

February 2008

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A Publication of the Grand Rapids Amateur Astronomical Association

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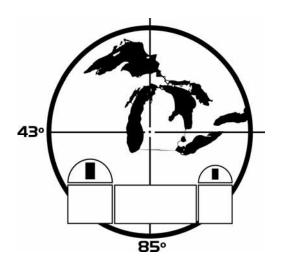
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"The sky was a midnight-blue, like warm, deep, blue water, and the moon seemed to lie on it like a water-lily, floating forward with an invisible current."

Willa Cather







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In This Issue:

February Meeting Information

Dr. Larry Molnar will speak to the GRAAA on Saturday, February 2. The title of his talk is "The Flora Asteroid Family: A Forensic Study of an Asteroid Collision."

Calendar of Events & News Notes

Happenings in the GRAAA and the astronomical community

Eclipse of the Snow Moon.....by Richard Bell

A dark and snowy mid-winter night is the perfect time for crisp, clear skies and eclipsed moons. Richard tells you just what to expect, and what too look for.

Mars Rover Seminar

A talk by Dr. Ray Arvidson at Western Michigan University

News from the 'Net

Production Staff

NASA's Space Place - "No Mars Rock Unturned"

The wonders of the world of science and technology, brought to you by NASA and the Jet Propulsion Laboratory

Chaffee Planetarium Sky Shows

Note: Any views and opinions expressed by the authors in this publication are not necessarily those of the GRAAA or its members.

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Contributing Authors Richard Bell Images Credit: (this edition) Brian Briggs

Kevin Jung

August 2007 Lunar Eclipse by Richard Bell

FEBRUARY MEETING NOTICE

Saturday, February 2, 2008
7.30pm - Calvin College Science Building, Room 110

"The Flora Asteroid Family: A Forensic Study of an Asteroid Collision."

Presented by Dr. Larry Molnar Professor of Physics Calvin College

Approximately one billion years ago a major collision occurred near the inner edge of the asteroid belt, producing a large number of collisional shards we now call the Flora family of asteroids. Since that time the orbits of the Floras have dispersed due to planetary resonances and light pressure from the Sun. Most of the collisions of asteroids with Earth in the last billion years may well be fallout from this original collision. He will discuss how we can recognize the signature of the original collision so long afterwards and how monitoring of the spins of Floras with modest telescopes can be used to fill in some of the details of the history of this momentous collision.



About the Speaker:

Dr. Larry Molnar is Professor of Physics at Calvin College. He received his PhD from Harvard in 1985, and has been currently working on researching minor planets. You can read more about him at his website.

Directions:

An online map (with a big red arrow pointing to the door at the northeast side of the building) is available, as are driving directions to the college. The meeting will be in Room SB 110 (northeast corner of the ground floor of the Science Building). There will have signs with arrows leading from that door to the lecture room. The nearest parking is either that surrounding the Fine Arts Center or that to the west of DeVries Hall.

The meeting is open to all interested individuals. GRAAA members and guests are encouraged to attend.



News and Events

(Latest News and Events always online at www.graaa.org)



THE GENERAL MEETING OF THE GRAAA will be held on Saturday, February 2nd at Calvin College Science Building, Room 110, beginning at 7.30pm. The program, beginning at 8.00pm, will feature Dr. Larry Molnar, who will speak on "The Flora Asteroid Family: A Forensic Study of an Asteroid Collision."

About the subject:

Approximately one billion years ago a major collision occurred near the inner edge of the asteroid belt, producing a large number of collisional shards we now call the Flora family of asteroids. Since that time the orbits of the Floras have dispersed due to planetary resonances and light pressure from the Sun. Most of the collisions of asteroids with Earth in the last billion years may well be fallout from this original collision. He will discuss how we can recognize the signature of the original collision so long afterwards and how monitoring of the spins of Floras with modest telescopes can be used to fill in some of the details of the history of this momentous collision.

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All GRAAA members are encouraged to attend.

Mars Talk IN Kalamazoo: On February 11th, Dr. Ray Arvidson will be giving a talk on the *Mars Rovers* at Western Michigan University. Please see the complete information elsewhere in this publication.

