alive in March of each year as amateur astronomers participate in a one night search for all of the objects in his catalog of nebulae, star clusters and galaxies.

By a quirk of fate, we are fortunate that most of the objects Messier and Méchain took 24 years to discover can be observed in one night around the time of the vernal equinox. Members are encouraged to bring a good pair of binoculars or a telescope and participate in this one night race across the sky.

This year's marathon will be held at the Kiwanis Youth Conservation Area, located on 15th Avenue, 3.6 miles north of Turkeyville in Calhoun County. Visit the Schedule of Events page for further directions.

The main building at the Kiwanis Area will act as a warm room for the Marathon. A stove and microwave oven will be available if you'd like to make yourself a late-night snack or warm beverage. However, running water will not be available at this time of year. Dick Gillespie will try and provide water, but it's recommended you bring your own. The restroom facilities are also closed right now, but portable toilets will be setup.

The Kiwanis Area offers some pretty dark skies, so all members are encouraged to attend if it's clear. Don't feel you have to stay the entire night (most people don't).

Many excellent Messier Marathon resources are available online and in print. One is Richard Bell's extensive step-by-step article on his personal web site. Be sure to also check out *The Observing Guide to the Messier Marathon* by Don Machholz. Finally, please write a report for *Prime Focus* if you are successful on March 13th.

— Member Discount Program —

The KAS is now pleased to offer a discount subscription to *Astronomy Technology Today*, your complete guide to astronomical equipment. In addition to receiving the print edition of the magazine, by purchasing a subscription members will also have unlimited online access to all back issues as long as your subscription remains current. The annual discounted subscription rate is **$14.00** ($4 off the regular rate).

There are 2 options for members to access this discount:

1. Members can subscribe directly on the *Astronomy Technology Today* website by using our new discount number (contact us to find out what it is). During the order process, simply enter the discount code and you will receive the discounted rate.
2. KAS Treasurer Rich Mather can also collect your subscription payment and forward the personal information and payment to *Astronomy Technology Today*. Information we must have to make sure you receive the subscription is: Full Name, Email (if you have one), Address, City, State, Zip and Phone Number. The first method is preferred, since this option is much slower.

Learn more about *Astronomy Technology Today* by visiting their website:

http://astronomytechnologytoday.com/

Sharpen, Steady & Clarify Your View

by Tom Koonce

There are at least three important elements affecting your telescope that if improved, can make a dramatic improvement in the views you'll get this springtime.

You've probably heard a lot about the first element – collimation. If you are using a Newtonian or Schmidt-Cassegrain telescope, accurate optical collimation can make a huge difference in your views. How much? From personal experience I can tell you that with an 8-inch Schmidt-Cassegrain, it makes the difference between being able to make out the main bands on Jupiter and being able to see the curly festoons *between* the main bands on clear, steady evenings. There are many fine articles about the proper way to collimate your telescope. One can be found here, and another example can be found here, but a Google search will reveal dozens more.

The second element to upgrade is your mount. Nothing can ruin a great observing night faster than a shaky, unsteady or oscillating mount. A number of years ago, I recall that a friend of mine had a custom telescope called a Schiefspiegler built for him. This was not a small telescope (at over 4 feet in length), but the planetary and binary star views promised to be superb based upon the indoor optical tests. I went out with him the first night he set it up. We found out that the slightest breath of wind or slight tap to the side of the scope would cause oscillations lasting for many, many seconds. This wasn't only annoying; it nearly made us seasick and it certainly spoiled the view. I remember that he spent several hours later trying to beef-up the mount. Ultimately he sold the telescope because he couldn't get the mount steady enough to be both functional and portable.

A high-quality set of eyepieces will bring out the best performance of your telescope. Photo courtesy of Rod Nabholz (www.homebuiltastronomy.com).

