The Michigan Earth Scientist

These teachers are ready for the International Year of Astronomy - Are You?

In This Issue

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THE JOURNAL OF THE MICHIGAN EARTH SCIENCE TEACHERS ASSOCIATION

From the Editor

This issue features a special section on Earth & Space Science sessions that will be held at the Michigan Science Teachers Association Conference in Detroit this March. Some sessions will be presented by MESTA members, others by representatives from other organizations. I'll be doing a session on Infrared Asrtonomy, Tabby Eldredge will be doing one on Southwest Astronomy. Check it out - and attend something to recarge your batteries after a long cold winter.

The cover photo is a group shot of last summer's telescope making workshop at SVSU conducted by MESTA member Kevin Dehne with funding from the Stoney Grant program. Kevin has led many of these workshops over the past few years and now teachers and students all over Michigan can enjoy the wonders of the night sky with these excellent Dobsonian telescopes. I have one as well - which I gave my son. I didn't make it, I won it in one of our raffles. We still enjoy it very much!

2009 is the International Year of Astronomy. In this issue we have an article from one of our board members on how he teaches his students about planets and plutoids, as well as exoplanets. Do you have a lesson plan you'd like to share in the next issue? Just let me know. I always appreciate new, interesting content for our journal.

As part of IYA 2009, NOAO and a number of partner organizations have developed the Galileoscope Project. Four hundred years ago Galileo first looked at the heavens with a telescope and firmly placed the Sun at the center of the solar system with the observations he made. It is the goal of the Galileoscope Project to put inexpensive quality telescopes into the hands of as many children around the planet as possible. I was able to check out a prototype at the American Astronomical Society's 2009 meeting in Long Baech, CA recently and was impressed. If they can deliver these telescopes for the ~ $10 cost they are planning on I hope to get one for each camper that takes my astronomy classes this summer at Camp Watonka. You can get on a mailing list for more information at this URL: www.galileoscope.org/.

Another way that you could participate in IYA 2009 would be participation in local or regional star parties. Every fall the Sunset Astronomical Society holds a star party called the Great Lakes Star Gaze at the River Valley RV Park near Gladwin. Watch their website: www.greatlakesstargaze.com/glsg6.html for information on this coming fall's event. If you can't come that far, organize a star party in your area

You could even do something as simple as taking your students outside (when you know it will be visible!) and show them that the Moon cab be seen in the day time. You'd be surprised how many people don't know that it can be seen.

Take a minute, go outside at night and enjoy the show. If we're lucky, you may even see a new comet in late February.

Cris L. DeWolf, Editor, the MES

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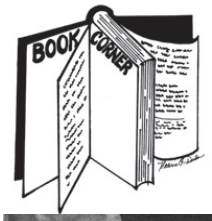
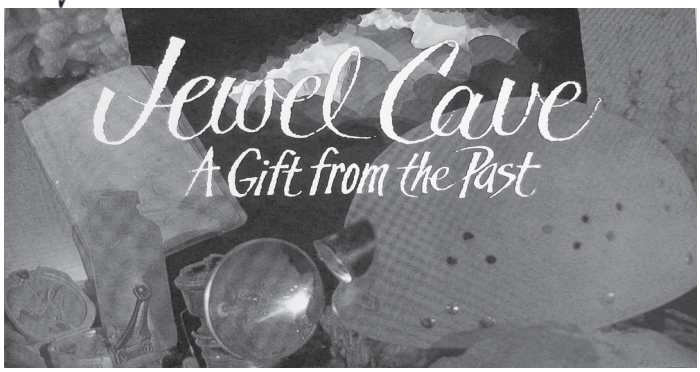
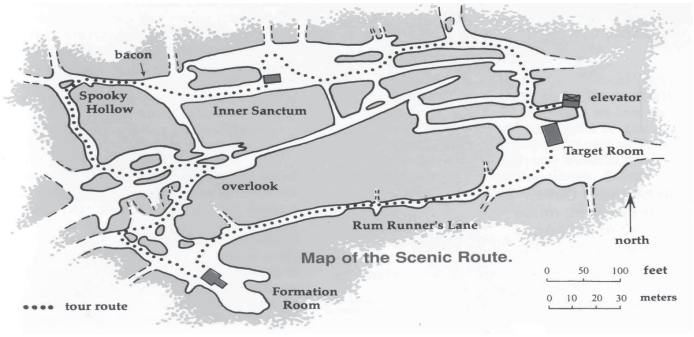




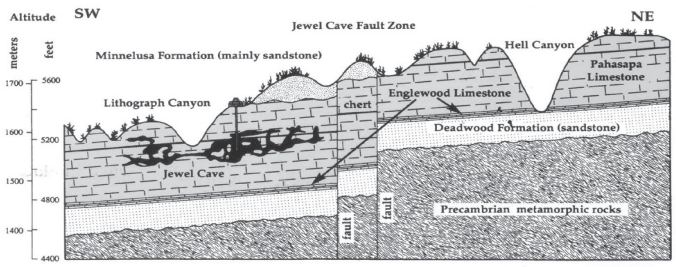
Jewel Cave - A Gift from the Past; Arthur N. Palmer; 2004; Black Hills Parks and Forest Association; 58 pages in 13 sections, Suggested Reading; paper pamphlet; $8.95. (available from: Black Hills Parks and Forest Association Wind Cave National Park, 26611 U.S. Highway 385, Hot Springs, SD 57747 Phone: 605-745-7020)

This little beautifully colored booklet does a nice job of explaining the features, origin and geology of Jewel Cave located in South Dakota's Black Hills. The images are outstanding and represent the decorations in one of the most spectacular caves I have ever visited. Jewel Cave - A Gift from the Past is worth the price just for the pictures.