HUBBLE PHOTOGRAPHIC EXHIBITION: Going on now through March 16th at the Muskegon Museum of Art. Heavens Above: Photographs of the Universe from the Hubble Space Telescope is an exhibition of 30 photographs of the universe from the Hubble Space Telescope was organized by the NASA Space Telescope Science Institute and the Midland Center for the Arts.

LUNAR ECLIPSE ALERT!! Remember there is a total lunar eclipse on February 20th. Keep your fingers crossed for crystal clear (and steady) skies. Read the article elsewhere for particulars on this event.

APRIL MEETING - ADVANCED NOTICE: The monthly meeting for April will be on a special date, Wednesday the 16th. We will be meeting at the Meijer theater in the museum. The special guest speaker is Captain David C. Leestma (USN Ret), former astronaut and now head of the Advanced Planning Office at the Johnson Space Center. More information will be online and in future newsletters. Mark your calendars now though.

GIANT STORM ERUPTION AT JUPITER UNEARTHS A BURIED PAST: Scientists around the globe have observed an astonishing and rare change in Jupiter's atmosphere -- a huge disturbance churning in the middle northern latitudes of the planet as two giant storms erupted.

Jupiter's winds are the strongest at middle northern latitudes, reaching about 600 kilometers per hour (370 miles per hour). Similar phenomena occurred in 1975 and 1990, but this event has never been observed before with high-resolution modern telescopes.

RED DUST IN PLANET-FORMING DISK MAY HARBOR PRECURSORS TO LIFE: Astronomers at the Carnegie Institution have found the first indications of highly complex organic molecules in the disk of red dust surrounding a distant star. The eight-million-year-old star, known as HR 4796A, is inferred to be in the late stages of planet formation, suggesting that the basic building blocks of life may be common in planetary systems.

STARDUST FORMED CLOSE TO SUN: Samples of the material picked up during the NASA Stardust mission indicate that parts of the comet Wild 2 actually formed in an area close to the sun. New research by an international collaboration including Livermore researcher Saša Bajt analyzed noble gases within Stardust samples. The helium and neon isotope analysis suggests that some of the Stardust grains match a special type of carbonaceous material found in meteorites; hence both must have spent time in the same gas reservoir, which was close to the sun.

NOAA: SUNSPOT IS HARBINGER OF NEW SOLAR CYCLE, INCREASING RISK FOR ELECTRICAL SYSTEMS: A new 11-year cycle of heightened solar activity, bringing with it increased risks for power grids, critical military, civilian and airline communications, GPS signals and even cell phones and ATM transactions, showed signs it was on its way late yesterday when the cycle's first sunspot appeared in the sun's Northern Hemisphere, NOAA scientists said.

ICE CLOUDS PUT MARS IN THE SHADE: Until now, Mars has generally been regarded as a desert world, where a visiting astronaut would be surprised to see clouds scudding across the orange sky. However, new results show that the arid planet possesses high-level clouds that are sufficiently dense to cast a shadow on the surface.

MESSENGER REVEALS MERCURY'S GEOLOGICAL HISTORY: Shortly following MESSENGER'S closest approach to Mercury on January 14, 2008, the spacecraft'S Narrow Angle Camera (NAC) on the Mercury Dual Imaging System (MDIS) instrument acquired this image as part of a mosaic that covers much of the sunlit portion of the hemisphere not viewed by Mariner 10. Images such as this one can be read in terms of a se-

quence of geological events and provide insight into the relative timing of processes that have acted on Mercury's surface in the past.

Journey to Saturn From Your Computer: Want a peek at Saturn as seen from space? A new interactive 3-D viewer that uses a game engine and allows users to travel to Saturn and see it the way the *Cassini* spacecraft sees it is now online at http://saturn.jpl.nasa.gov/multimedia/CASSIE.

WINTER OBSERVATORY USE: Remember, if you are using the observatory when it's cold, and you turn up the heat, <u>TURN IT DOWN WHEN YOU LEAVE!!</u> Recently it was discovered that the place was heated for nearly a week, without anyone there.

GRAAA ONLINE FORUM: Just a reminder of the forum for club members. It's a great place to get the latest scoop on club (and general astronomy) news, observing tips & tricks, and a whole bunch of other fun and informative things for all members to share in. You can find a link to the Forum in the Members' Section of the website. It hasn't been used much - c'mon people!!