Always go for 'overkill' when it comes to your mount. No astronomer has ever been heard complaining that their mount was just *too steady*. A big part of why the great observatories of the world are so expensive to build is because awesome views require rock steady support of the optics. I'm always trying to add stability. Little tricks like hanging a brick from a chain from below the center of your mount's tripod will add stability. Isolation pads under the tripod legs can reduce vibration. Talk to other amateurs at the next event to hear about other ideas you may try.

The third often neglected element is, of course, your eyepieces. Anything that affects the light path coming from the object you want to view contributes to the overall quality of the image your seeing. Spending good money for your telescope but then using cheap eyepieces will result in a disappointing view of the star, galaxy, or planet you want to see. The most obvious improvement to the sharpness, contrast and field of view can be obtained by using better eyepieces in the scope that you already have. Beginners typically will use whatever eyepiece(s) that came with their telescope, so I'm addressing the needs of "intermediate" level amateur astronomers with this advice.

I recommend the Meade, Celestron, Pentax and Orion lines of Plössl eyepieces, and strongly recommend *anything* made by Tele Vue. The best way to shop for an eyepiece is to go out with other amateurs to a star party and borrow their eyepieces for a few minutes and check out the view they produce using your own telescope. Most of the other folks in the astronomy club will be glad to do this since that's likely how they originally decided on what eyepieces to buy! You may be able to field test two or three "side-by-side". Just remember to treat their eyepieces as if they were gold and return them right after you're done with your assessment.

There are trustworthy classified ad sites like those at Astromart and Cloudy Nights that can offer you exceptional deals on top quality eyepieces. With patience and knowledge of what you want to buy you can build an eyepiece collection of higher-end eyepieces for relatively little money. If you have used 1¼ inch diameter eyepieces for a while, you may consider adding a 2 inch eyepiece to your collection. This may require that you upgrade your telescope's focuser to accommodate the larger size, but this is the sort of eyepiece change that will make your jaw drop with the spectacular vistas they show.

By considering any one of these elements you'll get the "Wow!" factor back into your viewing when you see the detail that your equipment is really capable of seeing.

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

A Brief History of the Messier Catalog

by Brad Hoehne

Beyond the solar system, amateur astronomers point to a wide dusting of distant sources of light, glittering and fuzzy, clear and faint. Many of the best and well-known of these have been can be found in the **Messier** (or "M") **Catalog**. When any sort of list - a list being a mean by which we organize the universe - is compiled, it is natural to assume that the process of its compilation was clear and systematic. In the case of this most popular of sky catalogs, it was anything but.

While Charles Messier (1730-1817) did discover the largest plurality of the objects (45 of them, to be exact) in the 110-strong "M" catalog we know today that list is far from the work of a single person. The celestial wonders it encompasses were discovered by 22 original observers spread over thousands of years. Messier (and a few others) merely brought them all together.

Historically, the earliest known objects in the Messier Catalog were the naked eye objects M45 (the Pleiades) and M44 (the "Beehive"). The naked-eye star cluster, M45 has been known about since stories have been told. In historical times the grouping has been associated with reams of ancient mythology and observation. Ancient cultures from the Babylonians who called it *MUL.MUL* ("Star of Stars"), to the Maori - who called it *Matariki* ("the eyes of God") to the Aztecs (*Tianquiztli* - "The Marketplace") to Japan (*Subaru*, a traditional unisex Japanese name) have folded lore of this celestial gem into their traditions. M44 is associated with similar, though much less numerous, traditions. The Greek poet and philosopher Aratus (310-240 BCE) made reference to *Praesepe* in his philosophical poem, *Phaenomena,*

In 964, the Persian Astronomer Al-Sufi noted M31 (The Andromeda Galaxy) and referred to it as "The Little Cloud" or, sometimes, the Little Fish.

The globular cluster M3, located in the constellation Canes Venatici, was Charles Messier's first true discovery. He spotted it on May 3, 1764. Messier described this as a nebulous object with no stars. In fact, M3 contains an estimated 500 thousand stars!