Palmer, a professor of Geology at the State University of New York and cave explorer, introduces the reader to Jewel Cave's discovery (in 1900), exploration, and mapping. After President Theodore Roosevelt established Jewel Cave National Monument in 1908, the National Park Service assumed responsibility in 1933 and began developing portions to allow easy access for visitors. Details on various tours, there are four, include maps illustrating several aspects of the cave's 125 plus miles of passageways.



Jewel Cave map The hour and a half Scenic Tour enters via an elevator at the visitors center and traverses one of the most interesting portions of the Jewel Cave.



Jewel Cave x-section This cross section illustrates the location of Jewel Cave in the Pahasapa Limestone that overlays the Precambrian rocks which form the core of the Black Hills.

Two sections discuss the deposition and nature of the Mississippian Pahasapa Limestone, the formation where Jewel Cave has formed. After a brief introduction to igneous and metamorphic rocks, the origin and subsequent history of the Black Hills is discussed. Groundwater and its role in development of the cave is followed with a nice discussion of how carbonic acid forms and dissolves limestone.

Finally, an extensive review of cave deposits and decorations rounds out the description of the nature of Jewel Cave. Nailhead cave linings, cave pearls, flowstone, dripstone, helicites, cave popcorn and a bunch of other interesting decorations are detailed and illustrated with outstanding pictures. One of the most amazing features is the extremely rare hydormagnesite balloons. Although these are poorly understood, one idea is they are formed when

carbon dioxide gas inflates the pasty hydromagnesite forming bubble-like balloons.

In the final sections Palmer reviews several ideas offered to explain the origin and geologic history of Jewel Cave. It appears that the usually accepted mode of limestone cave formation, solution by acid bearing groundwater, does not fit the geology in this case. In fact, "Black Hills caves were formed in a way that was quite different from nearly all others in the world." A nice series of cross-sectional sketches reviews the geologic history starting with deposition of the Pahasapa Limestone to the recent erosion of the Tertiary White River sediments that buried Black Hills caves more recently.

This little booklet does a nice job of describing this unusual cave, especially the images it contains.
Review by K R. Cranson

Save the Date!
June 16 and 17, 2009

Advancing Teacher Leaders in Space Science

workshop at Central Michigan University,
Mount Pleasant, Michigan

Each teacher receives professional development in the entire GEMS Space Science Sequence for Grades 6-8, one set of teacher's guides and CD-ROMS, and breakfast and lunch each day. More information can be found on the Central Michigan GEMS Education Center website: http://gems.cmich.edu, by emailing gems@cmich.edu, or by calling 989-774-1710. Up to 30 teachers will be accepted for this professional development. Applications for teachers will be accepted beginning March 9, 2009. More details to come.

Meet the Board

We kick of this new feature of the MES with one of our newer board members, Eric Kennedy.

As the relatively new guy on the block I'd like to take a minute and introduce myself…so here's a little bit about the guy who keeps all your membership data under control. I've been a MESTA member since the mid-90's, mentored under Jay Sinclair when he still had hair and currently teach at South Lyon High School. I'm married and have a wonderful daughter who turns four years old this spring. I love bass fishing and the outdoors in the spring and summer and woodworking in the winter.

Last summer we lost a true champion of Earth Science, Art Weinle. I'm not sure if every MESTA member knows exactly just how much "behind the scenes" effort our friend Art spent to make this organization hum, but let me assure you that it is an immense task filling his shoes…Art wore many hats. I'm proud to take the reins in keeping your membership data current and accurate, get the Michigan Earth Scientist mailed on a quarterly basis and oversee your conference registrations. Those are my three main tasks as membership chair.

Now that I have a few months and a few extra pounds under my belt, I noticed a few things that warrant a brief mention…

1. Expired memberships – almost 25% of our memberships have expired! You will receive a sticker on your MES newsletter if you membership has expired, or will be expiring soon. Please heed this friendly reminder and renew your membership…as soon as possible. I will happily update our records after our treasurer, Amanda Pata, has taken care of your payment. If ever you don't receive a newsletter, it's probably because your membership has expired, or your newsletter was returned by the USPS…
2. Have you moved? Changed schools, districts, or teaching assignments, phone numbers or e-mail address? If so, please notify me as soon as possible so our database can be updated. I'd like to ensure that any mailings and notifications we send you via USPS as well as e-mail will arrive correctly in a timely fashion. Please let me know if you've had a change in e-mail address, home address, or phone numbers.
3. I've inherited several boxes of recent as well as not-so-recent membership paperwork. In this period of transition, please bear with me as I familiarize myself with what's all there. I'm sure we'll find some errors along the way and things I have forgotten to take care of…but remember…baby steps. I also keep the MES newsletter archive - almost every MES newsletter ever printed...I think. If you need an old article, I can look it up for you and get a copy to you…if the original exists.

