

Gemini

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Observing the Virgo Cluster of Messier Galaxies

by Greg Haubrich

"The Virgo Cluster with its some 2000 member galaxies dominates our intergalactic neighborhood, as it represents the physical center of our Local Supercluster (also called Virgo or Coma-Virgo Supercluster), and influences all the [local] galaxies and galaxy groups by the gravitational attraction of its enormous mass. It has slowed down the escape velocities (due to cosmic expansion, the 'Hubble effect') of all the galaxies and galaxy groups around it, thus causing an effective matter flow towards itself (the so-called Virgo-centric flow). Eventually many of these galaxies have fallen, or will fall in the future, into this giant cluster which will increase in size due to this effect. Our Local Group has experienced a speed-up of 100 to 400 km/sec toward the Virgo cluster.

"Current data on the mass and velocity of the Virgo cluster indicate that our Local Group of Galaxies is probably not off far enough to escape, so that our galaxy's recession from Virgo will probably be halted at one time, and then it will fall and merge into, or be eaten by the cluster." (the above copied from reference 1).

Messier objects M49, M58, M59, M60, M61, M84, M85, M86, M87, M88, M89, M90, M91, M98, M99, and M100 are the brightest members of the Virgo cluster. These galaxies are approximately 60 million light-years away. The Virgo Cluster of Messier galaxies, with magnitudes ranging from magnitude 8.8 to magnitude 10.2, can be observed with only 3.5 inches of telescope aperture. These 16 galaxies lie in a very compact area of the sky of only about 15 degrees by 10 degrees, making it the most dense cluster of Messier Objects. With up to 7 or more galaxies visible in a single 1.2 degree telescope field-of-view (FOV), the Virgo Cluster has often been touted as one of the more challenging areas of the sky to to navigate and to identify specific galaxies.

However, with a good/detailed Star Chart, a 3.5 inch or larger aperture telescope, dark skies, a few tips, and a few hours of dedicated observing in the late winter through late spring, it is a guaranteed success. Fairly dark skies and an observing altitude of at least 45 degrees above the horizon during a night of at least good transparency helps tremendously. This guarantee assumes that you have done "your homework" prior to observing.

I have included two Star Charts to assist you in hopping manually through the Virgo Cluster and to help in verifying each specific galaxy's identity (even setting circles and Goto Scopes can have trouble resolving the fraction of a degree needed to unambiguously identify this dense area of the sky).

Where to start: The first chart is non-inverted and shows an wide angle sky view between the back side of the constellation Leo the Lion, above the constellation Virgo the Virgin, and below the constellation Coma Berenices (Bernices Hair). Notice the constellation lines drawn in along with an addi-

Continued on Page 3

Astronomy Day Dates Set

The Minnesota Astronomical Society's celebration of Astronomy Day 2004 will take place the weekend of April 23rd and 24th at the Onan Observatory, located in Baylor Regional Park. The agenda for the two days is not finalized, but will follow a format similar to last year's event with public star parties on Friday and Saturday night and presentations, displays and demonstrations during the day on Saturday. Members interested in participating should contact Mike Kibat (kibatme@visi.com; 952.884.0039) to volunteer.

Onan Keyholder Training Available

MAS members interested in becoming Onan Observatory keyholders can take advantage of two upcoming training sessions. Both take place on Saturday afternoons beginning at 1:30 p.m. and ending approximately at 3:00 p.m. The first session is on March 13th and the second on April 10th. Hands-on practice will be available the evening following each session, weather permitting.

In addition to completing training, prospective keyholders are required to assist with the maintenance or operation of the observatory sometime during the calendar year. This assistance can take many forms -- helping with construction projects, hosting MAS members at Baylor star parties, lending a hand with public events or cleaning up the observatory the day following an event, for example. Interested members should send email to OnanInfo@MnAstro.org, or contact Mike Kibat (952.884.0039) to sign-up.

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Send all MAS membership dues, change of address cards, subscriptions, and renewals to the current MAS treasurer. "See "How to pay your dues" on the last page of this newsletter."

Patron Members

MAS offers a patron membership to those who want to help support our activities by paying \$55 rather than the regular annual membership fee of \$22. We would like to thank the following patron members as of January 1, 2004