In the telescopic era, many "M" objects were discovered prior to Messier including them in his catalog. In 1610, not long after the Galileo's revolutionary (pardon the pun) observations, a crude telescope fell into the hands of French astronomer/mathematician Nicolas-Claude Fabri de Peiresc who made the first instrumented observation of M42, the Orion Nebula, with it. (Several ancient cultures, most notably the Maya, may have also recognized this object.)

Nine Messier objects - M6, M8, M33, M34, M36, M37, M38, M41 and M47 - were first noted by the relatively unknown Giovanni Batista Hodierna. Hodierna lived from 1597-1660 and was one of the first great catalogers of the night sky. His list, which included some 40 objects (many of which cannot be identified from his descriptions) was published in 1654 but was lost to history until the 1980s. Hodierna also made the earliest known sketch of M42.

Edmund Halley was the first to note the non-stellar nature of M13, the "Great Hercules Cluster," in 1714, though a few star catalogs from earlier times note it as a faint star of the sixth magnitude. In 1731, French geophysicist Jean-Jacques d'Ortous de Mairan reported seeing "*a small star surrounded by nebulosity in Orion*" which came to be known as M43. Many other "M" objects - such as M11, M57 and M46 - yielded to the scans of a host of lesser-known observers.

Messier's first noted observation of an object that was to appear in his catalog occurred in 1757. The object was M32, the small companion to the Andromeda galaxy.

That same year Messier had come across a small nebula while searching for the predicted return of Comet Halley. This task had been given to him by his mentor and employer Joseph Nicolas Delisle, the French astronomer of the Navy, who had calculated where to look. Though Messier did not encounter Halley's Comet, he did manage to discover several others and a curious comet-like object which did not move like a comet. Messier took note of its position for future reference. In the first edition of his catalog, he described it as follows:

> *The Comet of 1758, on August 28, 1758, was between the horns of Taurus, I discovered above the southern horn, & little distant from the star Zeta of that constellation, a whitish light, elongated in the form of the light of a candle, which didn't contain any star. This light was of almost the same as that of the Comet which I observed at that time; yet it was a bit more vivid, more white & a bit more elongated than that of the Comet which to me had always appeared almost round in its coma, without the appearance of a tail or beard… I determined the position of this nebula, its right ascension is 80d 0' 33,"& its declination 21d 45' 27"north...*

Portrait of the French comet hunter Charles Messier (June 26, 1730 - April 12, 1817).

It turns that Messier had made an independent discovery of what would come to be known as M1 - which had been observed in 1731 by English Astronomer John Bevis, but whose observation was not well known at the time. (Note the odd precision which Messier gives to his positional measurement, far greater than would be possible at the time - indeed, far greater that would be necessary for such an extended object as M1.)

Delisle, as it turns out, had erred in his Comet Halley calculations, which led Messier to into a long not-so-fruitless (as it turns out) scan of a good chunk of sky. A few years later, he bumped into what would later come to be called M2. This was a repeat observation of a 1746 discovery made by the French Jean-Dominique Maraldi. Perhaps, had Delisle made a better prediction, Messier's task would have been prematurely completed and his observing career would not have taken the turn it did.

In 1764, Messier, while on a scan for more comets (Comet Halley had returned, as predicted, in 1758, but not along Delisle's plotted course), bumped into his third nebulous object, M3 - his first true discovery. It was this event, apparently, that gave Messier the idea to perform a more systematic scan of the skies. Over the next few years Messier would independently discover the objects he would dub M9, M10, M12, M14, M18, M19 M20, M21, M23, M24, M26, M27, M28, M29, M30, M39 and M40. He would make independent searches for and observations of many others.

The first "Messier Catalog" was published in 1771 as part of the *Memoirs of the French Academy of Sciences for 1771*. It contained the 45 objects we now refer to as M1 through M45. By 1780, his list had grown to 68 objects. The following year the final revision of his lifetime expanded the list to 103 objects. It "officially" remained at this level until 1921. That year a Messier Catalog that included M104, an object that Messier had discovered and noted in his personal copy of his own catalog, was published by Camille Flammarion.