The best way to contact me is through my home e-mail: ekennedy3120@charter.net.
Don't worry…you're information is safe! We'll never give your personal information to anybody else. We'll use it for MESTA business only.

Your MESTA Membership Chair…

Eric Kennedy

Science in the News

….a compilation of current events in the Earth & Space Sciences

How to Cool the Planet, Manually

A recent study published in the journal *Atmospheric Chemistry and Physics Discussions* offers 17 schemes for cooling the planet. Roughly half of the plans involve changing the albedo, or reflectivity, of the Earth. Others include a variety of plans for removing greenhouse gases such as carbon dioxide from the atmosphere. For the complete article check out the American Association for the Advancement of Science's online weekly magazine ScienceNOW at - http://sciencenow.sciencemag.org/cgi/content/full/2009/128/1.

Astronomers Get a Sizzling Weather Report From A Distant Planet

Data taken with the Spitzer Space Telescope of HD 80606b, a planet orbiting a star 200 light years from Earth has been fed into a sophisticated atmospheric modeling program to reveal what conditions are like for the planet's weather system. The planet's extreme orbit brings it close and then far from the planet over the course of its year – powering immense storm systems stronger than anything ever seen on Earth. For the full story go to: http://www.sciencedaily.com/releases/2009/01/090128132639.htm.

Shell Tectonics May Explain Mars Mystery

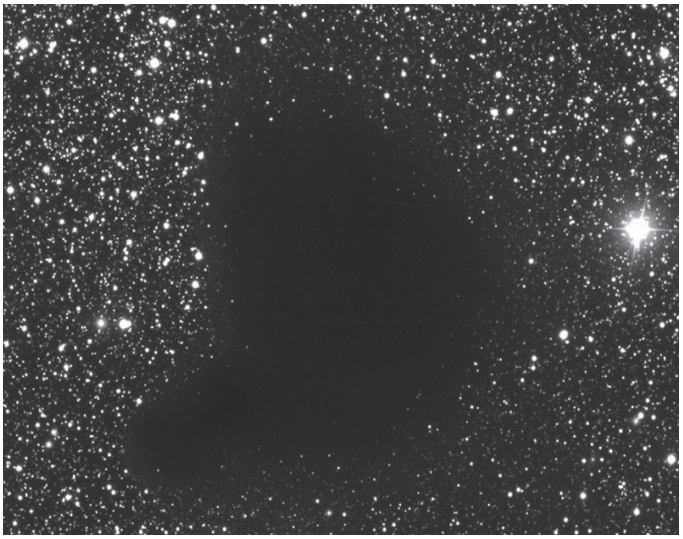
The crust of Mars may be a single tectonic shell. Motion of the crust across a source of upwelling may help explain the Tharsis Rise – a chain of volcanic mountains, among other features of the Martian surface. According to one researcher, the mantle plume (or plumes) of Mars may still be active. For the full story go to the American Geological Institute's EARTH website: http://www.earthmagazine.org/earth/article/1b7-7d9-1-10.

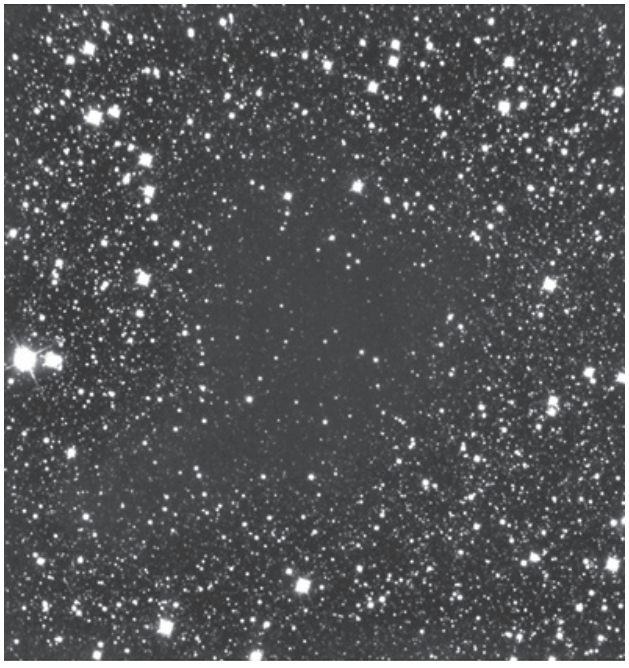
Early Warning Systems Underestimate Magnitude of Large Earthquakes

Scientists from Ireland and Italy recently looked into whether or not the magnitude of an earthquake can be determined at the beginning of the quake. Their method worked for small to moderate earthquakes, but not for quakes larger than magnitude 6.5. For the full story go to the ScienceDaily website: http://www.sciencedaily.com/releases/2009/01/090128160818.htm

Dark Nebulae

The images below are of Barnard 68, a dark molecular cloud only about 500 light years from Earth. BOTH of the images are of Barnard 68. WHY can you see more stars in one image than in the other??