Tom Alm	Robert Eichinger	Larry Larson	James Schenz
Rick Atterbury	Robert Featherly	Jacquelyn LaVaque	Robert Schmidt
Greg Baril	Allan Ferber	Michael Lavelly	David Schultz
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Doug Brown	Goodman	Bob Minor	Robert Speckhals
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Daniel DesLauriers	Sally Jorgensen	Jeff Quiram	
Frank Dorman	Michael Kibat	Jack Sandberg	
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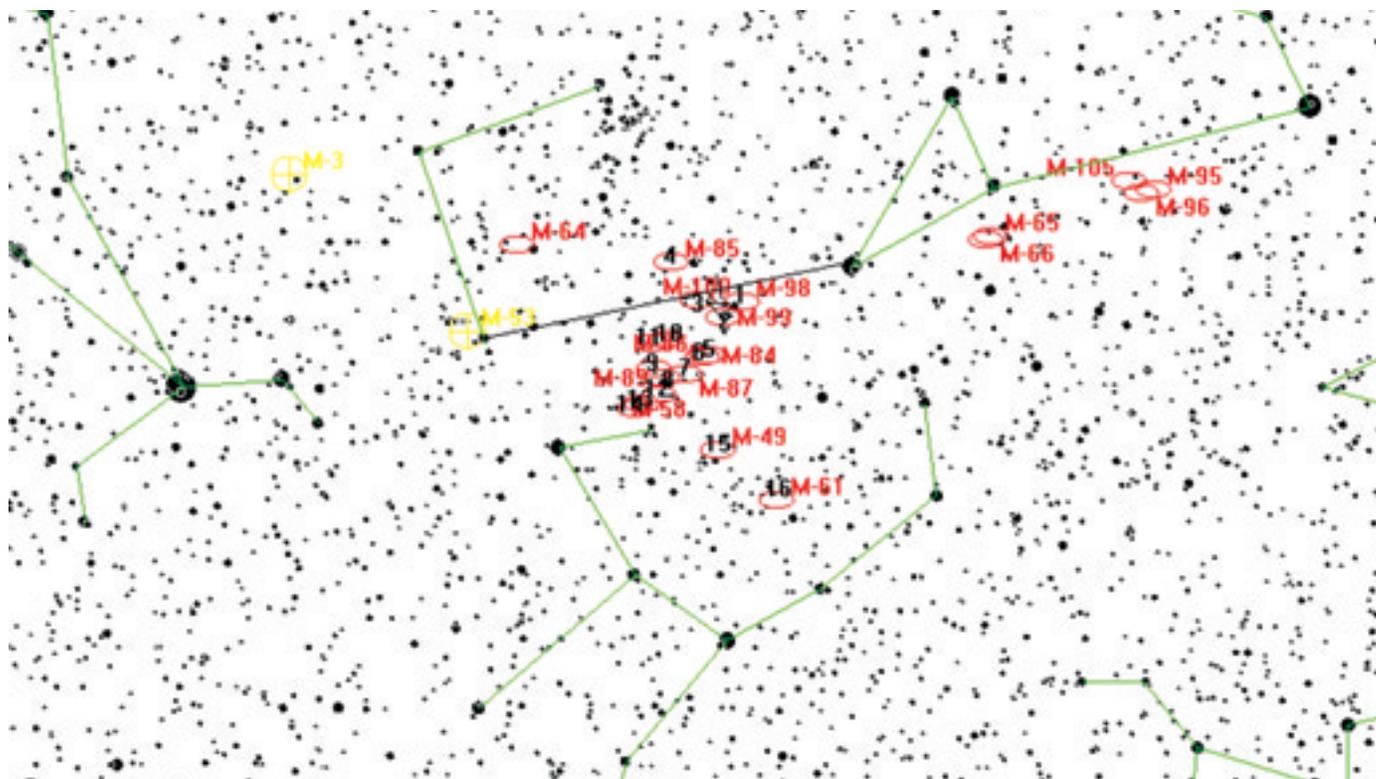
tional imaginary line connecting the very back of Leo to bottom star of Coma Berenices (these stars are named "Denebola" and "Diadem" respectively). Please note the small triangular grouping of galaxies M98, M99, and M100 which lie approximately one third of the way along the line from Leo to Coma (and ever so slightly below the line). This triangle of galaxies (and also a triangle of stars as you'll notice when we switch to the zoomed in and inverted star chart) will make a good starting point for beginning the observation of the Virgo Cluster of Messier Galaxies. First, use a reflex sight to point your telescope to this part of the sky. It also helps to be using the lowest practical power eyepiece you have (a 1 degree or larger FOV is highly desirable). Telescope FOV can be roughly calculated by taking the Apparent FOV of the eyepiece (i.e. 45deg, 52, 68, 82deg for Kelner, Plossil, Panoptic, and Nagler respectively), and dividing by the magnification of the telescope when used with that eyepiece. [Magnification = (Aperture in inches) X 25.4 X (F Ratio) divided by (the focal length of the eyepiece in mm).]