MARCH INSIDE ORBIT: The deadline for submissions to the March 2008 *Inside Orbit* is February 22nd. If you'd like to write anything, please feel free to do so. The editorial staff is very relaxed concerning submissions, and take anything that's remotely interesting. In fact, they will almost guarantee that it will be published.

INFORMATION SPOT: The <u>Umbra</u> is the darkest part of a shadow. In astronomy, umbra can refer to the darkest areas of phenomena such as eclipses and sunspots. For example, the umbra is the darkest region of shadow cast by the Sun or Moon during an eclipse. If an observer stood within the Moon's umbra during a solar eclipse, the Sun would "disappear" behind the Moon. Likewise, the Moon disappears from view when it passes through Earth's umbra during a total lunar eclipse. The umbra is also the darkest region of a sunspot, where the sunspot temperatures are lowest.

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Eclipse of the Snow Moon

by Richard Bell

Native Americans call February's Full Moon the Snow Moon. This month's Full Moon, however, might be better described as the Copper Moon or even the Blood Moon! Why? A total lunar eclipse takes place on the night of February 20th!

We were clouded out for the lunar eclipse last March, which was in progress at moonrise. Skies were clear for August's early morning eclipse, but dawn broke as the totally eclipsed Moon set in the west.

February's total lunar eclipse takes place late in the evening and we get to see the show from start to finish! The entire event will be visible over all of South America and most of North America as well as western Europe and Africa. Only our friends in the Far East and Australia will be shut out.

The eclipse officially kicks off at 8:05 pm EST (exactly two hours after moonrise) when the Moon slips into the Earth's penumbra, the lighter outer shadow cast by our planet. This stage of a lunar eclipse is undetectable as the shading on the outer penumbra is very slight.

Use the penumbral stage of the eclipse to setup your gear and observe the ringed planet Saturn, located only 3° or 4° to the Moon's northwest. Saturn reaches opposition three days after eclipse time, so it'll be near its maximum brilliance for the year. Regulus, the heart of Leo the Lion, is only 2° or 3° to the northeast of the Moon. This bonus conjunction will fit into the field-of-view of almost any pair of binoculars.

Small bites will be taken from the Moon's disk starting at about 8:43 pm. At this time, the Moon begins its gradual plunge into the Earth's umbra, the darker inner shadow. Observing the Moon through a telescope with low to medium powers can be really exciting at this stage. Watching the Earth's shadow creep across the lunar surface, covering up maria and craters, is one of the big thrills of astronomy. The objects we normally observe, such as the Moon on a regular night or deep sky objects, are static and unchanging. During a lunar eclipse, you get to watch astron-

omy in motion!

Crater timing is still a very important activity to perform if you're looking for a project during the eclipse. The umbra changes shape from one eclipse to the next; therefore adding a complication to predicting the duration of lunar eclipses. The effect is clearly related to the Earth's atmosphere, but this phenomenon is not completely understood. Generally, you pick a familiar crater like Copernicus or Tycho and record the times when the shadow touches the two opposite edges of the crater. Check out the NASA Eclipse Home Page by Fred Espenak for more information.

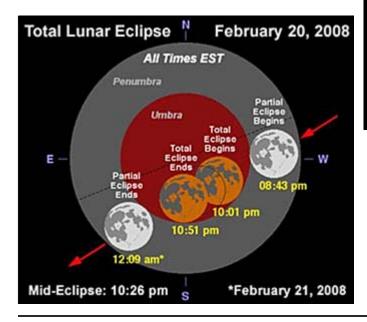
Totality is predicted to begin 10:01 pm, but try and see how accurately you can determine when this moment happens for yourself (and for science). The exact appearance of the totality eclipsed Moon depends on several factors. First is the Moon's path through the umbra. As you can see in the diagram below, the Moon skims the southwestern boundary. Therefore, the Moon's southern half should remain lighter than the northern half. Then there are various environmental factors such as the amount of cloud cover on eclipse day and how much contaminates are in the air (both naturally occurring and manmade).

Last August's total lunar eclipse was bright with an exquisite orange and copper hue, so it's safe to assume this month's eclipse will follow suit. Incidentally, the coppery to blood-red appearance of the totality eclipse Moon comes from sunlight refracted through the Earth's atmosphere. In essence, what we're seeing are the colors of all the sunrises and sunsets around the globe. The Moon would vanish completely during totality if it wasn't for the Earth's prism-like atmosphere.