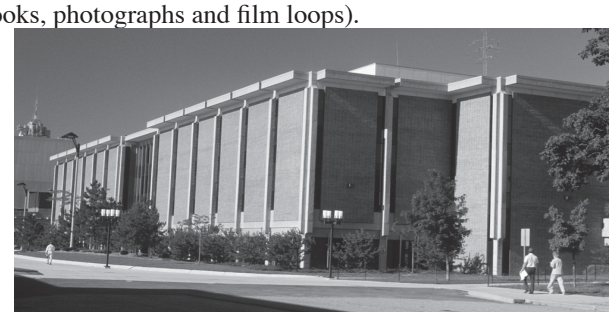


The top image was taken using visible wavelengths. The bottom image was taken using infrared wavelengths.

Out of the Past

Fall 1968

What was happening with the Michigan Earth Science Teachers Association forty years ago during the fall season? The forth issue of volume IV of the Michigan Earth Scientist was published in September, 1968. It was only two pages, but included the annual Fall MESTA Conference agenda, a map of the Lansing Community College campus (where the conference was held) and an Application for MESTA Membership. In addition to details on the conference, the issue announced the election of new officers, a 35 mm slide exchange, other meetings of interest to earth science teachers and several new instructional materials (books, photographs and film loops).



A&S Building - All sessions at the 1968 Fall MESTA Conference were held in the Lansing Community College's Arts and Science Building. This facility had just been constructed and included a planetarium and observatory.

November 2 was set as the conference date - these early gatherings were limited to a single Saturday. The keynote speaker for the Fall Conference was Mr. Garland Ells, a petroleum geologist with the Michigan Department of Conservation (before that department was reorganized). Ells was probably the most knowledgeable petroleum geologist in Michigan. He presented an overview of Michigan's petroleum production, exploration and potential for the future. Other presentations included a review of a recent survey of Earth Science Education in Michigan, using slides for evaluation in the classroom and use of planetarium in Earth Science Education. The day concluded with the annual MESTA Business Meeting and election of new officers for the next year. All sessions were held in the new Lansing Community College's Arts and Science Building.

LCC Telescope - Participants at the 1968 Fall Conference toured the LCC Observatory to inspect the 20 inch Schmidt-Cassegrain telescope. Both the observatory and planetarium served as resources for earth science teachers and their students in the central Michigan region.

The Michigan Earth Science Teachers Association's Proposed Constitution was prepared and presented for approval a year earlier at the December 9, 1967 Fall Conference. Article II established the purpose of the organization with this statement:

The purpose of the Michigan Earth Science Teachers Association shall be the advancement, stimulation, extension, improvement, and co-ordination of earth science education at all education levels.

Initial officers were set as an Executive Chairman, Secretary and Editor-Treasurer. Win Lindeman, Portage Northern High School was the first executive officer of MESTA. Grosse Point University Schools' William Hindle became Executive Secretary, and Rod Cranson at Lansing Community College was Editor-Treasurer. This first group of MESTA officers were charged with development of the MESTA Constitution.

MESTA officers elected for the 1968-70 school years were:

Ernest Fischer, Jackson East Jr. High - Executive Chairman
Virginia Chamberlain, Ovid-Elsie High School - Executive Secretary
Rod Cranson, Lansing Community College - Editor-Treasurer
Paul Meyers, Flint Community College - College Section Representative

MESTA began participation in other science meetings and members were encouraged to attend several during the year. Plans were made for the Michigan Science Teachers Association scheduled for Lansing in early March, 1969. Three sessions for that gathering featuring earth science topics were sponsored and prepared - half of the eight sessions on earth science topics were presented. A booth was requested and planned for distribution of free earth science materials (the first Free and Inexpensive?) and to sign-up new MESTA Members. In addition, a MESTA meeting was held in the afternoon to meet other earth science teachers and discuss several items of association business.

These early years of the Michigan Earth Science Teachers Association were exciting times, but I had no idea that it would develop into the vibrant organization we have today!

Rod Cranson, MESTA Historian

Our Growing Solar System – Is Your Astronomy Curriculum Up-To-Date?

Even though the new Michigan Earth Science standards do not include room for much discussion of our solar system's planetary groupings (at the high school level), most of us probably find a way to include some information on the current status. Are you current on the latest solar system news?

In addition to the four terrestrial planets and four Jovian planets, the International Astronomical Union (IAU) created a new class of planets called dwarf planets in 2006. In 2008, the IAU created a sub-group of dwarf planets called "plutoids". All dwarf planets that are similar to Pluto will receive this designation. As we start 2009 we now have five dwarf planets, four of which are designated as plutoids. Only Ceres, located in the asteroid belt between Mars and Jupiter is not classified as a plutoid. Eris, Haumea, and Makemake have joined Pluto as members of the plutoid sub-group.