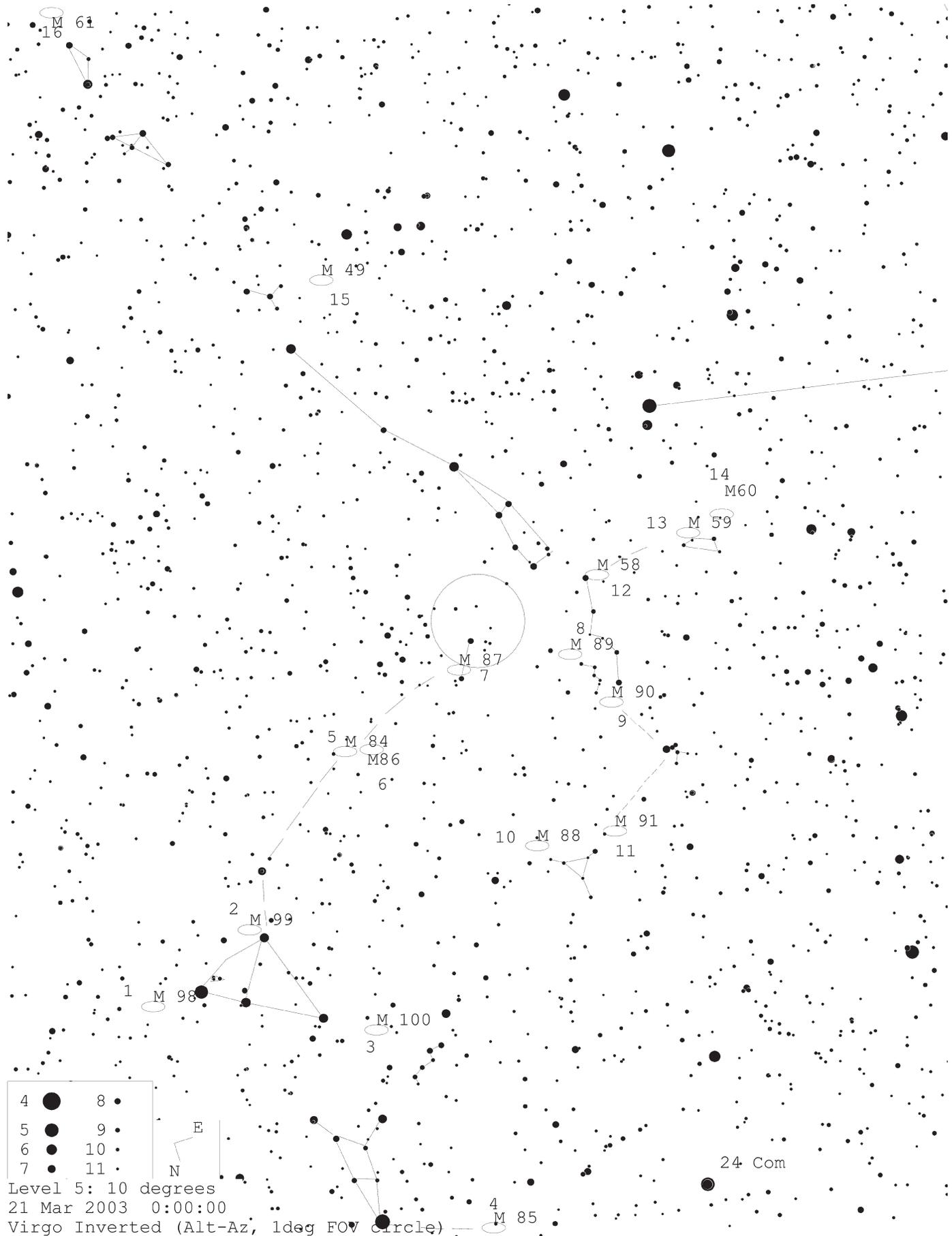
After the telescope has been initially pointed, we switch to the zoomed-in and inverted star chart (inverted so that it will look exactly as it would through the eyepiece of a Newtonian, or a refractor without a diagonal; with the circle near the center indicating a 1 degree FOV through the eyepiece). Now it works best to get the initial bearings by locating a star pattern on the chart with exactly what you see in the eyepiece FOV. As pointed initially above, you should start searching (by observing through the eyepiece) for the "large" triangular structure of stars that are shown connected with "miniature constellation lines" within M98, M99, and M100 (these miniature star patterns are called "asterisms" and they greatly aid in hopping through this region via

eyepiece views. This triangular asterism is slightly larger than the 1 degree FOV circle, so you may only see a portion of it. Also note the much smaller elongated triangular asterism just immediately above and right of M98 and contained within the larger triangular asterism. This is also helpful in orienting the "starting point".

Once you have positively identified this point, it's fairly easy from here. Just carefully navigate to each of the vertices of this triangular asterism and you'll see a galaxy near each vertex! Please note numbering sequence near each Messier Galaxy (1-16). This is a very efficient observing order for manual telescope navigation (the same order suggested in observing during the Messier Marathon). Observing the remainder of these galaxies will not involve grossly repointing the telescope as we did originally, but will instead all be done via navigating by star hopping at the eyepiece while continually comparing the eyepiece views to the detailed inverted star chart (both star patterns and relative galaxy positions). The other miniature asterisms I've drawn on the chart act as "sign posts" to guide you in moving from one galaxy to another and in identifying specific galaxies. It helps to envision how many FOVs you plan on moving, and the general direction as well (what you see through the eyepiece should be what you see on the star chart, the directions are as indicated on the chart as well).