The French astronomer André-Louis Danjon developed a five point scale for evaluating the visual appearance and brightness of the Moon during a total lunar eclipse. Again, check out the handy NASA Eclipse Home Page for details on the Danjon Scale. Try to determine the Danjon

rating for yourself and then compare your results with other amateur astronomers.

Totality lasts for a total of 50 minutes and ends at 10:51 pm. The Moon then gracefully exits the umbra entirely at 12:09 am on February 21st. At this point, you may as well pack up your gear and catch some sleep before work. Let's just hope the weather cooperates on February 20-21, because this is our last chance to enjoy the splendors of a total lunar eclipse until December 20 - 21, 2010.





The lunar eclipse of August 2007. Photographed by Richard Bell from the KAS's Owl Observatory

At a Lunar Eclipse
By Thomas Hardy

Thy shadow, Earth, from Pole to Central Sea,
Now steals along upon the Moon's meek shine
In even monochrome and curving line
Of imperturbable serenity.

How shall I link such sun-cast symmetry
With the torn troubled form I know as thine,
That profile, placid as a brow divine,
With continents of moil and misery?

And can immense Mortality but throw
So small a shade, and Heaven's high human scheme
Be hemmed within the coasts yon arc implies?

Is such the stellar gauge of earthly show,
Nation at war with nation, brains that teem,
Heroes, and women fairer than the skies?

Western Michigan University

College of Arts and Sciences Department of Geosciences

Hosts

Dr. Ray Arvidson
Director, Earth and Planetary
Remote Sensing Laboratory
Washington University in St. Louis

"The Mars Exploration Rover Mission"

The two rovers, Spirit and Opportunity, have been traveling across the surface and making scientific measurements for over 1200 Mars days or sols. Opportunity landed on Meridiani Planum on what we now know are ancient lake beds formed in an acid-sulfate aqueous system. Spirit landed on olivine-bearing basaltic plains and then drove to the older Columbia Hills.



The Hills are an ancient volcanic complex with extensive evidence for the interaction of water and magmatic systems, including hydrated sulfate and silica deposits. The evidence for the interaction of water and crustal materials will be discussed, along with implications for habitability and life on Mars.

Monday, February 11, 2008 4:00 P.M. 1104 Rood Hall Western Michigan University Campus

Study Shows over 68% of Science Stories Have Scientific Errors

Brian Briggs, BBspot.com

Evanston, IL – A recent joint study by the Columbia School of Journalism and the Department of Physics showed that 68% of science stories had scientific mistakes.

Frank Albertson, a journalism professor at Columbia who ran the study, said, "It can run from simple math errors to complete fabrication of facts. Many of the journalists who cover science stories don't have the scientific background to make sure that their stories are accurate. And whether from the pressure of deadlines or laziness, they don't do the extra work needed to make sure the stories are factual."

Albertson cited several examples of scientific errors from the study. In one New York Times story about the asteroid that could possibly hit Mars the reporter said, "The impact could split Mars in two causing it to fall into the Sun."

"I think the reporter has seen too many Michael Bay films," said Albertson. "It's no laughin matter though. Many people trust the New York Times, so that story becomes fact for a lot of people, and the body of science knowledge is harmed."

Even worse was a story in the Chicago Tribune about global climate change. One passage describing the melting of the polar ice caps said, "Whales support the rising oceans, because it gives them deeper water to swim in. Sharks on the other hand would be confused by the increased volume of water."

Albertson just shook his head sadly at that one.

Melanie Hogbarth, a science columnist for the Des Moines Register, defended scientific journalism. She said, "You can't expect us to know everything. Especially math, math is hard."

The effect is widespread from local papers to glossy science magazines. "It's no wonder that American students are falling behind the rest of the world. When they read things like, 'Snowflakes Can Cure Cancer' in the Discover. How can you blame them?" said Albertson.

Albertson said that education of reporters was the key. "If they were willing to learn how to use a calculator, and learn a few basic scientific principles, then it would eliminate almost half of the mistakes. Also, it'd be nice if they didn't rely on Wikipedia for their 'fact-checking.""

The good news for reporters was that over 42% of the stories were completely accurate.

Used with permission from the author. BBspot is the number one internet site for geeks, digerati, and otherwise web-savvy individuals.