Haumea and Makemake represent a new naming scheme for planets. Greek and Roman mythological heroes used to name the "original' eight planets (and Pluto) have been joined by Hawaiian (Haumea) and Easter Island (Makemake) gods and goddesses. A number of other Trans-Neptunian Objects (TNOs) may eventually be classified as dwarf planets.

In addition to the growth of planets in our own solar system, we have now cataloged over 330 extrasolar planets (planets found orbiting stars other than our own Sun). As our telescopes become even more powerful, additional planets are constantly being added to this list. Even with these improved telescopes, we cannot see planets orbiting other suns directly. As techniques improve in the area of spectroscopy, we can expect that even more extrasolar planets will be discovered. For a complete listing of discovered extrasolar planets, check out The Extrasolar Planets Encyclopaedia website (www.exoplanet.eu).

Earth & Space Science Sessions at MSTA 2009

Refer to this handy guide to plan your days at this year's MSTA conference in Detroit.

Friday Sessions

8 AM to 8:45 AM

Escape From the Dead Zone! Learn About the Great Lakes!
Steve Stewart - Michigan Sea Grant
What is the best way to learn about the Great Lakes? On one of Michigan Sea Grant Extension's educational cruises! Ask about available scholarships. Don't miss the boat!

Water You Doing?
Christine Spitzley - MI Section of AWWA
Learn new ways to present water resource education using tried and tested hands-on activities that won't break your budget. Each activity linked to "real life" career.

9 AM – 9:45 AM

Solar System - Interesting Facts and Stories You May Not Know
Dave Knopp
This session covers interesting and sometimes funny facts and stories about each planet. Session is based on presenter's manuscript "Secrets of the Planets". Handouts provided.

The International Polar Year, What's Happening in The Arctic and Antarctic?
Dwight Sieggreen - Hillside Middle School, Gary Gardolfi - Northville PS
I will share current information on the International Polar Year.

10 AM – 10:45 AM

Comparing the Grand Rapids Press to Michigan's HS Graduation Requirements
Kristy Butler - Stephen Mattox, Grand Valley State University
We share data from the Grand Rapids Press to show that science literate citizens need training in Earth Science and suggest Earth Science be required in high school graduation requirements..

Materials of the Earth
Cookie Rathkamp
Students will identify earth materials and their uses.

11 AM –11:45 AM

Earthwatch, Get Wild, Wet and Dirty
Claudia Seldon
Concerned about our world's environment, wildlife and cultural heritage? Help scientists in over 50 countries find real solutions. Archeology to zoology conservation to world health. Hands-on experience. Teacher grants available.

Exploring Southwest Astronomy
Therese-Anne Eldredge
Interested in astronomy? Come learn about Astronomy of the Southwest and how to bring it into your classroom and about the MESTA Cranson Scholarship for teachers new to Earth Science.

Making It Almost Real: Comparing and Contrasting Watershed in Michigan (CCWIM)
David Bydlowski
Join in as we bring teachers/students from the Upper Peninsula and Lower Peninsula, virtually, working collaboratively on an environmental issue/unit that emphasizes the use of technology to collect, analyze, and report data

Sandfastic
Lynda Wiltse
See it, size it, sort it. Using fee sand samples participants will explore weathering, erosion and sand composition.

The Dam Problem: A Michigan Case Study on River Erosion
William Hodges
Using mini-stream tables and USGS data, participants will walk through a small unit that explores stream erosion and how the sudden "dropping" of the dam on the Pigeon River damaged the river.

Touch Nature, See Science - Educational Experiences with the Huron-Clinton Metroparks
Michelle Serreyn - Huron-Clinton Metroparks
In the Detroit metro area, the Huron-Clinton Metroparks offer onsite and outreach nature and science programs for all ages. Come and explore Michigan's ecosystems first hand with your students.

2 PM– 2:45 PM

Weather Sense with AIMS: Hands-On Moisture
Anne Marie Muto
This hands-on session will show a series of investigations which lead to the discovery of moisture and how it cycles consistently throughout our world. Participants will walk away with several classroom ready activities, which cover Michigan Grade Level Content Expectations.

3 PM– 3:45 PM

FREE Internet Sites and Programs to Use in Your Classroom
Karen Malloy
Learn to use FREE on-line programs in your classroom to collect assignments, create more creative activities and more. Featured programs will be Moddle, Google, Photobucket, Slideshere and TeacherTube.

To The Moon, Mars, and Beyond: Space Science Activities
Kathy Godin
See what NASA is up to. Learn how to utilize space exploration to introduce and/or reinforce scientific concepts. Hands-on activities and lots of resources provided.

4 PM – 4:45 PM

How Do I Differentiate in an Earth Science Classroom?
Marcilynn Misaros - Fort Gratiot Middle School
This session will provide teachers with ideas and handouts to assist them in creating a differentiated learning environment for all learners in the earth science classroom.