By the 1950s the 104 object Messier catalog had become a popular fixture of the rapidly growing hobby of amateur astronomy. In 1953, astronomer Owen Gingerich repeated in *Sky & Telescope* the suggestion of British Astronomer Helen Sawyer Hogg of including a number of observations that Messier's protégé and collaborator, Pierre Méchain, had discovered and forwarded to Messier with the intent of including them in a proposed future edition of the catalog. (Méchain had been responsible for 25 of the discoveries that appeared in the 1781 edition of the catalog, including a number of the "M" galaxies in the Virgo cluster.) That final catalog had never come to be. It may have been that by the time of Méchain's discoveries a flood of reported observations from the talented, diligent, and optically much better equipped William Herschel was making his notes redundant.

Gingerich's suggestion was eagerly taken up by a number of popular writers, and, by the end of the 1950s, most published versions of the list included 109 objects. One exception was in the 1967 book *Amateur Astronomy* by Patrick Moore. Moore harkens back to the 1921 list, but includes M105-

Pierre Méchain was Messier's collaborator and helped complete his final catalog in the years 1779 to 1781.

M109 in an appendix. By the 1980's, however, the list of 109 objects, of which 22 were discovered by Méchain, was more or less universal (pardon the pun). For good measure, M110 - a second small satellite galaxy of M31 noted by Messier but not cataloged was, more often than not, thrown into the list.

Given this list's long history, it is not surprising that a number of errors and confusions have popped up. The first, M40, is an error only in that the object to which it refers, in a list of extended objects, is a simple double star. Messier included it because it appeared close to the reported location of a nebulous object that had been described by Johan Hevelius in the 1640s. Messier probably figured that the star had nebulosity that he, with limited instrumentation, could not see. Or, perhaps, he was "padding" to make his list longer for publication - as he has been accused of doing with his inclusion of such "non-comet-like" objects like M45. Though the M40 Messier describes is a real object, and is noted in the correct position in his catalog, publishers of Messier's catalog have been wary of including it. Throughout the years have many have skipped it, called it "missing," or left it in with a stern disclaimer.

Three Messier objects are located in this picture. M31, the great spiral galaxy in Andromeda, dominates the view. The other two objects are dwarf elliptical galaxies. M32 is the bright white patch above M31's nucleus. M110 is located to the lower left. All three objects are about the same distance from Earth, 2.5 million light-years.

The Great Orion Nebula (M42 & M43) was not known to pre-telescopic observers. The Frenchmen Nicholas-Claude Fabri Peiresc was the first to mention it in 1611. Giovanni Batista Hodierna made several sketches of the Orion Nebula in 1654.

The second object, M102, is truly lost. Méchain's description is as follows: *"Nebula between the stars Omicron of Boötes & Iota of the Draco]: it is very faint; near it is a star of the sixth magnitude."* Messier, in his handwritten notes, gives the position *14h 40m, +56.* The problem, however, is that there is no object at Messier's location. Exactly 5 degrees to the east, however, is NGC 5866, which vaguely matches Méchain's description, but Méchain himself, recognizing the error, claimed that it had been a duplicate observation of somewhat nearby M101. This, however, seems implausible.

Over the years, in various catalogs, a number of objects have occupied M102's slot, including NGC 5789, NGC 5907 and NGC 5908. Three other "mistaken" objects have been convincingly "found." M47, was reported by Messier in the wrong location when he calculated its location in the wrong direction from the star 2 Puppis. An object matching the description of M48 was charted roughly 2.5 degrees north of its true position. Finally, M91, was misplaced when Messier calculated its position as if he had measured its distance from M58, when, in fact, he had measured it relative to M89.