BBspot.com - "Satire for Smart People; The Truth for You"

New Upgrades Will Bring Web 2.0 Functionality to "Hubbl" Space Telescope

Brian Briggs, BBspot.com

Houston, TX – New upgrades to the Hubble Space Telescope will make the telescope 90 times more powerful and also add Web 2.0 functionality on the companion Web site "hubbl."

"It's time to bring the project into the 21st century," said NASA project manager Damon Evans. "Sure, top scientists have great ideas, but so do people on the Internet. Why not open it up to them? We're also adding a social networking aspect. Were there any other buzzwords I left out?"

Evans said that people could submit their own theories about the data that Hubble collects, and the most "hubbled" will "gain wide acceptance by the scientific community. Who knows maybe we'll get a good theory to challenge the Big Bang!"

Even the direction the telescope points will depend on the users of Hubbl.com. "We'll set the controls to whatever is the most popular coordinates are for that day," said Evans. "I do want to note that we're not turning the telescope toward Earth, so unfortunately no Jessica Alba beach shots will be available."

Many in the science community who rely on the Hubble Telescope for their research were not pleased, including Tom Richmond, an astrophysicist at Stanford, who said, "I don't want my research on the time-distortion properties of tachyon-field emissions to be derailed, because some kid thinks black holes are cool. That's not how science should work."

In addition to the exciting science aspects of the upgrade, people will also be able to "friend" stars and galaxies that they like, and if aliens from those areas ever contact Earth they'll be notified in their "HubbleFeed."

The ambitious plan hopes to bring more participation from young people. Profits from advertising on the site will fund the "Hubble Space Laser Cannon" project which will be used to destroy incoming asteroids and the upcoming invasion from the Andromeda galaxy.

Used with permission from the author. BBspot is the number one internet site for geeks, digerati, and otherwise web-savvy individuals.

BBspot.com - "Satire for Smart People; The Truth for You"



Note: These articles are courtesy NASA Space Place Program at the Jet Propulsion Laboratory.

No Mars Rock Unturned

by Patrick L. Barry

Imagine someday taking a driving tour of the surface of Mars. You trail-blaze across a dusty valley floor, looking in amazement at the rocky, orange-brown hillsides and mountains all around. With each passing meter, you spy bizarre-looking rocks that no human has ever seen, and may never see again. Are they meteorites or bits of Martian crust? They beg to be photographed.

But on this tour, you can't whip out your camera and take on-the-spot close-ups of an especially interesting-looking rock. You have to wait for orders from headquarters back on Earth, and those orders won't arrive until tomorrow. By then, you probably will have passed the rock by. How frustrating!

That's essentially the predicament of the Spirit and Opportunity rovers, which are currently in their fourth year of exploring Mars. Mission scientists must wait overnight for the day's data to download from the rovers, and the rovers can't take high-res pictures of interesting rocks without explicit instructions to do so.

However, artificial intelligence software developed at JPL could soon turn the rovers into more-autonomous shutterbugs.

This software, called Autonomous Exploration for Gathering Increased Science (AEGIS), would search for interesting or unusual rocks using the rovers' low-resolution, black-and-white navigational cameras. Then, without waiting for instructions from Earth, AEGIS could direct the rovers' high-resolution cameras, spectrometers, and thermal imagers to gather data about the rocks of interest.

"Using AEGIS, the rovers could get science data that they would otherwise miss," says Rebecca Castaño, leader of the AEGIS project at JPL. The software builds on artificial intelligence technologies pioneered by NASA's Earth Observing-1 satellite (EO-1), one of a series of

technology-testbed satellites developed by NASA's New Millennium Program.

AEGIS identifies a rock as being interesting in one of two ways. Mission scientists can program AEGIS to look for rocks with certain traits, such as smoothness or roughness, bright or dark surfaces, or shapes that are rounded or flat.

In addition, AEGIS can single out rocks simply because they look unusual, which often means the rocks could tell scientists something new about Mars's present and past.

The software has been thoroughly tested, Castaño says, and now it must be integrated and tested with other flight software, then uploaded to the rovers on Mars. Once installed, she hopes, Spirit and Opportunity will leave no good Mars rock unturned.

Check out other ways that the Mars Rovers have been upgraded with artificial intelligence software at http://nmp.nasa.gov/TECHNOLOGY/infusion.html#sciencecraft.