Weather Sense with AIMS: Hands-On Air Pressure and Wind
Jessica Wagenmaker - Holton Middle School
This hands-on session will show a series of investigations which lead to the discovery of air and, particularly, evidence of air pressure. Participants will walk away with several classroom ready activities, which cover Michigan Grade Level Content Expectations.

WMU Core Kids Know What's Underfoot In Michigan!
Susan Grammer - MI Geological Repository
Jennifer Lindquist - Western Michigan University
Our classroom presentations and web content can help teachers to bring Michigan's geology alive for their students. Hands-on activities and demonstrations. Hand-outs are available.

Saturday Sessions

8 AM -8:45 AM

Explore the Great Lakes Without Getting Wet! Use Real-time Data!
Nichole Koehler - Michigan Sea Grant
Learn how to use real-time Great Lakes data in your classroom and take your students on a virtual Great Lakes research cruise. New lessons and handouts provided. Welcome aboard!

9 AM – 9:45 AM

Activities to Discover Your Students' Perceptions of Geologic Time
Michelle Frasco - Stephen Mattox, Grand Valley State University
Teachers will complete two activities to gain insights into how students think about the age of geologic materials, duration of geologic processes, and the progression of life on Earth.

The Earth Spins
Stacy Biscorner - Central Middle School
Monica Hartman - St. Clair County RESA
Explore hands-on activities that will help your students learn the 4th grade Patterns in the Sky GLCE's (rotation and revolution) and 5th grade Earth Systems GLCE's (session). Handouts are provided.

The Latest and Greatest In Telescopes
Norbert Vance - Eastern Michigan University
A plethora of quality, low cost telescopes can be purchased today. How do you choose the right one? One lucky participant will win an 8-inch Dobsonian telescope compliments of EMU.

WMU Core Kids Know What's Underfoot In Michigan!
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Our classroom presentations and web content can help teachers to bring Michigan's geology alive for their students. Hands-on activities and demonstrations. Hand-outs are available.

10 AM -10:45 AM

Earthwatch, Get Wild, Wet and Dirty
Claudia Seldon - Earthwatch Institute
Vendor Session
Primary Subjects: Biology, Earth Science
Interest Level: College, High School, Later Elementary, Middle Level
Location: Nicolet B
Concerned about our world's environment, wildlife and cultural heritage? Help scientists in over 50 countries find real solutions. Archeology to zoology conservation to world health. Hands-on experience. Teacher grants available.

Plate Tectonics: Exploring Hawaiian Shield Volcanoes
Lisa Jones - Carolina Biological Society
Vendor Session
Primary Subjects: Earth Science
Interest Level: Middle Level
Location: Cadillac A
In this session you will use a model volcano to explore important features of Hawaiian shield volcanoes and investigate the relationship between the viscosity, temperature, and speed of lava flow.

Teacher - Ranger - Teacher: Connecting Educators and National Parks
Lisa Myers - Sleeping Bear Dunes National Lakeshore
Dennis Yockers - University of Wisconsin
Primary Subjects: Environmental Education, Instruction/ Pedagogy
Interest Level: Early Elementary, High School, Later Elementary, Middle Level
Location: Joliet A
Learn about the National Parks Service's Teacher - Ranger - Teacher Program that offers teachers a chance to be rangers for the summer in places such as Sleeping Bear Dunes National Lakeshore!

Visualizing the Impact of Burning Coal
Molly Hazel - Stephen Mattox, Grand Valley State University
SB CEU Session
Primary Subjects: Earth Science
Interest Level: College, High School, Middle Level
Location: Richard A
Coal is Michigan's primary method for generating electricity. Help students visualize coal's impact by using activities to assess personal consumption and mercury emissions. Handouts provided.

11 AM – 11:45 AM

Exploring the Timing and Location of the Next Hawaiian Volcano
Joe Russo - Stephen Mattox, Grand Valley State University
SB CEU Session
Primary Subjects: Earth Science
Interest Level: College, High School, Middle Level
Location: Richard A
Using hands-on activities participants calculate the location and timing of the next volcano to develop on the ocean floor southeast of the Island of Hawaii.

Infrared Astronomy: Seeing the Invisible
Cris DeWolf - Chippewa Hills HS
SB CEU Session
Primary Subjects: Earth Science
Interest Level: College, High School, Middle Level
Location: Cadillac A
Through hands-on activities participants will learn more about how different wavelengths of light can be detected. Handouts will be provided. Learn more about the Spitzer Teacher and Student Program.

Michigan Science Supernova Search
David Cinabro - WSU-Dept. of Physics & Astronomy
Primary Subjects: Physics
Interest Level: College, High School, Middle Level
Location: Mackinac West
I will describe a school based supernova search being developed at Wayne State. Multiple schools take search data which is then centralized and shared among all the participants.

1 PM – 1:45 PM

Black Holes and the Universe - How the LHC Recreates the Beginning of Time
Rene Bellwied - WSU . Dept. of Physics
Primary Subjects: Physics
Interest Level: College, High School, Middle Level
Location: Mackinac West
I will present the primary physics motivations and discovery opportunities for the Large Hadron Collider at CERN in Geneva, Switzerland.