In the observing sequence, some back-tracking will be required between sequence numbers 4 and 5, 11 and 12, and 14 and 15. Since this involves familiar territory, but in reverse, it's not too hard. Also, don't be too disappointed if you get lost and need to "reset" back to the beginning of the search sequence. After a few hours of studying this area under dark skies, it will get much easier. My observation time for the 16 Virgo Messier galaxies was 4 hours my first





time through (and I missed M91 which is fairly faint), dropping to about 25 minutes through all of them during my last Messier Marathon. You tend to get pretty good at navigating after you've been through it once. I'd be interested in hearing about your observing experience. Please share it with the MAS or Messier/Observing SIG.

It's also fun to point out to people at Star Parties (especially the younger folks) that the light you are seeing when observing these galaxies, initially left these galaxies at about the time the dinosaurs were driven to extinction by a meteor impact on Earth about 60 million years ago).

If you are interested in obtaining assistance in observing the Messier Virgo Cluster Galaxies, or would like to volunteer to help, or would just like to join us; the Messier SIG usually has a "Virgo Venture" event during the new moon weekend of April or May each year in which seasoned MAS volunteer observers lend a hand to those trying to observe

the Virgo Cluster for the first time. This year the MAS' BAD 24" scope should be available during the Virgo Venture. If you have trouble with the faint ones in your scope, put on your sunglasses and try not to burn your retina on the BAD! I hope to see you there! Please drop me a line if you would be interested in attending or helping with this event, or if you would like a PDF version of these Star Charts at: haubr003@tc.umn.edu

Carpe Noctem!!!

(reference 1: www.seds.org, Hartmut Frommert (spider@seds.org), and Christine Kronberg (smil@lrz.uni-muenchen.de))

(Note: The attached star charts were generated with Guide 8.0 Planetarium Software with the asterisms and search order added by me). 🐱

Wow! Postcards from Mars!

Robert J. Bonadurer

Amazing to ponder the tremendous human ingenuity it takes to achieve this feat of exploration. Launch a 400 pound robot geologist off our heavy, hurtling Earth. Slingshot it faster than a speeding bullet 300 million miles toward Mars! Crash land it right on target using giant air bags--and with Mars moving at 15 miles per second. Open the spacecraft like a flower with a computer command from Earth that takes 10 minutes to reach the red planet. Drive the rover off the lander and go investigating. Search for evidence of past water and conditions for ancient life in a 100 mile wide Martian crater. Astonishing! It takes hundreds of people working as a team to make this scientific and engineering marvel happen. Congratulations to everyone at NASA! And congrats to all who provide the collective "Spirit" that keeps humanity reaching for the stars. 🐱

www.MnAstro.org Renovation Nearly Complete

Mike Kibat

Updates to the MAS web site (www.mnastro.org) are underway. Changes include:

- New page background and font colors improve legibility and minimize problems with printed output.

- o The selection of page sizes and content formats ensure that printed outputs 'wrap' more effectively and on-screen displays require limited horizontal scrolling (for display widths of 800 pixels or higher).

- The 'events' section (www.mnastro.org/events) uses a common data base for all events -- meetings, star parties, Onan events, etc. -- and uses a convenient calendar format to display the information. Calendar entries are hyper-linked to details regarding the event. Secured maintenance forms allow authorized users to add, change or delete calendar entries.

- Authorized users can post directly to the home page, eliminating the need for manual intervention by the webmaster. Types of messages include high-importance notifications, star party announcements, next meeting notices, information regarding upcoming celestial events and general purpose notices.

- New content has been added. Examples include a link to Sky & Telescope's interactive star chart (see the left-hand menu on the home page), weather and sky condition screens for each observing facility / site (located on each site's descriptive page found at www.mnastro.org/facilities), a history of the MAS and a listing of 'key contacts' responsible for the various aspects of the Society's operation (www.mnastro.org/about/organization.htm).

- Email links throughout the site pre-generate a subject line (if the user's mail client supports this feature) providing recipients an option for managing their incoming mail based on subject line. (Please note that these updates are ongoing so some sections still use the original graphics and color schemes.)

Your feedback regarding the new site, particularly regarding how well it interacts with your browser and printer, is appreciated. Every page has a "Webmaster E-mail" link, or you can send your comments directly to kibatme@visi.com. 🐱

"On the road again...."

Gene Kremer

This is another invitation to join the MAS Road Trip special interest group. And a request for comments from those who have been to interesting star parties in the last few years (see below). Currently, we are considering trips to the Texas Star Party in May, and Northwoods (Eau Claire) in August, among others.

You don't need to be a party animal to appreciate star parties. There are fascinating amateur astronomers all over the world. And incredible skies that are literally beyond our horizons. I, for one, would like to meet and see as many as I can. The benefits of joining Road Trip:

- * Find out what particular star parties are like. Some are good places to observesome are not. Some have professional level programs and others are purposefully anarchistic. This info is available but not always accessible. "If you plan to go on an out-of-town astro-event, please consider posting it on the RoadTrip list. You can subscribe for as long as you want, and unsubscribe after the event. "

- * For newer members or persons going to a party the first time, a lot can be gained by knowing how things work at that party. Logistics vary. Experience counts.