M1, M31, M32, M34, M35, M36, M37, M38, M39, M42, M43, M44, M45, M78, M76, M110 and many others are well placed in the winter constellations for our evening observations. The brightness, beauty, complexity, and diversity of these objects rewards countless revisits. Though a mere collection of disparate objects - that is, inclusion in this list means almost nothing, scientifically - it is likely that Messier's bodged together a collection of fuzzy objects in the night sky is one of the most important lists in the history of science, for admiration of the wonders it contains has inspired generations of astronomers. May you be one of them.

Brad Hoehne is a member of The Columbus Astronomical Society in Ohio.

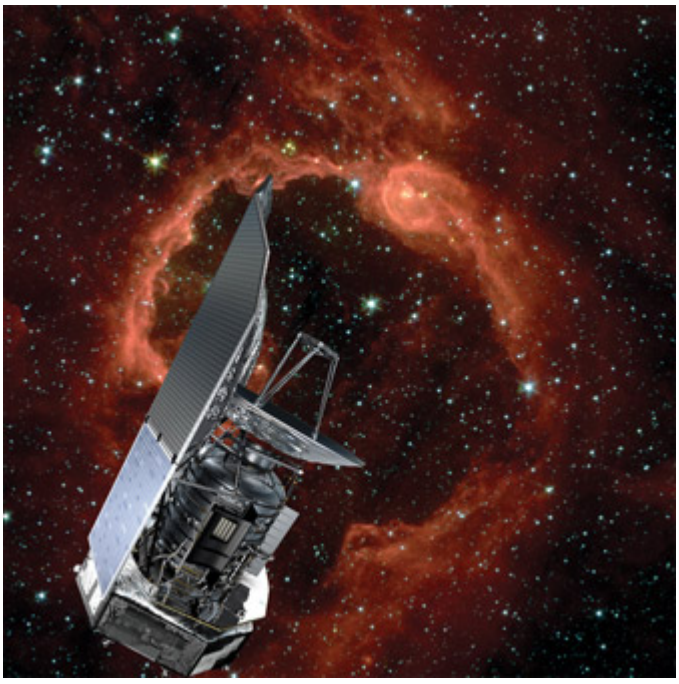
Flipping the Lights on Cosmic Darkness

Exploring the universe is a bit like groping around a dark room. Aside from the occasional pinprick of starlight, most objects lurk in pitch darkness. But with the recent launch of the largest-ever infrared space telescope, it's like someone walked into the room and flipped on the lights.

Suddenly, those dark spaces between stars don't appear quite so empty. Reflected in the Herschel Space Observatory's 3.5-meter primary mirror, astronomers can now see colder, darker celestial objects than ever before — from the faint outer arms of distant galaxies to the stealthy "dark asteroids" of our own solar system.

Many celestial objects are too cold to emit visible light, but they do shine at much longer infrared wavelengths. And Herschel can observe much longer infrared wavelengths than any space telescope before (up to 672 microns). Herschel also has 16 times the collecting area, and hence 16 times better resolution, than previous infrared space telescopes. That lets it resolve details with unprecedented clarity. Together, these abilities open a new window onto the universe.

"The sky looks much more crowded when you look in infrared wavelengths," says George Helou, director of the NASA Herschel Science Center at Caltech. "We can't observe the infrared universe from the ground because our atmosphere blocks infrared light, and emits infrared itself. Once you get above the atmosphere, all of this goes away and suddenly you can look without obstruction."



The Herschel Space Observatory has 3.5-meter primary mirror, allowing astronomers to see colder, darker celestial objects than ever before.

Herschel launched in May from the Guiana Space Centre in French Guiana aboard a European Space Agency Ariane 5 rocket. Since then, it has expanded the number of distant galaxies observed at far infrared wavelengths from a few hundred to more than 28,000. And with the instrument testing and system check-out phases finally completed, the discoveries are only now beginning.