Come, See, Get & Go - GEMS Share-a-thon
Cheryl Czarnik - Davis Jr. HS
Michelle Kirkland - Mt. Clemens MS
Deb Zolynsky - Kennedy MS
Denise Hirschmann - Davis Jr. HS
Primary Subjects: General Science
Interest Level: Middle Level
Location: Marquette A
Come and see some of the guides offered by GEMS. Get lessons to use with the guides and then go to another session.

Controversial
Janice - Schwartz
SB CEU Session
Primary Subjects: Earth Science
Interest Level: Later Elementary, Middle Level
Location: Cadillac A
This presentation addresses current issues and scientific models connected with wide applications of corn usage.

Hands-on Exploration of Population, Consumption and Our Changing Climate
Kristy Brugar
SB CEU Session
Primary Subjects: Environmental Education
Interest Level: Middle Level
Location: Brule B
Engage in innovative, hands-on activities to make the connections between human population growth, resource consumption and climate change. Free activities CD-ROM!
Motion Commotion
Suzanne O.Brien - Chippewa Valley Schools
Sharon Moats - Seneca MS
SB CEU Session
Primary Subjects: Earth Science
Interest Level: Later Elementary
Location: Richard A
Using everyday objects, participate in hands-on activities that teach many of the Earth in Science and Time GLCE's for 4th and 5th grade.

The Amazing Race-a-lesson On How to Use Compasses
Patricia Hartshorn - Susan Everett, U of M Dearborn
SB CEU Session
Primary Subjects: Environmental Education, Earth Science
Interest Level: College, High School, Later Elementary, Middle Level
Location: LaSalle B
Participants will compete in an amazing race while learning how to use compasses. Since the new GLCE's include compass instruction, we decided to model our lesson after the popular TV show.

2 PM – 2:45 PM

Earn 3 FREE Grad Credits - DataStream Ocean
Ronald Ferenczi
Primary Subjects: Environmental Education, Earth Science
Interest Level: College, High School, Later Elementary, Middle Level
Location: Cadillac A
Learn how you can earn 3 FREE graduate credits through an on-line course in physical oceanography and qualify to study at the U.S. Naval Academy.

NOAO
National Optical Astronomy Observatory
Kitt Peak National Observatory • Cerro Tololo Inter-American Observatory • NOAO Gemini Science Center
INTERNATIONAL YEAR OF ASTRONOMY 2009
THE UNIVERSE — YOURS TO DISCOVER
IAU USA NATIONAL NODE

Questions and Answers about the *Galileoscope* Program with *Galileoscope* (and U.S. International Year of Astronomy) Project Director Stephen Pompea
What is the *Galileoscope*?

The Galileoscope is
- An advanced educational telescope kit designed by a team of experts
- An educational program to accompany the kit
- A professional development program for teachers

- A cornerstone project for the International Year of Astronomy 2009, a worldwide effort in 123 countries led by the United States *Galileoscope* team

Why a Galileoscope for Science Education?
Astronomy is
- The perfect vehicle both to interest kids in science and to teach the basics of chemistry, physics, and even biology to elementary and middle school kids.

- A fantastic vehicle for teaching math skills

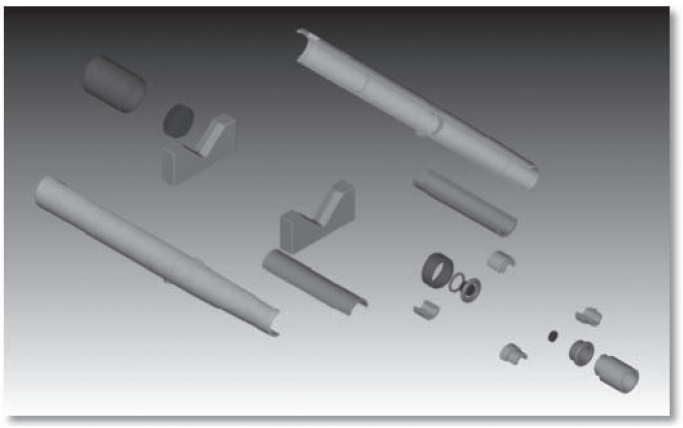
- A great way to show the scientific process-how observation and evidence lead to explanation about how the world works.

What is the International Year of Astronomy?
The General Assembly of the United Nations has designated 2009 as the International Year of Astronomy (IYA2009). This

year commemorates the 400th anniversary of Galileo's first astronomical observations through a telescope.