- * Want to show off that new equipment? Or learn what is new, what works and doesn't? These are the places to do it.

- * Many can be expensive to get to on your own, but affordable with shared transportation, lodging, etc. Although we cannot take responsibility for your trip, we will do our best to

coordinate resources for those going.

- * Trip reports are cool! Send them to us.

We like star parties more than meetings. The participants for each road trip may or may not meet to organize their trip. Each trip is Ad Hoc. But joining the list may alert you to an upcoming activity.

For those of you who ARE party animals, I'd like to summarize MAS member assessments of various star parties, observatory trips, eco-tours, etc. Please send me your comments and/or ratings for the following information:

Event:

Location:

website, if any:

(ratings: n.a., poor, fair, good, excellent)

quality of location for observing:

quality of programs:

housing/camping/food facilities:

Overall rating and comments:

If you have any other suggestions please e-mail me. Or join the RoadTrip SIG and post it online.

Gene Kremer

gene.kremer@presenter.com

or

Gene Kremer - MAS Road Trip

1471 Portland Avenue

St Paul MN 55104

For Sale

FOR SALE: Older 6" f/8 pyrex mirror. Original Ber-al surface coating by Leroy Clausing is now only in fair condition – perhaps in the range of 60% of original. No major flaws or spots. Good for "starter" scope, solar observing, or someone may be interested in tackling a re-silvering project. Mirror has slight turned edge. Also available, a 6" cast aluminum cell with 3-point floatation. Mirror is \$35, cell is \$15. Package price is \$45. ALSO FOR SALE: 1 _" rack and pinion focuser in good condition (action a little coarse - manufacturer unknown), \$25; Meade 6x30 white finder scope and mounting brackets like new, \$ 35; older Unitron 6x30 finder scope, good condition but needs some cleaning up – no mounting brackets, \$12. Bob Kerr,kerr-comm@hotmail.com.[1/13]

FOR SALE: 6" Criterion Dynascope, 1975. Collector's item. Fully functional with clock drive that works well, two eyepieces from Criterion, setting circles and an original mirror that has been recoated. It still has a sharp image and tracks well. Asking \$800.00 or best offer. Also 15" F/4.5 truss Dobsonian. Well made with sharp image. New JMI Jim's Mobile 2" focuser. Asking \$1500.00 or best offer. Call Bob Anderson (near Northfield, MN). (507) 744-2083. Or e-mail bob973us@yahoo.com [1/1]

FOR SALE: Meade Starfinder Dobsonian 16" Scope. Has 8X50 finder and three Meade eyepieces. (9, 12, & 25 MM) I received it as a Christmas gift in 1995 and it has been used less than 6 times. It is in like new condition! Free delivery if within 100 mile radius of Stacy, MN. price - \$850 - contact: Randy 651-462-9390 or phantoms4ever@msn.com [1/1]

For Sale

FOR SALE: Orion SkyView Deluxe 90 mm f/11 refractor with equatorial mount. Received as a gift in 2001. Comes with stock finder (6x30), stock mirror diagonal, SVD equatorial mount + gold-colored tripod, upgraded brass focuser knobs, and 25 mm & 9 mm Plossl eyepieces. I'll throw in a homemade Baader film solar filter for free! Equipment is in excellent condition, only used about 8 times. Very low color on bright objects. I've had some great views of the Moon and planets with this scope, and it's a fantastic double-star scope. I'm not using it much since I bought my Tak FS102. Asking \$175 and I'll deliver it to you. Call Jackie at (651) 330-2319 or e-mail buzzygirl@comcast.net. [12/1]

FOR SALE: Meade LX-200 10" f/10 Classic with the following extras: Meade 416XT Pictor camera with 201XT autoguider and accessories, Meade f/3.3 reducer/corrector, Meade Superwedge, Meade dewcap, Celestron LPRA model A broadband filter, Meade 2x Barlow, Software Bisque TheSky Level IV, version 5, Toshiba Tecra 635CDT laptop, Adaptec 1480 PC Card SCSI adapter, 5' x 10' custom built, fully enclosed telescope trailer. It has been used only six times over the past few years - hence the reason I'm getting rid of it. The trailer was custom built based on R. A. Greiner's (i.e. Doc G) design. It has an aluminum mount on teflon pads to swing the scope in place for use, then turn the setup 180 degrees for stowage, mirror down, when traveling. Aside from the normal tongue jack, there are two jacks mounted to either side of the trailer rear. This allows for a full three-point leveling of the trailer and greatly reduces vibration. Pictures available upon request. I'm asking \$3000 for everything. Contact Jamey at 952-200-7244 or jamey_a@hotmail.com. [8/11]

FOR SALE: Celestron C150-HD A nice newtonian Reflector scope with a German equatorial mount. 150MM [6"] 1000MM focal length [f7] 6x30 finderscope, 20mm [50x] plossl eyepiece, 1 1/4" focuser. Heavy duty adjustable aluminum tripod, with accessory tray setting circle all that good stuff. have the box if you want to ship. \$365.00 Call Dick at 651 4518666 [8/24].