Are these rocks of any scientific interest? With the new AEGIS software, the Mars Rovers, Spirit and Opportunity, will be able to judge for themselves whether a scene is worth a high-resolution image. (Artist's rendering.)



ROGER B. CHAFFEE PLANETARIUM

Public Museum, Grand Rapids

Show Schedule Through February 15, 2008

For general audiences and families

EVERYBODY'S SKY: STAR STORIES FROM AROUND THE WORLD – Celebrating the opening of the museum's new permanent exhibit, *Newcomers*, the Chaffee Planetarium presents sky stories originating from among the many cultures that are part of West Michigan. **30 minutes**SHOWTIMES: Daily at 2:00 pm

UNDER STARLIT SKIES – The planetarium operator takes the audience on a live tour of the night sky, pointing out prominent stars, constellations, and planets visible tonight. Current astronomical events, including a total eclipse of the moon on February 20th, are also illustrated. **30-40 minutes**

SHOWTIMES: Saturday and Sunday at 3:00 pm

Added Value: This show is free with paid Museum admission; or arrive after 2:30 p.m. for the planetarium show only and pay only \$3.00/ person.

For Families and Children

THE LITTLE STAR THAT COULD – A young star goes on a quest to find a family of planets and learn his special name. Along the way he learns about the different features of the universe, including planets, stars, clusters and galaxies. **35 minutes**

SHOWTIMES: Saturday and Sunday at 1:00 pm

Show Schedule February 15 - March 1, 2008

For General Audiences and Families:

TO BOLDLY GO – Famous explorers from across history tell the story of their voyages and discoveries in their own words. From China, to America,

Antarctica and even a future voyage to Mars, visitors will hear the personal hardships and triumphs of exploration. **45 minutes**

SHOWTIMES: Daily at 2:00 p.m.

UNDER STARLIT SKIES – The planetarium operator takes the audience on a live tour of the night sky, finding the prominent stars, constellations, and planets visible tonight. Current astronomical events are also presented. **30-40 minutes**

SHOWTIMES: Saturday and Sunday at 3:00 p.m.

Added Value: This show is free with paid Museum admission; or arrive after 2:30 p.m. for the planetarium show only and pay only \$3.00/ person.

For Families and Children:

MAPPING THE SKY – See how ancient and modern people used the sky to navigate. Learn how the stars can be used to find directions and location on the Earth. **30 minutes**

SHOWTIMES: Saturday and Sunday at 1:00 pm NOTE: The Chaffee staff may integrate celestial maps into Under Starlit Skies. In this event, *the Friendly Stars* will instead be run as the 1:00 show.

Laser Light Show Programming:

RUSH – In this all new show, a new lineup of Rush's greatest hits comes to the Chaffee Planetarium. **50 minutes**.

SHOWTIMES: Saturdays, 9:00 p.m.

WISH YOU WERE HERE – Welcome to the machine! The Pink Floyd's tribute to their former band member, the now deceased Syd Barrett, joins the Chaffee line-up with an array of breathtaking effects. Shine on you crazy diamond! **45 minutes**.

SHOWTIMES: Saturdays, 10:00 p.m.

Grand Rapids Amateur Astronomical Association Membership Application or Renewal Form

DATE:				
	New Membership	Renewal		
Please fill out the information below as <u>completely</u> as possible. For Family memberships, please include all persons for whom membership is desired.				
Please Print				
Name:		Birthdate:		
Address:				
City:		State: Zip:		
Home Phone:		Cell Phone:		
E-Mail:				
□ Adult (18 or older, a Minimum of \$40.00)				
□ Observatory Endowment Fund				
OBSERVATORY USER FEE: (a Minimum of \$25.00 per user)\$(Contributions of more than \$25 will help meet repairs and upgrade of equipment costs.) If you are a qualified user of the Veen Observatory, and wish to remain so, check the box for "User Fee."				
TOTAL ENCLOSI	ED (From all categories abo	ve)	\$	

Make Check or Money Order to:

GRAND RAPIDS AMATEUR ASTRONOMICAL ASSOCIATION (or GRAAA)

Mail to: Jerry Persha, GRAAA Treasurer 199 Smith St. Lowell, MI 49331

Grand Rapids Amateur Astronomical Association 3308 Kissing Rock Ave. SE Lowell, MI 4933I-89I8