Who is on your team?
Some of the key team members are

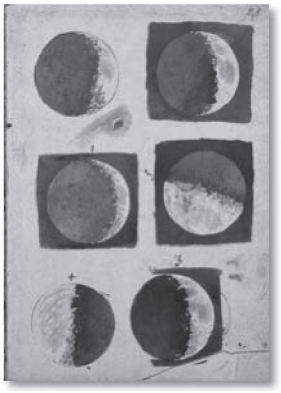
- Dr. Rick Fienberg, former editor of *Sky & Telescope*, now teaching at Andover
- Professor Doug Arion, from Carthage College, an expert in manufacturing
- Tom Smith, of Merit Models Inc., our manufacturing partner
- Rich Pfisterer and Dr. Scott Ellis, optical designers from Photon Engineering in Tucson
- Astronomy education experts Rob Sparks and Dr. Connie Walker from NOAO



Why a telescope kit?
Students experiment with lenses while building the telescope. This is a much more powerful learning experience than receiving an assembled telescope. They learn many aspects of optics and even have a chance to construct two types of telescopes-a more modern type and one identical to what Galileo used.

What can you see with the telescopes and what can be learned?
The best views are of the key objects Galileo observed that influenced his views on astronomy. The telescope is optimized to provide high-quality views of:

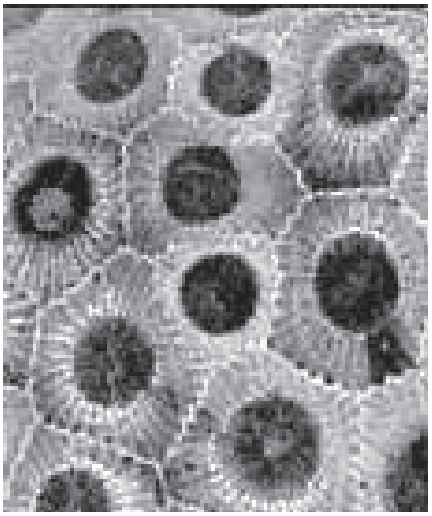
- Mountains and craters on the Moon, which revealed to Galileo that the Moon is a craggy world like Earth, not a smooth heavenly sphere.
- Four moons circling Jupiter, which revealed to Galileo that there can be more than one center of motion in the universe, and that aplanet can move through space without losing its satellites
- More stars in the Pleiades and Beehive star clusters than can be seen with the unaided eye, which revealed to Galileo that nature is filled with wonders never before imagined-literally more than meets the eye.
- Saturn's rings, which perplexed Galileo because his telescope wasn't good enough to show them clearly.
- Venus going through a complete set of phases, like the Moon, which showed Galileo that Venus orbits the Sun, not the Earth.



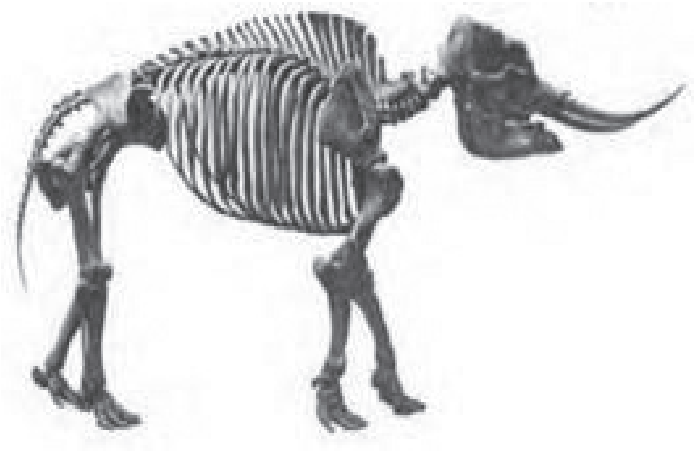
For more information contact Dr. Stephen M. Pompea Project Director, International Year of Astronomy 2009 National Optical Astronomy Observatory 950 N. Cherry Avenue Tucson, Arizona, 85719 U.S.A. Voice: 520.318.8285 Cell: 520.907.2493

MESTA Calendar of Events

February 18th, 2009	78th Anniversary of the discovery of Pluto – a planet, no a dwarf planet, no a plutoid!
March 3rd, 2009	GLOBE Training (Seasons) K-4 Teachers Detroit Zoo, Huntington Woods. Contact: David Bydlowski bydlowd@resa.net
March 5th-7th, 2009	MSTA Conference, Detroit Marriott Renaissance Hotel
March 19th – 21st	NSTA National Conference on Science Education. New Orleans, LA
March 20th 2009	Vernal Equinox 1:44 UT
May 3rd, 2009	MESTA Board Meeting, Lisa Bouda's
June 21th 2009	Summer Solstice 5:55 GMT
September 5th 2009	MESTA Board Meeting, Location to be determined
September 21st 2009	Autumnal Equinox
October 29th-31st 2009	NSTA Area Conference, Minneapolis, MN Session Proposal Deadline is April 15th.
March 18th-21st 2010	NSTA National Conference, Philadelphia, PA



State Rock - Petoskey Stone



State Fossil - Mastodon

The Michigan Earth Scientist is the official journal of the Michigan Earth Science Teachers Association, published quarterly.

Items to be considered for publication should be sent to the editor at cdewolf@chsd.us.

Microsoft Word documents in Times 10 are the preferred format. Any images should be sent as a separate jpeg file in grayscale – not color.

Deadlines for submissions are:
Winter – December 28th
Spring – March 28th
Summer – June 28th
Fall – September 15th