MAS Photo Page

David Schultz



I took one picture of Saturn on November 30, 2003 at 9:00 PM from my St. Paul backyard with my Meade LXD 55 ten inch scope using a 17 MM eyepiece and a 3x barlow lens, giving me a magnification of approximately 179X. The camera was an Olympus C-4000 digital camera that was attached to the eyepiece via a T-ring and adaptor. The exposure was for 1/25 of a second. The other Saturn was taken the same as above, on January 31, when the planet was in opposition.



I took this picture of Jupiter on December 2, 2003 at 4:00 AM. The M42 was taken with a 16 second exposure with the above equipment.

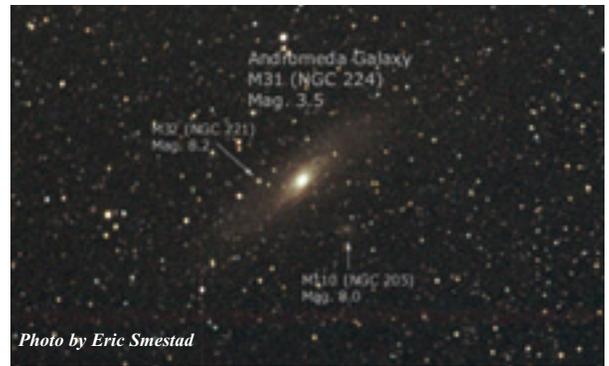
The partial eclipse was 1/30 of a second.



Eric Smestad



Orion Wide Field
Date: 11/19/2003
Film: Kodak Elitechrome 200
Lens: 28mm set at f/5.6
Exposure: About 30 minutes
Location: Cherry Grove, MN
Notes: Scanned from slide with HP PhotoSmart S20 scanner



M31 (The Andromeda Galaxy) at magnitude 3.5 is visible to the naked eye on a clear moonless night from a dark location. At a distance of 2.9 million light years it is the most distant object easily visible to the naked eye.
Date: 08/21/2003
Film: Fuji Superia Color 400
Lens: 135mm set at f/5.6
Exposure: 13 minutes

M81 and M82 Spiral and Irregular galaxies in Ursa Major

About: M81/82 are my favorite galaxies to look at. At magnitude 6.9 and 8.4 they are at a distance of about 11 million light years away. They are visible in the same telescope field but are at different angles which gives them an interesting almost 3D perspective.
Date: 04/22/2003
Film: Fuji Superia Color 400
Lens: 135mm set at f/3.5
Exposure: One 10 minute and one 3 minute combined
Notes: The line running across the lower left is a satellite.



Messier Marathon 2004

Greg Haubrich

The MAS' Messier/Observer's SIG invites you to the 6th Annual MAS Messier Marathon:

When: March 19, or 20 (alternate); Dusk until Dawn (Sunset: 18:27, Sunrise: 6:11).

Where: Cherry Grove Observatory, south of Cannon Falls.

Why: Because it's a rare opportunity to OBSERVE 109 out of 110 Messier Objects in ONE night! An OBSERVING bonanza, with fun, camaraderie, and prizes! Come out of winter Astro-hibernation and join us!

Winter Photon Deprivation got you down? Break out of Minnesota's Winter Astronomy Blues and kick-off the 2004 OBSERVING season with gusto. Join us for the 6th Annual MAS Messier Marathon.

The Messier Marathon is open to all skill levels, with individuals setting their own goals. This year 3 astronomy related prizes are being generously donated by Dan Fish from Radio City in Mounds View. The prizes will be awarded to Messier Marathon participants as follows: for most Messier objects observed by an individual (star hopping), and two random drawings of all participants (be sure to sign-in at the warming house).

The level of seriousness of this Marathon is strictly up to the observer/participant. It can range from a leisurely tour of a few interesting galaxies, star clusters, or nebula; to a frenzied race through the heaven's to observe EVERY Deep Sky object in one night that Charles Messier took a lifetime to find. Your choice. For example, in past years the MAS president logged 2 Messier Objects one whole night, while a first-timer logged over 90! Some newer members have also teamed on-site with more experienced observers and scored a celestial bounty from the night sky. Amateur Astronomers from three different Astronomy Clubs in Minnesota and Wisconsin have joined us at this event. All are welcome.

Whatever your observing skill level (or level of motivation), it's a chance for everyone to view many of the heaven's most beautiful objects in just one night! For links to a wealth of additional info on preparing for the Marathon, check out the links to the SEDS Web Page at (www.seds.org/messier/xtra/marathon/marathon.html).

For Sale

A like-new (bought in 2003) Hardin 10 inch Dobsonian with a Barlow lens and a couple of eyepieces. New it was \$495 plus shipping. I would like \$395.