Beyond simply imaging these dark objects, Herschel can identify the presence of chemicals such as carbon monoxide and water based on their spectral fingerprints. "We will be able to decipher the chemistry of what's going on during the beginnings of star formation, in the discs of dust and gas that form planets, and in the lingering aftermath of stellar explosions," Helou says.

And those are just the expected things. Who knows what *unexpected* discoveries may come from "flipping on the lights?" Helou says "we can't wait to find out."

Herschel is a European Space Agency mission, with science instruments provided by a consortium of European-led institutes and with important participation by NASA. See the ESA Herschel site at:

http://sci.esa.int/science-e/www/area/index.cfm?fareaid=16

Also, see the NASA sites at:

http://herschel.jpl.nasa.gov/
http://www.herschel.caltech.edu/
http://www.nasa.gov/mission_pages/herschel/

Kids can learn about infrared light by browsing through the Infrared Photo Album at The Space Place:

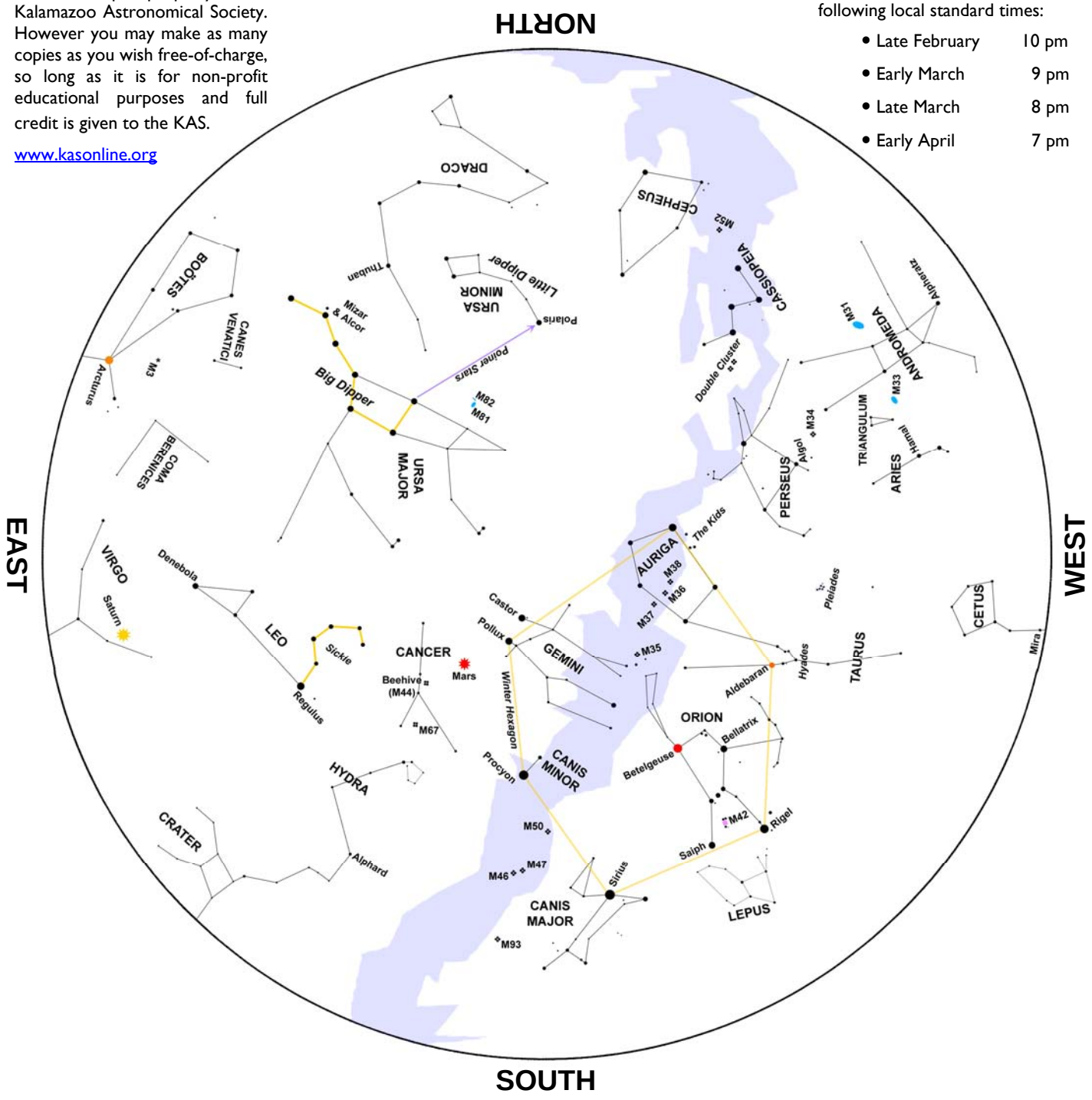
http://spaceplace.nasa.gov/en/kids/sirtf1/sirtf_action.shtml

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

March Night Sky.....

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

- Late February 10 pm
- Early March 9 pm
- Late March 8 pm
- Early April 7 pm



Look for the ringed-planet Saturn about 8º to the upper left of the just-past Full Moon on March 1st. Begin your search about 2 hours after sunset (which occurs at 6:32 pm EST).

Saturn may rise well before midnight, but it'll make its official transition to the evening sky on March 21st. That night it'll be at opposition (opposite the Sun with respect to Earth). Telescopic observes can enjoy the rings, which are titled 4º from our line-of-site at the top of the month.

The Waxing Crescent Moon will be very close to the Pleiades on March 20th. It passes just south of the cluster's core and occults 4 of the 6 stars that form a line south of Alcyone. Begin observing at about 9:00 pm EDT (about an hour after sunset).

Buy a GALILEOSCOPE

The Galileoscope is a refracting telescope kit with a 50mm objective lens. The supplied eyepiece is 20mm in focal length, giving a magnification of 25×. That can be doubled with an included 2× Barlow lens. The eyepiece can be replaced with any standard 1.25″ eyepiece. A ¼-20 mounting nut is also included which will work with any tripod. The Galileoscope weighs less than 2.5 lbs, so any tripod will do. We've got less than 30 left, so **contact us** and order *yours* before they're gone.

Only $40.00!

Kalamazoo Valley Museum

Planetarium Show Schedule

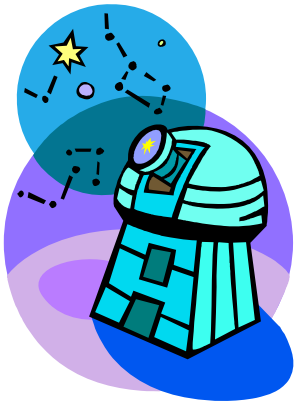
Sky Legends of the Three Fires
Weekdays, 11am; Saturdays; 1pm; Sundays, 2pm

Winter Nights
Saturdays at 2:00 pm

Invaders of Mars
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

OBSERVATORY NAMING CONTEST



Mike Patton is looking for suggestions on what to call his 20' × 20' roll-off roof observatory at Arizona Sky Village.

Therefore, we've decided to hold a "Name Mike's Observatory" Contest!

Please submit your suggestion (along with a brief explanation) using the Contact Form on KAS Online. We'll submit a list of names to Mike and he'll pick his favorite suggestion.

General Meeting Preview

Astronomy Before Copernicus

The Ptolemaic Tradition

presented by **Mike Sinclair**

We often believe that astronomy prior to the Renaissance was "finished" and complete, first described by Aristotle and formally presented to the world by Ptolemy (pictured to your left). But there were cracks in the facade of the Greek model long before Nicholas Copernicus presented the first serious public alternative to the geocentric system. Join us as former KAS President Mike Sinclair introduces us to the historical development of modern astronomy.

Friday, March 5 @ 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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