Two year old Celestron G-5 in great condition. The Celestron comes with both the equatorial CG-3 mount, tripod, and clock drive, and a very sturdy equatorial CG-5 mount, tripod, and clock drive. The scope also comes with a sun filer, star diagonal. I would like \$495 for this package.

Both scopes are highly portable and have great optics. If interested in either or both scopes, let's talk: David Schultz, 651.292.1096 or e-mail dschultz@hamline.edu.

No advanced registration is required, just sign in on the sheet in the Cherry Grove warming house early in the evening, and sign out with your total Messier Object count (observer's honor) in the morning. There will be copies of the "Messier Marathon Observer's Form" for logging in the warming house. Warm apple cider and cookies available.

Recommended: Telescope and/or Binoculars (etc.), good Charts, warm clothes, and de-dewing equipment (will have a 12V hair dryer on-site to loan out). A certain amount of passion for the night sky, otherwise diagnosed as "Messier-Madness" won't hurt either.

Classes of competition will include:

Individual: Telescope, Star-hopping.

Individual: Telescope, Device Aided.

Individual: Binocular.

Individual: Naked Eye.

Team/Group: Telescope, Star-hopping.

Team/Group: Telescope, Device Aided.

Team/Group: Binocular.

Team/Group: Naked Eye.

Check the MAS message-line @ 952-467-2426 for a go/no-go (updated by 3:30 PM; or call my home phone if it's not updated). Please contact me

(Greg) if you have any questions: haubr003@tc.umn.edu or my home phone

763-421-4736.

WARNING!: Messier Marathonning has been shown to be addictive. Those that have tried it tend to keep coming back year-after-year for more.

I hope to see you there!

Messier/OBSERVING SIG Coordinator and MAS Observing Chair.

2004 Onan Observatory Public Star Parties

Star parties are held on Friday if weather permits, otherwise on Saturday. Call (952) 467-2426 after 6:00 p.m. on a star party date to hear whether it will be held.

Date	Event	Starts	Ends
04/23/2004	Astronomy Day Star Party	06:30 PM	10:00 PM
04/24/2004	Astronomy Day / Star Party	Noon	10:00 PM
05/28/2004	Observatory Public Viewing	07:00 PM	10:00 PM
05/29/2004	Observatory Public Viewing	07:00 PM	10:00 PM
06/25/2004	Observatory Public Viewing	07:00 PM	10:00 PM
06/26/2004	Observatory Public Viewing	07:00 PM	10:00 PM
07/23/2004	Observatory Public Viewing	07:00 PM	10:00 PM
07/24/2004	Observatory Public Viewing	07:00 PM	10:00 PM
08/11/2004	Public Meteor Viewing Party	10:00 PM	Dawn
08/20/2004	Observatory Public Viewing	07:00 PM	10:00 PM
08/21/2004	Observatory Public Viewing	07:00 PM	10:00 PM
09/17/2004	Observatory Public Viewing	07:00 PM	10:00 PM
09/18/2004	Observatory Public Viewing	07:00 PM	10:00 PM
10/15/2004	Observatory Public Viewing	07:00 PM	10:00 PM
10/16/2004	Observatory Public Viewing	07:00 PM	10:00 PM
10/27/2004	Public Lunar Eclipse Party	07:00 PM	01:00 AM
11/16/2004	Public Meteor Viewing Party	10:00 PM	Dawn

Directions to the Star parties

Metcalf

Metcalf is the grassy parking lot of Metcalf Nature Center, about 20 miles east of St. Paul along highway 94. About 6 miles E of the 694/494 crossing is county road 15 (Manning Ave.). Turn right, then left onto the frontage road and continue east, crossing over county road 71. Turn right (south) onto Indian Trail; follow it 1.1 miles to an chicken-wire gate on the right, (marked by three blue reflectors), opening onto a dirt driveway, which is the entrance to Metcalf.

Baylor Regional Park

Baylor Regional Park is roughly 25 miles W of the SW corner of 494. Head west on highway 5, through x, to Young America. Turn right onto county road 33 and follow it about 2 miles to the park, a right turn. The observing site is through the gate and roughly 100 yards beyond. Card-carrying MAS members may observe at Baylor at any time; call the park keepers in advance at 448-6082.

When visiting Baylor Regional Park, MAS members are requested to NOT park on the grassy areas next to the observatory (or any other grassy areas for that matter). This is a matter of being considerate to the park, its caretakers, and other visitors, so PLEASE PARK in the PARKING AREA. Annual Park Permits (optional, not required for observing) can be purchased by sending a check to Carver County Parks, 10775 County Road 33, Norwood Young America, MN 55397. The cost for the Annual Permit is \$18. Permits are also available at the Park Office at Baylor Park, the Carver County Government Center located at 600 4th St. in Chaska, through the honor box systems and gate houses when staffed at both Baylor and Lake Minnewashta Regional Parks. Lake Minnewashta Regional Park is located in Chanhassen off of Hwy. 41 between Hwy. 5 and Hwy 7 .

Cherry Grove

Cherry Grove is about 20 miles south of Cannon Falls. Head south on Hwy 52. Around 6 miles south of Cannon Falls, take a right onto Goodhue County 1 and follow it around 16 miles, where it ends in a T with Dodge County A. The observatory and warming house are at your right, nestled in the corner of the T.

NGC Number:NGC 7635

Common Name:The Bubble Nebula

Constellation:Cassiopeia

Distance from Earth: 7,100 Light Years

Click here to view the full size image.

Date Taken: 1/11/2004

Location: Black Forest, CO

Equipment: 16" RCOS Ritchey-Chretien, Astro-Physics .67x Reducer, SBIG 10XME, NABG, SBIG CFW-8

Exposure Specs:145 minutes total, Lum: 18x5 min, Red: 3x5 min, Grn: 3x5 min,

Blu: 3x5 min

Processed with: MaximDL v3,

Adobe Photoshop CS

Matt Russell



Photo by Matt Russell

2004 Star Parties

Star parties are held on Friday if weather permits, otherwise on Saturday. Call (952) 467-2426 after 6:00 p.m. on a star party date to hear whether it will be held.

Date	Alt Date	Event	Start	End	Location
2/13/04	2-14-04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
2/20/04	2/21/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
2/27/04	2/28/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
3/12/04	3/13/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
3/20/04		StarParty: Cherry Grove+			
		MAS Messier Marathon(alt.)	Dusk	Dawn	Cherry Grove Observatory
3/26/04	3/27/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
4/9/04	4/10/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
4/16/04	4/17/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
4/23/04	4/24/04	Astronomy Day Star Party	6:30 PM	10:00 PM	Baylor Regional Park (Onan Observatory)
5/7/04	5/8/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
5/14/04	5/15/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
5/21/04	5/22/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
5/28/04	5/29/04	Observatory Public Viewing	7:00 PM	10:00 PM	Baylor Regional Park (Onan Observatory)
6/4/04	6/5/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
6/8/04		Transit of Venus	4:30 AM	7:00 AM	Urban/Suburban Location T.B.D.
6/11/04	6/12/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
6/18/04	6/19/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
6/25/04	6/26/04	Observatory Public Viewing	7:00 PM	10:00 PM	Baylor Regional Park (Onan Observatory)
6/25/04	6/26/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
7/9/04	7/10/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
7/16/04	7/17/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
7/23/04	7/24/04	Observatory Public Viewing	7:00 PM	10:00 PM	Baylor Regional Park (Onan Observatory)
7/23/04	7/24/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
8/6/04	8/7/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
8/11/04		Public Meteor Viewing Party	10:00 PM	Dawn	Baylor Regional Park (Onan Observatory)
8/13/04	8/14/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
8/20/04	8/21/04	Observatory Public Viewing	7:00 PM	10:00 PM	Baylor Regional Park (Onan Observatory)
8/20/04	8/21/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
8/27/04	8/28/04	Observatory Open House	Dusk	10:30 PM	Baylor Regional Park (Onan Observatory)
9/10/04	9/11/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
9/17/04	9/18/04	Observatory Public Viewing	7:00 PM	10:00 PM	Baylor Regional Park (Onan Observatory)
9/17/04	9/18/04	Star Party: Cherry Grove + Mini Messier Marathon	Dusk	Dawn	Cherry Grove Observatory
9/24/04	9/25/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
10/8/04	10/9/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
10/15/04	10/16/04	Observatory Public Viewing	7:00 PM	10:00 PM	Baylor Regional Park (Onan Observatory)
10/15/04	10/16/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
10/22/04	10/23/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
10/27/04		Public Lunar Eclipse Party	7:00 PM	1:00 AM	Baylor Regional Park (Onan Observatory)
11/5/04	11/6/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
11/12/04	11/13/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
11/16/04		Public Meteor Viewing Party	10:00 PM	Dawn	Baylor Regional Park (Onan Observatory)
11/19/04	11/20/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center
12/3/04	12/4/04	Star Party: Baylor	Dusk	Indefinite	Baylor Regional Park (Onan Observatory)
12/10/04	12/11/04	Star Party: Cherry Grove	Dusk	Indefinite	Cherry Grove Observatory
12/17/04	12/18/04	Star Party: Metcalf	Dusk	Indefinite	Metcalf Nature Center



MN ASTRONOMICAL SOCIETY

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<i>Patron membership</i>	\$55.00
<i>Student membership</i>	\$10.00
<i>Subscription to Gemini for members of other astronomy clubs</i>	\$4.50
<i>Subscription to Gemini for other persons</i>	\$9.00

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If you get *Sky and Telescope* at the club's discounted rate, you must renew your subscription through the club. When you get a renewal notice from S&T, send the notice along with a check for the amount indicated on the notice (currently \$32.95) to the MAS Treasurer (Patti Neavin) PO Box 16656 St Paul, MN 55116-0656. Make checks payable to MAS. If desired, you may renew your MAS membership at the same time, and write one check to cover both payments.

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and follow the subscription instructions.

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The MAS list has about 40% of the membership on it.